2014 WORK PLAN FINANCIAL SECURITY ESTIMATE FOR THE BAFFINLAND IRON MINES CORPORATION'S MARY RIVER PROJECT ACTIVITIES OCCURRING ON INUIT OWNED LANDS

December 18, 2013

Submitted to:	**QIKIQTANI INUIT ASSOCIATION**
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December 18, 2013

Mr. Stephen Williamson Bathory, Director
Department of Major Projects
Qikiqtani Inuit Association

RE: 2014 WORK PLAN FINANCIAL SECURITY ESTIMATE FOR BAFFINLAND IRON MINES CORPORATION' S MARY RIVER PROJECT

ARKTIS Solutions Inc. is pleased to provide the Qikiqtani Inuit Association with the above referenced document. We trust that the information presented in this report satisfies the requirements of the project.

Please do not hesitate to contact the undersigned if there are any questions or comments.

Sincerely,

ARKTIS SOLUTIONS INC.

Jamie VanGulck, Ph.D., P.Eng.
Chief Technical Officer, ARKTIS Solutions Inc.

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APPENDICES

ACRONYMS

A&R	Abandonment and Reclamation
ARKTIS	ARKTIS Solutions Inc.
BIMC	Baffinland Iron Mines Corporation
CLARC	Community Land and Resources Committee
IOL	Inuit Owned Lands
NEAS	Nunavut Eastern Arctic Shipping Inc.
NWB	Nunavut Water Board
OSPE	Ontario Society of Professional Engineers
QIA	Qikiqtani Inuit Association

1.0 INTRODUCTION

Article 19 of the Nunavut Land Claims Agreement establishes private ownership of selected surface and subsurface lands for Inuit. The Qikiqtani Inuit Association (QIA) is a landowner within the Qikiqtani (Baffin) region of Nunavut. Select components of Baffinland Iron Mines Corporation's (BIMC) Mary River Project (the Project) are, or are anticipated to be, situated on Inuit Owned Lands (IOL). Management of surface IOL parcels are managed by QIA, and in the case for the Project, this management is addressed through the Commercial Lease (Q13C301), agreed between the QIA and BIMC. Further, BIMC holds a Type A (2AM-MRY1325) and Type B (2BB-MRY1114) Water Licences with the Nunavut Water Board (NWB) for the Project that require further operational and closure requirements for the Project.

The Commercial Lease requires a reclamation security deposit, to be determined and held by QIA, for financial liability occurring on IOL as a result of the Project. A reclamation security amount of $26,200,000 is currently held by QIA as per Section 9.1 of the Commercial Lease. This initial reclamation security represents security held by QIA at the time the Commercial Lease was entered into, and reflects an estimate of the financial liability on IOL prior to 2013. Section 9 of the Commercial Lease requires QIA to determine (subject to arbitration if disputed by BIMC) an annual adjustment of the reclamation security amount based on all of the anticipated closure and reclamation costs at the end of the upcoming year. BIMC's 2014 Work Plan (BIMC, 2013a), as required under Section 6.1 of the Commercial Lease, provides descriptions of activities for the upcoming year. Section 9.2 of the Commercial Lease requires an updated estimate of the reclamation security amount to be submitted with the Work Plan.

The NWB also requires a reclamation security deposit to be held by the Minister for financial liability occurring on Crown lands and freshwater. Part C of the Type A Water Licence also allows for an annual adjustment of the reclamation security at the end of the upcoming year. In response to Schedule C of the Type A Water Licence, QIA is to participate in the NWB lead Annual Security Review process for the Project. Part of the Annual Security Review involves QIA presenting the amount of reclamation security held or to be held under the Commercial Lease specifically for IOL, in order to assist NWB in determining security to be held by the Crown.

The QIA has contracted ARKTIS Solutions Inc. (ARKTIS) to provide an estimate of the reclamation security associated with the 2014 Work Plan for IOL. Additionally, since no adjustment to the initial reclamation security occurred in 2013, a marginal increase in reclamation security associated with 2013 activities is also estimated. The estimates of reclamation security are for all activities (whether affecting land and water) occurring on IOL, and do not include any activities on Crown lands (e.g., Steensby Inlet, Mid Rail camp). The estimates also do not address the proposed Early Revenue Phase (ERP), pending actual licencing and permits of any specifically described activities by applicable regulatory authorities.

This report is organized as follows:

- Section 2.0 outlines the methodology and assumptions to develop the reclamation security estimate;
- Section 3.0 presents the analysis and results of the reclamation security estimate;
- Section 4.0 summarizes the recommendations;
- Section 5.0 lists the reference documents utilized in the estimate of the reclamation security; and,
- Section 6.0 provides a disclaimer for the contents of the report and a closure of the document.

2.0 METHODOLOGY

The reclamation security estimate has been developed in accordance with the QIA Abandonment and Reclamation Policy (QIA, 2013; herein after referred to as the QIA A&R Policy) and also generally applies the principles outlined within Nunavut Tunngavik Incorporated (2008) "Reclamation Policy" and AANDC (2002) "Mine Site Reclamation Policy for Nunavut". Select principles with respect to sustainable resource development include:

- Return the land to a safe and stable condition that maintains the ecosystem integrity and that is consistent with Inuit societal and cultural needs and aspirations;
- Adequate security is to be provided to ensure the cost of reclamation, including shutdown, closure and post-closure, is born by the operator of the mine;
- Following mine closure, mining companies or their future owners will continue to be responsible for the site, including the remediation of any environmental complication which may develop;
- Every mine will, at all times, have a mine closure and reclamation plan, which includes measures to be taken in the event of a temporary closure; and,
- Estimates of reclamation costs in reclamation security determination are to be based on the cost of having the necessary reclamation work completed by a third party contractor if the operator defaults. The estimates should also include contingency factors that are reflective of the reclamation undertaken.

The approach taken in preparing this reclamation security estimate generally involved the following:

- Review of available information and completion of a site inspection to further understand the Project;
- Assess the proposed reclamation objectives and activities for completeness and potential for success;
- Where there is uncertainty in the reclamation objectives or activities, describe the conditions that would produce an acceptable closure scenario;
- Consolidate the reclamation activities from which to apply a cost estimate to execute; and,
- Calculate the reclamation security estimate from direct and indirect costs.

The reclamation security amount for the Project was calculated from the sum of direct costs and indirect costs associated with the Project for 2013 and 2014 activities on IOL. The reclamation security estimate is based on the information available at the time of this report development. The following primary documentation was utilized to define the Project and closure conditions:

- The 2013 and 2014 Work Plans (BIMC 2013a and 2013b).
- The 2013 and 2014 reclamation security estimates (BIMC 2013c, 2013d, 2013e).
- BIMC's abandonment and reclamation plan (BIMC 2013d).
- The QIA A&R Policy.

The following general approach was used to develop the direct costs:

- The Project was separated into reclamation components occurring on IOL;
- For each reclamation component, the objective (i.e., condition) at closure was selected;
- For each reclamation component, the reclamation actions required to achieve the closure objective were selected;
- For each reclamation action, a quantity was specified and a unit cost was selected;
- The reclamation security amount associated with each reclamation action was calculated as the product of the quantity and unit cost; and,
- The reclamation security amount for each reclamation component was calculated as the sum of the reclamation security amount for each reclamation activity.

The indirect costs was calculated as the sum of the following:

- Engineering fees;
- Construction management and project management fees; and,
- Contingency.

BIMC method of calculating the total reclamation security amount, as presented in their reclamation security estimates, is similar to that described above.

2.1 QIA A&R Policy Assumptions

The QIA A&R Policy provides a list of assumptions that are required to be observed in development of a security estimate. A summary the QIA A&R Policy assumptions are provided in Table 1 with commentary on whether the assumption was adopted by BIMC in their security estimate. Some instances of BIMC non-compliance with the QIA A&R Policy are based on BIMC assumptions that can be questioned for applicability to QIA. For example, see Table 1, Items 4 and 7: the assumption that third party contractors will have access to on-site equipment and fuel may be acceptable for contractors retained by BIMC, but in relation to QIA initiated reclamation (and use of reclamation security in the event of default by BIMC) this does not take into account the prior claims of others to such assets, nor the likelihood of protracted negotiations or proceedings to establish a QIA right to the use of on-site equipment and fuel for reclamation purposes.

Additionally, the reclamation security estimate also applies the following general assumptions:

- All work is based on independent contractor rates;
- All costs are 2013 Canadian dollars, unless otherwise noted;
- There are no revenues from recovery of assets; and,
- The estimate does not include cost for catastrophic events such as failure of project infrastructure.

Table 1: Summary of QIA A&R Policy assumptions and comparison to BIMC's financial security assumptions.

Item Number	QIA A&R Policy Assumption	Comment
1	Incorporation of QIA's Community Land and Resources Committees (CLARC) A&R objectives and criteria	2013 estimate did not address this item. 2014 estimate provided a list of CLARC meeting dates and locations; however, there is no summary of the outcomes from the CLARC meetings that directly contributed to the CLARC A&R objectives and criteria.
2	A scenario where QIA assumes authority over project components on IOL	Compliance
3	Security cost should equal 100% of the cost for an independent third-party contractor and equipment, including mobilization and demobilization	BIMC "recognized non-compliance". BIMC assumption that QIA may facilitate the use of on-site equipment by its third-party contractors does not take into account the prior claims of equipment financiers, secured lenders or others, and the complexity and length of possible proceedings to determine priority of claims or to negotiate access to on-site equipment
4	An independent third-party contractor may be required to enter into a commercial lease with QIA and agree to standard terms and conditions (i.e., lease administration costs, tipping fees and water compensation)	Not applicable
5	Transportation rates (including air travel, marine shipping and overland haul) must be supported by site-specific invoicing and or cost quotations	Not compliant
6	Camp operation costs must be supported by site-specific invoicing or cost quotations	Not compliant

Item Number	QIA A&R Policy Assumption	Comment
7	Assumed use of on-site fuel for reclamation purposes is not acceptable	Not compliant. BIMC assumed sufficient fuel would be available on site for use in reclamation. BIMC equipment unit cost includes component for fuel cost, but does not include associated cost of transporting fuel to project site; assumption that on-site fuel will be sufficient and also available for use by QIA contractors does not take into account other claimants; see Item Number 4 above.
8	Salvage values for on-site equipment and materials are not accepted as a security credit	Compliance
9	Review and approval of all plans associated with infrastructure development, including stamped and signed as-constructed documentation (e.g., drawings, reports, etc.) by a qualified Engineer registered with Association of Professional Engineers, Geologists and Geophysicists of the NWT and Nunavut (NAPEG)	Review was limited to BIMC's financial security assessment. No approval has been granted.
10	Security should be posted in a form that is readily available to QIA, retains its value throughout the land use activity, and is beyond the control of the land user or its creditors in the event of insolvency	Security held as per Commercial Lease
11	Progressive reclamation credits may be applied against a security amount once proven through QIA assessment and authorization	Not compliant. For example, BIMC applied a credit for fuel bladder decommissioning in 2014 of $243,984. No evidence provided to demonstrate successful reclamation was provided.

Item Number	QIA A&R Policy Assumption	Comment
12	IOL aggregates are used in completing a reclamation program for any project element requiring aggregates	Not applicable
13	Potential transboundary impacts to IOL due to activities not on IOL will be considered	BIMC stated this item was "understood" but no details provided to understand its applicability.

Note: Table 1 is sourced from the QIA A&R Policy.

2.2 Direct Costs

The ARKTIS reclamation security estimate generally applied the following to calculate the Project direct costs. Complete details of the reclamation components, actions, quantities, and unit costs for 2013 and 2014 activities are provided in Appendix A and B, respectively.

- Reclamation components were selected based on BIMC's Work Plans and reclamation security estimates. Consistent with BIMC's security estimate, reclamation components are generally categorized as follows:
  - Open pit;
  - Buildings and equipment;
  - Chemicals;
  - Water management;
  - Mobilization; and,
  - Post closure.
- Reclamation objectives and actions were selected based on BIMC's abandonment and reclamation plan and reclamation security estimates.
- When available, the quantity associated with each reclamation action was selected based on BIMC's Work Plans, engineering drawings, or reclamation security estimates.

Instances where BIMC's documentation was not applied in the ARKTIS' reclamation security were a result of the following:

- When there was disagreement between BIMC's reclamation security approach from that specified in the QIA A&R Policy.
- There was uncertainty with BIMC's reclamation actions.
- There was uncertainty with BIMC's quantities or unit costs associated with reclamation actions.

2.2.1 Unit Costs

ARKTIS' unit costs for reclamation actions were selected based on one or more of the following methods, and further detailed below and within Appendix C.

- Construction costing data (labour and equipment rates, equipment type and costs, and productivity) for North America, published by RS Means (developed by Reed Construction Data), with location factors to account for the Project area;
- Shipping costing as published from a sealift company in the region;
- Stevedoring costing based on industry research in the region;
- Crew transportation costing from regional and local airlines; and,
- ARKTIS' experience in construction projects in the region.

2.2.1.1 Material, Labour and Equipment

RS Means (online version 5.0.1) was used to obtain material, labour, and equipment costs. Cost data is representative of the second quarter of 2013. Unit costs include overhead and profit, which would be required by an independent third party contractor, as per the QIA A&R Policy. RS Means has provided construction costs for more than 70 years and the costing data is updated annually. The factors that RS Means applies to determine costs and industry trends are summarized in Appendix D. All costs derived in RS Means represent U.S. national averages. RS Means provides location factors to adjust the U.S. national averages to a particular location. Location factors are provided for more than 70 areas in Canada. The location factor is a collection of multipliers that are applied to the U.S. national average cost of the same item. ARKTIS utilized the RS Means location factor for Ottawa of (1.038 for equipment, 1.052 for labour) to transform the U.S. national averages to Ottawa, which is a southern access point to Nunavut. Since RS Means does not provide a location factor for Nunavut, additional location factors were selected (value of 2.5 for equipment and 1.6 labour) and applied to the Ottawa costing to transform it to a costing representative of the Project area.

The Nunavut location factor was estimated based on analysis of typical labour and equipment rates charged by Nunavut contractors during construction projects, based on ARKTIS' experience (see Appendix C for comparison), to the labour and equipment rates for RS Means data in Ottawa. It should be noted these costs are associated with construction projects within established Nunavut communities. As such, there is uncertainty with the appropriate location factor to be applied to the Project area. It could be argued that the cost index associated with the Mary River Project should be higher than the estimated value considering the additional "remoteness" of the site compared to an established Nunavut community.

BIMC's 2014 reclamation security estimate provided their labour and equipment rates (effective January 1, 2013) from the onsite contractor (Nuna Logistics Inc.). In general, the BIMC rates are within 5 to 18% lower than the RS Means Ottawa rates. BIMC rates are only marginally higher than the RS Means Ottawa rates, a result that is in ARKTIS' opinion not typical of labour and equipment rates in Nunavut. The reason for the lower BIMC rates compared to ARKTIS' rates may be a function of the following.

- BIMC rates may not be inclusive of overhead and profit; and,
- BIMC rates may be preferred/negotiated rates that may be a function of longer-term involvement in the Project.

For the reasons detailed above, BIMC rates were not applied in the ARKTIS reclamation security. Thus, the ARKTIS rates are considered representative of Nunavut, include profit and overhead, and are not based on preferred/negotiated rates.

RS Means was also used to estimate the amount of time required for each activity based on the productivity of the appropriate crew and equipment associated with the specific reclamation action. The number of personnel required to undertake reclamation activities were determined from the crew sizes. Similarly, the type and number of

equipment for reclamation was derived from the equipment list associated with a given crew.

BIMC's reclamation security (BIMC 2013e) utilized the database in the RECLAIM model (version 6.1) to select unit costs for each reclamation action. For reclamation actions where there are no unit costs in the RECLAIM database, BIMC selected unit costs based on their experience. In general, the RECLAIM unit costs are a lump sum equivalent of the labour costs and labour and equipment productivity, which results in a user-friendly unit cost that relates to a physical characteristic of the reclamation action. For example, if the reclamation action was to excavate contaminated soil, the unit cost is expressed as a dollar amount to excavate a unit volume of soil. Thus, if the volume of soil to be excavated was known, the reclamation cost is simply the product of the excavation volume and unit costs per volume of soil. If the reclamation action was to demolish a building, the unit cost is expressed as a dollar value to demolish a unit area of building. Thus, if the building footprint is known, the reclamation cost is the product of the building footprint to the dollar amount to demolish per unit area of building.

A summary of the uncertainties in the use of RECLAIM unit costs in comparison to the ARKTIS approach is provided in Table 2. By considering the labour and equipment rates, equipment type, and productivity together, a unit cost was calculated that can be directly compared to the RECLAIM database (see Appendix C for comparison).

Table 2: Comparison of BIMC and ARKTIS unit costing.

Reclamation Component	BIMC Unit Costs (Based on RECLAIM)	ARKTIS Unit Costs (Based on RS Means)
Costing database	RECLAIM costing claim to be based on northern reclamation projects. The sample size, variability of the unit costs, and locations from which the data was obtained are unknown.	As further detailed in Appendix D, all costs derived in RS Means represent U.S. national averages and are based on the U.S. National Averages given in U.S. dollars. The RS Means location factors can be used to adjust costs to a particular location. Canadian location factors can be used to adjust U.S. National Averages to local costs in Canadian dollars. Labour costs - Labor costs are based on the average of wage rates from 30 major U.S. cities. Rates are determined from labor union agreements or prevailing wages for construction trades for the current year. Labor costs reflect productivity based on actual working conditions. These figures include time spent during a normal workday on tasks other than actual installation, such as material receiving and handling, mobilization at site, site movement, breaks, and cleanup. Productivity data is developed over an extended period so as not to be influenced by abnormal variations and reflects a typical average. Equipment costs - Equipment costs include rental costs and the operating costs for equipment under normal use. The operating costs include parts and labor for routine servicing such as repair and replacement of pumps, filters and worn lines. Normal operating expendables such as fuel, lubricants, tires and electricity (where applicable) are also included. Equipment rental rates are obtained from industry sources throughout North America including contractors, suppliers, dealers, manufacturers, and distributors.

Reclamation Component	BIMC Unit Costs (Based on RECLAIM)	ARKTIS Unit Costs (Based on RS Means)
Location index	RECLAIM unit costs claim to be appropriate for the Canadian territories. Unit costs do not vary between the territories or within a territory.	Location index values for labour and equipment rates deduced using a calculated Nunavut index based on Nunavut construction company rates.
Labour rate and type	The labour rates and type of worker in the reclamation crew (e.g., foreman, equipment operator, etc.) assumed in the development of the unit costs are unknown.	The labour rates and type of worker (e.g., foreman, equipment operator, etc.) in the reclamation crew are specified by RS Means and is based on the reclamation action.
Equipment type	The equipment types (e.g., dozer, excavator, etc.) assumed in the development of the unit costs are unknown.	The equipment types (e.g., dozer, excavator, etc.) required to execute the reclamation activity are specified by RS Means.
Labour and equipment productivity (i.e., the amount of work completed over a time period).	The labour and equipment productivity assumed in the development of the unit costs are unknown.	The labour and equipment productivity are specified by RS Means.
Fuel	The amount of fuel usage assumed in the development of the unit costs is unknown.	Fuel usage calculated from the equipment type and the productivity that are specified by RS Means.

2.2.1.2 Shipping

Cargo

The marine shipping costs for cargo was estimated by selecting Area A on the Nunavut Eastern Arctic Shipping Inc. (NEAS) Sealift Rates for the 2013 Season (which includes communities in relative close proximity to the Milne Port, such as Arctic Bay and Pond Inlet), and NEAS Insurance Premiums reference sheets (Appendix D). NEAS costing includes movement between beach (high water mark) to/from dock in southern port. The following costs were selected for cargo:

- For southbound shipment, general cargo rate of $96.02/m^3 and an insurance premium of $4.80/m^3 were selected resulting in a total general cargo rate of $100.82/m^3. Consistent with NEAS Sealift Rates for dangerous goods, waste, hazardous cargoes, a surcharge of 20% above the total general cargo rate was applied, which results in rate of $120.99/m^3.
- For northbound shipment, general cargo rate of $147.73/m^3 and an insurance premium of $4.80/m^3 were selected resulting in a total general cargo rate of $152.53/m^3. Consistent with NEAS Sealift Rates for dangerous goods, waste, hazardous cargoes, a surcharge of 20% above the total general cargo rate was applied, which results in rate of $183.04/m^3.

Stevedoring costing for the Project area was selected from TranSys Research Ltd. (2009), provided in Appendix D, that estimates a unit rate of $82.50/tonne for ammonium nitrate and packaged explosives, materials and supplies, construction equipment, and heaving equipment. Based on the TranSys Research Ltd. (2009), stevedoring fees are in addition to marine shipping costs for equipment that requires packaging/containerizing to permit loading onto shipping vessel. It is noted that the unit costs from the TranSys Research Ltd. (2009) are reflective of 2009 dollars and have not been adjusted or updated to 2013 dollars.

BIMC estimate for backhaul shipping costs was $46/m^3 ($115/tonne) and was based on 2013 sealift rates. However, no invoicing or quotations were provided to demonstrate this pricing. Further, it is not understood if BIMC's rate is a preferred or negotiated rate. Without any further agreements, ARKTIS cannot assume a preferred rate for shipping and therefore shipping costs were selected based on advertised NEAS Sealift Rates. BIMC does not provide a northbound shipping rate since their security estimate assumes use of on-site resources (e.g., fuel, equipment).

Fuel

Based on QIA discussions with a charter vessel company, a unit cost of $0.10/L for a dedicated vessel to back haul bulk fuel from Milne Inlet to a refinery at a southern port was selected to be $0.10/L. BIMC also applied a back haul of fuel cost of $0.10/L based on a dedicated tanker mobilized to the Project area.

2.2.1.3 Reclamation Crew

ARKTIS reclamation security accounts for the need for personnel to execute the reclamation activities. The personnel requirements in the ARKTIS analysis were calculated based on the reclamation actions and the crew productivity.

BIMC in the 2013 Work Plan assumed a marginal increase in personnel requirement; however, the 2014 Work Plan does not include a further increase, despite additional Project components to undergo reclamation and claim that the 2013 personnel are adequate to complete the 2014 Project components. BIMC has provided no supporting information support the claim that there should not be a further marginal increase in personnel associated with the 2014 Work Plan.

Mobilization / Demobilization of Crew

Based on ARKTIS' experience, the crew transportation costs assume all workers take a commercial First Air flight from Ottawa to Iqaluit and subsequently a chartered flight from Iqaluit to Milne Port. The frequency of return flights to and from Milne Port is based on the assumption that a crew change will occur approximately every four weeks which is consistent with ARKTIS' experience on other construction projects in Arctic Canada. The duration the crew is needed at site was calculated based on the productivity (see Appendix C).

2.3 Indirect Costs

The ARKTIS reclamation security estimate includes indirect costs associated with engineering, construction management and project management, and contingency fees. Engineering, contract administration and project management fees are calculated as the fee percentage multiplied by the direct costs (excluding mobilization/demobilization) for the Project. This method of calculating indirect costs is similar that that applied in the BIMC's security estimates. The contingency fee was calculated as the fee percentage multiplied by the direct cost (including mobilization/demobilization) for the Project.

2.3.1 Engineering Fees

The Ontario Society of Professional Engineers (OSPE, 2012) provides guidance on the selection of engineering fees as a percentage of "construction costs", which is defined as the contract price(s) of all elements of the project designed by, or on behalf of, the professional engineer, including the general contractor's overhead and profit and all applicable taxes, except HST.

The OSPE recommended fees are based on historical data reported by the Professional Engineers Ontario and on survey data received from professional engineers and clients. The OSPE recommended fees apply to undeveloped areas where complexity is not introduced by existing structures and suggest that an additional fee should be negotiated for services related to demolition work.

In its 2012 fee guideline, the OSPE states an engineering design services fee of 4.6% is fair and equitable compensation for projects of average complexity with constructions costs in excess of $10,000,000. By way of comparison, the Consulting Engineers of

British Columbia (CEBC, 2009) recommend an engineering design services fee of 4.1% and 3.9% for infrastructure engineering projects of average complexity with constructions costs of $10,000,000 and $20,000,000 respectively. For infrastructure engineering projects with above average complexity with constructions costs of $10,000,000 and $20,000,000, the CEBC (2009) recommends an engineering design services fee of 5.7% and 5.4% respectively.

Based on ARKTIS' opinion that the some of the reclamation activities involve above average complexity, an engineering design fee of 5.0% of direct costs (excluding mobilization/demobilization) was selected. BIMC engineering design fee was also set at 5.0% (excluding mobilization/demobilization).

2.3.2 Contract Administration and Project Management Fees

In its 2012 fee guideline, the OSPE also provides guidance on the fees associated with contract administration and project management. For construction projects costing more than $10,000,000, the total fees for contract administration and project management are reported as 9.4% of construction costs. This is the value that ARKTIS used in its security estimate.

BIMC, on the other hand, applied a 5% fee for project management and did not provide a separate fee for construction management or contract administration services. The CEBC (2009) distinguishes between project management services and construction management services. According to CEBC, construction management services include the following activities:

- Contract strategy, administration and expediting;
- Construction logistics, planning, scheduling and manpower forecasts;
- Labour relations, safety;
- Field office management, temporary facilities;
- Materials receiving and warehousing;
- Progress monitoring, trending and reporting;
- Cost performance monitoring, trending and claims processing; and
- Quality assurance.

BIMC (2013e) states that the 5% project management fee, which it applied, was based on the RECLAIM methodology. ARKTIS disagrees with BIMC's (2013e) interpretation that a 5% value for the project management fee is the RECLAIM methodology. The RECLAIM guide (Brodie Consulting Inc., 1997) reports that the user of the RECLAIM model inputs the percentage for Project Management into the model; there is no recommended value for project management fee within the RECLAIM guide or model database.

2.3.3 Contingency

ARKTIS' contingency fee calculation was applied to direct costs inclusive of mobilization/demobilization, whereas, BIMC's calculation was applied to direct costs exclusive of mobilization/demobilization. ARKTIS considers it appropriate to apply contingency mobilization/demobilization for there is uncertainty associated with the preliminary level of reclamation planning associates with movement of general cargo, hazardous cargo, fuel, and workers to/from the Project area. A more advanced (detailed) execution plan associated with mobilization/demobilization of these items to/from the Project area is required to reduce the level of contingency.

As required by the QIA A&R Policy, the contingency amount applied to the Project was selected based on Aboriginal Affairs and Northern Development Canada's recommendations that have been applied to their estimates of reclamation security for northern mining projects, as detailed in Table 3. In general, contingency is higher when the reclamation activities are conceptual in nature and lower for a detailed or final reclamation plan. Based on the Table 3, reclamation details of the Project were considered to range from the "preliminary or budget level" (15% contingency) to the "feasibility or advanced conceptual" level (20% contingency) for the following primary reasons:

- Although "for-construction" or "as-built" drawings were provided for many components of the Project, which are required to initially build the infrastructure, no such type of drawings were provided for site conditions at closure that depict site conditions after reclamation. Thus, the lowest type of contingency to apply based on lack of availability of reclamation construction drawings is 15%.
- The BIMC abandonment and reclamation plan was considered to provide a general level of engineering detail associated with reclamation which largely consisted of a description of the closure actions to achieve the objectives. However, no specifications (or reclamation drawings as described above) were provided to define how a contractor is to execute the reclamation activities. Thus, the contingency to apply based on availability of engineering detail is in the range of 15% to 20%.
- No verbal quotes were provided by BIMC to justify a 10% contingency is not appropriate;
- When available, unit costs were based on the RECLAIM database that is considered "typical unit costs" and not verbal quotes. As such, the appropriate contingency could be as high as 20%.

As detailed above, the contingency for the Project could be as high 20%; however, the lower bound value of 15% was selected for use in the ARKTIS reclamation estimate.

BIMC's 2013 and 2014 marginal reclamation estimate applied a 10% contingency to their reclamation security estimate with the following rational (BIMC, 2013e):

- "Reclamation activities for the Mary River Project are predominantly an earthworks exercise with simple demolition".
- "High allowances for contingency are not required as the construction program will be relatively simple".
- "based on confidence that the cost assigned for the activities required to meet reclamation objectives is adequate"

Although ARKTIS does recognize that the reclamation program does involve a large amount of "earthwork exercises" that may be "simple demolition", this is not the case for all activities. Consistent with Table 3, the RECLAIM guide (Brodie Consulting Inc., 1997) reports that a "contractor's estimate is likely to be more accurate as it will reflect current construction costs for the specific equipment to be used". BIMC has provided no engineering take-offs or written quotes and therefore ARKTIS does not consider a 10% contingency appropriate.

Table 3: Summary of contingency fees by estimate type.

Estimate Type	Description	Accuracy or Appropriate Contingency
Detailed or project control	Based upon detailed engineering take-offs and written quotes	+/- 5 %
Definitive or construction drawing phase	Based upon detailed engineering take-offs and written quotes	+/-10 %
Preliminary or budget level	Little detailed engineering and costs based upon verbal quotes	+/- 15 %
Feasibility or advanced conceptual	Engineering may be 10% complete and costs based upon typical unit costs	+/- 20%
Pre-feasibility, conceptual or trade-off study	Very basic engineering only and costs based upon typical unit costs	+/- 25 %

Note: Table 3 is sourced from the QIA A&R Policy.

3.0 ANALYSIS AND RESULTS

A comparison of the ARKTIS and BIMC reclamation security estimates are provided in Table 4. The 2013 and 2014 security values are combined to allow for direct comparison of the differences in security amounts for each reclamation component. It is appropriate to compare the combined 2013 and 2014 value, instead of the individual year security, due to the approach taken by ARKTIS compared to BIMC to reconcile the 2013 security. ARKTIS' 2013 estimate used information from BIMC' 2014 Work Plan to understand what activities were completed in that year. BIMC's 2013 estimate had assumed activities to be completed in 2013, and then an adjustment was made to BIMC's 2014 estimate to correct for what was planned in 2013 but not completed.

Table 4: Summary of the 2013 and 2014 combined reclamation security estimates.

RECLAIM Component Type	ARKTIS	BIMC	Difference
Open pit	$1,968,367	$1,168,218	$800,149
Underground mine	$-	$-	$-
Tailings	$-	$-	$-
Rock pile	$-	$-	$-
Buildings and equipment- Mine site	$4,101,882	$4,127,004	$(25,122)
Buildings and equipment- Milne port	$2,570,864	$4,447,277	$(1,876,413)
Buildings and equipment- Tote Road	$12,697	$(1,262)	$13,959
Chemicals and soil management	$4,564,524	$3,752,129	$812,395
Water management	$254,192	$43,175	$211,017
Post closure monitoring and maintenance	$-	$457,971	$(457,971)
SUB-TOTAL	*$13,472,527*	*$13,994,512*	*$(521,985)*
Mobilization/demobilization	$4,783,821	$(434,898)	$5,218,719
Contract administration and project management (ARKTIS-9.4%, BIMC-5%)	$1,266,418	$699,725	$566,693
Bonding	$-	$-	$-
Taxes (GST on supplies)	$-	$-	$-
Insurance	$-	$-	$-
Engineering (ARKTIS-5%, BIMC-5%)	$673,626	$-	$673,626
Contingency (ARKTIS-15%, BIMC-10%)	$2,738,452	$1,399,451	$1,339,001
TOTAL	**$22,934,845**	**$15,658,791**	**$7,276,054**

A high level comparison of the AKRTIS and BIMC reclamation security estimates are provided below:

- ARKTIS' total reclamation security is $22.9 million and BIMC's total reclamation security is $15.6 million.
- The difference in the total reclamation security estimates is $7.3 million.
- The total direct costs (excluding mobilization/demobilization) were similar in value.
- The difference in total reclamation security is primarily attributed to differences associated with mobilization/demobilization ($5.2 million), contract administration and project management ($0.6 million) and contingency ($1.4 million). The primary reasons for the differences in these budget items are further discussed below.

Mobilization/demobilization

A breakdown of the mobilization/demobilization line items is provided in Table 5 for both the ARKTIS and BIMC security estimates. In summary, the major items that are contributing to the cost difference between ARKTIS and BIMC are associated with the BIMC 2013 sealift credit, mobilize workers, and worker accommodations. The primary differences in costing are discussed below; note the following bullet items refer to the specific mobilization/demobilization items in Table 5.

1. Difference in cost attributed to short haul transport cost of building demolition debris to a landfill for disposal. BIMC's costing for building demolition does not include the transport of the debris to a landfill at site. ARKTIS includes a cost for a short haul transport costs from building demolition site demolition to a landfill for disposal.
2. Difference in cost primarily attributed to ARKITS mobilizing equipment to site to execute reclamation and BIMC assumes use of on-site equipment during reclamation. Use of on-site equipment is a BIMC "recognized non-compliance" with the QIA A&R Policy.
3. In 2014, BIMC applied credit for it was assumed that on-site equipment would be disposed of on-site and not demobilized from site. BIMC 2013 estimate assumed a demobilization cost for this equipment.
4. Difference in cost is largely attributed to a $1 million contingency BIMC applies to the 2014 estimate. ARKTIS applies a global contingency to the mobilization/demobilization category, and not specific to this line item.
5. In 2013, BIMC applied a $1.9 million "credit for sealift". Effectively, this is an adjustment in the initial security deposit. No supporting evidence is provided to justify this reduction and therefore contributes to the difference in cost between ARKTIS and BIMC. In 2014, BIMC applied $3.0 million credit since additional material information became available which is captured in the appropriate line items.
6. The differences in cost are attributed to differences in the additional worker requirements to execute the 2013 and 2014 marginal activities. ARKTIS based their worker requirements on the productivity to execute the reclamation tasks. In 2014, BIMC does not include a cost for crew transportation, as it is assumed no additional flights would be required. AKRITS considers it realistic that the 2013 and 2014

additional activities, compared to the 2013 A&R plan, would require either additional crew or additional time to execute the reclamation tasks.

7. The differences in costs are attributed to ARKTIS estimate included additional worker accommodation requirement to execute the 2013 and 2014 marginal activities. BIMC does not factor this into their costing. BIMC assumes all camp operation costs are covered by AMEC 2013 A&R. ARKTIS calculated worker requirements based on the productivity to execute the reclamation activities in 2013 and 2014, and assigned a daily accommodation rate. AKRITS considers it realistic that the 2013 and 2014 additional activities, compared to the 2013 A&R plan, would require either additional crew or additional time to execute the reclamation.
8. 2013 Work Plan references cement mobilized to site. ARKTIS assumed that 20% of the mobilized cement is required to be demobilized at closure. BIMC estimate does not include this item.

Table 5: Breakdown of mobilization/demobilization costs.

Item	Mobilization / Demobilization Item	ARKTIS 2013 Costs	BIMC 2013 Costs	AKRTIS 2014 Costs	BIMC 2014 Costs	ARKTIS 2013 and 2014 Combined	BIMC 2013 and 2014 Combined	Difference AKRTIS and BIMC
1	Mobilize demolition materials	$152,509	$-	$126,214	$-	$278,723	$-	$278,723
2	Mobilize heavy equipment	$812,416	$173,685	$-	$127,310	$812,416	$300,995	$511,421
3	Equipment backhaul credit	$-	$-	$-	$(173,688)	$-	$(173,688)	$173,688
4	Mobilize misc. supplies	$535,500	$3,000,000	$290,500	$1,270,607	$826,001	$4,270,607	$(3,444,606)
5	Sealift credit	$-	$(1,964,715)	$-	$(3,000,000)	$-	$(4,964,715)	$4,964,715
6	Mobilize workers	$775,000	$121,900	$765,000	$-	$1,540,000	$121,900	$1,418,100
7	Worker accommodations	$669,038	$-	$536,655	$-	$1,205,693	$-	$1,205,693
8	Other	$120,989	$10,003	$-	$-	$120,989	$10,003	$110,986
	TOTALS	**$3,065,452**	**$1,340,873**	**$1,718,369**	**$(1,775,771)**	**$4,783,821**	**$(434,898)**	**$5,218,719**

Contract administration and project management

ARKTIS has applied a fee for services related to contract administration and project management in the amount of 9.4% (see Section 2.3.2). BIMC applied a project management fee of 5.0%. Since the direct costs are similar between ARKTIS and BIMC, the difference in fee percentage of 4.4% between ARKTIS and BIMC is the reason for the $0.6 million difference in costing.

Contingency

The difference in contingency fee of $1.4 million between ARKTIS and BIMC is primarily a result of the following:

- ARKTIS applied a contingency fee to direct fees inclusive of mobilization/demobilization. BIMC applied a contingency fee to direct fees exclusive of mobilization/demobilization. As detailed in Section 2.3.3, there is uncertainty associated with the preliminary level of reclamation planning associates with movement of general cargo, hazardous cargo, fuel, and workers to/from the Project area; thus, it is appropriate to apply a contingency to mobilization/demobilization items.
- ARKTIS applied a contingency of 15% and BIMC used a contingency of 10%. As detailed in Section 2.3.3, it is ARKTIS' opinion that BIMC's reclamation plan and costing is at a "preliminary or budget level" and not advanced to BIMC recommended "definitive or construction drawing phase".

4.0 RECOMMENDATIONS

ARKTIS recommends that the reclamation security held by QIA (currently $26,200,000) pursuant to Q13C301 Commercial Lease for IOL be adjusted by an increase of $22,934,845 to an aggregate reclamation security of $49,134,845.

5.0 REFERENCES

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6.0 DISCLAIMER AND CLOSURE

ARKTIS Solutions Inc. assumes no responsibility for inappropriate use of the contents of this report, and disclaims all liability arising from negligence or otherwise in respect of such information and recommendations presented in this report. General terms and conditions are available in Appendix D.

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APPENDIX A – CLOSURE 2013 WORK PLAN FINANCIAL SECURITY ESTIMATE

Table A1: Summary of closure 2013 work plan cost estimate.

RECLAIM Component Type	RECLAIM Component Name	Total Cost
OPEN PIT		$1,201,153
UNDERGROUND MINE		$-
TAILINGS		$-
ROCK PILE		$-
BUILDINGS AND EQUIPMENT	MINE SITE	$1,564,628
	MILNE PORT	$1,281,452
	TOTE ROAD	$-
CHEMICALS AND SOIL MANAGEMENT		$787,226
WATER MANAGEMENT		$254,192
POST CLOSURE MONITORING AND MAINTENANCE		$-
SUB-TOTAL		*$5,088,651*
MOBILIZATION/DEMOBILIZATION		$3,065,452
PROJECT MANAGEMENT	9.4%	$478,333
BONDING		$-
TAXES (GST ON SUPPLIES)		$-
INSURANCE		$-
ENGINEERING	5%	$254,433
CONTINGENCY	15%	$1,295,709
TOTAL		**$10,101,985**

Table A2: Reclamation cost estimate.

Item Descritpion	# of Items	BIMC Headings	Site	Work Plan	Area (ft^2)/ Item	Area (m^2)/ Item	Area (m^2) Total	Volume/ Item	Volume (Total)	Weight/Item	Weight (Total)	TEU	Unit Rate	Reclamation Cost
Potable Water Treatment Plant (SOG)	1	BUILDINGS AND EQUIPMENT	Mary River	2013	4200	390.19	390.19						$ 29.18 /m^2	$ 11,388
10 cu.yd. Mixer Truck	6	BUILDINGS AND EQUIPMENT	Mary River	2013		32.24	193.43	103.16 m^3	618.97 m^3	30844 kg	185064 kg		$ 912.00 /each	$ 5,472
100ft Pump Trucks	2	BUILDINGS AND EQUIPMENT	Mary River	2013		49.25	98.50	157.60 m^3	315.20 m^3	17720 kg	35440 kg		$ 912.00 /each	$ 1,824
200 Ton Track Mount	2	BUILDINGS AND EQUIPMENT	Mary River	2013		122.32	244.64	391.43 m^3	782.86 m^3	136264 kg	272528 kg		$ 912.00 /each	$ 1,824
45ft Van Trailer Generator	2	BUILDINGS AND EQUIPMENT	Mary River	2013		15.16	30.33	48.52 m^3	97.04 m^3	38000 kg	76000 kg		$ 912.00 /each	$ 1,824
80 Ton Mobile RT Crane	2	BUILDINGS AND EQUIPMENT	Mary River	2013		56.10	112.20	179.53 m^3	359.05 m^3	49390 kg	98780 kg		$ 912.00 /each	$ 1,824
Airport Maintenance De-Icing Truck	1	BUILDINGS AND EQUIPMENT	Mary River	2013									$ 912.00 /each	$ 912
Ambulance (Ford 350 4 x 4 Ambulance)	1	BUILDINGS AND EQUIPMENT	Mary River	2013		16.10	16.10	51.52 m^3	51.52 m^3	4989 kg	4989 kg		$ 912.00 /each	$ 912
Ambulance (Ford 450 4 x 4 Ambulance)	1	BUILDINGS AND EQUIPMENT	Mary River	2013		15.11	15.11	48.36 m^3	48.36 m^3	6803 kg	6803 kg		$ 912.00 /each	$ 912
Bob Cat	1	BUILDINGS AND EQUIPMENT	Mary River	2013		4.99	4.99	15.98 m^3	15.98 m^3	4540 kg	4540 kg		$ 912.00 /each	$ 912
Boom Truck	3	BUILDINGS AND EQUIPMENT	Mary River	2013		32.24	96.71	103.16 m^3	309.48 m^3	30844 kg	92532 kg		$ 912.00 /each	$ 2,736
Buses	8	BUILDINGS AND EQUIPMENT	Mary River	2013		30.65	245.24	98.09 m^3	784.75 m^3	36200 kg	289600 kg		$ 912.00 /each	$ 7,296
Container Handler	2	BUILDINGS AND EQUIPMENT	Mary River	2013		42.93	85.86	137.37 m^3	274.74 m^3	36084 kg	72168 kg		$ 912.00 /each	$ 1,824
Crane RT	1	BUILDINGS AND EQUIPMENT	Mary River	2013		56.10	56.10	179.53 m^3	179.53 m^3	49390 kg	49390 kg		$ 912.00 /each	$ 912
Crawler Crane	1	BUILDINGS AND EQUIPMENT	Mary River	2013		122.32	122.32	391.43 m^3	391.43 m^3	136264 kg	136264 kg		$ 912.00 /each	$ 912
Crusher 6000 Ton/Day 6" (Cone Crusher)	2	BUILDINGS AND EQUIPMENT	Mary River	2013		44.81	89.62	143.39 m^3	286.79 m^3	152680 kg	305360 kg		$ 912.00 /each	$ 1,824
Cube Van	2	BUILDINGS AND EQUIPMENT	Mary River	2013									$ 912.00 /each	$ 1,824
Development Drills	4	BUILDINGS AND EQUIPMENT	Mary River	2013		18.91	75.64	60.51 m^3	242.03 m^3	8618 kg	34472 kg		$ 912.00 /each	$ 3,648
Development Rock Drills	2	BUILDINGS AND EQUIPMENT	Mary River	2013		119.55	239.11	382.57 m^3	765.15 m^3	41000 kg	82000 kg		$ 912.00 /each	$ 1,824
Drive on Compactor	8	BUILDINGS AND EQUIPMENT	Mary River	2013		11.97	95.80	38.32 m^3	306.55 m^3	15687 kg	125496 kg		$ 912.00 /each	$ 7,296
Emulsion Delivery Trucks	3	BUILDINGS AND EQUIPMENT	Mary River	2013		32.24	96.71	103.16 m^3	309.48 m^3	30844 kg	92532 kg		$ 912.00 /each	$ 2,736
Excavator	11	BUILDINGS AND EQUIPMENT	Mary River	2013		71.63	787.91	229.21 m^3	2521.31 m^3	71132 kg	782452 kg		$ 912.00 /each	$ 10,032
Fire Truck	2	BUILDINGS AND EQUIPMENT	Mary River	2013		32.24	64.48	103.16 m^3	206.32 m^3	30844 kg	61688 kg		$ 912.00 /each	$ 1,824
Fork Lift	6	BUILDINGS AND EQUIPMENT	Mary River	2013		3.33	19.95	6.82 m^3	40.92	3500 kg	21000 kg		$ 912.00 /each	$ 5,472
Fuel and Lube Truck	4	BUILDINGS AND EQUIPMENT	Mary River	2013		32.24	128.95	103.16 m^3	412.64 m^3	30844 kg	123376 kg		$ 912.00 /each	$ 3,648
Fuel Delivery Truck B-Train	2	BUILDINGS AND EQUIPMENT	Mary River	2013		32.24	64.48	103.16 m^3	206.32 m^3	30844 kg	61688 kg		$ 912.00 /each	$ 1,824
Grader	7	BUILDINGS AND EQUIPMENT	Mary River	2013		35.70	249.90	114.24 m^3	799.69 m^3	26060 kg	182420 kg		$ 912.00 /each	$ 6,384
Haul Trucks	25	BUILDINGS AND EQUIPMENT	Mary River	2013		79.24	1981.03	253.57 m^3	6339.31 m^3	164654 kg	4116350 kg		$ 912.00 /each	$ 22,800
Heated/Refrigerated Sea Container	4	BUILDINGS AND EQUIPMENT	Mary River	2013		14.87	59.48	36.29 m^3	145.16				$ 912.00 /each	$ 3,648
Hiboy Trailer	4	BUILDINGS AND EQUIPMENT	Mary River	2013		35.67	142.68						$ 912.00 /each	$ 3,648
Highway Tractor Truck	4	BUILDINGS AND EQUIPMENT	Mary River	2013		32.24	128.95	103.16 m^3	412.64 m^3	30844 kg	123376 kg		$ 912.00 /each	$ 3,648
Loader	26	BUILDINGS AND EQUIPMENT	Mary River	2013		56.46	1468.01	180.68 m^3	4697.62 m^3	49546 kg	1288196 kg		$ 912.00 /each	$ 23,712
Low Boy Drop Deck	2	BUILDINGS AND EQUIPMENT	Mary River	2013		18.91	37.82	60.51 m^3	121.02 m^3	8618 kg	17236 kg		$ 912.00 /each	$ 1,824
Low Boy Float	2	BUILDINGS AND EQUIPMENT	Mary River	2013		18.91	37.82	60.51 m^3	121.02 m^3	8618 kg	17236 kg		$ 912.00 /each	$ 1,824
Low Boy Trailers	8	BUILDINGS AND EQUIPMENT	Mary River	2013		18.91	151.27	60.51 m^3	484.07 m^3	8618 kg	68944 kg		$ 912.00 /each	$ 7,296
Maintenance Truck c/w Pick	2	BUILDINGS AND EQUIPMENT	Mary River	2013		32.24	64.48	103.16 m^3	206.32 m^3	30844 kg	61688 kg		$ 912.00 /each	$ 1,824
Manlift	6	BUILDINGS AND EQUIPMENT	Mary River	2013		26.31	157.85	84.19 m^3	505.12 m^3	17010 kg	102060 kg		$ 912.00 /each	$ 5,472

Item Descritpion	# of Items	BIMC Headings	Site	Work Plan	Area (ft^2)/ Item	Area (m^2)/ Item	Area (m^2) Total	Volume/ Item	Volume (Total)	Weight/Item	Weight (Total)	TEU	Unit Rate	Reclamation Cost
Ore Haul Truck - Recovery Tow Truck	1	BUILDINGS AND EQUIPMENT	Mary River	2013		30.99	30.99	127.14 m^3	762.84 m^3				$ 912.00 /each	$ 912
Plow/Sand Truck	4	BUILDINGS AND EQUIPMENT	Mary River	2013		32.24	128.95	103.16 m^3	412.64 m^3	30844 kg	123376 kg		$ 912.00 /each	$ 3,648
Portable Concrete Batch Truck	2	BUILDINGS AND EQUIPMENT	Mary River	2013		32.24	64.48	103.16 m^3	206.32 m^3	30844 kg	61688 kg		$ 912.00 /each	$ 1,824
Production Rock Drills	2	BUILDINGS AND EQUIPMENT	Mary River	2013		119.55	239.11	382.57 m^3	765.15 m^3	41000 kg	82000 kg		$ 912.00 /each	$ 1,824
Refridgerated Sea Container	13	BUILDINGS AND EQUIPMENT	Mary River	2013									$ 912.00 /each	$ 11,856
Roll Off Truck	2	BUILDINGS AND EQUIPMENT	Mary River	2013		32.24	64.48	103.16 m^3	206.32 m^3	30844 kg	61688 kg		$ 912.00 /each	$ 1,824
Scissor Lifts	6	BUILDINGS AND EQUIPMENT	Mary River	2013		7.70	46.20	22.33 m^3	133.98 m^3	4917 kg	29502 kg		$ 912.00 /each	$ 5,472
Service (Pick-Up) Trucks	29	BUILDINGS AND EQUIPMENT	Mary River	2013		16.72	484.88	33.98 m^3	985.42 m^3	6350 kg	184150 kg		$ 912.00 /each	$ 26,448
Sewage Vac Tanks	4	BUILDINGS AND EQUIPMENT	Mary River	2013		26.09	104.35	83.48 m^3	333.92 m^3	8165 kg	32660 kg		$ 912.00 /each	$ 3,648
Skid Steer	5	BUILDINGS AND EQUIPMENT	Mary River	2013		3.51	17.56	11.24 m^3	56.19 m^3	3812 kg	19060 kg		$ 912.00 /each	$ 4,560
Snow Cat	2	BUILDINGS AND EQUIPMENT	Mary River	2013		12.18	24.35	38.96 m^3	77.92 m^3	3629 kg	7258 kg		$ 912.00 /each	$ 1,824
Snow Rescue Vehicle	1	BUILDINGS AND EQUIPMENT	Mary River	2013		12.90	12.90	30.97	30.97				$ 912.00 /each	$ 912
Spill Response Truck	2	BUILDINGS AND EQUIPMENT	Mary River	2013									$ 912.00 /each	$ 1,824
Telehandler	4	BUILDINGS AND EQUIPMENT	Mary River	2013		12.96	51.86	41.48 m^3	165.94 m^3	16267 kg	65068 kg		$ 912.00 /each	$ 3,648
Tote Road Culvert Maintenance Steam Truck	1	BUILDINGS AND EQUIPMENT	Mary River	2013									$ 912.00 /each	$ 912
Track Dozer	13	BUILDINGS AND EQUIPMENT	Mary River	2013		12.47	162.09	39.90 m^3	518.69 m^3	20937 kg	272181 kg		$ 912.00 /each	$ 11,856
Tractor Truck	2	BUILDINGS AND EQUIPMENT	Mary River	2013		32.24	64.48	103.16 m^3	206.32 m^3	30844 kg	61688 kg		$ 912.00 /each	$ 1,824
Vac Truck (Roll Off)	2	BUILDINGS AND EQUIPMENT	Mary River	2013		32.24	64.48	103.16 m^3	206.32 m^3	30844 kg	61688 kg		$ 912.00 /each	$ 1,824
Water Truck	2	BUILDINGS AND EQUIPMENT	Mary River	2013		32.24	64.48	103.16 m^3	206.32 m^3	30844 kg	61688 kg		$ 912.00 /each	$ 1,824
Wheel Dozer	1	BUILDINGS AND EQUIPMENT	Mary River	2013									$ 912.00 /each	$ 912
Camp Infrastructure Pad	1	BUILDINGS AND EQUIPMENT	Mary River	2013		25795	25795						$ 1.42 /m^2	$ 36,511
Construction Laydown Area (Parking and Laydown Area)	1	BUILDINGS AND EQUIPMENT	Mary River	2013		60700	60700						$ 1.42 /m^2	$ 85,916
Explosive Magazines Pads	1	BUILDINGS AND EQUIPMENT	Mary River	2013		1896	1896						$ 1.42 /m^2	$ 2,684
Explosives Emulsion Plant Pad	1	BUILDINGS AND EQUIPMENT	Mary River	2013		6850	6850						$ 1.42 /m^2	$ 9,696
Site Service Facilities Pad	1	BUILDINGS AND EQUIPMENT	Mary River	2013		28228	28228						$ 1.42 /m^2	$ 39,955
Utilities Pad	1	BUILDINGS AND EQUIPMENT	Mary River	2013		12654	12654						$ 1.42 /m^2	$ 17,911
Landfill Buildings (2013)	1	BUILDINGS AND EQUIPMENT	Mary River	2013		16843.63	16843.63	25265.45 m^3	25265.45 m^3				$ 16.96 /m^3	$ 428,541
500,000L Diesel Fuel Tanks x 4	4	BUILDINGS AND EQUIPMENT	Mary River	2013		54.76	219.04	500.51 m^3	500.51 m^3				$ 252.59 /m^2	$ 55,328
Emergency Response Garage	1	BUILDINGS AND EQUIPMENT	Mary River	2013	3000	278.71	278.71						$ 178.63 /m^2	$ 49,785
Incinerator (3-20' ISO Containers)	1	BUILDINGS AND EQUIPMENT	Mary River	2013	560	52.03	52.03	158.68 m^3	158.68 m^3				$ 178.63 /m^2	$ 9,293
Sewage Treatment Plant	1	BUILDINGS AND EQUIPMENT	Mary River	2013	1920	178.37	178.37	544.04 m^3	544.04 m^3				$ 178.63 /m^2	$ 31,863
Waste Incinerators (3-20' ISO Containers)	1	BUILDINGS AND EQUIPMENT	Mary River	2013	560	52.03	52.03						$ 178.63 /m^2	$ 9,293
Waste Management Building	1	BUILDINGS AND EQUIPMENT	Mary River	2013	4800	445.93	445.93						$ 178.63 /m^2	$ 79,657
Accommodation Laboratory	1	BUILDINGS AND EQUIPMENT	Mary River	2013	3360	312.15	312.15	1236.13 m^3	1236.13 m^3				$ 56.95 /m^2	$ 17,776
Accommodation Laundry	1	BUILDINGS AND EQUIPMENT	Mary River	2013	4560	423.64	423.64	1677.61 m^3	1677.61 m^3				$ 56.95 /m^2	$ 24,125

Item Descritpion	# of Items	BIMC Headings	Site	Work Plan	Area (ft^2)/ Item	Area (m^2)/ Item	Area (m^2) Total	Volume/ Item	Volume (Total)	Weight/Item	Weight (Total)	TEU	Unit Rate	Reclamation Cost
Accommodation Office	1	BUILDINGS AND EQUIPMENT	Mary River	2013	6540	607.59	607.59	2406.04 m^3	2406.04 m^3				$ 56.95 /m^2	$ 34,601
Accommodation Service Core	1	BUILDINGS AND EQUIPMENT	Mary River	2013	19980	1856.20	1856.20	7350.56 m^3	7350.56 m^3				$ 56.95 /m^2	$ 105,706
Accommodation Wing AA	1	BUILDINGS AND EQUIPMENT	Mary River	2013	6583	611.58	611.58	2421.86 m^3	2421.86 m^3				$ 56.95 /m^2	$ 34,828
Accommodation Wing AB	1	BUILDINGS AND EQUIPMENT	Mary River	2013	6583	611.58	611.58	2421.86 m^3	2421.86 m^3				$ 56.95 /m^2	$ 34,828
Accommodation Wing AC	1	BUILDINGS AND EQUIPMENT	Mary River	2013	6583	611.58	611.58	2421.86 m^3	2421.86 m^3				$ 56.95 /m^2	$ 34,828
Accommodation Wing AD	1	BUILDINGS AND EQUIPMENT	Mary River	2013	6583	611.58	611.58	2421.86 m^3	2421.86 m^3				$ 56.95 /m^2	$ 34,828
Accommodation Wing AE	1	BUILDINGS AND EQUIPMENT	Mary River	2013	6583	611.58	611.58	2421.86 m^3	2421.86 m^3				$ 56.95 /m^2	$ 34,828
Accommodation Wing AF	1	BUILDINGS AND EQUIPMENT	Mary River	2013	6583	611.58	611.58	2421.86 m^3	2421.86 m^3				$ 56.95 /m^2	$ 34,828
Accommodation Wing AG	1	BUILDINGS AND EQUIPMENT	Mary River	2013	6583	611.58	611.58	2421.86 m^3	2421.86 m^3				$ 56.95 /m^2	$ 34,828
Emergency Response Office	1	BUILDINGS AND EQUIPMENT	Mary River	2013	960	89.19	89.19	217.62 m^3	54.40 m^3				$ 56.95 /m^2	$ 5,079
Potable Water Treatment Plant	1	BUILDINGS AND EQUIPMENT	Mary River	2013	4200	390.19	390.19	2380.18 m^3	2380.18 m^3				$ 56.95 /m^2	$ 22,221
Potable Water Treatment Plant (SOG)	1	BUILDINGS AND EQUIPMENT	Milne Port	2013	4200	390.19	390.19						$ 29.18 /m^2	$ 11,388
Construction Pad C (2013)	1	BUILDINGS AND EQUIPMENT	Milne Port	2013		15807.5	15807.5						$ 1.42 /m^2	$ 22,374
Heavy Equipment/Rolling Stock Laydown	1	BUILDINGS AND EQUIPMENT	Milne Port	2013		80900	80900						$ 1.42 /m^2	$ 114,508
Laydown A1 (2013)	1	BUILDINGS AND EQUIPMENT	Milne Port	2013		24500	24500						$ 1.42 /m^4	$ (26,668)
Laydown B1 (2013)	1	BUILDINGS AND EQUIPMENT	Milne Port	2013		63000	63000						$ 1.42 /m^6	$ 51,284
Weatherhaven Tents Laydown	1	BUILDINGS AND EQUIPMENT	Milne Port	2013		5335	5335						$ 1.42 /m^2	$ 7,551
12ML Diesel Fuel Tanks x 2	2	BUILDINGS AND EQUIPMENT	Milne Port	2013		794.23	1588.46	12112.01 m^3	24224.02 m^3				$ 252.59 /m^2	$ 401,236
5ML Diesel Fuel Storage Tank x 1	1	BUILDINGS AND EQUIPMENT	Milne Port	2013		514.72	514.72	5018.52 m^3	5018.52 m^3				$ 252.59 /m^2	$ 130,015
750,000L Jet A Fuel Tanks x 2	2	BUILDINGS AND EQUIPMENT	Milne Port	2013		82.52	165.04	754.23 m^3	1508.47 m^3				$ 252.59 /m^2	$ 41,688
Diesel Fuel Dispensing Module	1	BUILDINGS AND EQUIPMENT	Milne Port	2013	160	14.86	14.86	36.25 m^3	36.25 m^3			1	$ 178.63 /m^2	$ 2,655
Diesel Fuel Dispensing Module	1	BUILDINGS AND EQUIPMENT	Milne Port	2013	320	29.73	29.73	72.49 m^3	72.49 m^3			2	$ 178.63 /m^2	$ 5,310
Jet-A1 Fuel Dispensing Module	1	BUILDINGS AND EQUIPMENT	Milne Port	2013	160	14.86	14.86	36.25 m^3	36.25 m^3			1	$ 178.63 /m^2	$ 2,655
Sewage Treatment Plant	1	BUILDINGS AND EQUIPMENT	Milne Port	2013	1920	178.37	178.37	543.68 m^3	543.68 m^3				$ 178.63 /m^2	$ 31,863
Sewage Treatment Truck Building	1	BUILDINGS AND EQUIPMENT	Milne Port	2013	600	55.74	55.74						$ 178.63 /m^2	$ 9,957
Waste Incinerators (3-20' ISO Containers)	1	BUILDINGS AND EQUIPMENT	Milne Port	2013	560	52.03	52.03	158.57 m^3	158.57 m^3				$ 178.63 /m^2	$ 9,293
Waste Management Building	1	BUILDINGS AND EQUIPMENT	Milne Port	2013	4800	445.93	445.93	2718.42 m^3	2718.42 m^3				$ 178.63 /m^2	$ 79,657
Weatherhaven (Generator Building)	1	BUILDINGS AND EQUIPMENT	Milne Port	2013		44.65	44.65	136.18 m^3	136.18 m^3				$ 178.63 /m^2	$ 7,976
Accommodation Laundry	1	BUILDINGS AND EQUIPMENT	Milne Port	2013	4560	423.64	423.64	1678.62 m^3	1678.62 m^3				$ 56.95 /m^2	$ 24,125
Accommodation Office	1	BUILDINGS AND EQUIPMENT	Milne Port	2013	3600	334.45	334.45	1325.23 m^3	1325.23 m^3				$ 56.95 /m^2	$ 19,046
Accommodation Service Core	1	BUILDINGS AND EQUIPMENT	Milne Port	2013	14940	1387.97	1387.97	5499.70 m^3	5499.70 m^3				$ 56.95 /m^2	$ 79,042

Item Descritpion	# of Items	BIMC Headings	Site	Work Plan	Area (ft^2)/ Item	Area (m^2)/ Item	Area (m^2) Total	Volume/ Item	Volume (Total)	Weight/Item	Weight (Total)	TEU	Unit Rate	Reclamation Cost
Accommodation Wing BA	1	BUILDINGS AND EQUIPMENT	Milne Port	2013	6583	611.58	611.58	2423.33 m^3	2423.33 m^3				$ 56.95 /m^2	$ 34,828
Accommodation Wing BB	1	BUILDINGS AND EQUIPMENT	Milne Port	2013	6583	611.58	611.58	2423.33 m^3	2423.33 m^3				$ 56.95 /m^2	$ 34,828
Accommodation Wing BC	1	BUILDINGS AND EQUIPMENT	Milne Port	2013	6583	611.58	611.58	2423.33 m^3	2423.33 m^3				$ 56.95 /m^2	$ 34,828
Accommodation Wing BD	1	BUILDINGS AND EQUIPMENT	Milne Port	2013	6583	611.58	611.58	2423.33 m^3	2423.33 m^3				$ 56.95 /m^2	$ 34,828
Potable Water Treatment Plant (Water Building)	1	BUILDINGS AND EQUIPMENT	Milne Port	2013	4200	390.19	390.19	2378.62 m^3	2378.62 m^3				$ 56.95 /m^2	$ 22,221
Weatherhaven (Canvas Tents)	1	BUILDINGS AND EQUIPMENT	Milne Port	2013		58.14	58.14	212.79 m^3	212.79 m^3				$ 56.95 /m^2	$ 3,311
Weatherhaven (Dormitory Tents)	20	BUILDINGS AND EQUIPMENT	Milne Port	2013		55.82	1116.40	204.30 m^3	4086.02 m^3				$ 56.95 /m^2	$ 63,576
Weatherhaven (Tent Buildings)	3	BUILDINGS AND EQUIPMENT	Milne Port	2013		102.33	306.99	374.53 m^3	1123.58 m^3				$ 56.95 /m^2	$ 17,482
Weatherhaven (Tent Buildings)	5	BUILDINGS AND EQUIPMENT	Milne Port	2013		37.21	186.05	136.19 m^3	680.94 m^3				$ 56.95 /m^2	$ 10,595
Mine Tank Farm & Dyke	1	CHEMICALS AND SOIL MANAGEMENT	Mary River	2013		1912	1912						$ 13.89 /m^2	$ 26,564
Magazines	15	CHEMICALS AND SOIL MANAGEMENT	Mary River	2013								15	$ 4,583.34 TEU	$ 68,750
Fuel Tank Farm	1	CHEMICALS AND SOIL MANAGEMENT	Milne Port	2013		18000	18000						$ 13.89 /m^2	$ 250,080
Short Haul Contaminated Soils (2013)	1	CHEMICALS AND SOIL MANAGEMENT	N/A	2013		19912.00	19912.00	5973.60 m^3	5973.60 m^3				$ 9.05 /m^3	$ 54,087
100,000L ISO Container Fuel Storage	12	CHEMICALS AND SOIL MANAGEMENT	N/A	2013								12	$ 9,122.55 /TEU	$ 109,471
Ammonium Nitrate (2013)	1	CHEMICALS AND SOIL MANAGEMENT	N/A	2013						880000 kg	880000 kg		$ 302.47 /rev. ton	$ 266,175
Pre-package Explosives (2013)	1	CHEMICALS AND SOIL MANAGEMENT	N/A	2013						40000 kg	40000 kg		$ 302.47 /rev. ton	$ 12,099
Short Haul Buildings (2013)	1	MOBILIZATION/DEMOBILIZATION	N/A	2013		16843.63	16843.63	16843.63 m^3	16843.63 m^3				$ 9.05 /m^3	$ 152,509
Crew Transport	24	MOBILIZATION/DEMOBILIZATION	N/A	2013				26.45 m^3	634.74 m^3	3382 kg	81168 kg		$ 633.39 /rev. ton	$ 160,816
Docking Activities (Receive Heavy Equipemt 2013)	1	MOBILIZATION/DEMOBILIZATION	N/A	2013							628540 kg		$ 82.50 /tonne	$ 51,855
Dozer (200 H.P.)	2	MOBILIZATION/DEMOBILIZATION	N/A	2013				39.90 m^3	79.80 m^3	20937 kg	41874 kg		$ 633.39 /rev. ton	$ 26,523
Dump Trailer, 20 C.Y.	3	MOBILIZATION/DEMOBILIZATION	N/A	2013				199.04 m^3	597.12 m^3	8618 kg	25854 kg		$ 633.39 /rev. ton	$ 151,284
Flat bed Truck, Gas, 3 Ton	3	MOBILIZATION/DEMOBILIZATION	N/A	2013				103.16 m^3	309.48 m^3	30844 kg	92532 kg		$ 633.39 /rev. ton	$ 78,409
Grader (30,000 lbs.)	4	MOBILIZATION/DEMOBILIZATION	N/A	2013				114.24 m^3	456.96 m^3	26060 kg	104240 kg		$ 633.39 /rev. ton	$ 115,774
Hyd. Crane, 12 Ton	3	MOBILIZATION/DEMOBILIZATION	N/A	2013				48.67 m^3	146.01 m^3	19958 kg	59874 kg		$ 633.39 /rev. ton	$ 37,924
Loader (W.M., 5.5 C.Y.)	2	MOBILIZATION/DEMOBILIZATION	N/A	2013				180.68 m^3	361.36 m^3	49546 kg	99092 kg		$ 633.39 /rev. ton	$ 91,553
Truck Tractor (6x4, 380 H.P.)	3	MOBILIZATION/DEMOBILIZATION	N/A	2013				103.16 m^3	309.48 m^3	30844 kg	92532 kg		$ 633.39 /rev. ton	$ 78,409
Vibr. Roller	2	MOBILIZATION/DEMOBILIZATION	N/A	2013				38.32 m^3	76.64 m^3	15687 kg	31374 kg		$ 633.39 /rev. ton	$ 19,872
10,000L Gasoline ISO Container	1	MOBILIZATION/DEMOBILIZATION	N/A	2013								0.5	$ 3,819.45 TEU	$ 1,910
185 cfm Air Compressor	2	MOBILIZATION/DEMOBILIZATION	N/A	2013				4.12 m^3	8.24 m^3	866 kg	1732 kg	0.3	$ 252.06 m^3	$ 831
20 YD Garbage Bin	2	MOBILIZATION/DEMOBILIZATION	N/A	2013				40.5 m^3	81 m^3	2720 kg	5440 kg	2.5	$ 252.06 m^3	$ 8,167
2013 Bulk Fuel (Fuel Shipped to Site)	1	MOBILIZATION/DEMOBILIZATION	N/A	2013								12	$ 9,122.55 /TEU	$ 109,471
20kW Whisper Watt Gen Set	7	MOBILIZATION/DEMOBILIZATION	N/A	2013		1.4141	9.8987	1.78 m^3	12.47 m^3	820 kg	5740 kg	0.4	$ 252.06 /rev. ton	$ 1,447
30 YD Garbage Bin	2	MOBILIZATION/DEMOBILIZATION	N/A	2013				44.4 m^3	88.8 m^3	3540 kg	7080 kg	2.7	$ 252.06 m^3	$ 8,953
320000BTU Frost Fighter	20	MOBILIZATION/DEMOBILIZATION	N/A	2013				2.62 m^3	52.4 m^3	263 kg	5260 kg	1.6	$ 252.06 m^3	$ 5,283

Item Descritpion	# of Items	BIMC Headings	Site	Work Plan	Area (ft^2)/ Item	Area (m^2)/ Item	Area (m^2) Total	Volume/ Item	Volume (Total)	Weight/Item	Weight (Total)	TEU	Unit Rate	Reclamation Cost
4 Ton Propane Bullet c/w Refill Station	1	MOBILIZATION/DEMOBILIZATION	N/A	2013								1.0	$ 3,819.45 /TEU	$ 3,819
4" Ice Auger	1	MOBILIZATION/DEMOBILIZATION	N/A	2013								0.1	$ 3,819.45 /TEU	$ 382
400 Amp Welding Machines	1	MOBILIZATION/DEMOBILIZATION	N/A	2013				5.94 m^3	5.94 m^3	998 kg	998 kg	0.2	$ 252.06 m3	$ 599
6 YD Garbage Bins	9	MOBILIZATION/DEMOBILIZATION	N/A	2013				6.1 m^3	54.9 m^3	450 kg	4050 kg	1.7	$ 252.06 m^3	$ 5,535
8kW Light Towers	10	MOBILIZATION/DEMOBILIZATION	N/A	2013				12 m^3	120 m^3	885 kg	8850 kg	3.7	$ 252.06 m^3	$ 12,099
Air Compressors	2	MOBILIZATION/DEMOBILIZATION	N/A	2013				12.1 m^3	24.2 m^3	1723 kg	3446 kg	0.8	$ 252.06 m^3	$ 2,440
Boiler Modules	1	MOBILIZATION/DEMOBILIZATION	N/A	2013				87.994 m^3	87.99 m^3	14514 kg	14514 kg		$ 252.06 /rev. ton	$ 8,872
Camp Power-Genset (1250)	10	MOBILIZATION/DEMOBILIZATION	N/A	2013				34.58 m^3	345.80 m^3	14061 kg	140610 kg		$ 252.06 /rev. ton	$ 35,442
Construction Material	1	MOBILIZATION/DEMOBILIZATION	N/A	2013								2	$ 3,819.45 /TEU	$ 7,639
Consumables	1	MOBILIZATION/DEMOBILIZATION	N/A	2013								2	$ 4,583.34 /TEU	$ 9,167
Dewatering Pump	2	MOBILIZATION/DEMOBILIZATION	N/A	2013				9.1 m^3	18.2 m^3	894 kg	1788 kg	0.6	$ 252.06 m^3	$ 1,835
Dewatering Pump	2	MOBILIZATION/DEMOBILIZATION	N/A	2013				15.5 m^3	31 m^3	1571 kg	3142 kg	1.0	$ 252.06 m^3	$ 3,126
Docking Activities (2013 AN and Packaged Explosives)	1	MOBILIZATION/DEMOBILIZATION	N/A	2013						1924000 kg	1924000 kg		$ 82.50 /tonne	$ 158,730
Docking Activities (2013 Materials and Supplies)	1	MOBILIZATION/DEMOBILIZATION	N/A	2013								10	$ 1,271.33 /TEU	$ 12,713
Docking Activities (Construction Equipment)	1	MOBILIZATION/DEMOBILIZATION	N/A	2013								22.0	$ 1,271.33 /TEU	$ 27,969
Docking Activities (Equipment - 2013)	1	MOBILIZATION/DEMOBILIZATION	N/A	2013								4.0	$ 1,271.33 /TEU	$ 5,085
Frost Fighters	12	MOBILIZATION/DEMOBILIZATION	N/A	2013				2.62 m^3	31.44 m^3	263 kg	3156 kg	1.0	$ 252.06 m^3	$ 3,170
Hot Box	4	MOBILIZATION/DEMOBILIZATION	N/A	2013				19.91 m^3	79.64 m^3	1850 kg	7400 kg	2.4	$ 252.06 m^3	$ 8,030
Ice Profiler	1	MOBILIZATION/DEMOBILIZATION	N/A	2013				0.0226 m^3	0.0226 m^3	50 kg	50 kg	0.1	$ 252.06 /rev. ton	$ 13
Loader Snow Blower Attachments	5	MOBILIZATION/DEMOBILIZATION	N/A	2013								1	$ 3,819.45 TEU	$ 3,819
Materials and Supplies (2013)	1	MOBILIZATION/DEMOBILIZATION	N/A	2013								10	$ 5,872.52 /TEU	$ 58,725
Plate Compactors	4	MOBILIZATION/DEMOBILIZATION	N/A	2013				19.478 m^3	77.912 m^3	99.8 kg	399.2 kg	2.4	$ 252.06 m^3	$ 7,855
Portable Grout Plant (3 off Sea Cans)	1	MOBILIZATION/DEMOBILIZATION	N/A	2013								3	$ 3,819.45 TEU	$ 11,458
Potable Water Tank	1	MOBILIZATION/DEMOBILIZATION	N/A	2013				12.096 m^3	12.10 m^3	193 kg	193 kg	0.4	$ 252.06 /rev. ton	$ 1,220
Potable Water Tanks	2	MOBILIZATION/DEMOBILIZATION	N/A	2013				13.096 m^4	26.19 m^4	194 kg	388 kg	0.8	$ 252.06 /rev. ton	$ 2,641
Raw Water Tanks	2	MOBILIZATION/DEMOBILIZATION	N/A	2013				14.096 m^5	28.19 m^5	195 kg	390 kg	0.9	$ 252.06 /rev. ton	$ 2,842
Rock Breaker	1	MOBILIZATION/DEMOBILIZATION	N/A	2013						3550 kg	3550 kg	0.0	$ 252.06 /rev. ton	$ 895
Solution Modules	1	MOBILIZATION/DEMOBILIZATION	N/A	2013								0.5	$ 3,819.45 TEU	$ 1,910
Spray Equipment	1	MOBILIZATION/DEMOBILIZATION	N/A	2013								0.1	$ 3,819.45 /TEU	$ 382
Trash Pumps	8	MOBILIZATION/DEMOBILIZATION	N/A	2013				0.327 m^3	2.616 m^3	120 kg	960 kg	0.1	$ 252.06 m^3	$ 264
Walk Behind Compactor	4	MOBILIZATION/DEMOBILIZATION	N/A	2013				1.609 m^3	6.436 m^3	757 kg	3028 kg	0.2	$ 252.06 /rev. ton	$ 763
Airfare (2013)	1	MOBILIZATION/DEMOBILIZATION	N/A	2013										$ 775,000
Cement	1	MOBILIZATION/DEMOBILIZATION	N/A	2013							2,400,000 kg		$ 252.06 /rev. ton	$ 604,944
Camp Operation (2013)	1	MOBILIZATION/DEMOBILIZATION	N/A	2013										$ 669,038
Borrow Pit #1	1	OPEN PIT	Mary River	2013		27250	27250						$ 1.42 /m^2	$ 38,570
Borrow Pit #2	1	OPEN PIT	Mary River	2013		9460	9460						$ 1.42 /m^2	$ 13,390

Item Descritpion	# of Items	BIMC Headings	Site	Work Plan	Area (ft^2)/ Item	Area (m^2)/ Item	Area (m^2) Total	Volume/ Item	Volume (Total)	Weight/Item	Weight (Total)	TEU	Unit Rate	Reclamation Cost
Borrow Pit #3	1	OPEN PIT	Mary River	2013		56730	56730						$ 1.42 /m^2	$ 80,297
Borrow Pit #4	1	OPEN PIT	Mary River	2013		31830	31830						$ 1.42 /m^2	$ 45,053
Borrow Pit #5	1	OPEN PIT	Mary River	2013		48240	48240						$ 1.42 /m^2	$ 68,280
Quarry QMR2 (2013)	1	OPEN PIT	Mary River	2013		252700	252700		200000 m^3				$ 1.42 /m^2	$ 357,678
Rock Quarry/Borrow Area No. 2	1	OPEN PIT	Mary River	2013		16950	16950						$ 1.42 /m^2	$ 23,991
Borrow Development Areas	1	OPEN PIT	Milne Port	2013		42080	42080						$ 1.42 /m^2	$ 59,561
Quarry Q1 (2013)	1	OPEN PIT	Milne Port	2013		200000	200000		100000 m^3				$ 1.42 /m^2	$ 283,085
Landfill Heavy Equipment (2013)	1	OPEN PIT		2013			9089.08		13633.62 m^3				$ 16.96 /m^3	$ 231,247
Treated Effluent Pond	1	WATER MANAGEMENT	Mary River	2013		14432	14432						$ 13.89 /m^2	$ 200,508
Polishing Waste Stabilization Pond	1	WATER MANAGEMENT	Milne Port	2013		3864	3864						$ 13.89 /m^2	$ 53,684

APPENDIX B – CLOSURE 2014 WORK PLAN FINANCIAL SECURITY ESTIMATE

Table B1: Summary of closure 2014 work plan cost estimate.

BIMC Component Type	BIMC Component Name	Total Cost
OPEN PIT		$767,214
UNDERGROUND MINE		$-
TAILINGS		$-
ROCK PILE		$-
BUILDINGS AND EQUIPMENT	MINE SITE	$2,537,254
	MILNE PORT	$1,289,412
	TOTE ROAD	$12,697
CHEMICALS AND SOIL MANAGEMENT		$3,777,298
WATER MANAGEMENT		$-
POST CLOSURE MONITORING AND MAINTENANCE		$-
SUB-TOTAL		*$8,383,876*
MOBILIZATION/DEMOBILIZATION		$1,718,369
PROJECT MANAGEMENT	9.4%	$788,084
BONDING		$-
TAXES (GST ON SUPPLIES)		$-
INSURANCE		$-
ENGINEERING	5%	$419,194
CONTINGENCY	15%	$1,515,337
TOTAL		**$12,824,860**

Table B2: Reclamation cost estimate.

Item Descritpion	# of Items	BIMC Headings	Site	Work Plan	Area (ft^2)/ Item	Area (m^2)/ Item	Area (m^2) Total	Volume/ Item	Volume (Total)	Weight/Item	Weight (Total)	TEU	Unit Rate	Reclamation Cost
Maintenance Building (Concrete SOG)	1	BUILDINGS AND EQUIPMENT	Mary River	2014	26000	2415.48	2415.48						$ 29.18 /m^2	$ 70,494
Welding Shop Building (Concrete SOG)	1	BUILDINGS AND EQUIPMENT	Mary River	2014	4200	390.19	390.19						$ 29.18 /m^2	$ 11,388
Mid-size Excavator	2	BUILDINGS AND EQUIPMENT	Mary River	2014		48.97	97.94	156.7 m^3	313.40 m^3	45000	90000 kg		$ 912.00 /each	$ 1,824
Mobile Equipment Low-boy Trailer	1	BUILDINGS AND EQUIPMENT	Mary River	2014		18.35	18.35	58.71 m^3	58.71 m^3				$ 912.00 /each	$ 912
Reclaim Conveyor	1	BUILDINGS AND EQUIPMENT	Mary River	2014						1032700 kg	1032700 kg		$ 10,000.00 /each	$ 10,000
Shiploader	2	BUILDINGS AND EQUIPMENT	Mary River	2014						1960000 kg	3920000 kg		$ 10,000.00 /each	$ 20,000
Shiploader Link Conveyor	1	BUILDINGS AND EQUIPMENT	Mary River	2014						212330 kg	212330 kg		$ 10,000.00 /each	$ 10,000
Single Pass Production Drill	1	BUILDINGS AND EQUIPMENT	Mary River	2014		81.93	81.93	262.16 m^3	262.16 m^3	56800 kg	56800 kg		$ 912.00 /each	$ 912
Stockpile, Front End Loader	4	BUILDINGS AND EQUIPMENT	Mary River	2014		48.10	192.40	153.92 m^3	615.68 m^3	43400 kg	173600 kg		$ 912.00 /each	$ 3,648
Tote Road Ore Haul Truck - Lead Trailer	10	BUILDINGS AND EQUIPMENT	Mary River	2014		41.23	412.25	131.92 m^3	1,319.20 m^3	34500 kg	345000 kg		$ 912.00 /each	$ 9,120
Tote Road Ore Haul Truck - Pup Trailer	10	BUILDINGS AND EQUIPMENT	Mary River	2014		41.23	412.25	131.92 m^3	1,319.20 m^3	34500 kg	345000 kg		$ 912.00 /each	$ 9,120
Tote Road Ore Haul Truck - Tractor	16	BUILDINGS AND EQUIPMENT	Mary River	2014		37.59	601.45	120.29 m^3	1,924.64 m^3	11400 kg	182400 kg		$ 912.00 /each	$ 14,592
Aerodrome Runway Expansion	1	BUILDINGS AND EQUIPMENT	Mary River	2014		17950	17950						$ 1.42 /m^2	$ 25,407
New Aerodrome Apron	1	BUILDINGS AND EQUIPMENT	Mary River	2014		22775	22775						$ 1.42 /m^2	$ 32,236
Ore Crushing and Loading Area Pad	1	BUILDINGS AND EQUIPMENT	Mary River	2014		33940	33940						$ 1.42 /m^2	$ 48,040
Ore Stockpile Pad	1	BUILDINGS AND EQUIPMENT	Mary River	2014		248990	248990						$ 1.42 /m^2	$ 352,427
Landfill Buildings (2014)	1	BUILDINGS AND EQUIPMENT	Mary River	2014		13939.45	13939.45	20909.18 m^3	20909.175 m^3				$ 16.96 /m^3	$ 354,652
Airfield Lighting	1	BUILDINGS AND EQUIPMENT	Mary River	2014								2	$ 3,819.45 /TEU	$ 7,639
Airfield Power Generation	1	BUILDINGS AND EQUIPMENT	Mary River	2014				11.99 m^3	11.99 m^3				$ 252.06 /rev. ton	$ 1,209
Explosives Pad Access Road	1	BUILDINGS AND EQUIPMENT	Mary River	2014		4640	4640						$ 1.42 /m^2	$ 6,568
Pit 1 Haul Road	1	BUILDINGS AND EQUIPMENT	Mary River	2014		130800	130800						$ 1.42 /m^2	$ 185,138
Treated Effluent Pond Access Road	1	BUILDINGS AND EQUIPMENT	Mary River	2014		10140	10140						$ 1.42 /m^2	$ 14,352
Accommodation Areas E-House #1	1	BUILDINGS AND EQUIPMENT	Mary River	2014	640	59.46	59.46						$ 178.63 /m^2	$ 10,621
Accommodation Areas E-House #2	1	BUILDINGS AND EQUIPMENT	Mary River	2014	400	37.16	37.16						$ 178.63 /m^2	$ 6,638
Aerodrome Area E-House	1	BUILDINGS AND EQUIPMENT	Mary River	2014	400	37.16	37.16						$ 178.63 /m^2	$ 6,638
Crushing and Screening E-House	1	BUILDINGS AND EQUIPMENT	Mary River	2014	640	59.46	59.46						$ 178.63 /m^2	$ 10,621
Diesel Fuel Dispensing Module	1	BUILDINGS AND EQUIPMENT	Mary River	2014	320	29.73	29.73						$ 178.63 /m^2	$ 5,310
Emergency Response Garage	1	BUILDINGS AND EQUIPMENT	Mary River	2014	3000	278.71	278.71						$ 178.63 /m^2	$ 49,785
Explosives Magazine	1	BUILDINGS AND EQUIPMENT	Mary River	2014	360	33.45	33.45						$ 178.63 /m^2	$ 5,974
Explosives Plant Building	1	BUILDINGS AND EQUIPMENT	Mary River	2014	3680	341.88	341.88	1042.06 m^3	1042.06 m^3				$ 178.63 /m^2	$ 61,070
Explosives Shop	1	BUILDINGS AND EQUIPMENT	Mary River	2014	4000	371.61	371.61						$ 178.63 /m^2	$ 66,381
Fuel Tank Farm E-House	1	BUILDINGS AND EQUIPMENT	Mary River	2014	400	37.16	37.16						$ 178.63 /m^2	$ 6,638

Item Descritpion	# of Items	BIMC Headings	Site	Work Plan	Area (ft^2)/ Item	Area (m^2)/ Item	Area (m^2) Total	Volume/ Item	Volume (Total)	Weight/Item	Weight (Total)	TEU	Unit Rate	Reclamation Cost
Maintenance Building	1	BUILDINGS AND EQUIPMENT	Mary River	2014	26000	2415.48	2415.48	25768.34 m^3	25768.34 m^3				$ 178.63 /m^2	$ 431,474
Pit Office Washcar	1	BUILDINGS AND EQUIPMENT	Mary River	2014	480	44.59	44.59						$ 56.95 /m^2	$ 2,539
Power Generation E-House #1	1	BUILDINGS AND EQUIPMENT	Mary River	2014	720	66.89	66.89						$ 178.63 /m^2	$ 11,949
Power Generation E-House #2	1	BUILDINGS AND EQUIPMENT	Mary River	2014	720	66.89	66.89						$ 178.63 /m^2	$ 11,949
Power Generation Module #1	1	BUILDINGS AND EQUIPMENT	Mary River	2014	559	51.93	51.93	221.61 m^3	221.61 m^3				$ 178.63 /m^2	$ 9,277
Power Generation Module #2	1	BUILDINGS AND EQUIPMENT	Mary River	2014	559	51.93	51.93	221.61 m^3	221.61 m^3				$ 178.63 /m^2	$ 9,277
Power Generation Module #3	1	BUILDINGS AND EQUIPMENT	Mary River	2014	559	51.93	51.93	221.61 m^3	221.61 m^3				$ 178.63 /m^2	$ 9,277
Power Generation Module #4	1	BUILDINGS AND EQUIPMENT	Mary River	2014	559	51.93	51.93	221.61 m^3	221.61 m^3				$ 178.63 /m^2	$ 9,277
Power Generation Module #5	1	BUILDINGS AND EQUIPMENT	Mary River	2014	559	51.93	51.93	221.61 m^3	221.61 m^3				$ 178.63 /m^2	$ 9,277
Power Generation Module #6	1	BUILDINGS AND EQUIPMENT	Mary River	2014	559	51.93	51.93	221.61 m^3	221.61 m^3				$ 178.63 /m^2	$ 9,277
Power Generation Stores	1	BUILDINGS AND EQUIPMENT	Mary River	2014	320	29.73	29.73						$ 178.63 /m^2	$ 5,310
Raw Water Supply E-House	1	BUILDINGS AND EQUIPMENT	Mary River	2014	400	37.16	37.16						$ 178.63 /m^2	$ 6,638
Services Area E-House #1	1	BUILDINGS AND EQUIPMENT	Mary River	2014	400	37.16	37.16						$ 178.63 /m^2	$ 6,638
Services Area E-House #2	1	BUILDINGS AND EQUIPMENT	Mary River	2014	400	37.16	37.16						$ 178.63 /m^2	$ 6,638
Sewage Chemical Storage Container	1	BUILDINGS AND EQUIPMENT	Mary River	2014	320	29.73	29.73						$ 178.63 /m^2	$ 5,310
Sewage Treatment Plant	1	BUILDINGS AND EQUIPMENT	Mary River	2014	1920	178.37	178.37						$ 178.63 /m^2	$ 31,863
Sewage Treatment Truck (Concrete SOG)	1	BUILDINGS AND EQUIPMENT	Mary River	2014	600	55.74	55.74						$ 29.18 /m^2	$ 1,627
Sewage Treatment Truck Building	1	BUILDINGS AND EQUIPMENT	Mary River	2014	600	55.74	55.74						$ 178.63 /m^2	$ 9,957
Truck Wash Building	1	BUILDINGS AND EQUIPMENT	Mary River	2014	10800	1003.35	1003.35	7645.55 m^3	7645.55 m^3				$ 178.63 /m^2	$ 179,228
Welding Shop Building	1	BUILDINGS AND EQUIPMENT	Mary River	2014	4200	390.19	390.19	2973.27 m^3	2973.27 m^3				$ 178.63 /m^2	$ 69,700
Aerodrome Field Electrical Centre	1	BUILDINGS AND EQUIPMENT	Mary River	2014	160	14.86	14.86						$ 56.95 /m^2	$ 846
Aerodrome Office	1	BUILDINGS AND EQUIPMENT	Mary River	2014	720	66.89	66.89	163.11 m^3	163.11 m^3				$ 56.95 /m^2	$ 3,809
Batch Plant Office	1	BUILDINGS AND EQUIPMENT	Mary River	2014	720	66.89	66.89						$ 56.95 /m^2	$ 3,809
Communication Sheds (No. 1 and No. 2)	2	BUILDINGS AND EQUIPMENT	Mary River	2014	160	14.86	29.73	36.25 m^3	72.49 m^3			2	$ 56.95 /m^2	$ 1,693
Concrete Batch Plant	1	BUILDINGS AND EQUIPMENT	Mary River	2014	7200	668.90	668.90	4077.63 m^3	4077.63 m^3				$ 56.95 /m^2	$ 38,092
Crushing and Screening Electrical Trailer	1	BUILDINGS AND EQUIPMENT	Mary River	2014	424	39.39	39.39						$ 56.95 /m^2	$ 2,243
Field Electrical Centre	1	BUILDINGS AND EQUIPMENT	Mary River	2014	160	14.86	14.86	45.31 m^3	45.31 m^3				$ 56.95 /m^2	$ 846
Fuel System Lunchroom	1	BUILDINGS AND EQUIPMENT	Mary River	2014	720	66.89	66.89						$ 56.95 /m^2	$ 3,809
Fuel Systems Washcar	1	BUILDINGS AND EQUIPMENT	Mary River	2014	384	35.67	35.67						$ 56.95 /m^2	$ 2,032
Pit Office Building	1	BUILDINGS AND EQUIPMENT	Mary River	2014	2880	267.56	267.56	652.42 m^3	652.42 m^3				$ 56.95 /m^2	$ 15,237
Raw Water Pumphouse	1	BUILDINGS AND EQUIPMENT	Mary River	2014	160	14.86	14.86						$ 56.95 /m^2	$ 846
Site Services Lunchroom #1	1	BUILDINGS AND EQUIPMENT	Mary River	2014	720	66.89	66.89						$ 56.95 /m^2	$ 3,809
Site Services Lunchroom #2	1	BUILDINGS AND EQUIPMENT	Mary River	2014	720	66.89	66.89						$ 56.95 /m^2	$ 3,809
Site Services Washcar #1	1	BUILDINGS AND EQUIPMENT	Mary River	2014	384	35.67	35.67						$ 56.95 /m^2	$ 2,032
Site Services Washcar #2	1	BUILDINGS AND EQUIPMENT	Mary River	2014	384	35.67	35.67						$ 56.95 /m^2	$ 2,032
Smoke Shack	1	BUILDINGS AND EQUIPMENT	Mary River	2014	160	14.86	14.86						$ 56.95 /m^2	$ 846

Item Descritpion	# of Items	BIMC Headings	Site	Work Plan	Area (ft^2)/ Item	Area (m^2)/ Item	Area (m^2) Total	Volume/ Item	Volume (Total)	Weight/Item	Weight (Total)	TEU	Unit Rate	Reclamation Cost
Truck Weight Facility	1	BUILDINGS AND EQUIPMENT	Mary River	2014	3600	334.45	334.45	2038.81 m^3	2038.81 m^3				$ 56.95 /m^2	$ 19,046
Warehouse	1	BUILDINGS AND EQUIPMENT	Mary River	2014	9600	891.87	891.87	6796.04 m^3	6796.04 m^3				$ 178.63 /m^2	$ 159,314
Workshop Office Building	1	BUILDINGS AND EQUIPMENT	Mary River	2014	2880	267.56	267.56	652.42 m^3	652.42 m^3				$ 56.95 /m^2	$ 15,237
Workshop Office Washcar	1	BUILDINGS AND EQUIPMENT	Mary River	2014	384	35.67	35.67						$ 56.95 /m^2	$ 2,032
Maintenance Building (Concrete SOG)	1	BUILDINGS AND EQUIPMENT	Milne Port	2014	9600	891.87	891.87						$ 29.18 /m^2	$ 26,029
Sewage Treatment Truck (Concrete SOG)	1	BUILDINGS AND EQUIPMENT	Milne Port	2014	1920	178.37	178.37						$ 29.18 /m^2	$ 5,206
Welding Shop Building (Concrete SOG)	1	BUILDINGS AND EQUIPMENT	Milne Port	2014	1600	148.64	148.64						$ 29.18 /m^2	$ 4,338
Construction Pad C (2014)	1	BUILDINGS AND EQUIPMENT	Milne Port	2014		15807.5	15807.5						$ 1.42 /m^3	$ 22,374
Ore Stockpiles No. 1, 2, 3 and 4	1	BUILDINGS AND EQUIPMENT	Milne Port	2014		248990.00	248990.00						$ 1.42 /m^3	$ 352,427
Laydown A1 (2014)	1	BUILDINGS AND EQUIPMENT	Milne Port	2014		24500	24500						$ 1.42 /m^5	$ 34,678
Laydown B1 (2014)	1	BUILDINGS AND EQUIPMENT	Milne Port	2014		63000	63000						$ 1.42 /m^7	$ 89,172
Ramp to the Beach	1	BUILDINGS AND EQUIPMENT	Milne Port	2014		5176	5176						$ 1.42 /m^2	$ 7,326
Accommodations Area E-House #1	1	BUILDINGS AND EQUIPMENT	Milne Port	2014	640	59.46	59.46						$ 178.63 /m^2	$ 10,621
Accommodations Area E-House #2	1	BUILDINGS AND EQUIPMENT	Milne Port	2014	400	37.16	37.16						$ 178.63 /m^2	$ 6,638
Emergency Response Garage	1	BUILDINGS AND EQUIPMENT	Milne Port	2014	3000	278.71	278.71	1699.01 m^3	1699.01 m^3				$ 178.63 /m^2	$ 49,785
Fuel Tank Farm E-House	1	BUILDINGS AND EQUIPMENT	Milne Port	2014	25	2.32	2.32						$ 178.63 /m^2	$ 415
Maintenance Building	1	BUILDINGS AND EQUIPMENT	Milne Port	2014	9600	891.87	891.87	6796.04 m^3	6796.04 m^3				$ 178.63 /m^2	$ 159,314
Marine Manifold Building	1	BUILDINGS AND EQUIPMENT	Milne Port	2014	340	31.59	31.59						$ 178.63 /m^2	$ 5,642
Power and Generation Systems (Modules)	8	BUILDINGS AND EQUIPMENT	Milne Port	2014	559	51.93	415.46	221.61 m^3	1772.86 m^3				$ 178.63 /m^2	$ 74,214
Power Generation E-House #1	1	BUILDINGS AND EQUIPMENT	Milne Port	2014	810	75.25	75.25						$ 178.63 /m^2	$ 13,442
Power Generation E-House #2	1	BUILDINGS AND EQUIPMENT	Milne Port	2014	810	75.25	75.25						$ 178.63 /m^2	$ 13,442
Power Generation Stores	1	BUILDINGS AND EQUIPMENT	Milne Port	2014	320	29.73	29.73						$ 178.63 /m^2	$ 5,310
Services Area E-House #2	1	BUILDINGS AND EQUIPMENT	Milne Port	2014	400	37.16	37.16						$ 178.63 /m^2	$ 6,638
Sewage Chemical Storage Container	1	BUILDINGS AND EQUIPMENT	Milne Port	2014	320	29.73	29.73						$ 178.63 /m^2	$ 5,310
Welding Shop Building	1	BUILDINGS AND EQUIPMENT	Milne Port	2014	1600	148.64	148.64	1132.67 m^3	1132.67 m^3				$ 178.63 /m^2	$ 26,552
12ML Diesel Fuel Tanks x 1	1	BUILDINGS AND EQUIPMENT	Milne Port	2014		794.23	794.23	12112.01 m^3	12112 m^3				$ 252.59 /m^2	$ 200,618
750,000L Jet A Fuel Tanks x 1	1	BUILDINGS AND EQUIPMENT	Milne Port	2014		82.52	82.52	754.23 m^3	754.23 m^3				$ 252.59 /m^2	$ 20,844
Aerodrome Office	1	BUILDINGS AND EQUIPMENT	Milne Port	2014	720	66.89	66.89						$ 56.95 /m^2	$ 3,809
Batch Plant Office	1	BUILDINGS AND EQUIPMENT	Milne Port	2014	720	66.89	66.89						$ 56.95 /m^2	$ 3,809
Communication Shed	1	BUILDINGS AND EQUIPMENT	Milne Port	2014	160	14.86	14.86	36.25 m^3	36.25 m^3			1	$ 56.95 /m^2	$ 846
Concrete Batch Plant	1	BUILDINGS AND EQUIPMENT	Milne Port	2014	7200	668.90	668.90	4077.63 m^3	4077.63 m^3				$ 56.95 /m^2	$ 38,092
Construction Office	1	BUILDINGS AND EQUIPMENT	Milne Port	2014	2880	267.56	267.56						$ 56.95 /m^2	$ 15,237
Dock Office	1	BUILDINGS AND EQUIPMENT	Milne Port	2014	480	44.59	44.59						$ 178.63 /m^2	$ 7,966

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Emergency Response Office	1	BUILDINGS AND EQUIPMENT	Milne Port	2014	960	89.19	89.19	217.47 m^3	217.47 m^3				$ 56.95 /m^2	$ 5,079
Services Area E-House #1	1	BUILDINGS AND EQUIPMENT	Milne Port	2014	400	37.16	37.16	124.59 m^3	124.59 m^3				$ 56.95 /m^2	$ 2,116
Site Services Heated Warehouse	1	BUILDINGS AND EQUIPMENT	Milne Port	2014	4000	371.61	371.61						$ 56.95 /m^2	$ 21,162
Site Services Lunchroom #1	1	BUILDINGS AND EQUIPMENT	Milne Port	2014	720	66.89	66.89						$ 56.95 /m^2	$ 3,809
Site Services Lunchroom #2	1	BUILDINGS AND EQUIPMENT	Milne Port	2014	720	66.89	66.89						$ 56.95 /m^2	$ 3,809
Site Services Unheated Warehouse	1	BUILDINGS AND EQUIPMENT	Milne Port	2014	4000	371.61	371.61						$ 56.95 /m^2	$ 21,162
Site Services Washcar #1	1	BUILDINGS AND EQUIPMENT	Milne Port	2014	384	35.67	35.67						$ 56.95 /m^2	$ 2,032
Site Services Washcar #2	1	BUILDINGS AND EQUIPMENT	Milne Port	2014	384	35.67	35.67						$ 56.95 /m^2	$ 2,032
Smoke Shack	1	BUILDINGS AND EQUIPMENT	Milne Port	2014	160	14.86	14.86						$ 56.95 /m^2	$ 846
Workshop Office Building	1	BUILDINGS AND EQUIPMENT	Milne Port	2014	2880	267.56	267.56	652.42 m^3	652.42 m^3				$ 56.95 /m^2	$ 15,237
Workshop Office Washcar	1	BUILDINGS AND EQUIPMENT	Milne Port	2014	384	35.67	35.67						$ 56.95 /m^2	$ 2,032
Communication Sheds (No. 1 to 11)	11	BUILDINGS AND EQUIPMENT	Tote Road	2014	160	14.86	163.51	36.25 m^3	398.70 m^3			11	$ 56.95 /m^2	$ 9,311
Emergency Shelter (No. 1 to 4)	4	BUILDINGS AND EQUIPMENT	Tote Road	2014	160	14.86	59.46						$ 56.95 /m^2	$ 3,386
Waste Disposal Land Farm	1	CHEMICALS AND SOIL MANAGEMENT	Milne Port	2014		13780	13780						$ 13.89 /m^2	$ 191,450
1.35 ML Jet-A Fuel	1	CHEMICALS AND SOIL MANAGEMENT	Milne Port	2014					1,350,000 L				$ 0.10 /L	$ 135,000
30.35 ML Arctic Diesel Fuel	1	CHEMICALS AND SOIL MANAGEMENT	Milne Port	2014					30,350,000 L				$ 0.10 /L	$ 3,035,000
Short Haul Contaminated Soils (2014)	1	CHEMICALS AND SOIL MANAGEMENT	N/A	2014		13780	13780	4134 m^3	4134 m^3				$ 9.05 /m^3	$ 37,431
Calcium Chloride	1	CHEMICALS AND SOIL MANAGEMENT	N/A	2014						1447684	1447684		$ 302.47 /rev. ton	$ 437,884
Ammonium Nitrate and Pre-packaged (2013 Credit)	1	CHEMICALS AND SOIL MANAGEMENT	N/A	2014						-799602 kg	-799602		$ 302.47 /rev. ton	$ (241,857)
Ammonium Nitrate (2014)	1	CHEMICALS AND SOIL MANAGEMENT	N/A	2014						520000 kg	520000 kg		$ 302.47 /rev. ton	$ 157,285
Pre-package Explosives (2014)	1	CHEMICALS AND SOIL MANAGEMENT	N/A	2014						83000 kg	83000 kg		$ 302.47 /rev. ton	$ 25,105
Short Haul Buildings (2014)	1	MOBILIZATION/DEMOBILIZATION	N/A	2014		13939.45	13939.45	13939.45 m^3	13939.45 m^3				$ 9.05 /m^3	$ 126,214
2014 Bulk Fuel (Fuel Shipped to Site)	1	MOBILIZATION/DEMOBILIZATION	N/A	2014								11	$ 9,122.55 /TEU	$ 100,348
A/C Recovery Recharge Unit	2	MOBILIZATION/DEMOBILIZATION	N/A	2014				0.565 m^3	1.13 m^3	110 kg	220	0.1	$ 252.06 /rev. ton	$ 114
Battery Charger	4	MOBILIZATION/DEMOBILIZATION	N/A	2014								0.1	$ 3,819.45 /TEU	$ 382
Belt Scale	1	MOBILIZATION/DEMOBILIZATION	N/A	2014								0.1	$ 3,819.45 /TEU	$ 382
Bench Grinder	6	MOBILIZATION/DEMOBILIZATION	N/A	2014								0.1	$ 3,819.45 /TEU	$ 382
Diesel Fuel Dispensing Module (Arctic Diesel Pump)	14	MOBILIZATION/DEMOBILIZATION	N/A	2014								2	$ 4,583.34 TEU	$ 9,167
Docking Activities (2014 AN and Packaged Explosives)	1	MOBILIZATION/DEMOBILIZATION	N/A	2014						603000 kg	603000 kg		$ 82.50 /tonne	$ 49,748
Docking Activities (2014 Materials and Supplies)	1	MOBILIZATION/DEMOBILIZATION	N/A	2014								10	$ 1,271.33 /TEU	$ 12,713
Docking Activities (Equipment - 2014)	1	MOBILIZATION/DEMOBILIZATION	N/A	2014								6.0	$ 1,271.33 /TEU	$ 7,628
Fuel Oil Pump	6	MOBILIZATION/DEMOBILIZATION	N/A	2014								0.25	$ 4,583.34 TEU	$ 1,146
Generator	4	MOBILIZATION/DEMOBILIZATION	N/A	2014				0.234 m^3	0.94 m^3	84 kg	336 kg	0.1	$ 252.06 /rev. ton	$ 94

Item Descritpion	# of Items	BIMC Headings	Site	Work Plan	Area (ft^2)/ Item	Area (m^2)/ Item	Area (m^2) Total	Volume/ Item	Volume (Total)	Weight/Item	Weight (Total)	TEU	Unit Rate	Reclamation Cost
Goodall Boost System	2	MOBILIZATION/DEMOBILIZATION	N/A	2014								0.1	$ 3,819.45 /TEU	$ 382
Hydraulic Porta Power Pump	2	MOBILIZATION/DEMOBILIZATION	N/A	2014								0.1	$ 3,819.45 /TEU	$ 382
Inching Tool	1	MOBILIZATION/DEMOBILIZATION	N/A	2014								0.1	$ 3,819.45 /TEU	$ 382
Jet-A1 Fuel Dispensing Module Discharge Pump	2	MOBILIZATION/DEMOBILIZATION	N/A	2014								0.25	$ 4,583.34 TEU	$ 1,146
Jet-A1 Fuel Dispersing Module Fuelling Station	2	MOBILIZATION/DEMOBILIZATION	N/A	2014								0.25	$ 4,583.34 TEU	$ 1,146
Laboratory Equipment	27	MOBILIZATION/DEMOBILIZATION	N/A	2014								1	$ 3,819.45 TEU	$ 3,819
Magnetic Base Drill	2	MOBILIZATION/DEMOBILIZATION	N/A	2014				0.013 m^3	0.03 m^3	33 kg	66 kg	0.1	$ 252.06 /rev. ton	$ 17
Maintenance Building Diesel Tank	1	MOBILIZATION/DEMOBILIZATION	N/A	2014				6.17 m^3	6.17 m^3	707.6 kg	707.6 kg	0.2	$ 302.47 /rev. ton	$ 747
Materials and Supplies (2014)	1	MOBILIZATION/DEMOBILIZATION	N/A	2014								10	$ 5,872.52 /TEU	$ 58,725
Milling Machine	1	MOBILIZATION/DEMOBILIZATION	N/A	2014								0.1	$ 3,819.45 /TEU	$ 382
Ore Sampler	1	MOBILIZATION/DEMOBILIZATION	N/A	2014								0.1	$ 3,819.45 /TEU	$ 382
Platform Scale	2	MOBILIZATION/DEMOBILIZATION	N/A	2014								0.1	$ 3,819.45 /TEU	$ 382
Sampler Bin	1	MOBILIZATION/DEMOBILIZATION	N/A	2014								0.1	$ 3,819.45 /TEU	$ 382
Stockpile Generator	5	MOBILIZATION/DEMOBILIZATION	N/A	2014				55.69 m^3	278.45 m^3	29440 kg	147200 kg	8.4	$ 252.06 /rev. ton	$ 37,103
Tire Siping Machine	1	MOBILIZATION/DEMOBILIZATION	N/A	2014								0.1	$ 3,819.45 /TEU	$ 382
Track Pin Press	2	MOBILIZATION/DEMOBILIZATION	N/A	2014				0.04 m^3	0.08 m3			0.1	$ 3,819.45 /TEU	$ 382
Truck Mount Goodall Boost System	2	MOBILIZATION/DEMOBILIZATION	N/A	2014								0.1	$ 3,819.45 /TEU	$ 382
Truck Wash Building Diesel Tank	1	MOBILIZATION/DEMOBILIZATION	N/A	2014				6.17 m^3	6.17 m^3	707.6 kg	707.6 kg	0.2	$ 302.47 /rev. ton	$ 747
Tube Bender	2	MOBILIZATION/DEMOBILIZATION	N/A	2014								0.1	$ 3,819.45 /TEU	$ 382
Warehouse Building Diesel Tank	1	MOBILIZATION/DEMOBILIZATION	N/A	2014				6.17 m^3	6.17 m^3	707.6 kg	707.6 kg	0.2	$ 302.47 /rev. ton	$ 747
Airfare (2014)	1	MOBILIZATION/DEMOBILIZATION	N/A	2014										$ 765,000
Camp Operation (2014)	1	MOBILIZATION/DEMOBILIZATION	N/A	2014										$ 536,655
Settling Pond No. 1 (2014)	1	OPEN PIT	Mary River	2014		55000	55000						$ 1.42 /m^2	$ 77,848
Settling Pond No. 2 (2014)	1	OPEN PIT	Mary River	2014		100000	100000						$ 1.42 /m^2	$ 141,543
Settling Pond No. 3 (2014)	1	OPEN PIT	Mary River	2014		4135	4135						$ 1.42 /m^2	$ 5,853
Waste Rock Drainage Ditches	1	OPEN PIT	Mary River	2014		36550	36550						$ 1.42 /m^2	$ 51,734
Quarry D1Q1	1	OPEN PIT	Mary River	2014		27500	27500		275000 m^3				$ 1.42 /m^2	$ 38,924
Quarry D1Q2	1	OPEN PIT	Mary River	2014		22500	22500		700000 m^3				$ 1.42 /m^2	$ 31,847
Quarry QMR2 (2014)	1	OPEN PIT	Mary River	2014		70000	70000		250000 m^3				$ 1.42 /m^2	$ 99,080
Quarry Q1 (2014)	1	OPEN PIT	Milne Port	2014		92000	92000		690000 m^3				$ 1.42 /m^2	$ 130,219
Landfill Heavy Equipment (2014)	1	OPEN PIT	N/A	2014			1816.56		2724.84 m^3				$ 16.96 /m^3	$ 46,217
Quarry P1	1	OPEN PIT	Tote Road	2014		55000	55000		275,000 m^3				$ 1.42 /m^2	$ 77,848
Quarry Q11	1	OPEN PIT	Tote Road	2014		17500	17500		175,000 m^3				$ 1.42 /m^2	$ 24,770
Quarry Q19	1	OPEN PIT	Tote Road	2014		14600	14600		175,000 m^3				$ 1.42 /m^2	$ 20,665
Quarry Q7	1	OPEN PIT	Tote Road	2014		14600	14600		75,000 m^3				$ 1.42 /m^2	$ 20,665

APPENDIX C – SUMMARY OF SELECT UNIT COSTS

The following general notes apply to the unit costs presented below.

- RS Means data applied to:
  - Specify crew (labour and equipment) required to execute reclamation actions required to execute a complete reclamation activity.
  - Crew output.
  - Ottawa cost index factor to transform unit costs from US average to Ottawa average.
  - US average costs include worker's compensation, fixed overhead, percent overhead and percent profit.
- Nunavut index factor applied to transform unit costs from Ottawa average to Nunavut average.
- The labour, equipment, output, and unit costs were applied to develop the effective unit cost for reclamation activity. The calculated effective unit costs are then comparable to the BIMC unit costs.

Table C1: Comparison of ARKTIS' unit costs to BIMC for select reclamation activities.

Reclamation Activity	ARKTIS' Unit Cost	BIMC Unit Cost	Difference in Unit Costs
Demolish non-contaminated steel buildings	$56.95 /$m^2$	$57.02 /$m^2$	-$0.07 /$m^2$
Demolish contaminated steel buildings	$178.63 /$m^2$	$200.00 /$m^2$	-$21.37 /$m^2$
Concrete slab demolition and load	$29.18 /$m^2$	$26.73 /$m^2$	$2.45 /$m^2$
Grade and contour	$1.42 /$m^2$	$2.62 /$m^2$	-$1.2 /$m^2$
Culvert removal	$1,088.42 /each	$1,785.00 /each	-$696.58 /each
Reclaim bermed/lined areas	$13.89 /$m^2$	n/a	n/a
Short haul for buildings and contaminated soil *	$9.05 /$m^2$	n/a	n/a
Cover quarry/ landfill	$16.96 /$m^2$	$15.12 /$m^2$	$1.84 /$m^2$
Demolish bulk fuel oil tanks	$252.59 /$m^2$	$200.00 /$m^2$	$52.59 /$m^2$

* BIMC deconstructs buildings during reclamation, however, location for disposal not selected. Therefore, transport costs to move material from demolition site to landfill not addressed by BIMC.

Table C2: Unit cost to demolish non-contaminated steel buildings.

Demolition of Non-Contaminated Pre-engineered Steel Buildings (rigid frame, clear span & multipost, excl. salvage); 325 to 697 m2
RS Means 130505500550
Unit Cost Notes
- Cost to tear down only
- Overland haul costs to be considered separately (demobilization)

				U.S. Average Hourly	U.S. Average Daily	Ottawa Cost Index	Ottawa Costs Hourly	Nunavut Index	Nunavut Costs Hourly
Building Demolition	Crew	L10	1 Structural Steel Foreman (outside)	$ 92.85		1.052	$ 97.68	1.6	$ 156.29
			1 Structural Steel Worker	$ 89.30		1.052	$ 93.94	1.6	$ 150.31
			1 Equipment Operator (crane)	$ 73.75		1.052	$ 77.59	1.6	$ 124.14
			1 Hyd. Crane, 12 Ton	$ 88.85	$ 710.82	1.038	$ 92.23	2.5	$ 230.57
									$ 661.30 /hr
	Crew	L10	Daily Output (area) = 92.9 m^2						
			Daily Cost (8 hour day) = $ 5,290.42						
			Cost per m^2 = **$ 56.95 /m^2**						

Unit Cost to Demolish Non-Contaminated Steel Building = $ 56.95 /m^2
BIMC Cost to Demolish Non-Contaminated Steel Building = $ 57.02 /m^2

Table C3: Unit cost to demolish contaminated steel buildings.

Deconstruction of Contaminated Pre-engineered Steel Buildings (rigid frame, clear span & multipost, excl. salvage); 325 to 697 m2
RS Means 130505500550
Unit Cost Notes
- Cost to tear down only

				U.S. Average Hourly	U.S. Average Daily	Ottawa Cost Index	Ottawa Costs Hourly	Nunavut Index	Nunavut Costs Hourly
Building Demolition	Crew	L10	1 Structural Steel Foreman (outside)	$ 92.85		1.052	$ 97.68	1.6	$ 156.29
RS Means 130505500550			1 Structural Steel Worker	$ 89.30		1.052	$ 93.94	1.6	$ 150.31
			1 Equipment Operator (crane)	$ 73.75		1.052	$ 77.59	1.6	$ 124.14
			1 Hyd. Crane, 12 Ton	$ 88.85	$ 710.82	1.038	$ 92.23	2.5	$ 230.57
									$ 661.30 /hr
	Crew	L10	Daily Output (area) = 46.45 m^2			Note: It is assumed that buildings requiring decontamination will reduce daily output by 50%.			
			Daily Cost (8 hour day) = $ 5,290.42						
			Cost per m^2 = **$ 113.90 /m^2**			Tear Down Structure			
Strip Contamined Soil	Crew	B10B	1 Equip. Operator	$ 71.75		1.052	$ 75.48	1.6	$ 120.77
RS Means 312316464200			0.5 Labour ($54.60/hr.)	$ 27.30		1.052	$ 28.72	1.6	$ 45.95
			1 Dozer (200 H.P.)	$ 166.63	$ 1,333.00	1.038	$ 172.96	1.35	$ 233.49
									$ 400.21 /hr
			Daily Output (volume) = 455 m^3						
			Daily Cost (8 hour day) = $ 3,201.70						
			Cost per m^3 = $ 7.04 /m^3						
Load Contaminated Soil	Crew	B10T	1 Equip. Operator	$ 71.75		1.052	$ 75.48	1.6	$ 120.77
RS Means 025613100200			0.5 Labourer ($54.60)	$ 27.30		1.052	$ 28.72	1.6	$ 45.95
			1 Loader (W.M., 2.5 C.Y.)	$ 72.35	$ 578.82	1.038	$ 75.10	2.5	$ 187.75
									$ 354.48 /hr
			Daily Output (volume) = 229 m^3						
			Daily Cost (8 hour day) = $ 2,835.81						
			Cost per m^3 = $ 12.38 /m^3						
			Cost per m^3 = **$ 19.42 /m^3**			Strip and Load Contaminated Soil			
			Assume Contaminated 300mm Deep						
			Cost per m^2 = **$ 64.73 /m^2**			Strip and Load Contaminated Soil			

Unit Cost to Demolish Contaminated Steel Building = $ 178.63 /m^2
BIMC Cost to Demolish Contaminated Steel Building = $ 200.00 /m^2

Table C4: Unit cost for concrete slab demolition and load.

Demolition and Load of Concrete Slab-on-Grade Foundation (030505100050)

Unit Cost Notes

- For 150mm slab on grade with less than 1% reinforcing

				U.S. Average Hourly	U.S. Average Daily	Ottawa Cost Index	Ottawa Costs Hourly	Nunavut Index	Nunavut Costs Hourly
Demolish and Load	Crew	E18	1 Structural Steel Foreman (Outside)	$ 93.70		1.052	$ 98.57	1.6	$ 157.72
			3 Structural Steel Workers	$ 90.20		1.052	$ 94.89	1.6	$ 151.82
			1 Equipment Operator (med.)	$ 74.15		1.052	$ 78.01	1.6	$ 124.81
			1 Lattice Boom Crane, 20 Ton	$ 132.07	$ 1,056.55	1.052	$ 138.94	1.6	$ 222.30
									$ 656.65 /hr

Daily Output (volume) =	36	m^3
Assumed slab thickness =	0.2	m
Daily Output (area) =	180	m^2
Daily Cost (8 hour day) =	$ 5,253.18	
Cost per m^3 =	**$ 29.18**	**/m^2**

Unit Cost Concrete Slab Demolition and Load = $ 29.18 /m^2

BIMC Cost Concrete Slab Demolition = $ 26.73 /m^2

Table C5: Unit cost to grade and contour.

Re-grading Granular Laydown Areas, Building Pads and Airstrip (refer to RS Means 312213200280)

Unit Cost Notes

- No real definition of volume of material moved, just area to be covered be grader.

				U.S. Average Hourly	U.S. Average Daily	Ottawa Cost Index	Ottawa Costs Hourly	Nunavut Index	Nunavut Costs Hourly
Grade and Contour	Crew	B11L	1 Equip. Operator	$ 71.75		1.052	$ 75.48	1.6	$ 120.77
RS Means 312213200280			1 Labourer ($54.60/hr.)	$ 54.60		1.052	$ 57.44	1.6	$ 91.90
			1 Grader (30,000 lbs.)	$ 89.05	$ 712.40	1.038	$ 92.43	2.5	$ 231.08
									$ 443.76 /hr

Daily Output (area) = 2508.12 m^2

Daily Cost (8 hour day) = $ 3,550.06

Cost per m^2 = **$ 1.42 /m^2**

Unit Cost Grade and Contour = $ 1.42 /m^2

BIMC Unit Cost Grade and Contour = $ 2.62 /m^2

Table C6: Unit cost for culvert removal.

Removal of Culverts (RS Means 312316130130)
Unit Cost Notes
- 1.2m to 2m depth; 1.15m3 excavator
- Calculation of each based on 2m x 2m x 20m long excavation

			U.S. Average Hourly	U.S. Average Daily	Ottawa Cost Index	Ottawa Costs Hourly	Nunavut Index	Nunavut Costs Hourly
Crew	B11L	1 Equip. Operator	$ 73.75		1.052	$ 77.59	1.6	$ 124.14
		1 Labourer	$ 54.60		1.052	$ 57.44	1.6	$ 91.90
		1 Hyd. Excavator, 1.5 C.Y.	$ 187.41	$ 1,499.30	1.038	$ 194.53	2.5	$ 486.34
								$ 702.37 /hr

Daily Output (area) =	413	m^3
Daily Cost (8 hour day) =	$ 5,618.99	
Cost per m^3 =	**$ 13.61**	**/m^3**
Cost per culvert =	**$ 1,088.42**	**/each**
Bafl	**$ 1,785.00**	**/each**

Unit Cost Culvert Removal = $ 1,088.42 /each
BIMC Unit Cost Culvert Removal = $ 1,785.00 /each

Table C7: Unit cost to reclaim bermed/lined areas.

Reclaim Bermed/Lined Containment Areas

Unit Cost Notes

- Assuming excavation of contaminated soils using dozer (149 kW, 45m haul, sand and gravel); RS Means 312316464200
- 1.9m3 loader moving soil up to 45.5 m on-site to load into trucks; RS Means 025613100200
- Does not inlcude overland hauling (short or long) or shipping south

					U.S. Average		Ottawa Cost Index	Ottawa Costs	Nunavut Index	Nunavut Costs	
					Hourly	Daily		Hourly		Hourly	
Strip Contaminated Soil	Crew	B10B	1 Equip. Operator		$ 71.75		1.052	$ 75.48	1.6	$ 120.77	
RS Means 312316464200			0.5 Labour ($54.60/hr.)		$ 27.30		1.052	$ 28.72	1.6	$ 45.95	
			1 Dozer (200 H.P.)		$ 166.63	$ 1,333.00	1.038	$ 172.96	1.35	$ 233.49	
										$ 400.21	/hr
			Daily Output (volume) =	455	m^3						
			Daily Cost (8 hour day) =	$ 3,201.70							
			Cost per m^3 =	$ 7.04	$/m^3$						
Load Contaminated Soil	Crew	B10T	1 Equip. Operator		$ 71.75		1.052	$ 75.48	1.6	$ 120.77	
RS Means 025613100200			0.5 Labourer ($54.60)		$ 27.30		1.052	$ 28.72	1.6	$ 45.95	
			1 Loader (W.M., 2.5 C.Y.)		$ 72.35	$ 578.82	1.038	$ 75.10	2.5	$ 187.75	
										$ 354.48	/hr
			Daily Output (volume) =	229	m^3						
			Daily Cost (8 hour day) =	$ 2,835.81							
			Cost per m^3 =	$ 12.38	$/m^3$						
			Cost per m^3 =	**$ 19.42**	**$/m^3$**						
			Assume 300 mm Cover Soil								
			Cost per m^2 =	**$ 5.83**	**$/m^2$**	Strip and Load Contaminated Soil Only					

Liner Removal

				U.S. Average Hourly	U.S. Average Daily	Ottawa Cost Index	Ottawa Costs Hourly	Nunavut Index	Nunavut Costs Hourly
RS Means 025613100730	Crew	B47H	1 Skilled Worker Foreman	$ 74.50		1.052	$ 78.37	1.6	$ 125.40
			3 Skilled Workers ($71.45/hr.)	$ 214.35		1.052	$ 225.50	1.6	$ 360.79
			1 Flat bed Truck, Gas, 3 Ton	$ 45.07	$ 360.58	1.038	$ 46.79	2.5	$ 116.96
									$ 603.16 /hr

Daily Output (volume) = 706 m^2
Daily Cost (8 hour day) = $ 4,825.24
Cost per m^3 = **$ 6.83 /m^2**

Not for removal of liner assume work can be completed twice as fast compared to installation

Regrade area below liner and berms to natural contours

				U.S. Average Hourly	U.S. Average Daily	Ottawa Cost Index	Ottawa Costs Hourly	Nunavut Index	Nunavut Costs Hourly
RS Means 312213200280	Crew	B11L	1 Equip. Operator	$ 71.75		1.052	$ 75.48	1.6	$ 120.77
			1 Labourer ($54.60/hr.)	$ 54.60		1.052	$ 57.44	1.6	$ 91.90
			1 Grader (30,000 lbs.)	$ 89.05	$ 712.40	1.038	$ 92.43	2.5	$ 231.08
									$ 443.76 /hr

Daily Output (area) = 2880 m^2
Daily Cost (8 hour day) = $ 3,550.06
Cost per m^2 = **$ 1.23 m^2**

Total Cost to Remove Soil & Liner, then grade and contour area:
Cost per m^2 = $ 13.89 /m^2

ARKTIS Reclaim Bermed/Lined Areas = $ 13.89 /m^2

Table C8: Unit cost for short haul of buildings and contaminated soil.

Short Haul Buildings and Contaminated Soils
Unit Cost Notes
- Short Haul is defined as 3.2km at 24 km/h

				U.S. Average Hourly	U.S. Average Daily	Ottawa Cost Index	Ottawa Costs Hourly	Nunavut Index	Nunavut Costs Hourly	
RS Means 312323204018	Crew	B34D	1 Truck Driver	$ 56.05		1.052	$ 58.96	1.6	$ 94.34	
			1 Truck Tractor, 6x4, 380 H.P.	$ 84.21	$ 673.64	1.038	$ 87.40	2.5	$ 218.51	
			1 Dump Trailer, 20 C.Y.	$ 19.44	$ 155.54	1.038	$ 20.18	2.5	$ 50.45	
									$ 363.31	/hr.
			Daily Output (volume) =	321	m^3	Short Haul				
			Daily Cost (8 hour day) =	$ 2,906.47						
			Cost per m^3 =	$ 9.05	$/m^3$					

ARKTIS Unit Cost Short Haul = $ 9.05 $/m^3$

Table C9: Unit cost to cover quarry/landfill.

Cover Materials to be Placed Over Quarry/Landfill

Unit Cost Notes

- Assume materials used from Laydown Areas/Non-Contaminated Berms
- Load, Haul/Dump,Spread and Compaction

			U.S. Average Hourly	U.S. Average Daily	Ottawa Cost Index	Ottawa Costs Hourly	Nunavut Index	Nunavut Costs Hourly	
Load (RS Means 312323154670)									
Crew	B10T	1 Equip. Operator	$ 71.75		1.052	$ 75.48	1.6	$ 120.77	
		0.5 Labourer ($54.60)	$ 27.30		1.052	$ 28.72	1.6	$ 45.95	
		1 Loader (W.M., 5.5 C.Y.)	$ 145.20	$ 1,161.60	1.038	$ 150.72	1.6	$ 241.15	
								$ 407.87	/hr
		Daily Output (volume) =	1204	m^3					
		Daily Cost (8 hour day) =	$ 3,262.95						
		Cost per m^3 =	$ 2.71	$/m^3$					
Haul RS Means 312323204018									
Crew	B34D	1 Truck Driver	$ 56.05		1.052	$ 58.96	1.6	$ 94.34	
		1 Truck Tractor, 6x4, 380 H.P.	$ 84.21	$ 673.64	1.038	$ 87.40	2.5	$ 218.51	
		1 Dump Trailer, 20 C.Y.	$ 19.44	$ 155.54	1.038	$ 20.18	2.5	$ 50.45	
								$ 363.31	/hr.
		Daily Output (volume) =	321	m^3		Short Haul			
		Daily Cost (8 hour day) =	$ 2,906.47						
		Cost per m^3 =	$ 9.05	$/m^3$					

Spread (RS Means 312323170020)

Crew	B10B	1 Equip. Operator	$	71.75		1.052	$	75.48	1.6	$	120.77
		0.5 Labour ($54.60/hr.)	$	27.30		1.052	$	28.72	1.6	$	45.95
		1 Dozer (200 H.P.)	$	166.63	$ 1,333.00	1.038	$	172.96	1.35	$	233.49
										$	400.21 /hr

Daily Output (volume) = 765 m^3
Daily Cost (8 hour day) = $ 3,201.70
Cost per m^3 = $ 4.19 /m^3

Compaction (RS Means 312323235080)

Crew	B10Y	1 Equip. Operator (med.)	$	71.75		1.052	$	75.48	1.6	$	120.77
		0.5 Labourer ($54.60/hr.)	$	27.30		1.052	$	28.72	1.6	$	45.95
		1 Vibr. Roller	$	66.18	$ 529.40	1.038	$	68.69	2.5	$	171.72
										$	338.45 /hr

Daily Output (volume) = 2676 m^3
Daily Cost (8 hour day) = $ 2,707.56
Cost per m^3 = $ 1.01 /m^3

TOTAL = $ 16.96 /m^3

We know materials to cover landfills to be approximately 1.5m

ARKTIS Unit Cost to Cover Landfill = $ 16.96 /m^3
BIMC Unit Cost to Cover Landfill = $ 15.12 /m^3

Table C10: Unit cost to demolish bulk fuel oil tanks.

Deconstruction of Bulk Fuel Oil Tanks
RS Means 130505500550
Unit Cost Notes
- Cost to tear down only

				U.S. Average Hourly	U.S. Average Daily	Ottawa Cost Index	Ottawa Costs Hourly	Nunavut Index	Nunavut Costs Hourly
Building Demolition	Crew	L10a	1 Structural Steel Foreman (outside)	$ 92.85		1.052	$ 97.68	1.6	$ 156.29
RS Means 130505500550			4 Structural Steel Worker	$ 357.20		1.052	$ 375.77	1.6	$ 601.24
			2 Equipment Operator (crane)	$ 147.50		1.052	$ 155.17	1.6	$ 248.27
			2 Hyd. Crane, 12 Ton	$ 177.71	$ 1,421.64	1.038	$ 184.46	2.5	$ 461.14
									$ 1,466.94 /hr
	Crew	L10a	Daily Output (area) =	46.46 m^2					
			Daily Cost (8 hour day) =	$11,735.53					
			Cost per m^2 =	**$ 252.59 /m^2**					

Note: It is assumed that buildings requiring decontamination will reduce daily output by 50%.
Tear Down Structure

Unit Cost to Demolish Bulk Fuel Oil Tanks = $ 252.59 /m^2
BIMC Unit Cost to Demolish Bulk Fuel Oil Tanks = $ 200.00 /m^2

Table C11: Nunavut cost index - labour rates comparison.

	RS Means U.S. Avg. (Union), incl. O&P (ALL)	Ottawa City Cost Index	Ottawa	Nunavut	Ref. Location	Nunavut, incl. 20% O&P	Nunavut Location Factor
Foreman	$74.50	1.052	$78.37	$105.00	Sanikiluaq	$126.00	1.6
Labourer	$54.60	1.052	$57.44	$80.00	Sanikiluaq	$96.00	1.7
Labourer	$54.60	1.052	$57.44	$80.00	Sanikiluaq	$96.00	1.7
Carpenter	$69.15	0.925	$63.96	$80.00	Sanikiluaq	$96.00	1.5
Electrician	$78.40	0.961	$75.34	$100.00	Hall Beach	$120.00	1.6
Welder	$89.30	0.929	$82.96	$105.00	Sanikiluaq	$126.00	1.5
Mechanical	$81.30	0.856	$69.59	$93.75	Hall Beach	$112.50	1.6
Plumbers	$84.05	0.856	$71.95	$93.75	Hall Beach	$112.50	1.6
						Average=	**1.6**
Excavator (2 CY)	$129.50	1.035	$134.03	$275.00	Sanikiluaq	$330.00	2.5
Skytrack				$185.00	Sanikiluaq	$222.00	
Back Hoe	$50.00	1.035	$51.75	$245.00	Sanikiluaq	$294.00	5.7
Generator				$125.00	Sanikiluaq	$150.00	
Camp Room/Board				$285.00	Hall Beach	$342.00	

Notes:

Average for Nunavut labour index calculated to be 1.6.

Limited equipment comparisons available. Nunavut equipment index of 2.5 applied to ARKTIS estimate based on an excavator; calculated index for the backhoe was not considered reasonable.

Table C12: Shipping rates for general cargo, hazardous materials, and fuel.

Type	Direction	Unit Cost	Base Rate	Insurance Premium	Total	Notes
General Cargo	Northbound	per revenue tonne	$369.33	$12.00	$381.33	Costs obtained from NEAS 2013 General Cargo Freight Shipping Rates
General Cargo	Northbound	m^3	$147.73	$4.80	$152.53	Costs obtained from NEAS 2013 General Cargo Freight Shipping Rates divided by $2.5m^3$
General Cargo	Northbound	TEU	$5,687.72	$184.80	$5,872.52	Costs obtained from NEAS 2013 General Cargo Freight Shipping Rates
General Cargo	Retrograde	per revenue tonne	$240.06	$12.00	$252.06	Costs obtained from NEAS 2013 General Cargo Freight Shipping Rates
General Cargo	Retrograde	m^3	$96.02	$4.80	$100.82	Costs obtained from NEAS 2013 General Cargo Freight Shipping Rates divided by $2.5m^3$
General Cargo	Retrograde	TEU	$3,699.26	$120.19	$3,819.45	Derived from $12.00 per revenue tonne insurance from NEAS. 1 rev. tonne is 2.5 m3. So insurance is $12/2.5 = $4.80.
Hazardous	Northbound	per revenue tonne			$457.60	
Hazardous	Northbound	m^3			$183.04	
Hazardous	Northbound	TEU			$7,047.03	
Hazardous	Retrograde	per revenue tonne			$302.47	
Hazardous	Retrograde	m^3			$120.99	
Hazardous	Retrograde	TEU			$4,583.34	

Notes:
- Transys Research report indicates fuel vessel tanker costs are estimated at 1.85 x retrograde rate for general cargo.
- Fuel for transportation to Milne in barrels or container tank are direct from TranSys Reasearch report.

Type	Direction	Unit Cost	Base Rate	Insurance Premium	Total	Notes
Fuel (Vessel)	Retrograde	per revenue tonne	$444.11	$22.20	$466.31	Factor of 1.85 obtained from 2009 TranSys Research Ltd. Report and cost obtained from NEAS 2013
Fuel (Barrels)	Northbound	per revenue tonne			$582.00	Cost obtained from 2009 TranSys Research Ltd. Report
Fuel (Isocontainer)	Northbound	per revenue tonne			$592.00	Cost obtained from 2009 TranSys Research Ltd. Report
Fuel (Isocontainer)	Northbound	TEU			$9,122.55	

Table C13: Summary of reclamation crews – labour, output, accommodations, and transport.

2013 Summary

Reclamation Activity	Crews	# of Crews	Personnel	Total Persons	Daily Output	Quantity	Days	Accommodations Rate	Accommodations Cost	Total Days Crew	# of Return Flights	# of Seats	Flight Iqaluit-Milne	Flight Montreal-Iqaluit	Crew Airfare Costs
Demolition of Non-Contaminated Buildings		3	3	9	92.9 m^2	14710 m^2	53.0	$ 285.00 /person/day	$ 135,945.00						
Demolition of Contaminated Buildings	L10	3	3	9	46.45 m^2	1011 m^2	8.0	$ 285.00 /person/day	$ 20,520.00	79.0	3	27	$ 24,000.00	$ 2,500.00	$ 274,500.00
Demolition of Bulk Fuel Storage Tank		3	3	9	46.46 m^2	2487 m^2	18.0	$ 285.00 /person/day	$ 46,170.00						
Demolition of Bulk Fuel Storage Tank	L10a	3	4	12	46.46 m^2	2487 m^2	18.0	$ 285.00 /person/day	$ 61,560.00	18.0	1	12	$ 24,000.00	$ 2,500.00	$ 54,000.00
Grade and Contour	B11L	4	2	8	2508.12 m^2	1010906 m^2	101.0	$ 285.00 /person/day	$ 230,280.00	105.0	4	8	$ 24,000.00	$ 2,500.00	$ 176,000.00
Reclaim Bermed/Lined Areas	B11L	4	2	8	2880 m^2	38208 m^2	4.0	$ 285.00 /person/day	$ 9,120.00						
Landfill Cover	B10T	2	1.5	3	1204 m^3	23582 m^3	10.0	$ 285.00 /person/day	$ 8,550.00	36.0	2	6	$ 24,000.00	$ 2,500.00	$ 78,000.00
Reclaim Bermed/Lined Areas	B10T	2	1.5	3	763.33 m^2	38208 m^2	26.0	$ 285.00 /person/day	$ 22,230.00						
Landfill Cover	B34D	3	1	3	321 m^3	23582 m^3	25.0	$ 285.00 /person/day	$ 21,375.00	48.0	2	6	$ 24,000.00	$ 2,500.00	$ 78,000.00
Short Haul	B34D	3	1	3	321 m^3	21998 m^3	23.0	$ 285.00 /person/day	$ 19,665.00						
Landfill Cover	B10B	2	1.5	3	765 m^3	23582 m^3	16.0	$ 285.00 /person/day	$ 13,680.00	29.0	1	3	$ 24,000.00	$ 2,500.00	$ 31,500.00
Reclaim Bermed/Lined Areas	B10B	2	1.5	3	1516.67 m^2	38208 m^2	13.0	$ 285.00 /person/day	$ 11,115.00						
Landfill Cover	B10Y	1	1.5	1.5	2676 m^3	23582 m^3	9.0	$ 285.00 /person/day	$ 3,847.50	9.0	1	2	$ 24,000.00	$ 2,500.00	$ 29,000.00
Reclaim Bermed/Lined Areas	B47H	3	4	12	706 m^2	38208 m^2	19.0	$ 285.00 /person/day	$ 64,980.00	19.0	1	12	$ 24,000.00	$ 2,500.00	$ 54,000.00
			Total=	**86.5**		**Total=**	**343.0**	**Total=**	**$ 669,037.50**	**Total=**	**15**			**Total=**	**$ 775,000.00**

2014 Summary

Reclamation Activity	Crews	# of Crews	Personnel	Total Persons	Daily Output	Quantity	Days	Accommodations Rate	Accommodations Cost	Total Days Crew	# of Return Flights	# of Seats	Flight Iqaluit-Milne	Flight Montreal-Iqaluit	Crew Airfare Costs
Demolition of Non-Contaminated Buildings		3	3	9	92.9 m^2	2891.14 m^2	11.0	$ 285.00 /person/day	$ 28,215.00						
Demolition of Contaminated Buildings	L10	3	3	9	46.45 m^2	7089.06 m^2	51.0	$ 285.00 /person/day	$ 130,815.00	69.0	3	27	$ 24,000.00	$ 2,500.00	$ 274,500.00
Demolition of Bulk Fuel Storage Tank		3	3	9	46.46 m^2	876.75 m^2	7.0	$ 285.00 /person/day	$ 17,955.00						
Demolition of Bulk Fuel Storage Tank	L10a	3	4	12	46.46 m^2	876.75 m^2	7.0	$ 285.00 /person/day	$ 23,940.00	7.0	1	12	$ 24,000.00	$ 2,500.00	$ 54,000.00
Grade and Contour	B11L	4	2	8	2508.12 m^2	1087104 m^2	109.0	$ 285.00 /person/day	$ 248,520.00	111.0	4	8	$ 24,000.00	$ 2,500.00	$ 176,000.00
Reclaim Bermed/Lined Areas	B11L	4	2	8	2880 m^2	13780 m^2	2.0	$ 285.00 /person/day	$ 4,560.00						
Landfill Cover	B10T	2	1.5	3	1204 m^3	10633.59 m^3	5.0	$ 285.00 /person/day	$ 4,275.00	15.0	1	3	$ 24,000.00	$ 2,500.00	$ 31,500.00
Reclaim Bermed/Lined Areas	B10T	2	1.5	3	763.33 m^2	13780 m^2	10.0	$ 285.00 /person/day	$ 8,550.00						
Landfill Cover	B34D	3	1	3	321 m^3	10633.59 m^3	12.0	$ 285.00 /person/day	$ 10,260.00	28.0	2	6	$ 24,000.00	$ 2,500.00	$ 78,000.00
Short Haul	B34D	3	1	3	321 m^3	15333.09 m^3	16.0	$ 285.00 /person/day	$ 13,680.00						
Landfill Cover	B10B	2	1.5	3	765 m^3	10633.59 m^3	7.0	$ 285.00 /person/day	$ 5,985.00	12.0	1	3	$ 24,000.00	$ 2,500.00	$ 31,500.00
Reclaim Bermed/Lined Areas	B10B	2	1.5	3	1516.67 m^2	13780 m^2	5.0	$ 285.00 /person/day	$ 4,275.00						
Landfill Cover	B10Y	1	1.5	1.5	2676 m^3	10633.59 m^3	4.0	$ 285.00 /person/day	$ 1,710.00	4.0	1	2	$ 24,000.00	$ 2,500.00	$ 29,000.00
Reclaim Bermed/Lined Areas	B47H	3	4	12	706 m^2	13780 m^2	7.0	$ 285.00 /person/day	$ 23,940.00	7.0	1	12	$ 24,000.00	$ 2,500.00	$ 54,000.00
Concrete Slab Demolition and Load	E18	1	5	5	180 m^2	1218.89 m^2	7.0	$ 285.00 /person/day	$ 9,975.00	7.0	1	5	$ 24,000.00	$ 2,500.00	$ 36,500.00
			Total=	**91.5**		**Total=**	**260.0**	**Total=**	**$ 536,655.00**	**Total=**	**15**			**Total=**	**$ 765,000.00**

2013 Summary

Crew	# of Crews	# of Days		Equipment General	Quantity	Model	Fuel Tank Capacity	Height (m)	Length (m)	Width (m)	Volume	Weight	Revenue Tonne	Fuel Usage (days)	Fill Tank	Volume Fuel Used (L)
L10	3	79	1	Hyd. Crane, 12 Ton	3	Grove RT58B	227 L	3.28	5.563	2.67	48.67 m^3	19958 kg	19.96	2	40	27,240
L10a	3	18	1	Hyd. Crane, 12 Ton	3	Grove RT58B	227 L	3.28	5.563	2.67	48.67 m^4	19959 kg	19.96	2	9	6,129
B11L	4	105	1	Grader (30,000 lbs.)	4	CAT 16M	511 L	3.70	9.96	3.10	114.24 m^3	26060 kg	45.70	2	53	108,332
B10T	2	36	1	Loader (W.M., 5.5 C.Y.)	2	CAT 988H	712 L	4.13	12.22	3.58	180.68 m^3	49546 kg	72.27	2	18	25,632
B34D	3	48	1	Truck Tractor (6x4, 380 H.P.)	3	Kentworth T440	380 L	3.06	12.77	2.64	103.16 m^3	30844 kg	41.26	2	24	27,360
B34D	3	48	1	Dump Trailer, 20 C.Y.	3	Trailer		5	15.37	2.59	199.04 m^3	8618 kg	79.62			
B10B	2	29	1	Dozer (200 H.P.)	2	CAT D6T	424 L	3.20	5.11	2.44	39.90 m^3	20937 kg	20.94	2	14.5	12,296
B10Y	1	9	1	Vibr. Roller	1	CAT CS74	345 L	3.07	5.86	2.13	38.32 m^3	15687 kg	15.69	2	4.5	1,553
B47H	3	19	1	Flat bed Truck, Gas, 3 Ton	3	Kentworth T440	380 L	3.06	12.77	2.64	103.16 m^3	30844 kg	41.26	2	9.5	10,830
B38	0															
	24	105	1	Crew Transport	24	GMC 2500 Diesel 4x4	136 L	1.98	6.58	2.03	26.45 m^3	3382 kg	10.58	5	21	68,544
															Total=	287,916

# of 25,000L ISO Containers = 11.52
Use = 12

2014 Summary

Crew	# of Crews	# of Days		Equipment General	Quantity	Model	Fuel Tank Capacity	Height (m)	Length (m)	Width (m)	Volume	Weight	Revenue Tonne	Fuel Usage (days)	Fill Tank	Volume Fuel Used (L)
L10	3	69	1	Hyd. Crane, 12 Ton	3	Grove RT58B	227 L	3.28	5.563	2.67	48.67 m^3	19958 kg	19.96	2	35	23,835
L10a	3	7	1	Hyd. Crane, 12 Ton	3	Grove RT58B	227 L	3.28	5.563	2.67	48.67 m^4	19959 kg	19.96	2	4	2,724
B11L	4	111	1	Grader (30,000 lbs.)	4	CAT 16M	511 L	3.70	9.96	3.10	114.24 m^3	26060 kg	45.70	2	56	114,464
B10T	2	15	1	Loader (W.M., 5.5 C.Y.)	2	CAT 988H	712 L	4.13	12.22	3.58	180.68 m^3	49546 kg	72.27	2	7.5	10,680
B34D	3	28	1	Truck Tractor (6x4, 380 H.P.)	3	Kentworth T440	380 L	3.06	12.77	2.64	103.16 m^3	30844 kg	41.26	2	14	15,960
B34D	3	28	1	Dump Trailer, 20 C.Y.	3	Trailer		5	15.37	2.59	199.04 m^3	8618 kg	79.62			
B10B	2	12	1	Dozer (200 H.P.)	2	CAT D6T	424 L	3.20	5.11	2.44	39.90 m^3	20937 kg	20.94	2	6	5,088
B10Y	1	4	1	Vibr. Roller	1	CAT CS74	345 L	3.07	5.86	2.13	38.32 m^3	15687 kg	15.69	2	2	690
B47H	3	7	1	Flat bed Truck, Gas, 3 Ton	3	Kentworth T440	380 L	3.06	12.77	2.64	103.16 m^3	30844 kg	41.26	2	3.5	3,990
B38	1	8	1	Backhoe Loader, 48 H.P.	1	CAT 416	106 L	3.45	6.838	2.262	53.36 m^3	6750 kg	21.35	2	4	424
E18	1	7	1	1 Lattice Boom Crane	1	Terex Powerlift 1000	540 L	4.13	12.22	3.58	180.68 m^3	49546 kg	72.27	2	3.5	1,890
	26	111	1	Crew Transport	24	GMC 2500 Diesel 4x4	136 L	1.98	6.58	2.03	26.45 m^3	3382 kg	10.58	5	22.2	72,461
															Total=	252,206

# of 25,000L ISO Containers = 10.09
Use = 11

Table C14: Summary of heavy equipment volumes and weights.

Type	Model	Fuel Tank Capacity	Height (m)	Length (m)	Width (m)	Area	Volume	Weight	Revenue Tonne
Loader	CAT 988H	712 L	4.13	12.22	3.58	43.75	180.68 m^3	49546 kg	72.27
Grader	CAT 16M	511 L	3.70	9.96	3.10	30.88	114.24 m^3	26060 kg	45.70
Track Dozer	CAT D6T	424 L	3.20	5.11	2.44	12.47	39.90 m^3	20937 kg	20.94
Excavator	CAT 374DL	935 L	4.95	13.23	3.5	46.31	229.21 m^3	71132 kg	91.68
Haul Trucks	CAT 777G	1136 L	4.73	10.27	5.22	53.61	253.57 m^3	164654 kg	164.65
Service (Pick-Up) Trucks	GMC 2500 Diesel 4x4	136 L	1.98	6.58	2.03	13.36	26.45 m^3	3382 kg	10.58
Skid Steer	CAT 272D	117 L	2.1	3.85	1.39	5.35	11.24 m^3	3812 kg	4.50
Highway Tractor Truck	Kentworth T440	380 L	3.06	12.77	2.64	33.71	103.16 m^3	30844 kg	41.26
Low Boy Trailers	50T Low Boy		1.52	15.37	2.59	39.81	60.51 m^3	8618 kg	24.20
Boom Truck	Kentworth T440 (modified)	380 L	3.06	12.77	2.64	33.71	103.16 m^3	30844 kg	41.26
80 Ton Mobile RT Crane	Stirling Crane 80T Rough Terrain	300 L	3.8	14.23	3.32	47.24	179.53 m^3	49390 kg	71.81
200 Ton Track Mount	Stirling Crawler Crane 200T	292 L	3.43	15.85	7.2	114.12	391.43 m^3	136264 kg	156.57
Crane RT	Stirling Crane 80T Rough Terrain	300 L	3.8	14.23	3.32	47.24	179.53 m^3	49390 kg	71.81
Crawler Crane	Stirling Crawler Crane 200T	292 L	3.43	15.85	7.2	114.12	391.43 m^3	136264 kg	156.57
Vac Truck (Roll Off)	Kenworth T440 (modified)	380 L	3.06	12.77	2.64	33.71	103.16 m^3	30844 kg	41.26
Container Handler	Taylor TS-9972 Reach Stacker	144 L	4.78	8.33	3.45	28.74	137.37 m^3	36084 kg	54.95
Telehandler	CAT TL1255C (modified)	144 L	2.56	6.33	2.56	16.20	41.48 m^3	16267 kg	16.59
Ambulance	Ford F450 4x4	208 L	2.04	6.63	2.41	15.98	32.60 m^3	6577 kg	13.04
Fire Truck	Kenworth T440 (modified)	380 L	3.06	12.77	2.64	33.71	103.16 m^3	30844 kg	41.26
Plow/Sand Truck	Kenworth T440 (modified)	380 L	3.06	12.77	2.64	33.71	103.16 m^3	30844 kg	41.26
Buses	Blue-Bird All American	227 L	3.25	12.37	2.44	30.18	98.09 m^3	36200 kg	39.24
Manlift	Genie Z-80/60 (4WD)	132 L	3.00	11.27	2.49	28.06	84.19 m^3	17010 kg	33.67
Scissor Lifts	Genie GS-2668 DC		1.7	2.67	1.73	4.62	7.85 m^3	2905 kg	3.14
Maintenance Truck c/w Pick	Kenworth T440 (modified)	380 L	3.06	12.77	2.64	33.71	103.16 m^3	30844 kg	41.26
Fuel Delivery Truck B-Train	Kenworth T440 (modified)	380 L	3.06	12.77	2.64	33.71	103.16 m^3	30844 kg	41.26
Bob Cat	Bob Cat S850	124.2 L	2.12	3.75	2.01	7.54	15.98 m^3	4540 kg	6.39
Emulsion Delivery Trucks	Kenworth T440 (modified)	380 L	3.06	12.77	2.64	33.71	103.16 m^3	30844 kg	41.26
Development Rock Drills	Atlas Copco DM 45	1324 L	5.5	13.3	5.23	69.56	382.57 m^3	41000 kg	153.03
Production Rock Drills	Atlas Copco DM 45	1324 L	5.5	13.3	5.23	69.56	382.57 m^3	41000 kg	153.03
Crusher 6000 Ton/Day 6" (Cone (	Raptor XL 1100		4.81	5.46	5.46	29.81	143.39 m^3	152680 kg	152.68
45ft Van Trailer Generator	Generac MMG465		2.59	6.35	2.95	18.73	48.52 m^3	7257 kg	19.41
Drive on Compactor	CAT CS74	345 L	3.07	5.86	2.13	12.48	38.32 m^3	15687 kg	15.69
Roll Off Truck	Kenworth T440 (modified)	380 L	3.06	12.77	2.64	33.71	103.16 m^3	30844 kg	41.26
Water Truck	Kenworth T440 (modified)	380 L	3.06	12.77	2.64	33.71	103.16 m^3	30844 kg	41.26
Snow Cat	200XL Tucker-Terra	114 L	2.84	5.74	2.39	13.72	38.96 m^3	3629 kg	15.58
Fuel and Lube Truck	Kenworth T440 (modified)	380 L	3.06	12.77	2.64	33.71	103.16 m^3	30844 kg	41.26
Tractor Truck	Kenworth T440	380 L	3.06	12.77	2.64	33.71	103.16 m^3	30844 kg	41.26
Low Boy Float	50T Lowboy		1.52	15.37	2.59	39.81	60.51 m^3	8618 kg	24.20
Low Boy Drop Deck	50T Lowboy		1.52	15.37	2.59	39.81	60.51 m^3	8618 kg	24.20
Portable Concrete Batch Truck	Kenworth T440 (modified)	380 L	3.06	12.77	2.64	33.71	103.16 m^3	30844 kg	41.26
10 cu.yd. Mixer Truck	Kenworth T440 (modified)	380 L	3.06	12.77	2.64	33.71	103.16 m^3	30844 kg	41.26
100ft Pump Trucks	Concord Concrete Pump CCP-40X-170		4.00	12.4	3.00	37.20	148.80 m^3	28780 kg	59.52
		Average=	3.20		**Total=**	1502.23			

APPENDIX D – REFERENCE DOCUMENTS

The following reference documents are provided:

1. Abandonment and Reclamation Policy for Inuit Owned Lands. Qikiqtani Inuit Association. Version 3.0.
2. Reclamation Policy. Nunavut Tunngavik Incorporated.
3. Mine Site Reclamation Policy for Nunavut. Aboriginal Affairs and Northern Development Canada.
4. Understanding RS Means data.
5. Nunavut Eastern Arctic Shipping Inc. sealift rates for 2013 season.
6. Nunavut Eastern Arctic Shipping Inc. insurance premiums.
7. Arctic Shipping Rates Weight and Volume Influence. TranSys Research Ltd.
8. Ken Borek charter quote Iqaluit to Mary River return.

Abandonment and Reclamation Policy for Inuit Owned Lands
Qikiqtani Inuit Association - (Version 3.0)

1.0 Introduction

Article 19 of the Nunavut Land Claims Agreement establishes private ownership of selected surface and subsurface lands for Inuit and specified substances. The Qikiqtani Inuit Association (QIA) – Department of Lands and Resources, is responsible for the management of surface Inuit Owned Land parcels throughout the Qikiqtani Region. Inuit Owned Lands (IOLs) were selected for a variety of reasons based on community preferences. Categorically, IOLs were selected based on values assigned to both renewable and non-renewable resources such as:

- principal or other wildlife harvesting areas
- significant biological productivity or of value for conservation purposes
- high potential for propagation, cultivation or husbandry
- current or potential occupation by outpost camps
- value for sport camps or other tourist opportunities
- known or potential mineral deposits
- value for various operations and facilities associated with the development of non-renewable resources
- commercial value
- archaeological, historical or cultural importance

QIA receives and reviews land tenure applications for access to IOLs.. In granting access to IOL, QIA approves all project plans. QIA requires all plans submitted with an application are executable

standalone documents with adequate rational, detail and appropriate referencing to any supplemental materials. Appropriate referencing shall include the document name, author, section, and page number.

An Abandonment and Reclamation Plan (A&R plan) is required for access to IOL for all exploration and development projects.[1] In general, an A&R plan outlines the plans and process the Tenant will undertake to reclaim IOL to a level acceptable to QIA. A Tenants A&R plan is to only address impacts specific to IOL. A key feature in granting rights to IOLs includes the establishment of a financial security deposit. Financial security deposits are required to protect QIA against potential reclamation liabilities associated with project specific use of IOL. **Appendix A** provides a select list of relevant documents Tenants may elect to provide guidance in developing an A&R plan. QIA does not endorse or reject the contents and use of these documents. Furthermore, QIA is aware numerous documents exist in addition to those referenced in this document. .

This policy applies to all land uses carried out on IOL throughout the Qikiqtani Region. However, as the potential impacts to IOL can vary significantly depending on the type and duration of specific land uses, the policy will be applied in a manner that reflects the scale, scope and nature of the land use activity. This policy does not limit any additional requirements that may be set-out in project specific licences and leases issued by QIA. Tenants are advised to consult any policy or procedural documents adopted by QIA for additional guidance on Tenant requirements. Policy or procedural documents may form an extension of this Abandonment and Reclamation Policy. QIA further requires that Tenants apply an information exchange protocol, as discussed with QIA, guiding the submission of documents in supporting the application of this Policy. Adherence to information exchange protocols will ensure a stable basis of information exists from which QIA can accurately and effectively conduct its review efforts.

2.0 QIA's Guiding Principles on Reclamation

To ensure that future generations of Inuit will be able to enjoy the land as Inuit do today, Nunavut Tunngavik Incorporated (NTI) and the Regional Inuit Associations require users of IOL to return the land to a safe and stable condition that maintains the ecosystem integrity and that is consistent with Inuit societal and cultural needs and aspirations. QIA requires that all A&R documents are developed with an awareness of NTI's Reclamation Policy.

Consistent with NTI's Reclamation Policy the goals of reclamation and the obligations of the land user are as follows:

- 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 locally valued ecosystem components and regional planning objectives, including land use plans

[1] Exploration includes early exploration through advanced exploration. Development includes pre-development site preparation through construction and operation. Development includes projects other than mining.

- Integration of Inuit Qaujimajatuqangit (IQ) and consultation with Community Land and Resources Committee(s) (CLARC)[2]
- Reclamation should result in a site in which all applicable federal and territorial laws of general application related to public health and safety requirements are met and risks to human health are minimized
- Land use operations should be planned and conducted in a manner that minimizes reclamation requirements at closure
- Land users should undertake progressive reclamation, consistent with approved terms and conditions and reclamation plans
- Land users should employ international best practices for arctic conditions, as well as federal and territorial legislation, regulations and guidelines, in the planning and carrying out of reclamation
- Land users should undertake any research necessary for them to be able to meet reclamation objectives
- Land users may be required to undertake post-activity monitoring to confirm reclamation objectives have been achieved

3.0 Abandonment and Reclamation Objectives and Criteria

An A&R plan should be sufficiently developed to act as a standalone document, tailored to project plans, with adequate detail to guide QIA through the review of a Tenant's abandonment and reclamation program. In the event an A&R plan does not contain sufficient information for on-site execution, QIA may elect to reject the plan.

Commonly, A&R plans contain general reclamation goals, along with specific objectives and criteria to reclaim each project component. Criteria are detailed to a level that can provide a measure of success or failure of the objective. A Tenant may complement their submission through opinion and argument presented in other literature (scientific journal articles, policy and guidelines from other jurisdictions) and/or with relevant on-site supporting information. If a Tenant chooses to use outside information as a basis of opinions formed in their submission, supporting documentation shall be appropriately referenced and provided to QIA upon request.

QIA maintains that the CLARC(s) play an important role in providing project approval and determining appropriate terms and conditions, including A&R outcomes. Consultation with the CLARC(s) both prior to and during the review process must be considered as important steps in the project application and planning process. Tenants are advised to consult any policy or procedural documents adopted by QIA for additional guidance on Tenant requirements for consultation.

QIA recommends the following items are contained in an A&R plan:

- Description of the environment[3]
- Description of site development, facilities and operations
- Method of fuel storage

[2] Qikiqtani Inuit Association Community Lands and Resources Committee Manual. 1996.

[3] This is meant to encompass land use history, baseline environmental conditions and current environmental conditions.

- Reclamation objectives and closure criteria
- Application and discussion of use of Inuit Qaujimajatuqangit and consultation with Community Land and Resources Committee(s) including Tenant discussions on project impacts and reclamation goals, objectives and criteria for each project component
- Detailed records of community consultation sessions
- Progressive reclamation
- Temporary closure
- Permanent closure reclamation activities
- Contingencies
- Schedule
- Financial security estimates
- Post reclamation monitoring program
- Reclamation research including appendices with supporting studies, plans, etc.

4.0 Financial Security Estimation

From a liability perspective, mature and intrusive projects will require a financial security estimate. A simplistic financial security estimate without evidence and detail may not be accepted as sufficient by QIA. A financial security estimate requires a detailed review of project specific information relative to what is represented in the A&R plan. Commonly, Tenants have employed the RECLAIM model as a tool to develop a financial security estimate.[4] It is QIA's position that the RECLAIM model does not offer a fully transparent assessment of security costs, nor does RECLAIM represent the best interest of Inuit as private landowners.[5]

The Tenant shall estimate the financial security amount to complete the A&R plan. When presenting and describing unit costs values and quantities, the Tenant shall report all results in a manner that is methodic and self-explanatory. Evidence shall be provided (e.g., material quantities based on "For Construction" drawings, number of surface and groundwater samples, clear calculations for person-hours used, quotes and invoicing from Third Party Contractors and suppliers, etc.) to support unit costs and quantities. If there is uncertainty in how quantities and unit cost values are calculated, the Tenant shall clearly outline the limitations in obtaining costing accuracy and propose a contingency to account for unknowns and limitations. QIA will assess the level of confidence in the evidence presented by the Tenant, and make adjustments to the contingency value if the evidence is not sufficient (Please refer to **Appendix D**). In many instances, an individual cost estimate associated with a particular project component is a function of numerous associated costs. Therefore, QIA requires both a comprehensive summary of project security estimates, as well as, individual component justification. **Appendix B** contains tables may aid a Tenant in developing a methodical framework to present a financial security costing estimate. These examples are not complete and do not represent all required budget line items for such activities. QIA requires a detailed line item breakdown of each cost to complete reclamation of each component. This may increase the level of confidence in the evidence presented. Furthermore, QIA requires all A&R plan submissions include a completed version of QIA's concordance table presented in **Appendix C**. When completing a financial security costing estimate, the Tenant is strongly encouraged to contact QIA if uncertainty exists in how to determine an acceptable estimate.

[4] Indian and Northern Affairs Canada. 2002. Mine Site Reclamation Policy for Nunavut. Ottawa, ON.

[5] Michael Wenig. 2008. Security Issues Arising from Water Licencing on Private Lands in the Northwest Territories and Nunavut. Canadian Institute of Resource Law. Calgary, AB.

In reviewing a Tenant's A&R plan and financial security estimate, QIA reserves the right to conduct an independent security estimate for the proposed project. QIA's security estimate may consider identified deficiencies in the Tenant's A&R plan and security estimate; impact of assumptions on security amount; uncertainty in unit cost values and quantities; and risk to QIA. In addition to a deterministic approach to estimate security, QIA may elect to use probabilistic methods to aid in understanding the impact of assumptions and uncertainties in the input values on the security value.

4.1 Assumptions

In developing a security estimate, assumptions may be made to narrow the scope of the assessment. QIA requires the ability to make direct contact with Tenant contractors and suppliers in order to determine level of involvement and clarify security costs officially. QIA requires the following assumptions are observed:

- Incorporation of QIA's CLARC A&R objectives and criteria
- A scenario where QIA assumes authority over project components on IOL
- Security costs should equal 100% of the cost for an independent third-party contractor to reclaim the site
- Security costs are based on an independent third-party contractor and equipment, including mobilization and demobilization
- An independent third-party contractor may be required to enter into a commercial lease with QIA and agree to standard terms and conditions (i.e., lease administration costs, tipping fees and water compensation)
- Transportation rates (including air travel, marine shipping and overland haul) must be supported by site-specific invoicing and or cost quotations
- Camp operation costs must be supported by site-specific invoicing or cost quotations
- Assumed use of on-site fuel for reclamation purposes is not acceptable
- Salvage values for on-site equipment and materials are not accepted as a security credit
- Review and approval of all plans associated with infrastructure development, including stamped and signed as-constructed documentation (e.g., drawings, reports, etc.) by a qualified Engineer registered with Association of Professional Engineers, Geologists and Geophysicists of the NWT and Nunavut (NAPEGG)
- Security should be posted in a form that is readily available to QIA, retains its value throughout the land use activity, and is beyond the control of the land user or its creditors in the event of insolvency.
- Progressive reclamation credits may be applied against a security amount once proven through QIA assessment and authorization
- IOL aggregates are used in completing a reclamation program for any project element requiring aggregates
- Potential transboundary impacts to IOL due to activities not on IOL will be considered

4.2 Progressive Reclamation

QIA holds financial security to ensure the project area will be reclaimed in a manner consistent with QIA's objectives and criteria. Progressive reclamation activities planned and implemented will be verified by QIA. On-site verification of completed progressive abandonment and reclamation will only occur once as-built construction reports with record drawings are filed with the appropriate authorities, including QIA. The financial security held for a specific project element will only be released once QIA has completed its verification process. This includes confirmatory inspection and verification. If reclaimed to a satisfactory level QIA will issue a release letter to the Tenant identifying satisfactory reclamation of project elements. Partial completion of progressive reclamation efforts, such as the completion of physical works in the absence of as-built construction reports and record drawings, will not result in financial security credits.

4.3 Limitations

Though every attempt may be made during a financial security assessment to capture all project components, there may be limitations when assigning financial values to elements of A&R plans. Therefore, all A&R plans shall include a detailed description of the A&R plan and security estimate limitations, as well as, identify and detail all line items where security values cannot be accurately estimated or predicted.

5.0 Closing Statements

Though many projects do not occur exclusively on IOL, QIA is committed to applying the contents of this policy where appropriate. From QIA's perspective this includes the review of all components associated with any given project.

Extraordinary costs associated with A&R plan review and approval borne by QIA will be charged back to the Tenant.

QIA lease agreements with the Tenant will form additional conditions including how A&R plans will updated and administrated (i.e. scheduling timelines for updates).

QIA recognizes abandonment and reclamation planning and financial security estimates are a dynamic portion of project planning and development. QIA will commit to regular updates to this policy in order to better serve the interests of Inuit and project developers.

APPENDIX A:
REFERENCE MATERIALS

Aboriginal Affairs and Northern Development Canada, 2011. Aboriginal Affairs and Northern Development Canada Technical Intervention DeBeers Canada Mining Inc. Snap Lake Water Licence MV2011L2-0004. Submitted to the Mackenzie Valley Land and Water Board, November 7, 2011.

Indian and Northern Affairs Canada. 1992. Mine Reclamation in Northwest Territories and Yukon.

Indian and Northern Affairs Canada. 2002. Mine Site Reclamation Policy for Nunavut.

Indian and Northern Affairs Canada. 2006. Mine Site Reclamation Guidelines for the Northwest Territories.

Northwest Territories Water Board and Department of Indian Affairs and Northern Development. 1990. Guidelines for Abandonment and Restoration Planning for Mines in the Northwest Territories.

Nunavut Tunngavik Incorporated. 2008. Reclamation Policy.

Wenig, Machael. 2008. Security Issues Arising from Water Licensing on Private Lands in the Northwest Territories and Nunavut. Canadian Institute of Resource Law. Calgary, AB.

APPENDIX B:
FINANCIAL SECURITY COSTING TABLES

Table 1: Project Component Summary

Identifier	Infrastructure, operation, management action	Description and reference documents	Total cost	Limitations in developing a financial security value	Contingency due to limitations
A	(example: Acid Rock Drainage)				
B	(example: backhaul shipping costs)				

Table 2: Individual Component Details (example: Acid Rock Drainage)

Identifier	Description	Total Line Cost	Unit Cost	Total Quantity Required	Evidence and Justification for Unit Cost and Total Quantities Required
A	Quarry concession fees	A x B	$A/m^3	B m^3	
A	Transportation of buffering rock	(C x E) + (D x E)	$/per person hour (C) $/equipment hour (D)	Total Hours (E)	
A	Placement of rock	(C x E) + (D x E)	$/per person hour (C) $/equipment hour (D)	Total Hours (E)	

Table 3: Individual Component Details (example: Backhaul Shipping Cost)

Identifier	Description	Total Cost	Unit Cost	Total Quantity Required	Evidence and Justification for Unit Cost and Total Quantities Required
B	Sealift of materials to Montreal		$A/ m^3 $A/ kg		
B	Barge for loading/off-loading materials		$/day	Number of days	
B	Stevedoring costs in Montreal		$A/ m^3 $A/ kg		
B	Land transportation costs to final disposal facility		$A/ m^3 $A/ kg		

Table 4: Inventory of Tenant Materials at Site (example: Heavy Construction Equipment)

Identifier	Item	Location	Quantity	Mass (kg)	Volume (m^3)
A	Caterpillar 315C	Main Camp	1	16,402	63.2

APPENDIX C:
CONCORDANCE TABLE

The following concordance table has been prepared to characterize the content of a Tenant's Abandonment and Reclamation submission to the Qikiqtani Inuit Association (QIA). The concordance table is consistent with the principles of QIA's *Abandonment and Reclamation Policy for Inuit Owned Lands ('the Policy')*. It is the Tenant's responsibility to submit an Abandonment and Reclamation plan, along with supporting information, which satisfies the Policy. QIA requires Tenants to submit a completed concordance table with their submission.

Table 5: Concordance Table

Item	QIA Policy	Tenant Response
1	Have **all** reports and plans including addendums and responses been submitted?	
2	Are the submitted reports and plans executable standalone documents with adequate rational and detail?	
3	Do all reports and plans contain appropriate referencing (document name, author, section, and page number) to **all** supporting information?	
4	Do the reports and plans demonstrate a firm understanding, of QIA's *Guiding Principles on Reclamation* and provide rationale on how these principles have been satisfied?	
5	Has IQ and consultation with Community Land and Resources Committee(s) been applied? Has the Tenant provided detailed community consultation records?	
6	Are **all** the components that are considered in the abandonment and reclamation plan listed?	
7	Does each component of the project have an abandonment and reclamation objective(s) and criteria?	
8	Has an A&R plan been provided with a financial security estimate?	
9	Have Table 1, 2, 3 and 4 of Appendix B been used in completing the financial security estimate?	
10	Has evidence been provided to support the Policy assumptions for **all** reports and plans?	
11	Has the Tenant contacted QIA if uncertainty existed in how the Tenant was to determine an acceptable estimate?	

APPENDIX D:
COST ESTIMATE CONTINGINCIES

QIA adopts the common principles of cost estimate contingencies in construction such as those presented by Aboriginal Affairs and Northern Development Canada[6] for recent Class category estimates for other North of 60 mining developments (**Table 6**).

Table 6 – Acceptable Cost Estimate Contingencies

Estimate Type	Description	Appropriate Contingency
Detailed or Project Control	Based upon detailed engineering take-offs and written quotes	5%
Definitive of construction drawing phase	Engineering mostly complete, some written quotes	10%
Preliminary or budget level	Little detailed engineering and costs based upon verbal quotes	15%
Feasibility or advanced conceptual	Engineering may be 10% complete and costs based upon typical unit costs	20%
Pre-feasibility, conceptual or trade-off study	Very basic engineering only and costs based upon typical unit costs	25%

[6] Aboriginal Affairs and Northern Development Canada, 2011. Aboriginal Affairs and Northern Development Canada Technical Intervention DeBeers Canada Mining Inc. Snap Lake Water Licence MV2011L2-0004. Submitted to the Mackenzie Valley Land and Water Board, November 7, 2011.

RECLAMATION POLICY

NUNAVUT TUNNGAVIK INCORPORATED

Approved by the NTI Board of Directors
September 17, 2008

Introduction

Through the Nunavut Land Claims Agreement (NLCA), Inuit acquired title to land throughout Nunavut. The Regional Inuit Associations (RIAs) have been designated to hold the surface title to these Inuit Owned Lands (IOL) in their respective regions, with Nunavut Tunngavik Incorporated (NTI) holding the mineral title to about 10 percent of IOL. Inuit Owned Lands are intended to promote economic self-sufficiency of Inuit in a manner consistent with Inuit social and cultural needs and aspirations. In order to benefit Inuit now and into the future, IOL must be sustained through sound management. Thus, the land should be maintained in a condition that supports productive ecosystems and should not be impaired for future use. To accomplish this, following a land use operation, the land must be reclaimed—that is, it must be returned to a condition as near as possible to its original condition. Such reclamation of IOL is an important component of managing these lands for sustained benefit.

The purpose of this policy is to guide the RIAs and NTI in carrying out their respective responsibilities related to land use operations on IOL, including dealing with regulatory agencies such as the Nunavut Impact Review Board (NIRB) and the Nunavut Water Board (NWB). The policy will be the basis for the development of reclamation guidelines and appropriate terms and conditions to be included in licences, leases, and other authorizations issued by the RIAs and NTI.

Application

This policy applies to all land uses carried out on IOL throughout Nunavut. However, as the potential impacts to IOL can vary significantly depending on the type and duration of specific land uses, the policy will be applied in a manner that reflects the scale of the land use activity. Thus, a short-term land use carried out under a land use license may require only a one-page reclamation plan; a mining operation, on the other hand, will require a lengthy and detailed plan. The policy is intended to provide only general guidance on the requirements of NTI and the RIAs for reclamation following land use activities on IOL. Specific requirements are set out in land use licences and leases issued by the RIAs and in authorizations of agencies such as NIRB and the NWB. Mineral rights granted by NTI also state the requirement for reclamation. The RIAs and NTI will attempt to harmonize their reclamation requirements with those of other authorities where possible.

Guiding Principle

To ensure that future generations of Inuit will be able to enjoy the land as Inuit do today, NTI and the RIAs require users of IOL to return the land to a safe and stable condition that maintains the ecosystemic integrity and that is consistent with Inuit social and cultural needs and aspirations.

Objectives

The Objectives of the Reclamation Policy are to:

1. Establish goals for the reclamation of IOL and set out the obligations of the land user.

2. Minimize the environmental liability to Inuit from the use of IOL.

3. Ensure that reclamation requirements are incorporated in a reclamation plan.

4. Integrate Inuit Qaujimajatuqangit (IQ) and consultation with Inuit into the reclamation process.

5. Maximize the benefits of reclamation to Inuit.

Policy Statements

NTI sets out the following policy statements to meet the objectives:

Objective 1: Establish Goals for the Reclamation of IOL and Set Out the Obligations of the Land User*.*

The NLCA states: “The primary purpose of Inuit Owned Lands shall be to provide Inuit with rights in land that promote economic self-sufficiency of Inuit through time, in a manner consistent with Inuit social and cultural needs and aspirations.” Inuit recognize that while land uses may result in temporary or permanent changes to the land, and that it is not always possible to return land to its pre-development state, it is important to ensure that any land use does not preclude other types of land use in the future. Thus, the lands must be reclaimed to a

state where they are safe, stable, productive and available to as many future land uses as possible.

For a site to be considered safe following reclamation, there should be no public health concerns, such as contaminants emanating from the site, and all physical hazards should be removed. Furthermore, the site must conform to all applicable safety legislation.

A site must also be physically and chemically stable. "Physically stable" means that any land use component that remains after reclamation must not pose a hazard to public health, safety or the environment. The component should continue to perform the function for which it was designed at closure. It should not erode, slump or move from its intended location under natural extreme events or disruptive forces.

The term "chemically stable" means that, following reclamation, hazardous chemicals should not be released into the environment and that water quality should not endanger public health or safety, or result in a situation in which the receiving environment does not meet water quality objectives. In addition, the reclaimed site should not have a deleterious effect on soil or air quality.

Another goal of reclamation is that reclaimed sites should be aesthetically and environmentally compatible with the surrounding undisturbed landscape. In reclaiming the land, the land user must also take into account the naturally occurring biophysical conditions of the area, the characteristics of the surrounding landscape, local community values and culturally significant or unique attributes of the land. Land use prior to activity and post-operational land use activities must also be considered in planning reclamation.

The goals of reclamation and the obligations of the land user are as follows:

- *Reclamation should be planned and executed so as to achieve a site which is physically and chemically 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 locally valued ecosystem components and regional planning goals and objectives.*

- *Reclamation should result in a site in which all applicable federal and territorial public health and safety requirements are met and risks to human health and safety are minimized.*

- *Land use operations should be planned and conducted in a manner that*

- *Land users should undertake progressive reclamation, consistent with approved terms and conditions and reclamation plans.*

- *Land users should employ international best practices for arctic conditions, as well as federal and territorial legislation, regulations and guidelines, in the planning and carrying out of reclamation.*

- *Land users should undertake any research necessary for them to be able to meet reclamation objectives.*

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

Objective 2: Minimize the Environmental Liability to Inuit from the Use of IOL

The responsibility for reclamation of a land use site on IOL rests with the land user. To ensure that Inuit, the owners of the land, do not incur any environmental liability as a result of a land use activity, the RIA will require a land user to submit a plan for the reclamation of a site as well as financial security adequate to carry out the reclamation plan.

To minimize the potential environmental liabilities to Inuit:

- *Land users will be required to provide financial security for reclamation prior to commencing activity on IOL.*

- *The amount of security should equal 100% of the cost for a third party to reclaim the site in accordance with the approved reclamation plan.*

- *Security should be in a form that is readily available to the RIA, retains its value throughout the land use activity, and is beyond the control of the land user or its creditors in the event of insolvency.*

- *The RIA may grant credit for progressive reclamation and return a portion of the security, provided that the remaining security is sufficient to cover the outstanding reclamation liability.*

- *When the RIA is satisfied that the land user has met its reclamation obligations, written acknowledgement to that effect will be provided and the financial security returned.*

- *The RIA will relieve a land user of responsibility for reclamation only when*

all reclamation requirements have been met.

- *The creation of "perpetual care" sites on IOL shall be avoided.*

Objective 3: Ensure that Inuit Reclamation Requirements are Incorporated in a Reclamation Plan

In order that land users will reclaim IOL in accordance with our requirements, we will communicate these requirements both to the land users and to the agencies that regulate these activities. The land users will make use of this and other information to prepare a reclamation plan for a project and to carry out the required reclamation.

To provide land users with certainty and clarity on our expectations for reclamation and to ensure our reclamation requirements are incorporated in a reclamation plan:

- *We will develop appropriate reclamation requirements and provide them to land users of IOL upon request.*

- *We will provide the preferred outcomes for reclamation and include them as terms and conditions for licences, leases and other surface rights based on this policy.*

- *A land user must submit a reclamation plan to the RIA with an application for a land use licence, lease, or other surface right.*

- *A reclamation plan should provide a level of detail commensurate with the level of the proposed land use activity.*

- *The RIA will not grant a licence, lease, or other surface right until it has approved the reclamation plan.*

- *The land user must update a reclamation plan regularly and/or when land use activity changes from that described in the existing plan.*

- *To avoid conflicting requirements, the RIAs and NTI will promote coordination of our reclamation requirements with those of the regulatory authorities.*

Objective 4: Integrate Community Consultation and Inuit Qaujimajatuqangit in the Reclamation Process

Reclamation must address the needs and values of Inuit. To ensure that this happens, the final condition of a reclaimed site must be consistent with locally identified valued ecosystem components and regional planning goals and objectives. These can be identified through existing documentation such as land use plans and Inuit policies and guidelines and through consultation with the RIAs. For long-term land uses, such as those conducted under lease, land users should also consult local Inuit to determine reclamation objectives. At the local level, land users should consult with committees that report to the RIA – the Community Beneficiary Committees (CBCs) in the Kitikmeot region, and Community Lands and Resources Committees (CLARC) in the Kivalliq and Qikiqtani regions – as well as with hamlet representatives and other citizens. Land users should also communicate regularly with local Inuit and the RIAs about the status of on-going reclamation.

Inuit Qaujimajatuqangit (IQ) is more than traditional knowledge and is more properly defined as the Inuit way of doing things: the past, present and future knowledge, experience and values of Inuit society. It is important that the land user take IQ into account when developing reclamation objectives and undertaking reclamation activities.

To integrate community consultation and IQ into the reclamation process:

- *As part of the preparation of reclamation plans for operations conducted under a lease, the land user must consult the RIAs as well as local Inuit about reclamation objectives and alternatives.*

- *The CBCs and CLARCs should be the primary local Inuit groups that a land user should consult during the preparation of reclamation plans.*

- *Land users should incorporate IQ in their reclamation plans.*

Objective 5: Maximize the Benefits of Reclamation to Inuit

The use of IOL is intended to benefit Inuit and promote economic self-sufficiency of Inuit through time. While we want to maximize the benefits from all activities on IOL, including reclamation, we recognize that the level of benefits and Inuit participation will depend on the scale of the reclamation work. The most significant benefits will be associated with the reclamation of a large site that has had extensive use. Although some reclamation is normally done as part of the on-going operations, most of it will be done after operations have ceased. For a large project, this may involve many months or even several years of work. Inuit want to participate in these activities. Our requirements, as set out below,

will apply to differing degrees for different projects and some may not apply at all to projects where little reclamation is required.

To maximize the benefits to Inuit from the reclamation of IOL:

- *Land users should employ Inuit in reclamation activities.*
- *Land users should provide business opportunities to competitive Inuit firms to participate in reclamation activities.*
- *Land users should provide advance notice of business opportunities to Inuit firms to enable them to participate more effectively.*
- *To increase the participation of Inuit firms, the land user should provide opportunities for reclamation work by tendering a number of small contracts rather than a large general contract.*
- *Land users should incorporate training opportunities to Inuit and Inuit businesses in reclamation projects.*
- *Where the RIA determines that there are benefits to retaining infrastructure or other improvements on IOL, the land user may be permitted to leave such improvements in place.*

Implementation

This policy will be incorporated into the Rules and Procedures for the Management of Inuit Owned Lands and implemented through the terms and conditions of licences, leases and other authorizations issued by the RIAs for access to IOL. It will also be used as a basis for the communication to the regulatory agencies of the NTI and RIA requirements with respect to reclamation on IOL and will be used to guide NTI and RIA intercessions with respect to reclamation carried out on Crown land. Compliance with the policy does not absolve land users from any other legislative requirements for conducting land use activities on IOL and reclaiming the site.

The RIAs shall be responsible for the implementation of this policy.

Review and Revision

This policy will be subject to periodic review and revision by NTI and the RIAs.

Acronyms and Initialisms

CBC	Community Beneficiary Committee
CLARC	Community Lands and Resources Committee
INAC	Indian and Northern Affairs Canada
IOL	Inuit Owned Lands
NIRB	Nunavut Impact Review Board
IQ	Inuit Qaujimajatuqangit
NLCA	Nunavut Land Claims Agreement
NTI	Nunavut Tunngavik Incorporated
NWB	Nunavut Water Board
RIA	Regional Inuit Association

Further Information

For further information about IOL and reclamation on IOL, please consult the Nunavut Land Claims Agreement or contact the Regional Inuit Associations or Nunavut Tunngavik Incorporated.

Indian and Northern Affairs Canada

Affaires indiennes et du Nord Canada

MINE SITE RECLAMATION POLICY FOR NUNAVUT

Canada

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MINE SITE RECLAMATION POLICY FOR NUNAVUT

A policy for the protection of the environment
and the disposition of liability relating to mine closures in Nunavut.

Message from the Minister of Indian Affairs and Northern Development

I am pleased to present the *Mine Site Reclamation Policy for Nunavut*. This policy reflects the Government of Canada's desire to ensure a strong resource management base in Nunavut while reducing the impacts to the environment and human health.

The development of this policy has included a broad-based consultation process involving representatives from Aboriginal organizations, industry, stakeholders, Northern boards and the territorial governments.

Sustainable resource development is essential to the North. Our objective is to strengthen federal standards for both the protection of the environment and the reclamation of mine sites. Through this policy we are establishing a clear standard and are providing clarity and certainty for industry and other stakeholders which will lead to sustainable and responsible development in the North.

I would like to acknowledge and thank all those who have contributed to the development of this policy. We must continue to work together to create an industry that is sustainable, profitable and environmentally responsible.

Sincerely,

Honourable Robert D. Nault
Minister of Indian Affairs and Northern Development

INTRODUCTION

For more than a hundred years, mines have been operating in Canada's North, providing important economic benefits, not only for northerners, but to all Canadians. Mining in the North has been good for Canada. A rough estimate of the cumulative value of metal and mineral production for the three territories since 1977 is over $18 billion.

However, some mining operations closed without adequately addressing their clean-up and reclamation responsibilities, leaving hundreds of millions of dollars of clean-up costs to the federal government. While this represents a relatively small percentage of the economic benefit, in absolute terms, it still amounts to a substantial burden on the government's accounts.

The public is becoming more concerned about the growing number of insolvencies and abandoned mining properties, which are leaving significant environmental liabilities. This increased consciousness on the issue has led to outward expressions of concern and questioning of support for mining in the North.

On April 1, 1999, Canada created the new territory of Nunavut and, with it, the expectation that Inuit would become the managers of their own destiny. This includes unprecedented participation in the management of their renewable and non-renewable resources. In essence, the creation of Nunavut has given the Inuit a "clean slate" to develop the kind of resource management regime they want to take with them into the new millennium. To this end, there have already been strong signals that the development of a comprehensive resource management program, particularly for mining, is a high priority.

The Department of Indian Affairs and Northern Development (DIAND) is concerned with the public's eroding confidence in northern mining. It also recognizes the desire to build a strong resource management base in Nunavut. Both complement DIAND's thinking and its ongoing search for opportunities to improve the way resource management responsibilities are carried out across Canada's three northern territories.

DIAND considers the Mine Site Reclamation Policy for Nunavut an important new step in the development of a comprehensive mineral resource management component of the Department's Sustainable Development Strategy.

The development of the Policy was not the only option available. Government continues to look at various legislative and regulatory initiatives to support the principles set out in this Policy. However, legislative and regulatory changes take a relatively long time to accomplish, and it is important to deal with this issue in the context of current legislation from the perspective of operating mines preparing to close in the next few years and new mines expected to open shortly.

It is critical to have resource management tools in place in Nunavut before new mineral development activities become too far advanced. Industry, investors, environmental interests and communities all share the desire for certainty, consistency and clarity.

The Mine Site Reclamation Policy for Nunavut serves four main objectives:

- Ensure the impact of mining on the environment and human health and safety is minimized.
- Reduce the environmental liability that falls to government to the greatest extent possible.
- Provide industry and the public with a clear signal of the government's expectations.
- Build positive and supportive relationships with the new regulatory authorities coming into operation in the North.

DIAND also recognizes that many of the provisions incorporated within this Policy are governmental "principles" that provide general guidance and direction. They work in harmony with the existing regulatory framework and the regulators charged with their application. It is not the intent of this Policy to supplant or diminish these existing regulatory authorities or the organizations that have been created to carry them out.

DIAND has been guided by The Minerals and Metals Policy of the Government of Canada, wherein specific reference is made to the challenges associated with mine site reclamation and the federal government's direct responsibilities in the three territories.

It should also be noted that DIAND is developing another complementary policy that relates to orphaned or abandoned sites, including mines. It is called the Policy on the Management of Contaminated Sites in Canada's North. This proposed policy is part of DIAND's commitment to reduce or eliminate the human health and safety dangers posed by contaminated sites, including abandoned mines.

In addition to legislation governing conventional mining, the mining of uranium and other related hazardous minerals is regulated by specific legislation (e.g., *The Nuclear Safety and Control Act)*.

This Policy is intended to be consistent with the legislative, regulatory and policy instruments currently in effect in Nunavut, including the Nunavut Land Claims Agreement.

The Policy offers guidance for the planning and implementation of mine site reclamation in Nunavut. To a large degree, the principles outlined in this Policy have already been adopted and adhered to by the federal government and industry, within the existing regulatory framework in Nunavut. This Policy codifies, clarifies and provides more certainty. It gives a template for the development and enhancement of operational procedures and processes required to ensure that objectives are met.

Enforcement of regulatory provisions related to mine site reclamation will continue to be undertaken through the existing regulatory regime. The *Territorial Lands Act* and its regulations, the *Northwest Territories Waters Act* and the Nunavut Land Claims Agreement will be the primary vehicles used, although other pieces of federal and territorial legislation are also in play (e.g., *Fisheries Act, Canadian Environmental Protection Act and Nunavut Waters and Nunavut Surface Rights Tribunal Act*).

The environmental assessment processes will continue to identify and consider the environmental, social, cultural and economic effects of a mining project and its reclamation, and ensure that the potentially affected public participates during the monitoring and reporting of mine site reclamation.

The principles and objectives laid out in this Policy will guide DIAND's decision-making powers in matters where DIAND has authority and will shape DIAND's position as an intervener in regulatory processes carried out by resource management boards.

DIAND will continue to be guided by other federal policies concerning regulatory efficiency and environmental protection. Given the number of regulatory authorities emerging in the North, it is critical that this Policy be integrated with the existing regulatory and policy framework.

APPLICATION

Given the multi-jurisdictional landscape in Nunavut, application of this Policy depends on the circumstances. It will provide internal guidance to DIAND staff in the drafting of terms and conditions of regulatory instruments, such as surface leases, over which the Department retains jurisdiction and in the preparation of interventions to the resource management boards within the territory. The Policy will also inform the resource management boards of the Minister's expectations in terms of their work and what the Minister will be looking for in the regulatory instruments submitted for the Minister's approval. Finally, it tells industry what is expected in its project designs (as it relates to reclamation planning) and what industry can expect from regulatory decision makers, thereby "fixing the goal posts" and removing ad hoc, case-by-case interpretations.

This Policy only applies within the jurisdiction of the federal government and, as such, does not apply to those aspects of reclamation that fall within the jurisdiction of the Government of Nunavut or the Inuit as private owners of the surface of land through the Nunavut Land Claims Agreement. This would clearly include the non-water-related aspects of surface reclamation on lands that are either owned by the Inuit pursuant to the Nunavut Land Claims Agreement or administered by the Government of Nunavut as Commissioner's land. Mining operations, which are located on a combination of Inuit-owned and Crown lands, will be dealt with on a case-by-case basis, probably, through some form of co-operative arrangement between DIAND and the Inuit land-owning organization.

This Policy applies to new and existing mines, whether operating or not, with clearly identified owners/operators. It does not cover orphaned or abandoned sites, which will fall under the proposed Policy on the Management of Contaminated Sites in Canada's North.

The Policy applies only to developed mines and to those mining-related activities that take place on mine sites. It does not apply to activities undertaken during the prospecting, exploration or advanced exploration stages of the development of a mineral property.

This policy is virtually identical to the Mine Site Reclamation Policy for the Northwest Territories (NWT) and is intended to cover mining properties which might straddle the Northwest Territories–Nunavut border. Yukon mining activities are not managed under the *Territorial Lands Act*/Canada Mining Regulations, and a modified policy vehicle is being developed which is consistent with Yukon's legislative and regulatory framework. It is intended that it will complement its NWT and Nunavut counterparts, to create a consistent pan-Northern policy framework.

PRINCIPLES FOR MINE SITE RECLAMATION

The following principles respecting mine site reclamation should provide proponents, boards and government departments with certainty, clarity and consistency regarding expectations, from project design to operations and post-closure.

1. General

- Mine site reclamation should reflect the collective desire and commitment to operate under the principles of sustainable development, including the "polluter pays" principle.
- The required standard of reclamation should be based on the 1994 Whitehorse Mining Initiative definition: "returning mine sites and affected areas to viable and, wherever practicable, self-sustaining ecosystems that are compatible with a healthy environment and with human activities."
- Every new mining operation should be able to support the cost of reclamation. Existing mining operations will also be held accountable for their reclamation liabilities.
- Adequate security should be provided to ensure the cost of reclamation, including shutdown, closure and post-closure, is born by the operator of the mine rather than the Crown.
- Best management practices, including progressive reclamation, should be applied to advance environmental protection and reduce environmental risks.
- Communication and consultation among all applicable parties should be comprehensive, complete and timely.

2. Reclamation Planning

- Every mine should, at all times, have a mine closure and reclamation plan, which includes measures to be taken in the event of a temporary closure.
- The direct closure impact of all components of a mine site should be addressed as an integral part of the design criteria during the detailed engineering phase of the project, including tailings handling, disposal of chemicals and hydrocarbons and pit shutdown.
- The selection of key reclamation and closure alternatives should be based on current and comprehensive technical information generated by experts, such as competent, credible consultants.
- Mine closure and reclamation plans should be sufficiently flexible to allow adjustments as the life of the mine progresses, including the flexibility to adapt to new and improved technologies and methodologies, and allowing for progressive reclamation, while ensuring obligations under the plans are met.

3. Post-Closure Responsibilities

- Following mine closure, mining companies or their future owners should continue to be responsible for the site, including the remediation of any additional environmental complications which develop.

4. Financial Security

- The total financial security for final reclamation required at any time during the life of the mine should be equal to the total outstanding reclamation liability for land and water combined (calculated at the beginning of the work year, to be sufficient to cover the highest liability over that time period).

- Estimates of reclamation costs, for the purposes of financial security, should be based on the cost of having the necessary reclamation work done by a third-party contractor if the operator defaults. The estimates should also include contingency factors appropriate to the particular work to be undertaken.

- The recognized methodology for calculating reclamation costs, for the purposes of financial security, should be the RECLAIM or some other appropriate model.

- Consideration should be given to alternate or innovative forms of security, such as mine reclamation trusts, provided they meet certain criteria that protect the government's interests and objectives.

- Financial security requirements related to reclamation should be clearly set out in water licences, land leases and other regulatory instruments, though there may be circumstances where security requirements may be more appropriately dealt with through an agreement.

- Mining operators should be credited for approved progressive reclamation, and the value of financial security required should be adjusted in a timely fashion.

5. Regulatory Authorities

- There should be, to the extent possible, co-ordination among the various regulatory authorities sharing jurisdiction with respect to the management of lands and water to facilitate the consistent application of this Policy, particularly as it relates to the provision of financial assurance for environmental liability.

- The regulatory regime governing mine site reclamation should provide industry and stakeholders with the certainty and clarity required to accept the risks associated with mine developments.

- Status reports on the progress of mine site reclamation and revisions to plans should be required, pursuant to the relevant regulatory instruments.

IMPLEMENTATION CONSIDERATIONS

The following implementation considerations provide an explanatory framework and add detail to the principles set out above.

Mine Closure and Reclamation Plans

All proposals for a new mine must include a mine closure and reclamation plan. This is critical to the long-term future and environmental legacy of the development site. For greater efficiency, a plan should integrate the requirements associated with leasing surface rights and water licensing.

Required Standard of Reclamation

Site-specific criteria should be developed by regulators for assessing the adequacy of plans and their implementation, based on the 1994 Whitehorse Mining Initiative principle of "returning mine sites and affected areas to viable and, wherever practicable, self-sustaining ecosystems that are compatible with a healthy environment and with human activities," including applicable archiving of reports, records, etc.

Where regulatory boards with jurisdiction for land and water management have developed specific guidelines and standards of environmental rehabilitation, these will be adopted for use in the applicable region.

Elements of Mine Closure and Reclamation Plans

Planning for closure, before development occurs, provides the opportunity to develop a flexible and cost-effective design, which helps ensure mine reclamation takes place and the responsibility for costs is borne by industry. It can be expected that techniques and methodology for mine site reclamation will continue to evolve with changes to our scientific understanding and technology. Therefore, approaches to mine site reclamation need to remain dynamic, and evolving "best practices" should be an integral component of reclamation planning.

Best practices for both regulatory and voluntary/non-regulatory efforts include policies, programs, technologies, reclamation research and other measures that have been found to be cost effective and environmentally appropriate. Best practices encompass and build on measures embodied within local, national and international initiatives.

A plan should fully address the following:

- The progressive reclamation of the site during the life of the operation, to the extent feasible, given the mining and processing methods employed.
- The removal or stabilization of any structures and workings remaining at the site after closure to ensure that, over time, they remain physically sound and are no threat to public safety.
- The design of tailings and waste rock disposal areas within accepted engineering standards for slope, stability and erosion control.
- The reclamation of the surface to meet acceptable standards.

- Meeting or exceeding currently accepted standards of water quality for drainage from the site.

- Ensuring the site is left in a condition which will minimize or eliminate long-term care and maintenance requirements.

- A cost estimate of the work required to close and reclaim the mine, for each year of the proposed operating life needs to be part of the plan. (Cost estimates should be based on the work being performed by an independent contractor in case the operator default. Estimates should include contingency factors appropriate to the particular work to be undertaken.)

- A list of contingency measures for temporary closure of the mine, outlining specific actions and their scheduling, to be taken during the temporary closure. (As temporary closure is commonly an uncertain condition, the schedule will be necessarily progressive as each week, month, season or year passes.)

- A plan for post-closure monitoring of the site including a monitoring schedule and reporting frequencies. (For a monitoring program to be meaningful, it must include provision for appropriate progressive responses which trigger action whenever exceeded, including the establishment of thresholds or the identification of changes in circumstances.)

The plan should describe detailed measures for the reclamation, closure and decommissioning of the mine including but not necessarily limited to:

- buildings and other structures;
- roads and airstrips;
- tailings disposal facilities and management;
- waste rock disposal management;
- quarries and open pits;
- petroleum and chemical storage areas and facilities;
- pipelines and electrical transmission lines;
- sewage and waste disposal areas and facilities;
- mine and site drainage systems;
- mine workings;
- mine shaft, adit and decline openings;
- site hydrology and water quality including water flows leaving the site;
- revegetation of the site where practicable;
- recycling of materials; and
- site specific requirements.

Progress Reporting on Reclamation

Status reports on the progress of mine site reclamation work should be submitted to the relevant regulatory authority periodically. Since reporting on progressive reclamation is directly related to amendments to the financial security, the timing and content of the reports should match the provisions found in each plan relating to amendments to the financial security (see Financial Security).

Status reports need not be elaborate documents, but should include basic details, such as the reclamation work performed, amount of materials moved, dollars spent and a general account of areas yet to be reclaimed.

Mine Closure and Reclamation Plan Revisions (Updates)
When revisions to mining plans require significant changes in reclamation requirements, an amendment to the plan will be required, in addition to the above described progress report. In many cases, these changes will require an environmental screening, and amendments to licences and permits through the regulatory process.

A significant component of any revision will be the evaluation of the degree to which reclamation costs will vary as a result of changes to the mining plan and the implications for the amount of financial assurance already in place.

Financial Security
A key element of the Plan is the relationship between the closure and reclamation obligations, and the financial security provided to ensure the liability for reclamation remains with the mining company. There are a number of issues relating to financial security which must be considered as part of this policy.

1. Forms of Security

Financial security for mine site reclamation for new mines must be readily convertible to cash. Such security must have the following basic criteria:

- Subject to applicable legislation and due process, it must provide the Crown with immediate, unconditional, unencumbered access to the full amount of the security.
- It must retain its full value throughout the life of the mine and if applicable, beyond.
- It must remain beyond the control of the mining company, or its creditors in the event of insolvency.

The Minister may consider new or innovative forms of security, such as reclamation trusts, provided they meet the above criteria.

2. Co-ordination Among Regulatory Agencies

Regulatory authority to require financial assurance for mine site reclamation is not contained in a single statute. On Crown-owned lands in Nunavut, DIAND has jurisdiction with respect to land leases and related security issues. For water licences, the Nunavut Water Board determines the amount of security, while the Minister of DIAND determines the form.

Since financial security has become a multi-jurisdictional issue, co-ordination is an important consideration. To ensure that financial security is most efficiently and effectively applied, DIAND will facilitate discussions between the various regulatory bodies to promote the co-ordination of financial security obligations. This will include:

- developing and updating of recognized standards, models and assumptions for calculating reclamation costs (e.g., RECLAIM model);

- ensuring that, at any given time during the life of the mine, the total financial security for mine site reclamation in place, subject to the timing of any application for credit for progressive reclamation, is equal to the total outstanding reclamation liability of the mine site, and the financial security for closure-related activities, imposed by land and water jurisdictions cumulatively, does not exceed the total reclamation cost estimates for both the land-related and water-related reclamation elements at each mine;

- ensuring that the terms, conditions and notification processes in financial security are compatible for all regulatory instruments; and

- coordinating the regulatory determinations required from each decision maker (e.g., the Minister or the Water Board) to facilitate the integration of all financial security obligations.

3. Progressive Reclamation

Ongoing reclamation throughout the life of the mine is preferable from both the environmental and financial liability perspectives. The financial security of a mining project will be adjusted to reflect progressive reclamation on the following basis:

- When ongoing reclamation work reduces the outstanding environmental liability, it will result in a reduction in the level of financial security required to be maintained.

- Credit for progressive reclamation work should be made in a timely fashion in accordance with authorities set out in the applicable legislation.

- The value of reclamation work will be based on generally accepted modelling (e.g., the RECLAIM model) and calculated as the difference between previous outstanding liabilities and estimates made of the remaining liability following the reclamation work (as opposed to actual costs, if actual costs do not fully reduce outstanding liability).

- The amount of financial security on deposit will normally increase proportionately as mining proceeds. Generally, this implies that as the mine site grows, water usage increases and the cost to restore a site expands. Accordingly, reclamation costs are usually estimated to rise over the life of the mine. However, as reclamation work is performed, the environmental liability is reduced and the financial security required may decrease proportionately.

- If, during a specific period, the value of any progressive reclamation exceeds the value of new reclamation liability created through additional mining operations, DIAND would reduce the amount of security required through the surface lease and would support an application by the mining company to the Water Board to reduce the amount of the water licence security accordingly.

- Progressive reclamation may not reduce the financial assurance required to zero. Sometimes, a residual amount is required to meet other licensing obligations.

Post-Closure Reclamation and Final Decommissioning

Near the end of production when closure is anticipated, the most recent approved plan will be the basis for final decommissioning. As reclamation work is successfully completed and environmental liability is reduced, the amount of financial assurance required will be proportionately reduced and the surplus refunded.

Where applicable, in addition to the physical aspects of closure, pertinent records should be collected, prepared and archived. These could include a survey of any underground workings, drill cores and broader environmental data and reports.

Once the reclamation work required by the plan is deemed completed, the site will be allowed to stabilize. During this time, monitoring will be conducted by the company and verified by DIAND and other agencies as appropriate, with respect to the effectiveness of the mitigative measures, the accuracy of the environmental assessment and any unforeseen environmental impacts. The duration of the required monitoring phase will be reviewed and confirmed at the time of closure and will depend on the risks associated with the potential impacts on the environment.

During this period, the mining company will continue to be responsible for the site, including remediation of any additional environmental complications which develop.

If warranted by site conditions, the monitoring period may be extended to ensure remedial measures are met.

Some mines are anticipated to require long-term care and maintenance after closure.

Examples include sites where:

- acid mine drainage requires neutralization by water treatment;
- tailings containment structures require periodic monitoring and maintenance; and
- remediation technologies are not proven.

The Minister may hold back an appropriate amount of financial assurance to cover future requirements for the site. In such cases, the mining company will be responsible for the care and maintenance of the site, but will also maintain a claim to any remaining financial assurance.

When the Minister is satisfied the operator has met the requirements for decommissioning under the relevant legislation and that the objectives of the plan have been fully met, the Minister will provide the mining company with a written acknowledgement to that effect.

TRANSITION RULES FOR EXISTING MINES

This Policy covers existing mining operations. However, it is recognized that the status of reclamation planning and the degree of financial assurance in effect varies considerably from mine to mine. Therefore, the application of certain aspects of this Policy will have to take into account the specific situation and issues of individual mines on a case-by-case basis.

For existing operations, the financial security provided to the Minister for reclamation obligations should be increased in increments to 100 percent coverage as soon as possible, but not later than the forecast life of the mine. Only when a mine operator could conclusively demonstrate that it was financially incapable of doing so, and the Minister was satisfied that it was in the public's best interests, would the Minister consider options relating to the form, amount or schedule for the provision of financial security.

All new reclamation liabilities created by future operations would be subject to the same requirement to provide full security as new mines.

INSOLVENCIES

The issue of what happens when the operators of existing mines become insolvent poses a distinct and unique challenge to both the regulatory system and the application of this Policy. When a mine operator seeks court protection from creditors under either the *Companies' Creditors Arrangement Act* or the *Bankruptcy and Insolvency Act*, the company does so with the intent to negotiate with its creditors a financial restructuring that will allow the company to emerge from court protection as a viable entity. When this process is successful, the mine operator remains liable for the closure and reclamation of the mine.

However, when this process is not successful, the creditors of the company will frequently have the court appoint a receiver or Interim Receiver under the provisions of the *Bankruptcy and Insolvency Act* to sell the assets of the company. The negotiations with prospective purchasers of a mine within insolvency proceedings will frequently involve DIAND as the representative of the Crown, as a creditor of the insolvent operator and as an environmental regulator. While DIAND will be as co-operative as possible in trying to facilitate such a sale, the Crown will **not** compromise or assume environmental liability to facilitate a sale of a mine for the benefit of creditors.

When a property is abandoned by a receiver, Interim Receiver, or Trustee in bankruptcy, DIAND will take any measures necessary to safeguard human health and safety, and the environment, using the authority of the Minister under the *Northwest Territories Waters Act*. Under this Act, the costs of such measures will be recovered from the financial security provided by the operator. Should these costs exceed the value of the security provided by the operator, the excess becomes a debt due to the Crown which, under the *Companies' Creditors Arrangement Act*, and the *Bankruptcy and Insolvency Act* is secured by a first charge over the property. If the property is subsequently sold, the Crown intends to recover any debts due to the Crown from the proceeds of the sale of the property.

When a mine operator is insolvent and a mine is abandoned by a receiver, Interim Receiver or Trustee in bankruptcy, because the unsecured environmental liabilities exceed the economic value of the mine, which means the property cannot be sold in a conventional sale, DIAND would consider entering into a transaction with a purchaser for the mine on the following basis:

- The sale would generate the maximum benefit to the Crown in terms of reducing the net liability remaining with the Crown.
- Any significant consideration related to the transaction would be paid into a trust fund for the remediation of the existing environmental liabilities at the site.
- A purchaser would have its liability for the existing environmental condition of the property limited.
- A portion of the economic value of the production from the mine would go to a fund for the remediation of the existing environmental liabilities at the site.

- The purchaser would remain fully liable for the remediation costs of any environmental impact resulting from its operations at the site.

Whether or not DIAND entered into such a transaction would depend on the extent of the benefits or potential benefits to the Crown in reducing the environmental impacts and ultimate cost to Canadian taxpayers of environmental remediation at the mine site.

POLICY REVIEW

The political and legislative environment in the North is in a period of unprecedented change. If this Policy is to keep pace with the shifting operational environment, and political, legislative and technological developments, it must be a living document, or it will lose its currency and effectiveness.

To this end, the Department will undertake to review this Policy periodically.

RSMeansOnline

Understanding RSMeans data

RSMeans Online is your online access to industry-standard **RSMeans** commercial construction data, giving you the ability to create accurate, up to date building estimates. This section provides an overview of the factors that go into compiling and reporting **RSMeans** commercial construction data.

Monitoring trends that affect costs

RSMeans continuously monitors developments in the construction industry in order to ensure reliable, thorough and up-to-date cost information. While overall construction costs may vary relative to general economic conditions, price fluctuations within the industry are dependent upon many factors. Individual price variations may, in fact, be opposite to overall economic trends. Therefore, costs are continually monitored and complete updates are published yearly. Also, new items are frequently added in response to changes in materials and methods.

Factors used in determining costs

All costs derived in **RSMeans** represent U.S. national averages and are based on the U.S. National Averages given in U.S. dollars. The **RSMeans** Location Factors can be used to adjust costs to a particular location. Canadian Location Factors can be used to adjust U.S. National Averages to local costs in Canadian dollars. No exchange rate conversion is necessary.

The following is an overview of the factors used in determining costs:

Material costs

The **RSMeans** staff contacts manufacturers, dealers, distributors, and contractors all across the U.S. and Canada to determine national average material costs. If you have access to current material costs for your specific location, you may wish to make adjustments to reflect differences from the national average. Included within material costs are fasteners for a normal installation. **RSMeans** engineers use manufacturers' recommendations, written specifications and/or standard construction practice for size and spacing of fasteners. Adjustments to material costs may be required for your specific application or location. Material costs do not include sales tax.

Labor costs

Labor costs are based on the average of wage rates from 30 major U.S. cities. Rates are determined from labor union agreements or prevailing wages for construction trades for the current year. Rates along with overhead and profit markups are listed in PDF format in the References tab of **RSMeans Online**. If wage rates in your area vary from those used in this product, or if the rate increases are expected within a given year, labor costs should be adjusted accordingly. Labor costs reflect productivity based on actual working conditions. These figures include time spent during a normal workday on tasks other than actual installation, such as material receiving and handling, mobilization at site, site movement, breaks, and cleanup. Productivity data is developed over an

extended period so as not to be influenced by abnormal variations and reflects a typical average.

Note: For information about the breakdown in unit-hours, see Estimating labor hours.

Equipment costs

Equipment costs include rental costs and the operating costs for equipment under normal use. The operating costs include parts and labor for routine servicing such as repair and replacement of pumps, filters and worn lines. Normal operating expendables such as fuel, lubricants, tires and electricity (where applicable) are also included. Equipment rental rates are obtained from industry sources throughout North America including contractors, suppliers, dealers, manufacturers, and distributors.

Notes:

- Extraordinary operating expendables with highly variable wear patterns such as diamond bits and blades are included under materials, not equipment.
- The power equipment required for each crew is included in the crew cost and can be expressed by the ratio Crew Equipment Cost/Day. The daily cost for crew equipment is based on dividing the weekly bare rental rate by 5 (number of working days per week), and then adding the hourly operating cost times 8 (hours per day). This "Crew Equipment Cost/Day" is listed in Subdivision 01590.
- Mobilization and demobilization (the cost to move construction equipment from an equipment yard or rental company to

the job site and back again) is not included in equipment costs. Mobilization (to the site) and demobilization (from the site) costs can be found in Section 02305-250. If a piece of equipment is already at the job site, it is not appropriate to utilize mobilize/demobilize costs again in an estimate.

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About General Conditions

Cost data is presented as either Bare Costs or Total Cost. The term *Total Cost* indicates that overhead and profit (O&P) is included in that figure. General Conditions are always added to the Total Cost.

- The costs for General Conditions are listed in Division 1 and the Reference Section.
- General Conditions for the *Installing Contractor* may range from 0% to 10% of the Total Cost.
- For the *General* or *Prime Contractor*, costs for General Conditions may range from 5% to 15% of the Total Cost, with a figure of 10% as the most typical allowance.

Factors affecting costs

Costs can vary depending upon a number of variables, as described below:

- **Quality**: The prices for materials and the workmanship upon which productivity is based represent sound construction work. They are also in line with U.S. government specifications.
- **Overtime**: Cost data makes no allowance for overtime. If premium time or work beyond normal working hours is anticipated, be sure to make an appropriate adjustment to the affected labor costs.
- **Productivity**: The productivity, daily output, and labor-hour figures for each line item are based on working an eight-hour day in daylight hours in moderate temperatures. For work that extends beyond normal work hours or is performed under adverse conditions, productivity may decrease.
- **Size of project**: The size, scope of work, and type of construction project have a significant impact on cost. Economies of scale can reduce costs for large projects. Unit costs can often run higher for small projects.
- **Location**: Material prices are for metropolitan areas. However, in dense urban areas, traffic and site storage limitations may increase costs. Beyond a 20-mile radius of large cities, extra trucking or transportation charges may also increase the material costs slightly. Conversely, lower wage rates may be in effect. Be sure to consider both these factors when preparing an estimate, particularly if the job site is located in a central city or remote rural location. In addition, highly specialized subcontract items may require travel and per diem expenses for mechanics.
- **Other factors**: The following are other factors to consider:
  - season of the year
  - contractor management
  - weather conditions
  - local union restrictions
  - building code requirements
  - owner's special requirements/restrictions
  - safety requirements
  - environmental considerations
  - availability of:
    - adequate energy
    - skilled labor
    - building materials
- **Unpredictable factors**: General business conditions influence "in-place" costs of all items. Substitute materials and construction methods may have to be employed and can affect the installed cost and/or life cycle costs. Such factors may be difficult to evaluate and cannot necessarily be predicted on the basis of the location of a job in a particular section of the country. Thus, where these factors apply, you may find significant but unavoidable cost variations which require a measure of judgment to your estimate.

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SEALIFT RATES for 2013 SEASON

NUNAVUT

as at February 12th, 2013

DESTINATIONS	NORTHBOUND (rate per revenue ton)	NORTHBOUND 20' (rate per 20' merchant container unit)	NSDR (NEAS Stuffed, Delivered, Returned 20' container)	RETROGRADE (rate per revenue ton)	RETROGRADE 20' (rate per empty 20' container unit)	LATERAL (rate per revenue ton) (subject to port rotation)
Area "C" Iqaluit	$283,58	$4 367,16	$6 527,16	$184,33	$687,11	$184,33
Area "D" Cape Dorset, Kimmirut, Pangnirtung	$320,26	$4 932,05	$7 092,05	$208,18	687,11	$208,18
Area "E" Arviat, Baker Lake, Chesterfield Inlet, Coral Harbour, Rankin Inlet	$326,49	$5 027,95	$7 187,95	$212,22	687,11	$212,22
Area "A" Arctic Bay, Clyde River, Grise Fjord, Kugaaruk (via Nanisivik), Nanisivik, Pond Inlet, Qikiqtarjuaq, Resolute Bay	$369,33	$5 687,72	$7 847,72	$240,06	687,11	$240,06
Area "B" Hall Beach, Igloolik, Repulse Bay	$347,18	$5 346,61	$7 506,67	$225,67	687,11	$225,67
Area "G" Cambridge Bay, Kugluktuk, Gjoa Haven, Taloyoak	$427,99	6591,04	$8 751,04	$278,19	687,11	$278,19
Area "H" Sanikiluaq	$357,77	$5 509,57	$7 669,55	$232,55	$687,11	$232,55

NOTICE

(1) 20' container unit measures 20'L x 8'W x 8.5'H

(2) Rates per revenue ton apply per metric ton of 1000 kilograms or 2.5 cubic meters whichever produces the greater revenue per piece.

(3) Dangerous goods, waste, hazardous cargoes: a surcharge of 20% above the applicable rate will be applied. Excludes explosives (class 1) and Radioactive (class 7) cargoes, which are subject to negotiations.

(4) NEAS containers must be timely destuffed by merchant so that empty unit can be returned on same sailing, else demurrage charges shall apply

(5) Taxes: The G.S.T. is not included in the ab

(6) Rate for Region 'C' is $286.68 per revenue ton.

This rate sheet is intended for quick reference only. Shipments which must be timely executed by the parties.

Rates and transportation are subject to term and conditions of a marine transportation contract in effect at time of shipment which must be timely executed by the parties.

Nunavut Eastern Arctic Shipping Inc.

INSURANCE PREMIUMS

1. General cargo

1.1. Premium of $12.00 per revenue ton for general cargo valued up to $2999.99 per revenue ton.

1.2 Premium for general cargo valued at $3000.00 and over per revenue ton shall be negotiated on a case by case basis.

2. Automobiles and small pick-up trucks not exceeding 20 m^3

2.1 Premium of **$15.60** per revenue ton for vehicles valued up to $12,499.99

2.2 Premium of **$19.50** per revenue ton for vehicles valued from $12,500. to $14,999.99

2.3 Premium of **$23.50** per revenue ton for vehicles valued from $15,000. to $17,499.99

2.4 Premium of **$27.30** per revenue ton for vehicles valued from $17,500. to $19,999.99

2.5 Premium of **$31.25** per revenue ton for vehicles valued from $20,000. to $22,499.99

2.6 Premium of **$35.20** per revenue ton for vehicles valued from $22,500. to $24,999.99

2.7 Premium of **$39.00** per revenue ton for vehicles valued from $25,000. to $27,499.99

2.8 Premium of **$43.00** per revenue ton fro vehicles valued from $27,500. to $29,999.99

2.9 Premium of **$46.80** per revenue ton for vehicles valued from $30,000. to $32,499.99

2.10 Premium of **$50.80** per revenue ton for vehicles valued from $32,500. to $34,999.99

2.11 Premium of **$54.70** per revenue ton for vehicles valued from $35,000. to $37,499.99

2.12 Premium of **$58.50** per revenue ton for vehicles valued from $37,500. to $39,999.99

2.13 Premium for vehicles valued $40,000.00 and over shall be negotiated.

3. ATVs, snowmobiles up to 4m^3

3.1 Premium of **$40.00** per revenue ton for units valued up to $5,999.99

3.2 Premium of **$46.00** per revenue ton for units valued from $6000. to $7999.99

3.3 Premium of **$62.00** per revenue ton for units valued from $8000. to 9999.99

3.4 Premium of **$78.00** per revenue ton for units valued from $10,000. to $11,999.99

3.5 Premium of **$93.00** per revenue ton for units valued from $12,000. to $13,999.00

3.6 Premium for units valued at $14,000.00 and over shall be negotiated.

4. Small boats & canoes

4.1 Premium of **$40.00** per revenue ton for units not exceeding $7999.99

4.2 Premium for units valued at $8000.00 shall be negotiated.

ARCTIC SHIPPING RATES
Weight and Volume Influence

Prepared for:

Arktis Solutions Inc.

by

TranSys Research Ltd

682 Milford Drive
Kingston, ON K7M 6B4

March 2009

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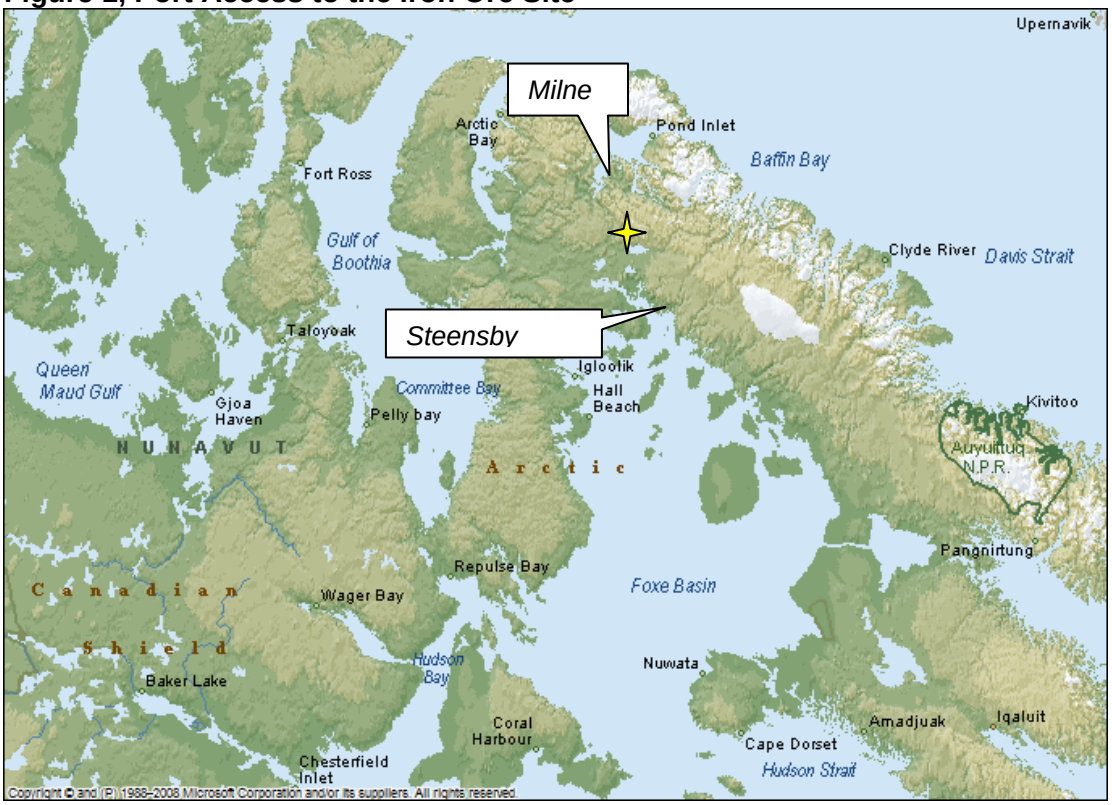
1 Introduction

1.1 Background

Baffinland Iron Mines Corporation (BIMC) is developing an iron ore mine at Mary River on Baffin Island. Milne Inlet, 100 km north of the Mary River mine site, offered the closest access to the sea, and was equipped with as temporary docks to bring in construction equipment and supplies (see *Figure 1*). Steensby Inlet, 149 km to the southeast, is being viewed as the preferred location for the iron ore port, due to the longer ice-free period accommodating a 12-month shipping season.

Figure 1, Port Access to the Iron Ore Site



In posting a performance bond for the landholders a number of reclamation costs need to be identified. One aspect s the transportation costs associated with providing materials into, and more importantly, away from the Mary River Mine Site. Either or both access locations (Milne and Steensby) might be used for as access points.

1.2 Objectives

- The examination of shipping costs as a function of mass and/or volume is the main objective of the study.
- A related objective is to outline what functions and factors will influence the cost vs. mass and/or volume relationship.
- Finally, a 'best-effort' ballpark estimate of the incremental costs of providing temporary docks at Milne Inlet is desired.

2 Shipping Rates as a Function of Weight and Volume

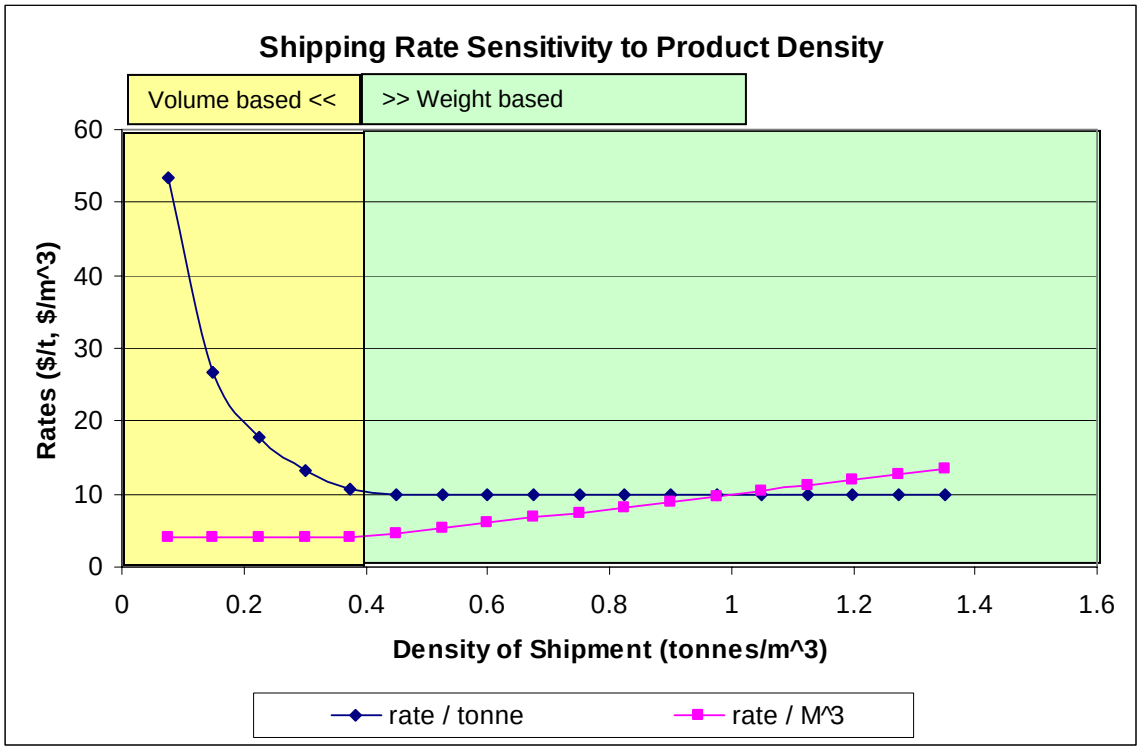
2.1 Basis of General Cargo Rates

One of the key attributes of maritime rates is the relationship between volume and weight. For marine, these relationships were established centuries ago. The basic term used to define a ship's capacity was its gross registered tons (GRT), a term that remains in use today. The term is misleading as it refers not to the actual tonnage capacity of the ship but its volume capacity – one GRT equals 100 cubic feet of volume.

This characteristic density of 2,000 lb/100-ft^3 has served as breakpoint of weight and volume charges (or shipping rates) for general cargo vessels through the centuries. With metric measures it has been rounded off to be tied to 1,000 kg or 2.5 m^3. Commodities with a density lower than 1,000 kg/2.5 m^3 are recognized as occupying ships volume beyond that of the base definition and are charged a volume-based rate, while commodities with a density higher than 1,000 kg/2.5 m^3 are recognized as loading a ship's weight carrying capacity beyond the base definition and are charged a weight-based rate.

Figure 2 illustrates the effective rate per tonne and per m^3 for as a function of product density for a specified shipping rate of $10/tonne.

Figure 2, Rate Relationship to Density



While there is only one specified rate at work (i.e. $10/tonne) the rate only applies as a tonnage rate for commodities with a density greater than 0.4 t/m^3. For products with densities below 0.4 t/m^3, the rate becomes volume based at $10/2.5m^3 or $4/m^3. Thus, in the volume-based region, the cost per m^3 is fixed at $4 while the effective cost/tonne rises

steeply as density is lowered. Similarly, in the weight based region, the cost per tonne is fixed at $10, while the effective cost per m^3 rises as density increases.

2.2 Estimated Arctic Shipping Costs for Specific Products

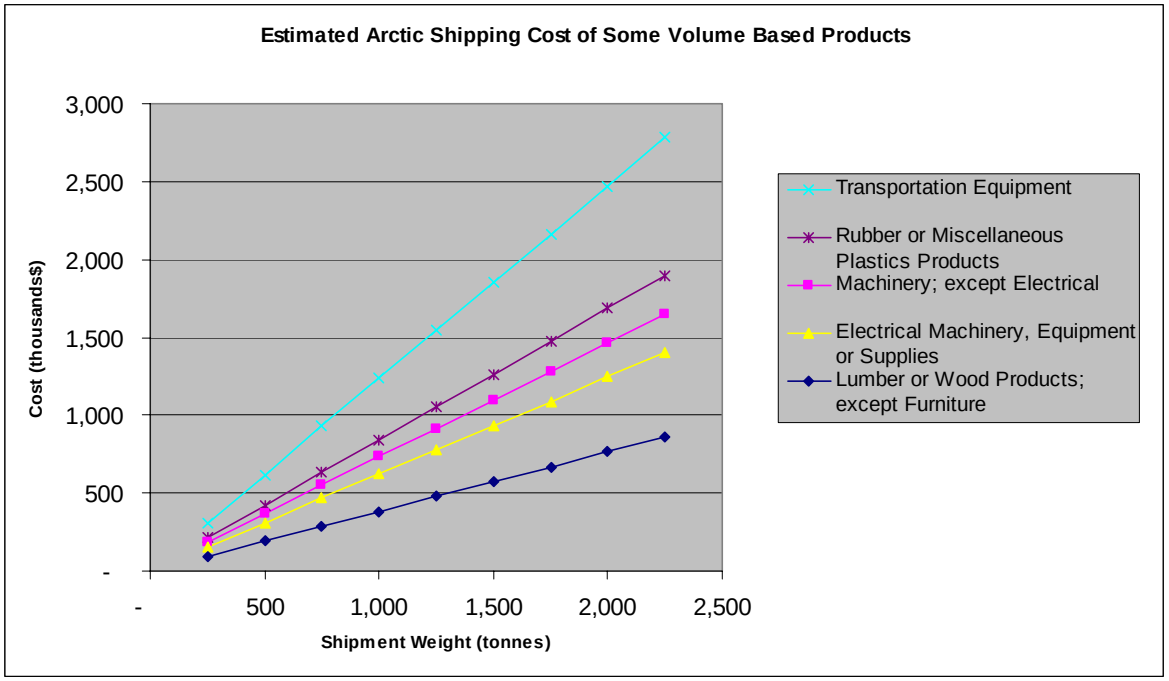
2.2.1 General Cargo

The first factor in determining a shipping rate is to know the commodities density in relationship to the base 1,000 kg/2.5 m^3 density or 0.4 tonnes/m^3. The shipping costs from Montreal to Milne are developed in this section based on typical product densities. Actual rates could be determined if the weight ands shipping-volume were accurately known.

Shipping rates for general cargo to the Arctic are specified by regional block of ports. The base-rate from Montreal to Milne would be the same as the rate from Montreal to Grise Fjord/Pond Inlet, while the rate to Steensby would be the same as to Hall Beach/Igloolik. The 2008 rates cited for the vessels used by BIMC were $382 and $356 per tonne to Grise Fjord/Pond (Milne) and Hall Beach/Igloolik (Steensby) respectively.

The estimated shipping cost from Montreal to Milne for a number of products considered to have densities below 0.4 t/m^3 and thus having a volume based shipping rate, are illustrated in *Figure 3*. The fixed volume rate (of $382/2.5$m^3$ = $152.8/$m^3$) results in different costs per tonne depending on the product densities, and the costs are shown as a function of the tonnage shipped.

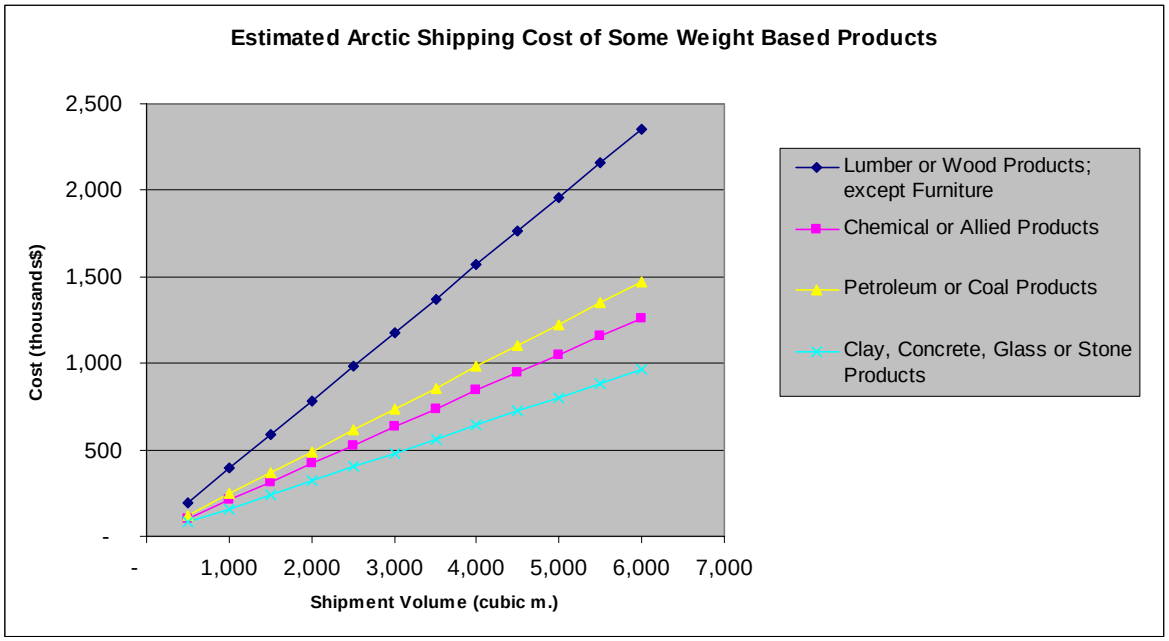
Figure 3, Shipping Costs to Milne for Lower Density Products



The lumber and wood products category is very close to the base-rate density of 1 t/2.5 m^3 and reflects the cost per tonne of all products with a density high enough to be weight based. Most bulk and liquid commodities would fall into this category.

Figure 4 illustrates the shipment cost as a function of the volume shipped for several weight-based products/commodities. Lumber is repeated in this figure as it is close to the base-rate density and establishes the highest cost per m^3.

Figure 4, Shipping Costs to Milne for Higher Density Products



The above rates are fairly straight forward for package products and bulk commodities, but become problematic for items such as heavy construction equipment that have odd shapes. In this case, the volume is based on its maximum outside dimensions of the equipment in its shipping state.

2.2.2 Container Rates

One of the breakthroughs in attaining efficiencies of cargo handling was the move to containerization of cargos. Containers can be efficiently stacked on a vessel and the container volume is often the basis of the container shipping rate. A standard twenty ft. container (8 ft. wide X 8.5 ft. high X 20 ft. long) is usually the reference and referred to as a TEU (20 ft equivalent unit). The external volume of 1,360 ft^3 or 38.5 m^3 in a TEU is the basis of the container rate. Thus, for a basic rate of \$100/2.5-m^3, the container rate would be \$100 / 2.5 X 38.5 = \$1,540 per TEU. The tonnage and container rates for Milne and Steensby are summarized in Table 1.

The internal capacity of a 20 ft. container is 33.2 m^3 and its payload weight limit is 21.7 tonnes. The internal capacity of a 40 ft. container is 65 m^3 and its payload weight limit is 26.75 tonnes.

Table 1, Tonnage-based and Container Rates to Steensby and Milne

Rates from Montreal to:	per rate-tonne*	per TEU
Steensby	$356	$5,476
Milne	$382	$5,885

* Rate-tonne is maximum of (per-tonne or per-2.5 m^3)

2.3 Vetting the BIMC-provided Rates

BIMC provided the shipping cost information summarized in Table 2 without explanation. In each case the costs are the total of all shipments included in the named vessel, and do not necessarily represent the actual density of any of the products shipped. Nonetheless, the costs and quantities should be in the ballpark of the shipping rates.

Table 2, BIMC Data on Shipping Costs

Year	Ship	Weight	Volume	Cost	Trip
2008	Avataq	3,517	9,677	1,428,623	to Milne
	Qamutik	2,090	7,673	1,025,353	to Steensby
	Avataq	484	1,350	121,297	Return Milne-VF
2007	Avataq	3,218	5,532	2,071,177	To Milne
	Avataq	2,732	2,785	1,679,500	To Milne
	Umiavut	1,316	3,849	541,745	partial trip

Table 3 compares the derived rate of the reported shipments for the costs, weights and volumes reported by the company with the published rates on the basis of uniform density of product for the complete shipment. The costs for 2008 are in line with the tonnage and container TEU rates; however, the costs in 2007 are significantly higher.

Table 3, Cost Reported as a Percent of Estimated Rates

Year	Ship	Trip	Per/TEU	Per/Rate-tonne
2008	Avataq	To Milne	97%	97%
	Qamutik	to Steensby	94%	94%
	Avataq	Return Milne-VF	98%	98%
2007	Avataq	To Milne	245%	168%
	Avataq	To Milne	395%	161%
	Umiavut	partial trip	N.A.	N.A.

It is possible that the 2007 costs are higher because the commodities shipped in 2007 had significant premiums for dangerous goods or high insurance premiums. A 20% premium for normal dangerous goods is cited and there would be packaging costs to unitize the barrels of fuel and chemicals that might have been shipped. Reinforcing and strapping of drums on shipper's hardwood pallet has a preparation rate of $ 42 per m^3. Crating of dangerous goods has a preparation rate of $ 184 per m^3. Explosives are only accepted for shipment on a 'negotiated' price basis. While the quantity of explosives on site is small, its

shipment could have involved a significant price premium. It is possible the 67% increment over normal tonnage rates were derived form a combination of Dangerous Goods premium and packaging costs.

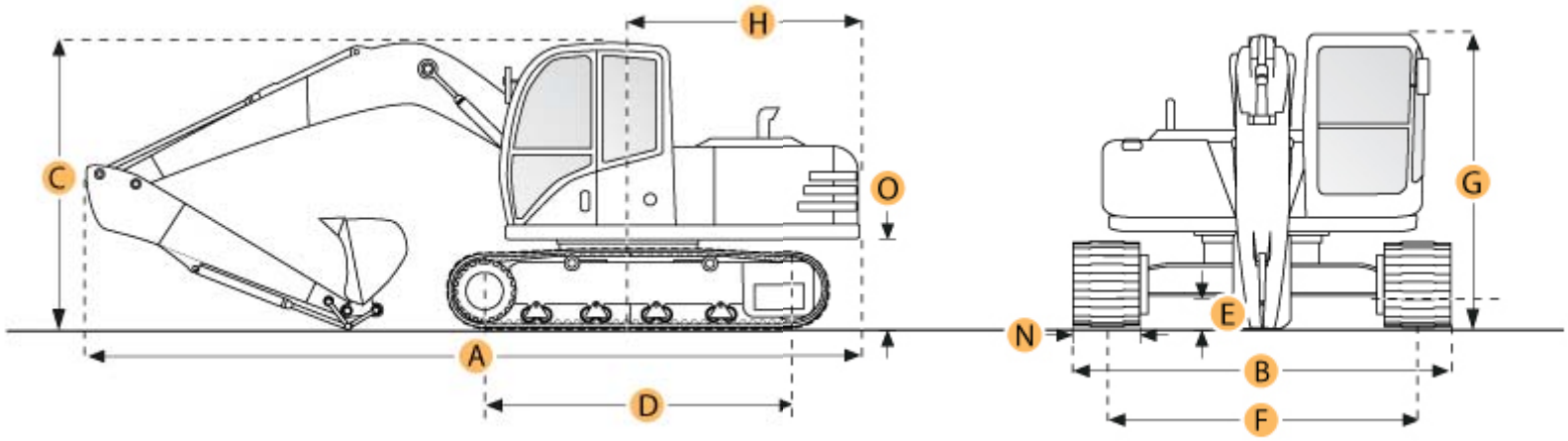
Another factor is that heavy construction equipment might have been priced on the basis of the number of container spaces that were displaced (i.e. the opportunity cost) rather than on the basic cube involved. Lighter vehicles can be stacked on top of other containers and would normally go at the base-rate. However, heavy equipment would have to be on deck and would potentially displace a stack of containers stacked three high. If the equipment exceeded the length and width of a container, then potentially 2 or 3 stacks of 3 could be displaced by one machine. The 16 tonne Cat 315 excavator shown in Figure 5 has a shipping cube of 63 m^3 but could displace 6 or 9 containers with a total cube of 154 m^3 or 230 m^3. Thus the container-opportunity cost based rate would be 154/63 = 2.4 to 230/63 = 3.7 times higher than the basic dimensional rate. Thus, a few pieces of large equipment would shift the average.

A significant quantity of fuel was reported sealifted to site in 2007. Baffinland's November, 2007 application to the NWB indicated the following fuel shipments took place in 2007[1]:

- 8 million litres heating fuel (bulk)
- 1,320 drums (264,000 l) of p50
- 4,720 drums (947920 l) + 250,000 l bulk Jet-A
- 41 drums (8200 l) gasoline

In addition, 1,000 tonnes drilling salt was reported sealifted to site.

[1] Baffinland Iron Mines Corporation, Application for amendment to the Water License issued by Nunavut Water Board, November 13, 2007, NWB Item No. 071203-07CA070-NWB.



Operating Weight	36,160 lb	16,402 kg
A. Shipping Length of Unit	27.8 ft in	8,470 mm
B. Width to Outside of Tracks	8.5 ft in	2,590 mm
C. Shipping Height of Unit	9.4 ft in	2,880 mm

Figure 5, Shipping Specifications Caterpillar 315C Hydraulic Excavator
Source: RitchieSpecs

3 Estimated Shipping Costs Associated with Reclamation

While cost rates for different types of materials and equipment can be estimated with some accuracy, the costs of reclamation can only be roughly estimated since the quantities required are not accurately known. The quantities have been derived from the information provided by BIMC and the level of activity estimated for BIMC operations.

There are two components to the shipping costs associated with reclamation:

1. bringing in equipment and supplies to perform the reclamation and,
2. removing both the existing equipment and supplies on site and the equipment and remaining supplies brought in for the reclamation.

In addition to the shipping costs, there would be a need for a dock facility at site to moor ships and transfer goods. Each cost component is discussed in the following subsections.

3.1 Bringing Equipment and Supplies to Site

3.1.1 Volume of Inbound Shipments

BIMC reported that about 13,000 tonnes were shipped by general cargo vessel to Milne and Steensby during 2007 and 2008. The materials shipped to site were enough to set up 6 camps, housing on average a total of 200 people. Shipments of new materials/supplies can be expected to continue during construction of the railways and development of the mine site. The types of equipment, camps, fuel and materials required for reclamation work would be very similar to the construction start up phase, but on a smaller scale. Our estimate of shipping costs to site is based on a scale of effort that is:

- one-third the general cargo that BIMC sealifted in over 2007-2008 for start up, and
- one-sixth the bulk fuel that BIMC sealifted in 2007 for heating.

No drilling salt is assumed to be required for reclamation. The resulting volumes to be shipped in to perform the reclamation are summarized in Table 4:

Table 4, Inbound Equipment and Supplies to Perform Reclamation

Cargo Description	Site	BIMC Tonnes	Reclamation inbound supplies (tonnes)
General Cargo (including barrel-fuel)	Steensby	2,091	696
	Milne	10,785	3,591
Bulk fuel	Milne	6,923	1,154
Bulk salt	Milne	1,000	0
Total		20,798	5,441

3.1.2 Cost of Inbound Shipments

The cost rates are estimated to be the same as those reported by BIMC, escalated by 3.5% for one-year cost escalation. If the reclamation is required at a longer lapsed time, the rates should be escalated to reflect any rate changes introduced by the carriers.

The amount of fuel required is not enough to warrant a bulk vessel delivery and is assumed to be brought in either drums or tank containers. Oil drums are used for smaller quantities of fuel because of the low tare weight and low container cost. The oil has a DG shipping premium of 20% and must be palletized and secured at a cost of $\$42/m^3$. The estimated cost of shipping fuel by palletized drums to Milne involves the cost elements shown in Table 5.

Table 5, Estimated cost of shipping barrels of fuel to Milne

Cost component	**Cost ($/product tonne)**
Packaging costs to palletize the drums for handling:	$98
Shipping cost (20% DG premium over tonnage rate):	$458
Subtotal (shipping cost to site)	$556
Removal of drums from site (crushed drums returned)	$26
Total costs of oil shipment via drums	$582

Tank containers can hold larger quantities of fuel, have lower handling costs (they are shipped at the container rate) but have a higher tare weight and higher container cost. A 20 ft container tank holds about 25,000 litres or about 23.6 tonnes of fuel. A budgetary lease rate is US$5,000/yr, whereas the demurrage rate of a non-leased tank container is US$100/day. It is assumed that the tank container would be required for more than the 50 day breakeven time (the general cargo vessel has a 60 day full-cycle schedule from and back to Montreal).

The estimated cost of shipping fuel by tank container to Milne involves the cost elements shown in Table 6. As indicated, the tank containers are a lower cost means of transporting fuel to site, but would become more expensive if lease periods in excess of one-year are required. The cost estimate also assumes that a normal container rate would apply. If a tonnage rate is used, the higher tare weight of the tank containers would further increase its cost by about $225.

Table 6, Estimated cost of shipping tank containers of fuel to Milne

Cost component	**Cost ($/product tonne)**
Shipping cost (20% DG premium over container rate):	$300
Cost of tank container*	$265
Cost of returning empty container (@645/container)	$27
Total costs of fuel shipment via containers	$592

Thus, we assume that the fuel would be shipped in pallets of barrels at a premium rate of $582/382 = 1.52 times the normal tonnage rate. The resulting estimated cost of inbound

equipment/supplies and fuel is shown in Table 7. The rate-tonnes column is the volume adjusted rate and applies the same average volume/weight ratios involved in the BIMC shipment. Similarly, the rate premium for general cargo is the same rate premium over the volume adjusted rate that was paid for the BIMC shipments. Total estimated cost to sealift reclamation equipment and supplies is seen to be is about $3 million.

Table 7, Estimated Cost of Shipping Inbound Equipment and Supplies for Reclamation Work

Cargo Description	Site	Reclamation inbound supplies (tonnes)	Rate-tonnes	Average Rate Premium	Cost*
General Cargo	Steensby	696	1,022	0	$376,192
	Milne	3,591	3,784	35%	$2,018,466
Fuel**	Milne	1,154	1,154	53%	$695,765
Total		5,441			$3,090,423

* The tonnage rates applied are the 2008 rates, escalated by 3.5%.

** The portion of bulk fuel brought in by BIMC that is required for reclamation is brought in by general cargo vessel in barrels.

3.2 Removing Equipment and Supplies from Site

3.2.1 Volume of Outbound Shipments

The equipment and supplies that must be removed form site include those left by BIMC and those brought in to perform the reclamation. The tonnages brought in by BIMC and for reclamation were shown previously in Table 4. We assume that 85 percent of the general cargo brought in involved non-consumables. The other 15 percent was consumables and we assumed that 60 percent of that would be consumed at the time of work stoppage. Similarly, 60% of the bulk fuel and bulk salt that was brought in by BIMC is assumed to have been consumed. A higher proportion (eighty percent) is assumed for the consumables brought in for reclamation. The remaining quantities to be removed from site are shown in Table 8.

Table 8, Estimated Outbound Cargo Tonnage

Cargo Description	Site	BIMC sealift (tonnes)	Reclamation Sealift (tonnes)	Consumption (tonnes)	Total Outbound (tonnes)
General Cargo	Steensby	2,091	696	272	2,515
	Milne	10,785	3,591	1,402	12,975
Bulk fuel	Milne	6,923	1,154	5,077	3,000
Bulk salt	Milne	1,000	0	600	400
Total		20,798	5,441	7,350	18,890

3.2.2 Cost of Outbound Shipments

The general cargo rate for return trip to Montreal is 65% of the north bound rate. The shipping season is constrained to three trips per year between April and November and arrangements are ideally made through the winter to influence the schedule stops that will

be made. If the reclamation work is timed optimally, equipment and supplies could arrive on the first visit and all shore-based work would be conducted before the last visit.

If significant quantities are being shipped, it might be economical to charter a non-scheduled carrier. However, ice-class vessels are not always available for short term charters and charter rates vary with demand. We are unaware of any Canadian registered vessels available for summer-season charter. However, hypothetically, a new 11,000 tonne capacity vessel with Canadian crew could charter out at $35 to $40 thousand/day.

The transit time between Montreal and Milne by scheduled carrier with intermediate stops and circuitous routing is about a month each way. In comparison, a direct route without intermediate stops is about 8 days (4,200 km at 12 knots). If time at each port is 5 days, a two-month charter could make 2 visits and cost about $2,400,000. If 6,500 tonnes is shipped each time, the cost per tonne would be $184. The rate for the scheduled carrier is $250. While the scheduled carrier rates include handling, a chartered vessel would pay/charge for handling separately. The port fees and handling costs are estimated to be:

- Containers: $275 each end for loads and $150 each end for empties (if empty return is required).
- General cargo: $27.50/tonne each end.

Thus, for general cargo, the cost per tonne is very similar. Smaller quantities would have a lower cost by scheduled carrier, while quantities in excess of 6,500 tonnes might have a lower cost by chartered vessel (if one could be found).

The bulk fuel on site would either need to be containerized for shipment by general cargo vessel or shipped out be tanker. The cost per tonne to bring fuel in by tank container was previously estimated in Table 6. While that cost involved an empty return rate for containers, shipping fuel out would involve shipping tank containers in at the full container rate, and the loaded container shipped out on the next scheduled call at the retrograde rate (i.e. 65% of loaded rate). The cost increases to $800/tonne.

Tanker vessels deliver fuel from Montreal to Pond Inlet and it is possible that a return shipment to Montreal could be arranged at a more reasonable rate, particularly if the volume of fuel involved is the estimated 3,000 tonnes in Table 8. A double hulled, ice breaking fuel tanker has a higher capital cost than a general cargo vessel but involved lower cargo handling costs. The carriers make fuel supply visits to Arctic ports under contract rates negotiated with the territorial government. We presume that Nunavut could negotiate a reasonable return rate for the fuel at Milne. We estimate the rate to move fuel back to Montreal in a tanker would be similar to the loaded tonnage rate for dangerous goods shipped to the Arctic by general cargo vessel, which is 1.2 X 1/.65 = 1.85 times the retrograde rate for general cargo.

The general cargo and salt would require packaging and/or transport from the camp sites to the docks. While the vessels are equipped with cranes to transfer containers and hoist-equipped products, stevedoring companies have to be used at unionized ports to operate the cranes. Since Milne and Steensby do not have stevedoring services, either stevedoring

crews must be flown in, or the on-site reclamation crews must do the packaging/loading/unloading. A significant cost increase over the normal rates can be expected. The incremental costs include transporting crews to site, local living costs and a much lower utilization/productivity at site. A ballpark scaling factor would be 400% for the on site packaging and loading activities. Thus, the estimated $27.50/tonne of general cargo would have an incremental cost of three-times that or $82.50/tonne.

The estimated shipping cost of removing everything from site is shown in Table 9.

Table 9, Estimated Cost of Shipping Outbound Equipment and Supplies

Cargo Description	Site	Total Outbound (tonnes)	Equivalent Rate-tonnes	Average Rate Premium	Cost*
General Cargo	Steensby	2,515	3,693	0	$883,403
	Milne	12,975	13,669	35%	$4,739,916
Fuel	Milne	3,000	3,000	85%	$1,426,477
Salt	Milne	400	400	0	$102,818
Total shipping		18,890	20,762		$7,152,614
Arctic cargo handling costs		15,890			$1,310,925
Total Outbound Costs					$8,463,539

* The tonnage rates applied are the 2008 rates, escalated by 3.5%.

3.3 Temporary Dock Facility

A ballpark estimate of the cost of setting up a temporary dock was based on using barges brought on by tug from Montreal. The barges would be left for the season and the tug returned Montreal and then made the return trip to collect them later. The daily rate for a tug and four 60 m long barges was estimated from barging cost models developed for the Mississippi River/Gulf operations. On that basis, the daily cost of a tug was estimated to be:

$11,108 under way, and
$8,348 working at dock, while

the cost of three barges was:

$604/day

The trip to/from Milne at 8 knots would take about 12 days and the tug is assumed to work at site for 5 days to set up the barges into a T-dock. The dismantling trip would involve the same round trip for the tug.

The total estimated cost is summarized in Table 10.

Table 10, Estimated Cost of Temporary Docks at Milne

Item/Activity	Days	Rate	total cost
tug underway	48	$11,108	$533,199
tug at site	10	$8,348	$83,476
barges	140	$604	$84,492
Ballast and steel piles/ structure			$75,000
Total	N.A.	N.A.	$776,167

3.4 Summary of Costs

The total shipping costs associated with the reclamation is estimated to be $12.3 million as summarized in Table 11.

Table 11, Estimated Total Shipping Costs for Reclamation

Item/Activity	Total cost
Inbound Cargo	$3,090,423
Outbound Cargo	$8,463,539
Dock Facilities	$776,167
Total	$12,330,129

3.5 Data Needs to Refine the Cost Estimates

A number of areas of uncertainty were identified in previous discussion (Sections 2.3, 3.1 and 3.2). While the shipping rates for a known quantity can be reasonably estimated, the quantities that will need to be shipped is less certain (for both directions). Some refinement of estimates could be made if BIMC provides additional details on the following:

A) Prior shipping activity

- Quantities, vessels and shipping costs for bulk fuel and drilling salt brought in,
- Explanation of the differences in shipping rates for 2007 versus 2008, and/or
- a mode detailed breakout of the various materials and applicable rates within each vessel trip shown in the previously provided 'tonnes and dollars' table for 2007, 2008.
- Cost details on setting up the temporary dock for general cargo and for iron ore.

B) Site inventory:

- Equipment/materials inventory for all camps, and expected annual additions in 2009 and 2010.
- Identification and quantities of consumables on site at different times of year (April, September, December) including (for example):
    - Fuels and other petroleum products,
    - Chemicals,
    - Batteries,
    - Scrap and waste,
    - Food/supplies.

C) Reclamation Estimate

- Provision of a price quotation from BIMC against the trust if BIMC employees/ contractors perform all the reclamation work.

Unaalik ᐅᓇᓕᒃ

Iqaluit, Nunavut
Phone: 867-979-0040 Fax: 867-979-0132
Email: yfbdispatch@northwestel.net

CHARTER QUOTE

Prepared for:
ARKTISSOULTIONS
Att:Morgan Schauerte

Tel No. 867-446-4129 **Fax:**
Email : schaurte@arktissolutions.com

CHARTER DATE: AUG 13 & AUG 17 2013
QUOTED BY: BILL MCDONALD
QUOTE DATE: JULY 26 / 2013

AIRCRAFT: DHC-6 TUNDRA
TYPE: TWIN OTTER
FLIGHT CREW:
LOGSHEET #:

ROUTING				PAX	DEPART	DISTANCE	FLIGHT TIME	ARRIVE
CYFB	(IQALUIT)	- CYUX	(HALL BEACH)			493	3:05	
CYUX	(HALL BEACH)	- CMR2	(MARY RIVER)			182	1:08	
CMR2	(MARY RIVER)	- CYUX	(HALL BEACH)			182	1:08	
CYUX	(HALL BEACH)	- CYFB	(IQALUIT)			493	3:05	
						1350	8.4 Hrs	

FUEL CHARGES:

3.5 hr. X	400 litres per hr. @	$1.6186	equals	$2,266.04
2.2 hr. X	400 litres per hr. @	$1.8630	equals	$1,639.44
3.5 hr. X	400 litres per hr. @	$1.8630	equals	$2,608.20
hr. X	400 litres per hr. @		equals	
hr. X	400 litres per hr. @		equals	

NOTES:
1. Flight times shown are estimates - invoice will be based on actuals.
2. Any additional third party charges will be added to invoice.
3. Quote valid for 60 days unless otherwise specified at top.
4. This quotation does not constitue an aircraft booking.

HOURLY:	
MILEAGE:	$15,917.00
SITE INSPECTION FEES:	
AIRPORT FEES:	$350.00
NAV CANADA:	$89.00
FUEL:	$6,513.68
STAND BY FEES:	
CREW EXPENSES:	
MISC:	
SUBTOTAL:	$22,869.68
5 %GST:	**$1,143.48**
TOTAL:	**$24,013.16**

APPENDIX E – GENERAL TERMS AND CONDITIONS

This report incorporates and is subject to these "General Conditions"

USE OF REPORT

This report has been prepared for the specific site, design objective, development and purpose described to ARKTIS Solutions Inc. (ARKTIS) by the Client. The factual data, interpretations and recommendations pertain to a specific site, a specific development, and a specific scope of work. It is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation of site conditions, purpose, and development plans, or if the project is not initialed within three months of the date of the report may alter the validity of the report. ARKTIS cannot be responsible for use of this report, or portions thereof, unless ARKTIS is requested to review, and if necessary, revise the report.

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The report is of a summary nature and is not intended to stand alone without the reference to the instructions given to ARKTIS by the Client, communications between ARKTIS and the Client, and to any other reports prepared by ARKTIS for the Client relative to the specific site described in the report. In order to properly understand suggestions, recommendations and opinions expressed in this report, reference must be made to the whole of the report. ARKTIS cannot be responsible for use of portions of the report without reference to the entire report.

Unless otherwise stated, the suggestions, recommendations and opinions given in this report are intended only for the guidance of the Client in the design of the specific project. The extent and detail of investigations, including the number of test holes, necessary to determine all of the relevant conditions which may affect construction costs would normally be greater than has been carried out for design purposes. Contractors bidding on, or undertaking the work, should rely on their own investigations, as well as their own interpretations of the factual data presented in the report, as how subsurface conditions may affect their work, including but not limited to proposed construction techniques, schedule, and safety and equipment capabilities.

Classification and identification of soils, rocks, and geologic units have been based on commonly accepted methods employed in the practice of geotechnical engineering and related disciplines. Classification and identification of the type and condition of these materials or units involves judgment, and boundaries between different soil and rock or geologic types or units may be transitional rather than abrupt. Accordingly, ARKTIS does not warrant or guarantee the exactness of the descriptions.

LIMITATIONS OF LIABILITY

The client, and any other parties using this report with the express written consent of the clients and ARKTIS, acknowledge that conditions affecting the financial liability of the site can vary with time and that the conclusions and recommendations set out in this report are time sensitive.

During the performance of the work and the preparation of this report, ARKTIS may have relied on the information provided by persons other than the client. While ARKTIS endeavors to verify the accuracy of such information when instructed to do so by the client, ARKTIS accepts no responsibility for the accuracy or the reliability of such information which may affect the report.

The client, and any other party using this report with the express written consent of the client and ARKTIS, also acknowledge that the conclusions and recommendations set out in this report are based on limited observations and testing on the subject site and that conditions may vary across the site which, in turn, could affect the conclusions and recommendations made.

The client acknowledges that ARKTIS is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the property, the decisions on which are the sole responsibility of the client.

STANDARD OF CARE

Services performed by ARKTIS for this report have been conducted in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions in the jurisdiction in which the services are provided, subject to the time limits and financial and physical constraints applicable to the services. Engineering judgment has been applied in developing the conclusions and/or recommendations provided in this report. No warranty or guarantee, express or implied, is made concerning the test results, comments, recommendations, or any other portion of this report.

ALTERNATE REPORT FORMAT

Where ARKTIS submits both electronic file and hard copy versions of reports, drawings and other project related documents and deliverables (collectively termed instruments of professional service), the Client agrees that only the signed and sealed hard copy versions shall be considered final and legally binding.

The hard copy versions submitted by ARKTIS shall be the original documents for record and working purposes, and, in the event of a dispute or discrepancies, the hard copy versions shall govern over the electronic versions. Furthermore, the Client agrees and waives all future right of dispute that the original hard copy signed version archived by ARKTIS shall be deemed to be the overall original for the Project.

The Client agrees that both electronic file and hard copy versions of instruments of professional services shall not, under any circumstances, no matter who owns or uses them, be altered by any party except ARKTIS. The Client warrants that instruments of professional services will be used only and exactly as submitted by ARKTIS.