Voisey's Bay Nickel Project
Mine/Concentrator Operations
Business Opportunities Study

Prepared by:

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and
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Prepared for:

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Department of Natural Resources

under the

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GOVERNMENT OF NEWFOUNDLAND AND LABRADOR

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Project History

In September 1993, the Voisey's Bay nickel deposit was discovered on the coast of Labrador, 350 km north of Happy Valley-Goose Bay by Diamond Fields Resources (DFR). In 1996, Inco Ltd. acquired the rights to the Voisey's Bay property from DFR and formed the Voisey's Bay Nickel Company as a wholly-owned subsidiary responsible for the development of the Voisey's Bay project. Negotiations between Inco and the Government of Newfoundland and Labrador to develop the project concluded in June 2002. Both parties agreed on a $2.9 billion project to develop the Voisey's Bay deposit, with processing facilities in the province.

The Resource Base

The Voisey's Bay mineral deposit, containing nickel (Ni), copper (Cu) and cobalt (Co), is contained in four main deposits:

1. Ovoid and related deposits (Mineral Reserve)
2. Eastern Deeps (Mineral Resource)
3. Reid Brook (Mineral Resource)
4. Discovery Hill (Mineral Resource)

The proven reserves are contained in the open pit Ovoid and related deposits, which have a total of 32 million tonnes. The remaining deposits, including the Eastern Deeps are located at much greater depths and will have to be mined using underground methods. The total mineral resources identified in these deposits is 54 million tonnes of indicated resources and 16 million tonnes of inferred mineral resources, giving a total resource potential of approximately 100 million tonnes.

Project Development Plan

The Voisey's Bay project will be developed in phases. During the first phase, an open pit mine with a daily ore output of 6,000 to 7,200 tonnes will be operated. The expected life of the open pit mine is 14 years. The associated concentrator plant will commence operations at a rate of 6,000 tonnes per day (t/d) and will be upgraded to 7,200 t/d in the second half of the open pit mine life as the ore grade decreases. Contained nickel production is expected to range between 51,000 and 66,000 tonnes/year (t/y) and contained copper between 32,000 and 45,000 t/y.

2) Physical Facilities

Concentrator/Mineral Processing Facilities

The primary function of the mineral processing facilities is to separate rock from the recoverable metals (nickel, copper and cobalt).

Port Facilities and Services
The port facility will be constructed at Edward's Cove, on the southeast shore of Anaktalak Bay, approximately 11 km from the processing plant. The facility will be used to load nickel and copper concentrates into deep-sea vessels and to receive cargo and consumables for use on site.

Site Services and Infrastructure
The site services, including the operation of various maintenance, service and utility systems will be required to support the mine-mill site and the port facilities at Anaktalak Bay. These facilities will include the following:

- Roads and Transportation Infrastructure
- Site Services (e.g. accommodations, power, communications)
- Civil Infrastructure (e.g. water and sewer)
- Operations Support

Shipping
Nickel and copper concentrates will be transferred from the plant site to the port concentrate storage building by side-dump trucks. It will then be transferred from this building and loaded onto purpose-built ships by means of a shiploading conveyor system. From there, the concentrate will be shipped for further processing. Under the terms of the IEBA, the shipping contractor will be required to have a base of operations in Newfoundland and Labrador.

For the first five years of operations, concentrate will be shipped from Voisey's Bay via the St. Lawrence River to Ontario and Manitoba for processing. During this time, equipment and supplies will be transported to site in containers on the concentrate ship through a marshalling port on the St. Lawrence River. Businesses will be required to supply their products FOB that port, which will be identified by VBNC at a later date. Following the first five years of operation, the concentrate will be shipped to Argentia and it is anticipated the containers will be backhauled through that port. Therefore, in the opinion of the Study Team, the departure port for containers is an important consideration for suppliers.

Throughout the project, air transportation will be used for selected items such as perishables, personal belongings, and sensitive electronic equipment.

Transportation and Logistics
On-site material handling operations will be required to ensure the efficient flow of people, materials and equipment. As a result, transportation logistics management will be required throughout the course of the operations phase. The transportation and logistics services will require management of the following movements:

- Diesel fuel oil
- Containers and other cargo
- Air transport of personnel and essential supplies
- Fresh food, perishables and emergency supplies

3) Voisey's Bay Nickel Project Procurement Framework

There are several major agreements governing the Voisey's Bay project. These include the following:

- Voisey's Bay Development Agreement
- Industrial and Employment Benefits Agreement (IEBA)
- Impacts and Benefits Agreements (IBA) (one each with Labrador Inuit Association and Innu Nation)

Voisey's Bay Nickel Company has negotiated IBAs with both LIA and Innu Nation. While the specific contents in these agreements is confidential, presentations by VBNC, LIA and Innu Nation at various mining conferences show that the IBAs provide specific business, employment and training opportunities for members of Innu Nation and LIA related to the mine and concentrator component of the project.

The proactive approach by VBNC, LIA and Innu Nation has resulted in some 70%, or $480 million, in contracts having been awarded to Aboriginal businesses during the construction phase of the project as of July 1,2004.

Procurement and Contracting Philosophy

VBNC's contracting philosophy is based on adhering to the commitments made in the IEBA with the Government of Newfoundland and Labrador and IBAs with Labrador Inuit Association and Innu Nation. These agreements contain commitment to full and fair opportunity and first consideration for qualified Newfoundland and Labrador businesses. VBNC evaluates potential suppliers based on standard commercial evaluations including:

- Knowledge, appreciation and understanding of the work
- Experience, competence and ability to meet technical specifications
- Cost
- Continuity of supply
- Ability to manage, perform, and complete on schedule
- Safety, security and QA programs
- Level, nature and location of provincial benefits
- Ability to work with VBNC

Contracting Options

VBNC has not yet determined what its contracting strategy will be for the operations phase of the project. However, suppliers should be aware of the various purchasing procedures used in the mining industry, including electronic or e-procurement.

Other Considerations for Newfoundland and Labrador Suppliers

There are a number of salient issues which should be understood by all potential Newfoundland and Labrador suppliers to the Voisey's Bay project, including:

- IBA commitments, which provide first consideration to LIA and Innu Nation businesses

- The site is remote and has particular ramifications for suppliers of both goods and/or services.
- Sudbury and Voisey's Bay are comparable in that they are nickel projects and that Inco is involved. Beyond that, there are few similarities between the two and suppliers are cautioned not to focus too much on how the Sudbury operations work.
- There is a need for specialized products and services that may not be currently available in the Newfoundland and Labrador market.
- Backhaul shipping to the site and how this impacts on where supplies will be loaded onto the ships.

4) Opportunities

Specific business opportunities for supplying goods and services to the project are in the following areas:

Mining Opportunities

The major cost items for the mining operations are labour, fuel, tires, explosives and drilling supplies. Total annual mining costs will vary depending on the stage of the mine plan, however, it is estimated that the mining costs will average approximately $10-15 million per year.

Concentrator Opportunities

It is expected that the annual operating cost for the concentrator is in the $25-30 million range. The main cost items for the concentrator operations include labour, reagents (chemicals), steel, electrical power and maintenance materials.

General and Administrative

General and administrative costs represent the highest level of costs in the operation of the mine and mill at approximately $30 million per year. In general, G&A costs are those not directly related to the core mining and milling activities; rather, they include costs related to support services such as camp and catering and operation of the power plant, among others.

Owner's Costs

Owner's costs typically include costs such as insurance, the operation of offices in Labrador and on the Island of Newfoundland, business travel, environmental monitoring and compliance and other similar costs. Total owner's costs are expected to average $4-5 million annually.

Transportation

Transportation costs include the costs related to shipping the concentrate for further processing, and moving personnel and supplies to site. Opportunities may be available for the complete supply of transportation services. For example, the haulage of concentrate from the mill to the port may be a contracted opportunity. The shipment of goods and employees to the site may be handled by one or more airline contractors. Total shipping/transportation costs are estimated to be $20 million annually.

Sustaining Capital
Sustaining capital is a necessary ongoing expenditure for upgrades and improvements that will provide opportunities for Newfoundland and Labrador businesses. The annual sustaining capital can be expected to be in the $7 to 14 million range (based on a $700 million capital cost).

Operations and Maintenance Opportunities
After a specified number of operating hours, process equipment and components will be removed and restored to original specification and then put back in operation. This will be required for items such as conveyors, pumps, etc.

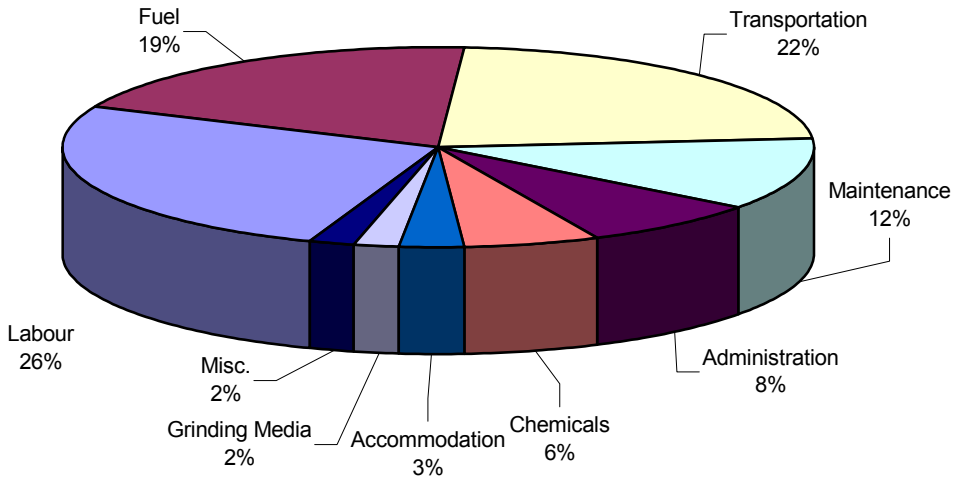
Contracted Out Opportunities
VBNC has indicated that it may contract out certain support activities, which are non-core to the operation. The following is a list of possible opportunities:

- Camp and catering
- Haulage operations
- Power supply and distribution
- Port and airstrip operations
- Freight handling and logistics
- Maintenance and repair of shipping containers
- Security

Consumables
The operation of the mine/concentrator will require many consumables ranging from steel, chemicals, janitorial supplies, office supplies and many others.

It is anticipated that the Voisey's Bay mine/concentrator operations will have an annual expenditure of approximately $90 to $100 million, of which, it is estimated that $40 million will be spent on direct labour and the remaining $50-60 million will be for non-labour expenditures. A proportional breakdown of the expected annual expenditures for the Voisey's Bay Mine/Concentrator operations is illustrated with the following chart:

Voisey's Bay Mine and Concentrator
Breakdown of Annual Spend



5) Conclusions

The Voisey's Bay project will require a wide variety of goods and services over the life of the project. In order for the Newfoundland and Labrador business community to position itself to take advantage of these opportunities, the following factors should be considered:

- The implications of the Impacts and Benefits Agreements (IBAs) with Labrador Inuit Association and Innu Nation
- The departure point for supplies and materials being sent to site, along with other transportation/shipping considerations
- Unique commercial evaluation criteria (e.g. price, quality, delivery, level and nature of Provincial benefits, etc.)
- The implications of procurement trends such as e-procurement
- The unique challenges presented by the remoteness of the site
- The relative size of the project as it relates to the volume of goods and services required. For example, the IOC operations in Labrador West move 150,000 tonnes of ore each day compared to a production rate of 6,000 tonnes per day planned for Voisey's Bay.

The pursuit of the opportunities identified in this study by Newfoundland and Labrador firms requires the following steps:

- Register with VBNC's supplier database
- Review the company's website and become familiar with the operational requirements of a Mine/Concentrator operation in a remote location
- Review this report and other similar reports
- Contact VBNC's operating team
- Understand the company's IBA commitments and recognize that they take priority

1.0 Introduction

This study has been prepared by Davis Engineering and Associates Ltd. and Strategic Concepts, Inc. for the Newfoundland and Labrador Department of Natural Resources. The study was conducted following a call for proposals to research and report on the operational requirements and the opportunities available to Newfoundland and Labrador businesses to supply goods and services required for the 6,000 tonnes per day (t/d) mine and concentrator component of the Voisey's Bay nickel project.

This project was overseen by a Federal-Provincial Steering Committee consisting of individuals from the Atlantic Canada Opportunities Agency and the Newfoundland and Labrador Department of Natural Resources. Funding for this study was provided under the Canada/Newfoundland Comprehensive Economic Development Agreement.

1.1 Study Objectives

The primary objective of the study is to provide timely supplier information that will enhance the ability of Newfoundland and Labrador businesses to participate in the Voisey's Bay open pit mine and concentrator operations phase of the project. In doing so, this objective was supported by a number of secondary objectives:

- to profile the mining industry supply and service industry
- to explain the framework under which the Voisey's Bay project operates
- to identify potential procurement and contracting philosophies
- to identify the goods and services requirements of the operations phase of the Mine/Concentrator component of the Voisey's Bay project.

1.2 Methodology

Working with the Steering Committee, the Study Team developed and finalized three major research activities including: a document review, personal interviews and a top-down engineering analysis. An overview of each follows.

Review Existing Documentation provided by VBNC and the Steering Committee
This methodological component was the primary source of information for this study. Included in this component was a review of the numerous engineering studies and other documents which describe the operational requirements of the Voisey's Bay Mine/Concentrator project, including:

- Voisey's Bay Project Technical Report (pursuant to National Instrument 43-101 of the Canadian Securities Administrators)
- Voisey's Bay Environmental Impact Statement

- VBNC website (www.vbnc.com)
- Industrial and Employment Benefits Agreement between VBNC and the Government of Newfoundland and Labrador

These sources were supplemented with a literature search for general mining and mineral industry supply and service requirements, including current trends in procurement, and an overview of industry size and structure.

These sources of information included:

- Natural Resources Canada, Canadian Suppliers of Mining Goods and Services, 1999
- Natural Resources Canada, Canadian Mining Yearbook, 2002
- Canadian Association of Mining Equipment and Services for Export (CAMESE), Supplier Directory
- Atlantic Canada Opportunities Agency, Newfoundland and Labrador Chamber of Mineral Resources and the Government of Newfoundland and Labrador, E-Procurement and Supplier Development in the Mining Industry, April 2002
- Canadian Institute of Resource Law, A Guide to Impact and Benefits Agreements
- Quadrem - www.Quadrem.com
- InfoMine - www.infomine.com
- Mining Association of Canada - www.mining.ca
- Department of Natural Resources, Government of Newfoundland and Labrador. "Analysis of the Supply and Service Capabilities as they Relate to the Voisey's Bay Vendor Database", July 2003

Personal Interviews

Personal interviews and ongoing dialogue with VBNC and Steering Committee officials from the Department of Natural Resources and Atlantic Canada Opportunities Agency were a critical component of the study methodology. These individuals provided additional information and clarified and confirmed information contained in the project documents.

In addition, the Study Team interviewed a representative of Société Minière Raglan du Québec Ltée to understand the logistical considerations involved with the supply and servicing of the remote Raglan nickel project operated by Falconbridge in Northern Quebec.

Top-Down Engineering Analysis

A top-down engineering analysis was undertaken, involving a review of the actual equipment that has been ordered or purchased that will be used during the operations of the mine and mill. A key member of the Study Team is a former maintenance superintendent with Inco's Ontario Division. His experience provided insight into the maintenance and servicing requirements of this equipment, which will be one source of business opportunities. The other area of opportunity is in the supply of consumables, which was analyzed based on the Study Team's knowledge of the industry and through discussions with Voisey's Bay Nickel Company (VBNC) officials.

1.3 Study Limitations

The study is limited by the information made available to the Study Team. While this information was made available both from VBNC and from third party sources, certain commercially confidential project-specific information, such as the detailed project plans contained in the bankable feasibility study, could not be incorporated into the final report.

The other major limitation is the confidentiality of the Impacts and Benefits Agreements signed between VBNC and Labrador's Inuit Association and Innu Nation. The Study Team was unable to review any information contained therein, particularly any information related to procurement and supplier issues. Finally, the study is limited in that the specific operational phase contracting strategy has not been finalized by VBNC. This is expected to occur before the end of 2004.

2.0 Project Background

This section of the report provides information on the overall Voisey's Bay mine and concentrator project. It contains an overview of the project history, its resource estimates, the development plan and a broad project description (broken down into key operational components). See Appendix A for additional information on the nickel industry in Canada, including the supply industry and procurement trends.

2.1. Project History

In September 1993, the Voisey's Bay nickel deposit was discovered on the coast of Labrador, 350 km north of Happy Valley-Goose Bay by Diamond Fields Resources (DFR). In 1996, Inco Ltd. acquired the rights to the Voisey's Bay property from DFR and formed the Voisey's Bay Nickel Company as a wholly-owned subsidiary responsible for the development of the Voisey's Bay project.

Negotiations between Inco and the Government of Newfoundland and Labrador to develop the project concluded in June 2002 when both parties reached an agreement on a $2.9 billion project to develop the Voisey's Bay deposit with processing facilities in Newfoundland.

2.2 The Resource Base

The Voisey's Bay mineral deposit, containing nickel (Ni), copper (Cu) and cobalt (Co), is classified into two main types: Mineral Reserves and Mineral Resources[1]. These reserves and resources are contained in four main deposits:

- Ovoid and related deposits (Mineral Reserve)
- Eastern Deeps (Mineral Resource)
- Reid Brook (Mineral Resource)
- Discovery Hill (Mineral Resource)

The proven reserves at this time are contained in the open pit Ovoid and related deposits, which have a total of 32 million tonnes. The reserves contained within the ovoid and related deposits are summarized in Table 1. The remaining deposits, including the Eastern Deeps, are located at much greater depths and would have to be mined using underground methods. The total mineral resources identified in these deposits is 54 million tonnes of indicated resources and 16 million tonnes of inferred mineral resources, giving a total resource potential of approximately 100 million tonnes[2].

[1] A "Mineral Reserve" is the economically mineable part of a Measured or Indicated Mineral Resource demonstrated by at least a Preliminary Feasibility Study.
A "Mineral Resource" is a concentration or occurrence of natural, solid, inorganic or fossilized organic material in or on the Earth's crust in such form and quantity and of such a grade or quality that it has reasonable prospects for economic extraction. The location, quantity, grade, geological characteristics and continuity of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge.

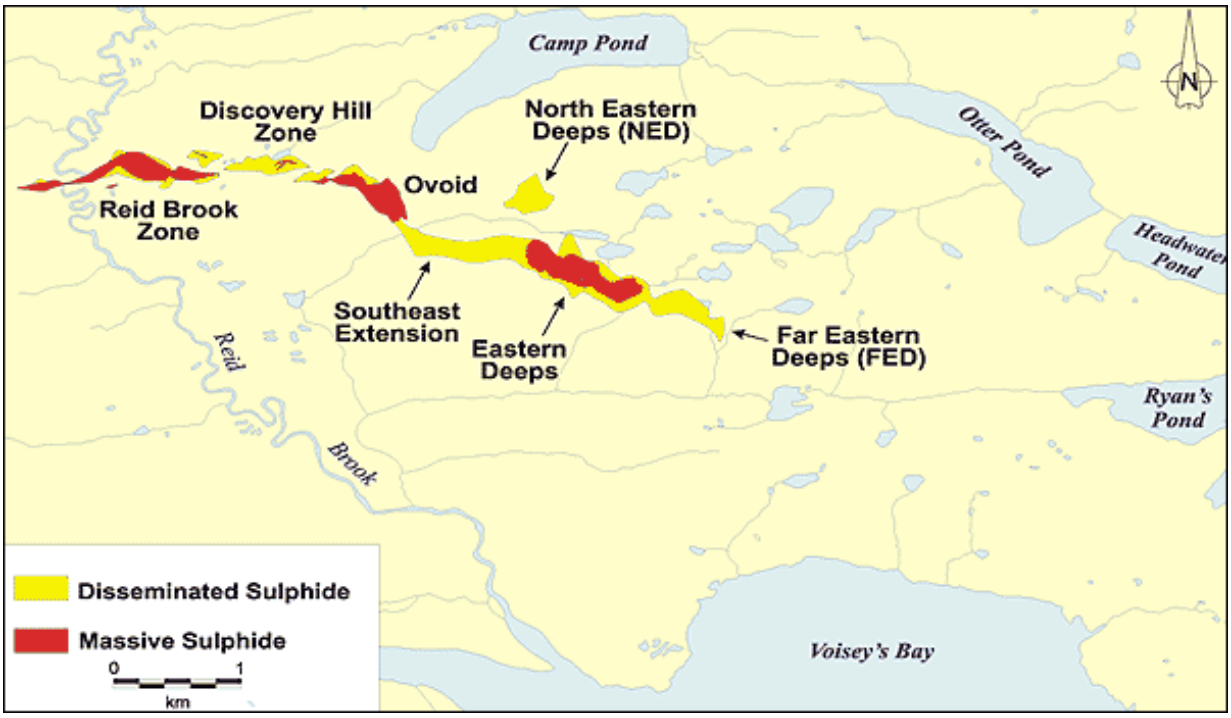
[2] Opportunities resulting from the development of the underground resources and the supply and servicing implications for the Newfoundland and Labrador business community are not included in this analysis as advanced exploration, feasibility and engineering work have not been completed at this point in time.

Table 1
Mineral Reserve Estimates

Zone	Tonnes	Ni %	Cu %	Co %	Category
Ovoid and Mini-Ovoid Massive[1]	21,280,000	3.72	2.17	0.184	Measured
Ovoid and Mini-Ovoid Disseminated[1]	8,030,000	1.00	0.67	0.055	Measured
Sub-Total[1]	29,310,000	2.97	1.76	0.149	Measured
Southeast Extension[2]	2,600,000	0.81	0.47	0.038	Indicated
Total Measured + Indicated	**31,910,000**	**2.79**	**1.65**	**0.140**	

1 All the blocks in the model are reported as mineral resource, i.e. no cut-off applied
2 Assuming selective mining of 10m x 10m x 5m blocks based on a 0.5% Ni cut-off grade
Source: Inco Ltd Technical Report (Pursuant to National Instrument 43-101 of the Canadian Securities Administrators), Aug 31, 2003

Figure 1
Voisey's Bay Project - Mineralized Zones



Source: www.vbnc.com/ReservesandResources.asp "Mineralized Zones at Voisey's Bay"

2.3 Project Development Plan

The Voisey's Bay agreement provides for the development of a $909 million ($CDN) mine and mill/concentrator processing plant at Voisey's Bay, and a $180 million research and development program in hydrometallurgical processing, including a $130 million hydromet demonstration plant at Argentia, Newfoundland. According to the project schedule, the hydromet demonstration plant will be ready for feed at the same time as the mill starts producing nickel and copper concentrates in 2006.[3]

[3] Opportunities related the hydromet demonstration plant are the subject of a separate study.

The project will have a 30-year lifespan, consisting of three phases as follows:

- ***Phase One*** involves the development of an open pit mine and the construction and operation of a concentrator and related infrastructure to produce nickel and copper concentrates at Voisey's Bay. Phase One also involves the construction and operation of a hydromet demonstration plant on the island of Newfoundland to develop hydrometallurgical processes to extract nickel and cobalt from concentrates produced at Voisey's Bay.
- ***Phase Two*** includes the construction of a commercial plant on the island of Newfoundland to process nickel concentrates, based on the innovative technology to be developed in Phase One. The Project Agreement also contains a clause that should the hydrometallurgical processing not be successful, a nickel refinery using conventional proven technology will be constructed.
- ***Phase Three*** involves the development of an underground mine and expansion of the concentrator plant at the Voisey's Bay site to serve the mine operation until exhaustion of the mineral resources for which economic viability has been demonstrated. This phase is conditional on a successful underground exploration program.

During the first phase of the Voisey's Bay project, an open pit mine with a daily ore output of 6,000 to 7,200 tonnes will be operated. The expected life of the open pit mine is 14 years. The associated concentrator plant will commence operations at a rate of 6,000 tonnes per day (t/d) and will be upgraded to 7,200 t/d in the second half of the open pit mine life as the ore grade decreases. Contained nickel production is expected to range between 51,000 and 66,000 tonnes/year (t/y) and contained copper between 32,000 and 45,000 t/y.

As previously stated, the focus of this study is on the operational requirements of the Voisey's Bay Mine/Concentrator component of Phase 1.

2.4 Core Operations - Mine/Concentrator

To differentiate between the strict mining and milling operations and the site support activities involved with operating a remote work site, the project components have been classified as core and support activities. The core activities relate strictly to operations that deal directly with the extraction and processing of the ore.

The facilities related to the core operations at the Voisey's Bay site will be the open pit mine, the concentrator, and tailings disposal areas.

Figures 2 and 3 illustrate the site map for the Voisey's Bay project. The first illustration includes the broader area while the second figure focuses on the mine and concentrator site.

Figure 2
Voisey's Bay Site Map

Source: www.vbnc.com/locationmaps.asp "Voisey's Bay Site Map"

Figure 3
Voisey's Bay Mine/Concentrator Site

Source: www.vbnc.com/InformationSheet.asp "Mine/Concentrator"

2.4.1 Open Pit Mine

The open pit mine development will be undertaken concurrently with the construction of the site infrastructure and concentrator.

The Ovoid deposit will be mined utilizing conventional open pit methods. The deposit will be drilled on 5m benches, with final walls being double (or quadruple) benched. Material will be loaded using wheel loaders into 90-tonne haul trucks which will haul the ore to the primary crusher located at the mill. Waste rock and overburden will be hauled and deposited in dumps located within close proximity to the pit. All waste material identified as potentially acid-generating will be hauled to Headwater Pond for underwater deposition.

Annual ore production is scheduled to ramp up from 1.6 million tonnes in 2006 to the peak rate of 2.6 million tonnes by 2014. Annual waste production is expected to start at 3 million tonnes in 2006 and reach a high of 6.2 million tonnes before declining late in the mine life. The overall strip ratio for the mine is 1.3:1 waste to ore. The waste total includes 6.2 million tonnes of overburden scheduled to be removed during the pre-production period.

The primary source of water draning into the pit will be from surface runoff with little water expected from groundwater inflow. All pit water is expected to be pumped to the mine water surge pond with mine dewatering pumps.

The primary activity in the mining area will initially be the removal of the overburden, recovery of ore from the pit and transportation to the mill. This process will include drilling, blasting, loading and transportation and will require individuals with the following skills:

- Management, with expertise in overseeing mining operations, will be responsible for safety, environment and efficiency of the mining activity.

- Geologists, who will prepare drawings of ore body and keep track of ore grade during the mining process and undertake mine planning.

- Mining Engineers with open pit experience will design the roads and removal process.

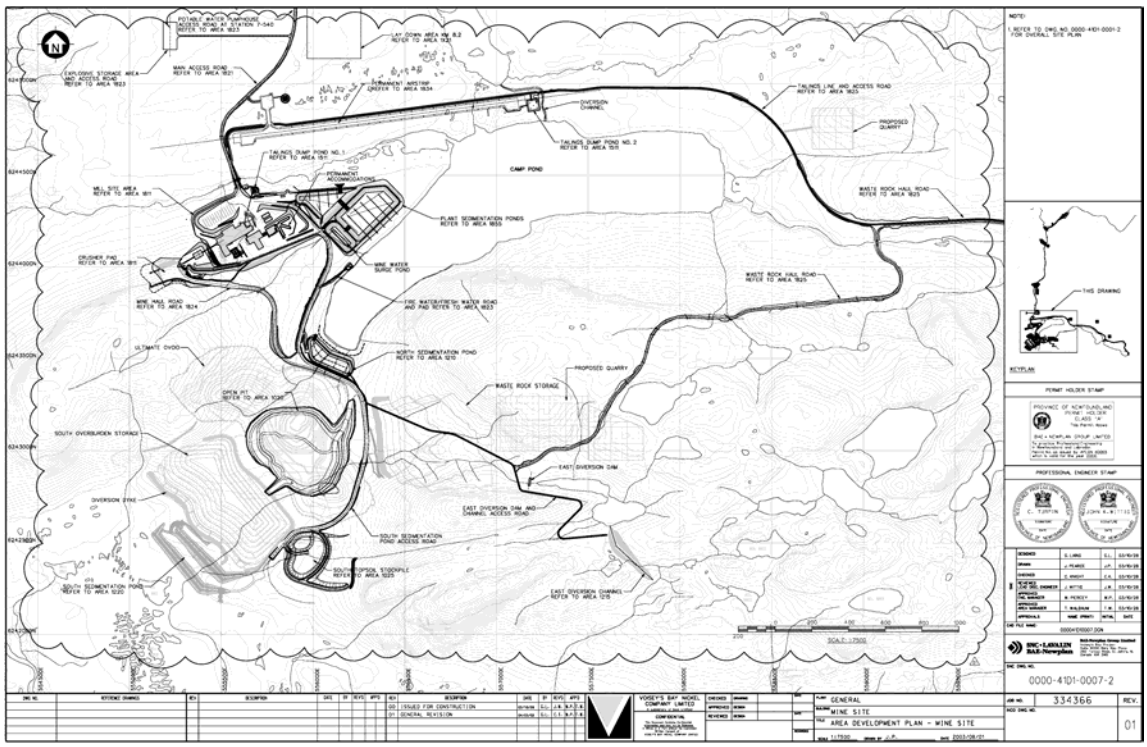
- Supervisors, who will manage the operation on a day-to-day basis assuring the work is being performed according to company standards.

- Equipment operators, who will operate drills, explosive loading equipment, loaders and haulage trucks.

- Equipment maintenance, which will require a crew of heavy equipment mechanics with experience in servicing and maintaining the pit equipment, such as drills, loaders and haulage trucks.

Figure 4 illustrates the layout of the open pit mine site.

Figure 4
Voisey's Bay Site Plan



Source: Voisey's Bay Nickel Company

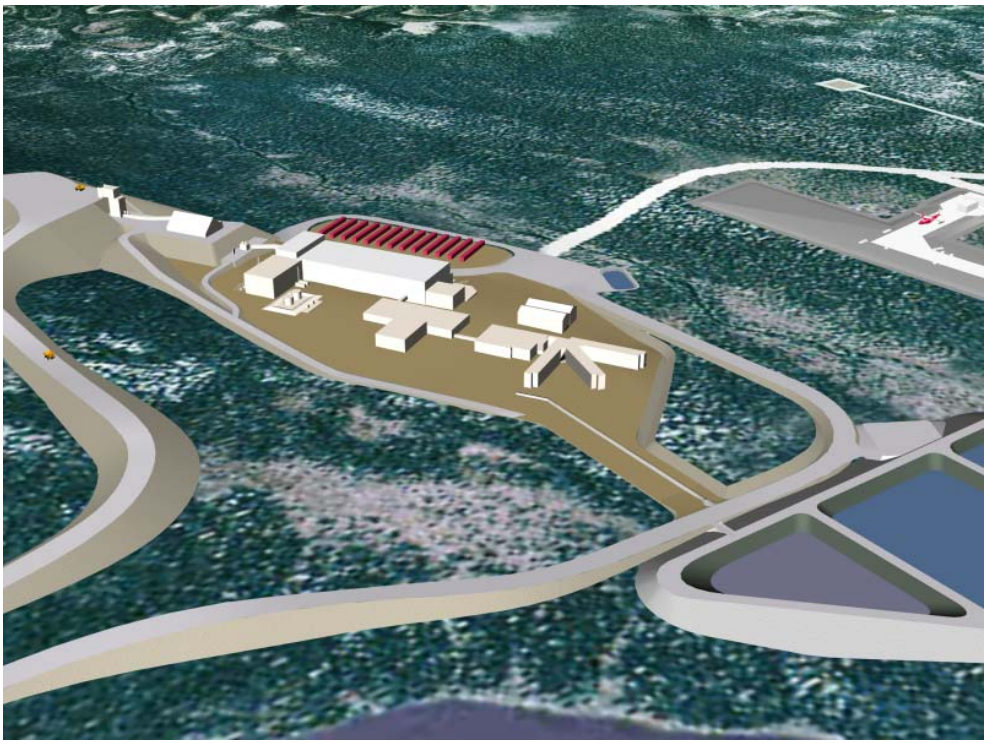
2.4.2 Concentrator/Mineral Processing Facilities

The other core activity involves processing of the ore into concentrate. This will require the following buildings and systems:

- Crushing building
- Coarse ore storage building
- Ore reclaim system
- Concentrator

Figure 5 illustrates the layout of the processing facilities and site services.

Figure 5
Voisey's Bay Plant Site Layout

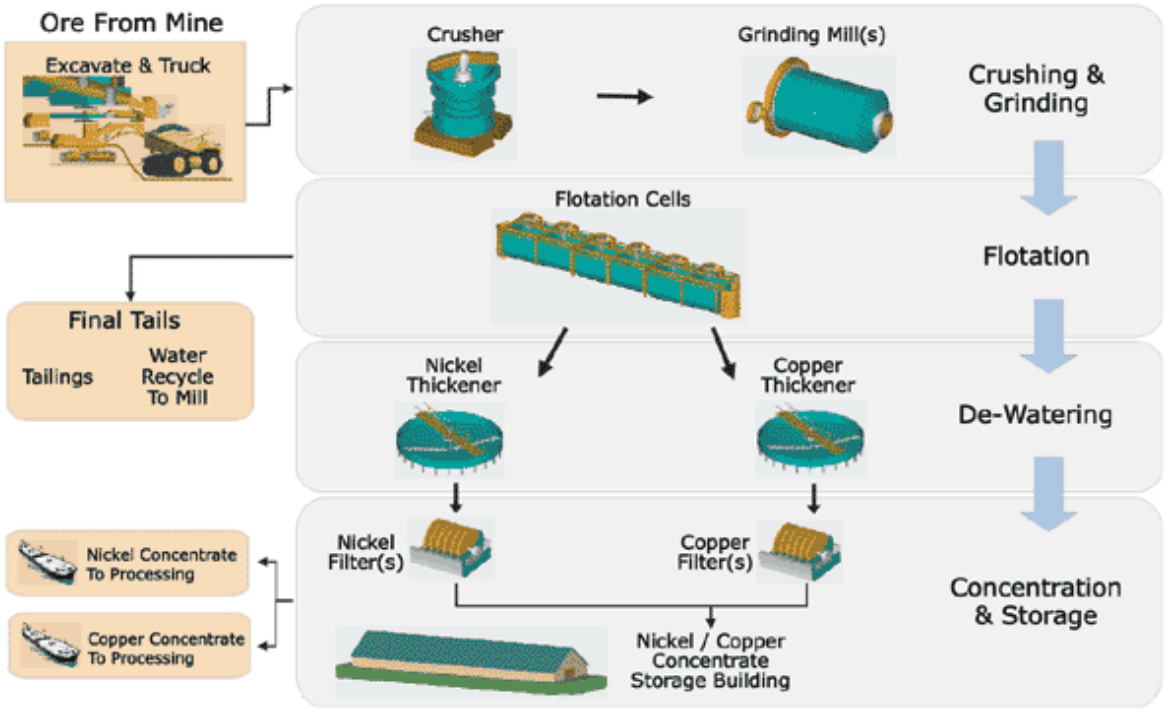


Source: Voisey's Bay Nickel Company

The primary function of the mineral processing facilities is to separate rock from the recoverable metals (Ni, Cu and Co). This process includes crushing, grinding and classifying to get the ore to the desired size for separation into two types of concentrate , a nickel concentrate containing mainly Ni and Co and a copper concentrate containing primarily Cu, and tailings. The concentrate will be dried using press filters to the desired moisture content and trucked to a concentrate holding facility at the port site. Tailings from the mill will flow to a thickener outside the concentrator building prior to being pumped to the Headwater Pond tailings storage facility. A water treatment plant will be housed within the concentrator building. The water will be collected and clarified in a clarifier outside the concentrator building before treatment and release into Anaktalak Bay via pipeline. Laboratories capable of analyzing samples from the mine, concentrator, site water management system and port will be housed in two locations at the site.

A diagram illustrating the work process at Voisey's Bay is provided in Figure 6.

Figure 6
Voisey's Bay Project Mill Flow Chart



Source: www.gov.nl.ca/voiseys/mill_concentrator.htm

The tasks required for this aspect of the processing operations require individuals with the following skills:

- Management, who will oversee the milling operation with responsibilities for safety, environment and efficiency of the mining activity.
- Mill Metallurgists, who will be responsible for assuring the recovery process is optimized.
- Process Technologists, who will monitor the mill process on a daily basis, verify process measurement integrity with a sampling system, and advise operations on changes required to improve efficiency.
- Mill Supervisors, who will manage the operation on a day-to-day basis assuring the work is being performed according to company standards.
- Control Room Operators, who will control the complete operation using a distributed control system (DCS) that starts, stops, adjusts and monitors all equipment from a central control room.
- Mill Process Operators, who work on the floor and perform equipment inspections, clean and remove scrap, marshall supplies, maintain grinding media and make process adjustments not performed by the DCS system. Mill process operators will be trained to use fixed equipment such as overhead cranes and hoists as well as mobile equipment.
- Maintenance Managers, who will oversee the maintenance process for the protection and availability of all plant assets.
- Maintenance Supervisors, who will supervise skilled tradesmen in carrying out the maintenance program

- Maintenance Tradespersons, who will carry out preventive and predictive maintenance; troubleshooting, adjustments, repairs and overhauls as required.

2.4.3 Tailings Facilities/Environmental Services

All tailings generated from the processing of ore will be disposed of in Headwater Pond, approximately 9 km east of the mine/concentrator site. The mill tailings will be thickened to permit the recovery of reclaim water and then pumped to Headwater Pond through a pumping station and an insulated pipeline. The pipeline route will run parallel to the airstrip and access road from the plant site to Headwater Pond. At project inception, the water level in Headwater Pond will be lowered and two dams constructed to increase the overall holding capacity of the pond.

2.5 Support Activities

The preceding section discussed the core activities of the site - mining and milling the ore to concentrate form for shipment for final processing. In support of these primary activities, a variety of support services will be required. Some of these support services are directly mining related, while others are required largely due to the remote nature of the site.

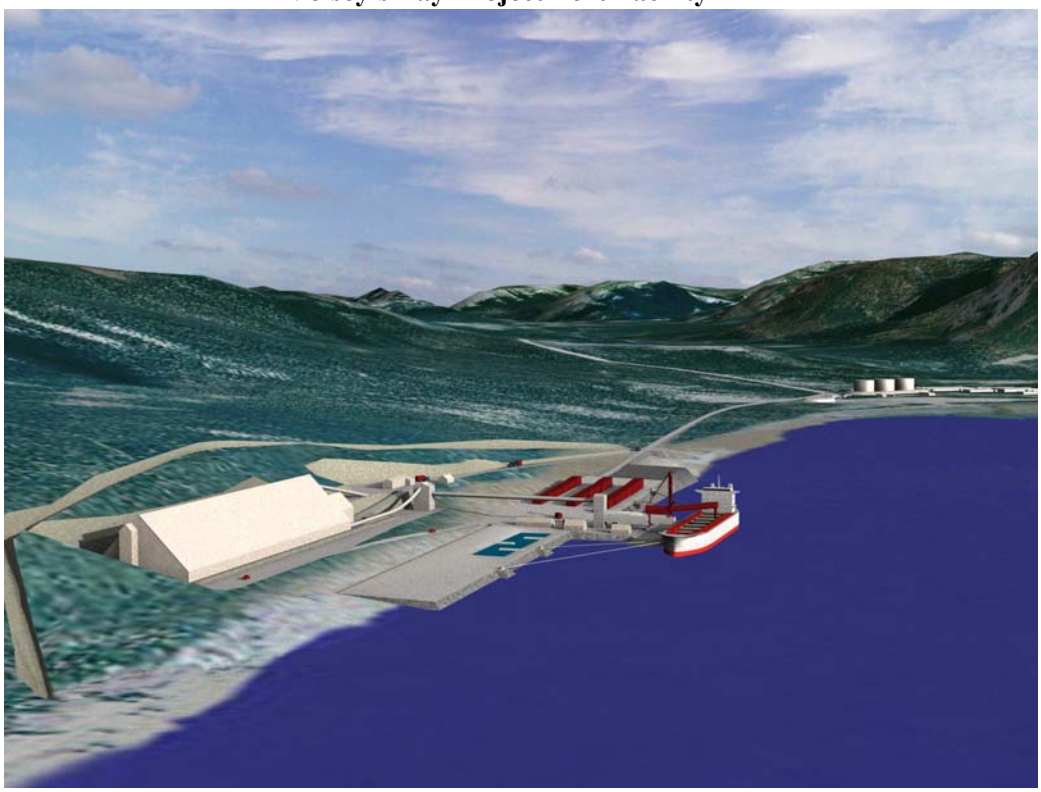
2.5.1 Port Facilities and Services

The port facility will be constructed at Edward's Cove, on the southeast shore of Anaktalak Bay, approximately 11 km from the process plant. The facility will be used to load nickel and copper concentrates into deep-sea vessels and to receive cargo and consumables for use on site. The port site will have the following facilities:

- concentrate receiving station, a tripper conveyor system and a 175,000 t concentrate storage building
- concentrate reclaim conveyor system
- fixed shiploader
- wharf
- container and break-bulk receiving and storage area
- fuel off-loading, storage tank farm and truck-loading facilities
- general site services, including electrical distribution, potable water and fire protection
- stormwater runoff collection system and sedimentation pond
- communication system
- port administration building, yard and laydown area.

Figure 7 depicts the port facility.

Figure 7
Voisey's Bay Project Port Facility



Source: Voisey's Bay Nickel Company

2.5.2 Site Services and Infrastructure

The site services, including the operation of various maintenance, services and utility systems will be required to support the mine-mill site and the port facilities at Anaktalak Bay. These facilities will include the following:

Roads and Transportation Infrastructure

- Port access road, measuring 11 km in length and connecting the port at Anaktalak Bay to the plant site
- Waste rock disposal road, measuring 9 km in length and connecting the mine site to the tailings basin/waste rock disposal area and the process water reclaim barge
- Other shorter access roads (mine, overburden, topsoil and waste rock storage areas, explosives plant and airstrip)
- Gravel-surfaced airstrip, measuring 1.6 km in length

Site Services

- Accommodation complex with approximately 255 single-occupancy bedrooms, dining and recreational facilities and an aboriginal food preparation area
- Service complex, including equipment maintenance and warehousing facilities, male/female mine dry areas and administration offices
- Diesel oil fired power plant to supply electrical power to the site
- Diesel fuel storage facilities
- Communication capability to and from the mine-mill site

Civil Infrastructure

- Potable water supply for the mine-mill facilities
- Fresh/firewater supply from Camp Pond through a pumphouse facility and fire ring water pipeline around the mill site
- Process water supply from the tailings basin
- Treatment and discharge system for site wastewater, including a water treatment plant
- Sewage treatment plant at the mill site

Operations Support

- Explosives plant
- Fleet of mobile equipment to maintain the site roads; remove snow; support the maintenance, concentrator and port operations; and deliver concentrates from the plant site to the concentrate storage area at the port site

2.5.3 Shipping

Nickel and copper concentrates will be transferred from the plant site to the port concentrate storage building by side-dump trucks. It will be transferred from the port concentrate storage building and loaded onto purpose-built ships by means of a shiploading conveyor system. From there, the concentrate will be shipped for further processing. Under the terms of the IEBA, the shipping contractor will be required to have a base of operations in Newfoundland and Labrador. Specifically, Article 10 of the IEBA states that:

> *The Proponent shall require that Suppliers retained to ship Nickel Concentrate and finished nickel, cobalt and copper revert, have a base of operations in the Province. For the purposes of this Section, "base of operations" means the day to day administration of ship management, including technical management, crew management, loading and unloading requirements and procurement services relating thereto.*

For the first five years of operations, concentrate will be shipped from Voisey's Bay via the St. Lawrence River to Ontario and Manitoba for processing. During this time, equipment and supplies will be transported to site via container on the concentrate ship through a marshalling port on the St. Lawrence River. Businesses will be required to supply their products FOB that port, which will be identified by VBNC at a later date. Following the first five years of operation, the concentrate will be shipped to Argentia and it is anticipated the containers will be backhauled through that port. Therefore, in the opinion of the Study Team, the departure port for containers is an important consideration for suppliers.

Throughout the project, air transportation will be used for selected items such as perishables, personal belongings, and sensitive electronic equipment.

Another shipping-related consideration is the company's commitments to Labrador Inuit Association and Innu Nation. These IBA commitments require that shipping to the site be closed for two six-week periods annually in the December-January period and the April-May period. This, however, is not expected to have any adverse affects for the delivery of consumables to the site.

2.5.4 Transportation and Logistics

On-site material handling operations will be required to ensure the efficient flow of people, materials and equipment. As a result, transportation logistics management will be required throughout the course of the operations phase. The transportation and logistics services will require management of the following processes:

- Diesel fuel oil will be discharged from the ships to the port storage tanks, and then transferred by road tanker truck to the process plant storage tanks.

- Containers and other cargo will be unloaded using ship- or shore-based mobile cranes, transferred to port storage by container-handling top-lift or forklift trucks, and transferred between the port and other on-site storage locations by road transport equipment.

- Ship loading and discharge operations will be carried out on a 24-hour basis.

- In addition to marine shipment for freight movement, the project will be supported by air transport of personnel and essential supplies. On average, 460 personnel will be flown to and from the site every month. Additional scheduled or charter flights will be established to serve aboriginal personnel traveling from and to their communities.

- Some emergency supplies and consumables will be delivered to Voisey's Bay from qualified suppliers on chartered air flights.

- Logistics will be handled by a marshalling/freight consolidation contractor who will most likely be located at the originating port where the containers are loaded onto the vessel.

3.0 Voisey's Bay Nickel Project Procurement Framework

In this section, the analysis is focused more directly on procurement and how it relates to the Voisey's Bay project. It begins with an overview of the agreements which are in place with specific emphasis on the supplier development aspects of these agreements. This section also discusses the possible contracting philosophy and contracting options that may be employed as well as a summary of the issues and concerns facing Newfoundland and Labrador businesses.

There are several major agreements governing the Voisey's Bay project. These include the following:

- Voisey's Bay Development Agreement
- Industrial and Employment Benefits Agreement (IEBA)
- Impacts and Benefits Agreements (IBA) (one each with Labrador Inuit Association and Innu Nation)

The latter two of these agreements in particular have implications for how Voisey's Bay Nickel Company will purchase the goods and services required for the mine/concentrator project. An overview of the key parameters of the IEBA and IBAs is provided in the following sections.

3.1 Industrial and Employment Benefits Agreement

The Industrial and Employment Benefits Agreement (IEBA) forms part of VBNC's overall Development Agreement with the Government of Newfoundland and Labrador. In the IEBA, VBNC committed to a number of procurement and supplier development principles and initiatives. Some of the highlights of the IEBA include commitments to:

- full and fair opportunity for provincial suppliers;
- first consideration to participate on a competitive basis for provincial suppliers;
- the timely and ongoing identification of upcoming opportunities and the communication of these opportunities to the provincial supplier community;
- work with government to identify major contracts that have significant long-term potential;
- ensure that VBNC's contractors and sub-contractors adhere to VBNC's stated procurement philosophy and procedures;
- ensuring procurement personnel are familiar with the province's industrial capacity and to locate those personnel in the province;
- use a pre-qualification process;

- undertake bid packaging and specifications in such a way as to not preclude provincial suppliers from bidding;

- not create artificial barriers to entry by specifying non-provincially produced products when equivalent products are available within the province;

- include provincial benefits as part of bid requirements;

- utilize provincial construction, fabrication and assembly infrastructure where competitive; and

- make non-provincial bidders aware of the capabilities resident within the province

Suppliers are encouraged to review the full legal text of the document, which can be found on the Government of Newfoundland and Labrador's website at the following address: www.gov.nl.ca/voiseys/legal.htm.

In addition to the commitments made in the IEBA agreement with the Government of Newfoundland and Labrador, VBNC also made several commitments in the Environmental Impact Statement hearings. During the public hearings, VBNC made commitments to adhere to the Adjacency Principle. This principle commits VBNC to ensuring that business benefits flow to those living closest to the project, first to Innu and Inuit who have recognized land claims in the Voisey's Bay area and to whom IBA commitments will apply, second to other Labrador businesses and finally to businesses located elsewhere in Newfoundland.

3.2 Impacts and Benefits Agreements

Impacts and Benefits Agreements (IBAs) have become standard practice in Canada where a significant project (usually resource-based) is proposed for development on Aboriginal traditional lands. Because these projects, such as the Voisey's Bay project, have social, cultural and environmental impacts on traditional lands and on local communities, companies are required to negotiate and enter into agreements with affected Aboriginal groups to ensure that impacts are properly managed.

IBAs are formal, written agreements between companies and Aboriginal groups that give consent for individual industrial developments, provide economic benefits, create obligations for both the Aboriginal group and the developer, and manage the impacts associated with an industrial development. IBAs vary considerably in their scope and complexity, depending on the scale and nature of the project and the issues identified by the negotiating parties involved. However, most agreements deal with issues such as:

- Environmental protection, including special concerns about wildlife
- Protection and promotion of Aboriginal social and cultural values
- Education, training and employment
- Workplace conditions

- Business opportunities
- Aboriginal access to the project site
- Financial arrangements
- Dispute resolution mechanism

According to Steven A Kennett, in his book "A Guide to Impacts and Benefits Agreements", written for the Canadian Institute of Resource Law, the business opportunity sections of IBAs deal with items including:

- General provisions regarding contracting and business opportunities, including preference and first consideration. They may also include targets for Aboriginal business participation.
- Identification of business opportunities whereby a list of Aboriginal businesses is maintained and made available to the company and its contractors. On the demand side, IBAs may also contain a specific list of goods and services that may be earmarked for Aboriginal businesses.
- General preferences for Aboriginal businesses
- Procedures for securing contract goods and services
- Unbundling of contract requirements into more manageable sized packages that can be provided by the Aboriginal business community
- Monitoring of contracts
- Assistance for local business development
- Research and development
- Right of first refusal on equipment and property
- Economic development

Voisey's Bay Nickel Company has negotiated IBAs with both LIA and Innu Nation. While the specific contents in these agreements is confidential, presentations by VBNC, LIA and Innu Nation at various mining conferences show that the IBA's provide specific business, employment and training opportunities for members of Innu Nation and LIA related to the mine and concentrator component of the project.

VBNC is working closely with LIA and Innu Nation to have Aboriginal businesses taking part, on a competitive and reliable basis, in business opportunities available from the project. This proactive approach by VBNC, LIA and Innu Nation has resulted in contracts worth more than $400 million being awarded to Aboriginal businesses during the construction phase of the project. It is evident from the construction phase experience that Aboriginal businesses have been established to pursue supply and service opportunities presented by the project. It is highly probable that this will continue into the operations phase of the project.

Additionally, VBNC has established, subject to operational requirements and efficiencies, a process for evaluating certain proposals from qualified Labrador Inuit and Labrador Innu businesses prior to seeking competitive bids from other contractors. VBNC will advise bidders that it shall, subject to the bids being otherwise competitive, give consideration to the following factors when awarding contracts:

- First consideration is given to qualified Aboriginal businesses

- The degree of meaningful Labrador Inuit and Labrador Innu participation in the venture
- Labrador Inuit and Labrador Innu participation in the share structure of the Contractor
- The number of Labrador Inuit and Labrador Innu on the board of directors of the Contractor
- The location of the Contractor's offices
- Labrador Inuit and Labrador Innu equity participation in the venture
- Benefits provided to Labrador Inuit and Labrador Innu by way of meaningful direct and indirect employment, training, staff development and business opportunities
- The steps taken by the Contractor to promote gender equality in the Project workforce

There is a database of qualified Labrador Inuit and Labrador Innu businesses which are interested in providing goods and services to the project. This database is made available to pre-qualified contractors.

As with all other provincial businesses, any Labrador Inuit or Labrador Innu business seeking to supply goods and services to the Voisey's Bay project must be competitive as to cost, reliability and quality. It should also be noted that while Inuit and Innu businesses are the subject of specific IBA related provisions, they are also provincial businesses and are guided by the Industrial and Employment Benefits Agreement as discussed in Section 3.1.

3.3 Voisey's Bay Procurement to Date

Procurement for the project during the construction phase is managed by SNC-Lavalin, the EPC contractor for the Voisey's Bay construction project. SNC maintains a database of Newfoundland and Labrador businesses. Vendors can register on VBNC's website (www.vbnc.com).

During the construction phase of the project, Newfoundland and Labrador companies have been awarded numerous contracts and have been pre-qualified to bid on most contract packages. According to a presentation made at the 2004 Voisey's Bay and Beyond Conference, $480 million of the $674 million awarded to that point had been awarded to Aboriginal firms and another $140 million to Newfoundland firms.

3.4 Procurement and Contracting Philosophy

VBNC's contracting philosophy is based on adhering to the commitments made in the IEBA with the Government of Newfoundland and Labrador and IBAs with Labrador Inuit Association and Innu Nation. These agreements contain a commitment to full and fair opportunity and first consideration for qualified Newfoundland and Labrador businesses. VBNC evaluates potential suppliers based on:

- Knowledge, appreciation and understanding of the work
- Experience, competence and ability to meet technical specifications
- Cost
- Continuity of supply

- Ability to manage, perform, and complete on schedule
- Safety, security and QA programs
- Level, nature and location of provincial benefits
- Ability to work with VBNC

To help Newfoundland and Labrador and Aboriginal businesses acquire business opportunities for the construction phase of the project, VBNC has initiated and will maintain a supplier pre-qualification procedure that will ensure that all local companies with required capabilities are identified. This process also helps local businesses to understand the requirements of supplying a major company such as VBNC. The first step in the pre-qualification procedure is for companies to register on the vendor database through the submission of an Expression of Interest (EOI) to VBNC. From there, companies are evaluated and it is determined whether or not they meet the company's pre-qualification requirements. If so, they are included on the pre-qualified supplier list according to the type of goods and/or services provided.

This pre-qualified list will also be used when tenders are being issued. Companies with the requisite skills and experience will be selected from the pre-qualification list and will be sent bid packages directly. Out-of-province suppliers can access this database when looking for provincial suppliers for potential joint ventures. In certain cases pre-qualified companies will be added to a short list before they are chosen for contract work.

3.5 Contracting Options

VBNC has not yet determined what its contracting strategy will be for the operations phase of the project. However, it is likely that their choice of contracting strategy will focus on the following options for contracting, procuring and managing inventory on site.

Contract Types:

- ***Cost-plus pricing*** is a pricing method commonly used by firms. It is used primarily because it is easy to calculate and requires little information. There are several ways of implementing a cost-plus pricing system, however, the common thread in all of them is the calculation of the cost of the product plus an additional amount (mark-up) to represent profit.

- ***Fee for service*** is a method whereby a company would contract out a service area (e.g. equipment maintenance, port operations, accommodations and catering, etc.) and the contractor would hire the persons required, purchase the goods and services required and submit lump-sum cost invoices to VBNC. The alternative is for VBNC to hire people directly for these service areas, however, this can become more costly from an administrative perspective. It is also beneficial in that it separates core activities and allows VBNC to focus on these rather than the support services required to operate the site.

Contracting Methods:

- ***Competitive tenders*** are the standard contracting arrangements whereby goods and services required are specified in bid documents and sent out to pre-qualified bidders. The result is a competitive bidding process which should result in the lowest cost to the project. Despite its appeal of delivering best value for money, there are several potential problems. One potential pitfall is continuity; if the goods or services are required on a regular basis, it becomes inefficient to issue tenders for each order. Another potential problem is the administrative time and cost involved with preparing tender documents and evaluating bids, costs which may negate any savings realized through a competitive process.

- ***Sole source*** contracts are those in which the Owner approaches only one of multiple eligible vendors. The reasons for using sole source contracts vary. One reason may be due to a manufacture's warranty that requires a specific firm to perform maintenance on a particular piece of equipment. Another may be due to contractual obligations. A variation of sole source contracting is **single source**. In this method the Owner approaches the only available/eligible vendor.

Inventory Management Options:

- ***Consignment*** is a method whereby the supplier will maintain an inventory of supplies and only when the supplies are used will an invoice be sent to the purchaser for using the goods. This method is useful for consumables and is beneficial to the buyer because they do not have the inventory carrying costs. For the Voisey's Bay project, this would require VBNC to allocate warehouse space on site to vendors who would supply goods through this method.

- ***Vendor-managed*** is an extension of the consignment method and gives the vendor more control over inventory management. Rather than passively having goods and consumables on site in a warehouse, under this system the vendor would be more active in inventory management, logistics and shipping.

3.6 Other Considerations for Newfoundland and Labrador Suppliers

There are a number of salient issues which should be understood by all potential Newfoundland and Labrador suppliers to the Voisey's Bay project. Each of these issues is discussed in turn:

IBA Commitments

The importance of the Company's IBA commitments on the contracting procedures and the ability of Newfoundland and Labrador firms to successfully win contracts cannot be understated. In the IBAs, there are clear commitments to give first consideration to firms owned by members of Labrador Inuit Association and Innu Nation. The impact of these

commitments is clearly illustrated in the many contracts awarded to date to joint ventures between Aboriginal and non-Aboriginal firms (see Appendix B).

Remote Site

The Voisey's Bay mine is located on a remote site with no existing connections to major populated centres. As such, the Voisey's Bay site will be a fly-in/fly-out site that provides accommodation services to workers who will rotate in/out on 2-week rotations. The unique requirements of a remote location have significant implications for the supply and service opportunities available to 3rd party contractors. Unlike established mining towns such as Labrador City-Wabush, there is no industrial base to provide the supplies and services required.

Sudbury is Not the Perfect Model

A comparison between Inco's Sudbury operation and VBNC in Labrador is only partially valid. The Sudbury operation is supported by industries that are located in close proximity to Inco and that have grown with Inco and Falconbridge over the past one hundred years. Services from these support industries, when required, are minutes away. These support industries evolved over a hundred years to take advantage of opportunities from Inco, Falconbridge, and other similar developments. The market for servicing these industries is therefore larger than that found in Labrador. With the exception of major out-sourced services such as catering and accommodations, it is unlikely that many commercial businesses would be viable with VBNC's Labrador operation as its only customer. Because it is a remote site, it is anticipated that VBNC will have to supply a significantly larger proportion of the regular operational requirements on site, compared to the outsourcing opportunities of an operation located in an established community. This will be reflected in the size and skills of the workforce, material and parts inventory, and service equipment permanently on site. As an example, in Sudbury, Inco maintains a basic maintenance crew. When major maintenance is required, however, they outsource those services to contractors located in the Sudbury region.

Need For Specialized Products and Services

Given that this is the first nickel mining and milling project in the province, there will be some specialized supplies, services and equipment that are not currently available through Newfoundland and Labrador businesses. The closest operation relevant to the Voisey's Bay project is the iron ore operations in Labrador West. However, as with the case of Sudbury, the iron ore operations were developed in an era when communities were built around mining developments. This provided local businesses with the opportunity to become suppliers based on their proximity to the mining activities. The supplier community must take steps to identify the operational requirements, existing suppliers, VBNC's contracting philosophy, quality requirements and other salient factors which will have an impact on their ability to generate business from the Voisey's Bay project.

Back Haul Shipping to Site

It is anticipated that much of the goods and materials required will be shipped to the site via containers on the concentrate ships that will be returning to the site after unloading the concentrate. Businesses wishing to pursue supply opportunities must gain a good understanding of the supply-chain management strategy that VBNC will employ. While final details on this strategy have not been completed, VBNC will have a Materials Manager based

in Labrador who will oversee all aspects of the mine/concentrator's materials supply, including procurement. The procurement approach noted in Section 3.4 and the underlying principles in agreements with the Province, LIA and Innu Nation will guide VBNC's supply-chain management system. For the period of 2006 to 2011, its is expected that the primary marshalling yard will be at a port on the St. Lawrence River which will transship nickel concentrate from the mine/concentrator to Inco's operations in Ontario and Manitoba. When processing begins at Argentia, it is anticipated that the marshalling yard may be at Argentia. In the opinion of the Study Team, the departure port for containers is an important consideration for suppliers.

4.0 Voisey's Bay Mine/Concentrator Supply and Service Opportunities

This section of the report contains a detailed list of the typical consumables required for an open pit mine and concentrator operation. It also outlines the mine's service opportunities that could be available. The list of service opportunities related to the equipment that will be operational on site is based on an extensive listing of all equipment purchased during the construction phase of the Voisey's Bay project to May 2004. It gives an indication of the repair and maintenance requirements that may be needed over time.

4.1 Operating Cost Summary

In summary, it is expected that the Voisey's Bay mine/concentrator operations will have an annual expenditure of approximately $90 to $100 million. A breakdown of annual operating expenditure is provided in Table 2. This breakdown was derived from a Technical Report filed by VBNC pursuant to national instrument 43-101 of the Canadian Securities Administrators.

Table 2
Voisey's Bay Mine/Concentrator Project
Annual On-Site Operating Cost Estimate ($CDN, 000's)

	2006	2007	2008	2009	2010	2011
Cost Category						
Mining	$14,000	$17,000	$17,000	$18,000	$19,000	$19,000
Concentrator	$20,000	$25,000	$25,000	$27,000	$28,000	$28,000
General and administration	$28,000	$34,000	$35,000	$37,000	$38,000	$38,000
Owner's costs	$3,500	$4,000	$4,000	$5,000	$5,000	$5,000
Freight to supply site	$7,000	$9,000	$9,000	$10,000	$10,000	$10,000
Total Operating Costs	**$72,500**	**$89,000**	**$90,000**	**$97,000**	**$100,000**	**$100,000**
Assumptions						
Ore production ('000's tonnes)	1,612	1,944	2,016	2,131	2,190	2,190
Costs/tonne of ore						
Mining	$8.68	$8.68	$8.68	$8.68	$8.68	$8.68
Concentrator	$12.60	$12.60	$12.60	$12.60	$12.60	$12.60
G&A	$17.33	$17.33	$17.33	$17.33	$17.33	$17.33
Owner's costs	$2.14	$2.14	$2.14	$2.14	$2.14	$2.14
Freight to supply site	$4.57	$4.57	$4.57	$4.57	$4.57	$4.57

Source: Inco Ltd Technical Report (Pursuant to National Instrument 43-101 of the Canadian Securities Administrators), Aug 31, 2003

A detailed breakdown of the line items within each of the categories is not available publicly. However, based on a general understanding of the industry, 25-30% of the costs are expected to be wages and salaries (including benefits). This would leave approximately $70-75 million in annual non-labour operating costs, including freight and owner's costs (e.g. insurance, environmental monitoring. etc.)

Each of these major cost categories is discussed in turn in the following sections.

4.2 Mining Opportunities

The open pit mining operation is relatively straightforward in terms of the types of inputs required. The major cost items for the mining operations are the following:

- ***Labour***, which is required primarily for operating heavy equipment, maintaining equipment, preparing explosives, drilling and blasting, etc.
- ***Fuel*** for mine equipment, which will be required in significant quantities
- ***Tires***, which are highly specialized, expensive and sourced most likely from the original supplier of the equipment
- ***Explosives***, which will need to be batched and prepared on site as well as being planned and set off to facilitate the mining effort.
- ***Drilling equipment and supplies***, which will be required to support the drilling activities.
- ***Other maintenance supplies (oil, lube, etc.)***, which will be required in various quantities over the life of the project.

The main cost is labour for the operators who work on the heavy mining equipment. The next largest expenditure item is expected to be fuel for operating the heavy equipment. The maintenance of this equipment will also require a variety of inputs, most notably tires which wear out frequently and are quite expensive given the specialized nature of the equipment and the massive size of the tires. The mine equipment that will be in use during open pit operations includes the following:

Table 3
Voisey's Bay Mine Equipment Requirements

	Number of Units	
Item	**Start-up (2006)**	**Peak (2012)**
Rotary drill	1	2
Cap rock drill	1	1
Wheel loader	2	3
Haul truck	4	9
Track dozer	2	3
Wheel dozer	1	1
Road grader	1	1
Backhoe	1	1
Water/gravel truck	1	1

Source: VBNC, "Voisey's Bay Project, Technical Report Pursuant to National Instrument 43-101 Of The Canadian Securities Administrators"

It should be noted that this list of mobile equipment is that required for the operation of the open pit mine only. Other mobile equipment will also be required for use in other areas of the operation.

4.3 Concentrator Opportunities

In the concentrating (milling) process, the ore is crushed and then ground into fine particles using a jaw crusher and a ball mill which grinds the ore to flour-size particles. The next step is froth flotation which uses reagents (chemicals) to float the ore particles and sink the waste material. A flow chart for the Voisey's Bay mill is illustrated in Figure 6 in Section 2.4.2.

The operation of the concentrator will involve a greater variety and volume of inputs than used in the operation of the open pit mine. It is expected that the annual operating cost for the concentrator is in the $25-30 million range. The main cost items for the concentrator operations include the following.

- ***Labour,*** which is expected to be supplied internally with VBNC salaried and hourly employees.
- ***Reagents*** include the chemicals used during the milling process and typically include chemicals such as lime, sodium sulphite, xanthate, frothers and collectors.
- ***Steel*** refers to costs associated with the steel used in the crushing and grinding process. The steel includes two main types of inputs: grinding balls and mill liners. The grinding balls are metallic balls which are put into the grinder and grind the crushed ore down into fine particles. As they grind the ore, the grinding balls become ground down as well and are therefore used in fairly large quantities. The other main part which requires replacement is the mill liners which line the sides of the mill and get worn through the action of the grinding.
- ***Electrical power*** is a major cost item for the mill, however, it is expected to be supplied internally through the power generation system that will be built on site and operated by VBNC. The inputs into the power generation system include diesel fuel, maintenance materials for maintaining the generators and distribution system, and labour to operate the power supply system.
- ***Maintenance materials*** include the materials and inputs required for general maintenance of the mill equipment.

4.4 General and Administrative

General and administrative costs represent the highest level of costs in the operation of the mine and mill. In general, G&A costs are those not directly related to the core mining and milling activities. Rather, they include costs related to support services such as the following:

- Camp and catering costs
- Operation of power plant
- Operation of port
- Operation of yard equipment
- Maintenance of non-core assets (roads, airstrip, accommodations complex, etc.)

4.5 Owner's Costs

Owner's costs typically refer to overhead costs that are allocated to the project. These would include costs such as insurance, the operation of various offices in Labrador and on the Island, business travel, environmental monitoring and compliance and other similar costs.

4.6 Transportation

Transportation costs include the costs related to shipping the concentrate for further processing. It also includes the costs related to shipping supplies to site as well as the movement of personnel to and from the site.

Opportunities may be available for the complete supply of transportation services. For example, the haulage of concentrate from the mill to the port may be a contracted opportunity. The shipment of goods and employees to the site may be handled by one or more airline contractors.

4.7 Sustaining Capital

While not listed in Table 2, sustaining capital is an ongoing expenditure that is required and will provide opportunities for Newfoundland and Labrador businesses. If it is assumed that a 1 to 2% sustaining capital factor is used (meaning that on average 1 to 2% of the installed capital base will be required to be added each year in order to maintain the capital assets), then the annual sustaining capital can be expected to be in the $7 to 14 million range (based on a $700 million capital cost).

4.8 Operations and Maintenance Opportunities

After a specified number of operating hours, or when detected by a predictive maintenance program, process equipment and components will be removed and restored to original specification and then put back in operation. This will be accomplished by having spares on site or by having the work performed during a shutdown period. Either way spares will need to be repaired. The list below outlines work that could be performed by off-site companies with the required skills.

- **Conveyor drive**. Replace bearings, seals and gear sets.
- **Head and Tail pulleys**. Replace bearings, seals and legging.
- **Pumps.** Rebuild pump barrel, bearings, and seals.
- **Pump wet end.** In a slurry-handling service, pump cases, suction side liners and impellers are replaced on a frequent basis. Water, sewage and chemical pumps require the same service on a less frequent basis.

- **Diesel Engines**. Over 40 pieces of equipment are powered by diesel engines. These engines will require major rebuilds in a range of 12,000 to 20,000 hours of operations. This work could be performed on site or shipped to an outside supplier.
- **Rubber lining**. The major part of this work is prefabricated pipe spools of various sizes, tank and vessel linings, chute lining and rubber backing for mill liners.
- **Non-destructive testing (NDT) Service**. A modern maintenance program includes a high quantity of predictive maintenance. The tools and skills required to perform ultrasonic, infrared termography, vibration analysis, thickness measurements, and oil analysis will be difficult to economically justify having on site. This service could be performed by an outside company as part of an ongoing maintenance program.
- **Project Engineering Service**. A new plant of this type will require ongoing minor modifications and renovations to resolve problems and improve the operation. This kind of work usually cannot be handled by in-house staff and is contracted out. A business that can perform this work requires project management, design, procurement and construction capabilities.
- **Electric motor repairs**. The mill and surface facilities will utilize over 450 electrical motors. Approximately 200 of these are + 30 HP. In the event of failure motors of this size would be rewound for future use. Smaller motors would be scrapped and replaced with new.
- **Hydraulic & pneumatic hose and fittings**. The mill and mine will require many custom made hydraulic hoses for various equipment. The options are to have the ability to make hoses on site or maintain a high inventory of custom hoses. An opportunity exists to become knowledgeable of the requirement and supply the needs.
- **Distributed Control System (DCS).** A computerized control system used to manage and control process plant operations using 1) field-mounted transducers to measure temperatures, pressures, flows and switches and 2) contacts to measure equipment status (started/stopped, running/shut down). The DCS system is very important to the overall operation of the processing plant. It will require ongoing maintenance and updates throughout the course of the mine's operations.

A detailed listing of all equipment ordered during the construction phase is provided in Appendix C. This list contains a description of the equipment, manufacturer data (where available) and an overview of the expected maintenance requirements during operations.

4.9 Contracted Out Opportunities

VBNC has indicated that it may contract out certain activities that are non-core to their operations. These support activities typically are not the core areas of expertise for VBNC and, if industry trends prevail at Voisey's Bay, the following opportunities may be designated for outsourcing:

- Camp and catering
- Haulage operations

- Power supply and distribution
- Port operations
- Airstrip operations
- Freight handling and logistics
- Maintenance and repair of shipping containers
- Security

VBNC is still determining its actual outsourcing approach and, therefore, this list is a best estimate on the part of the Study Team. Furthermore, some of these opportunities may have been identified in the IBAs as areas where Aboriginals will have first preference in providing the services.

4.10 Consumables

An extensive volume and variety of consumables will be required during the operation of the mine, mill and site. Based on a review of Inco's commodity listing for its Sudbury operations, the Study Team's knowledge of the industry and through other information found during the course of this research, the Study Team has prepared a list of 60 commodity types that are expected to be required at Voisey's Bay. These commodity types include the following:

Table 4
Voisey's Bay Mine/Concentrator
Commodity Types

1)	Abrasives	31)	Heating Equipment (Building)
2)	Adhesives, Coatings and Sealants	32)	Janitorial Supplies
3)	Aggregates	33)	Laboratory Supplies
4)	Agricultural Equipment and Supplies	34)	Lubricating Equipment
5)	Automotive Electrics	35)	Lumber, Timber and Wood Products
6)	Automotive Powertrain and Brakes	36)	Material Handling
7)	Batteries and Chargers	37)	Medical Supplies
8)	Building and Building Materials	38)	Metal Fabrication and Forgings
9)	Castings	39)	Metals
10)	Cement and Concrete Products	40)	Office Equipment Supplies and Services
11)	Chemicals	41)	Off-Road Vehicles
12)	Industrial Cleaning Agents	42)	On-Road Vehicles
13)	Cleaning Contracts	43)	Personal Hygenics and Sanitation
14)	Cleaning Machines	44)	Pipe and Fittings
15)	Computer Equipment and Supplies	45)	Plastics
16)	Electrical Instrumentation	46)	Plumbing
17)	Electrical Insulation and Lighting	47)	Power Transmission Industrial
18)	Electrical Powered Devices	48)	Process Equipment
19)	Electrical Transfer and Interrupt Devices	49)	Promotional Supplies
20)	Electrical Wire Cable and Service Entrance	50)	Pumps
21)	Engineering, Geological and Environmental	51)	Rock Drilling
22)	Small Engines	52)	Rubber, Industrial
23)	Explosives	53)	Safety and Fire Protection
24)	Fasteners - Rock Bolts	54)	Shop Equipment
25)	Powered Fastening Systems	55)	Textiles and Hides
26)	Filters and Media	56)	Tools
27)	Finished Product Handling	57)	Valves and Flow Controls
28)	Foodstuffs and Confectionery	58)	Ventilation Equipment

29)	Fuels, Gases and Lubrication	59)	Welding Equipment
30)	Hardware	60)	Wire Rope Chain and Fittings

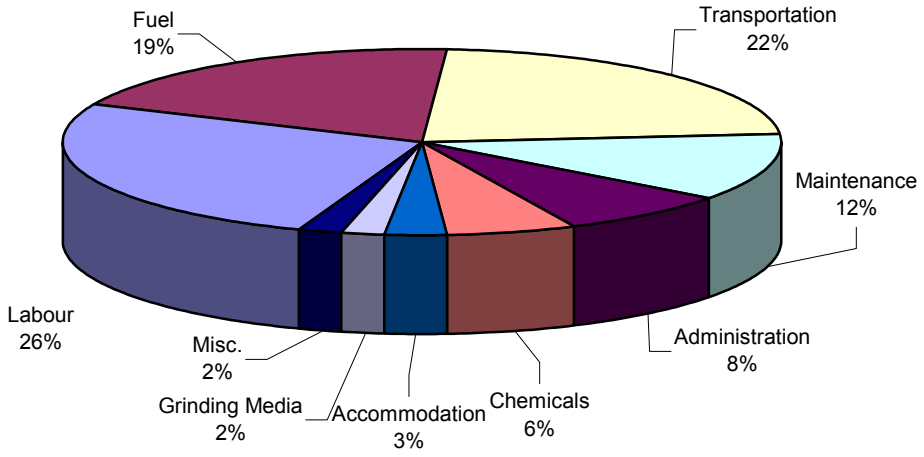
A detailed listing of these commodity groups, including a description, and examples is provided in Appendix D.

4.11 Supply Opportunities Summary

The preceding sections discussed the business opportunities for the Voisey's Bay Mine/Concentrator project in terms of the areas in which expenditures are made (e.g. mining, concentrating). To provide another perspective, this section discusses the breakdown of operating costs by function.

Figure 8 illustrates the breakdown of expected operating costs by function. This is followed by a brief description of each category:

Figure 8
Voisey's Bay Mine and Concentrator
Breakdown of Annual Spend



Labour:
This includes all the labour on site with the exclusion of labour for accommodation services. This labour will include both VBNC and contract labour. The category of labour can be broken down into mine, concentrator, and site services, with the mine and concentrator broken down further into maintenance and operating labour. Site services will be broken down to include services such as concentrate hauling, ship loading, waste disposal, etc. VBNC may be contracting labour for some processes on site.

Transportation:
This includes all aspects of transportation including air (passenger and freight), concentrate shipping, resupply of material via ship and off site marshalling of material. The majority of material resupplied will be via the concentrate vessel which will follow the concentrate shipping schedule. VBNC will strive to operate only scheduled passenger and freight air transportation.

Maintenance:
This includes materials only for the entire maintenance effort including tires, spare parts, shop tools and equipment and lubricants

Administration:
This includes all overhead cost such as insurance, communication, travel, consultants and information technology. Significant material cost would include safety clothing and supply (200K), office supplies (150K), and medical supplies (20K).

Miscellaneous:
This includes a number of smaller items as well as more significant items such as drilling steel and bits, building supplies, and quarrying of rock on site.

Accommodation:
This includes all labour costs, food, cleaning supplies and linen required to operate the accommodation complex.

Chemicals:
This includes all chemicals involved in the treatment of ore to produce concentrate, treatment of water laboratory chemicals and explosives.

Grinding media:
Grinding media are the balls for the various stages of grind including sag mill, ball mill and required mills.

Fuel:
This is primarily diesel fuel for the generation of electricity and the running of vehicles on site.

The pursuit of these and other opportunities as identified in this study by Newfoundland and Labrador firms requires the following steps:

- Register with VBNC's supplier database
- Review the company's website and become familiar with the operational requirements of a Mine/Concentrator operation in a remote location
- Review this report and other similar reports
- Contact VBNC's operating team
- Understand the company's IBA commitments and recognize that they take priority

Appendices

Appendix A - Nickel Supply and Service Industry Overview
Appendix B - Selected Companies Awarded VBNC Construction Contracts and Registered Companies with Labrador Inuit Association and Innu Nation

Appendix C - List of Major Equipment Ordered by VBNC During Construction Phase

Appendix D - Classification of Mining Goods and Services from Inco's Commidity Listing

Appendix A
Nickel Supply and Service Industry Overview

This appendix provides some context around the Canadian nickel mining industry, including the supply and service industry which supports these activities. It also discusses general trends in the approach to procurement used by mining companies.

Nickel Mining Industry Overview[4],[5]

Canada is a world leader in mineral production. In 2002, the value of metal production from Canadian mines totalled $10.2 billion and included production of iron ore, silver, uranium, copper, platinum group metals, cobalt, lead, zinc, and more recently, diamonds.

Canada is the third largest nickel producer in the world after Russia and Australia, accounting for some 15% of world production.. The next largest are New Caledonia and Indonesia. In 2002, Canadian production of nickel in concentrates was 188,100 t and refined nickel production was 144,500 t[6]. This production was generated from fifteen mines, all of which are located in Quebec, Ontario and Manitoba, three smelting complexes and three refineries.

Inco is the largest producer in Canada, having produced 147,900 t of finished nickel in Canada, of which 69% was produced in Ontario and 31% in Manitoba. During 2002, Inco's Ontario operations included nine mines, a concentrator, two smelters, a nickel refinery, and a copper refinery.

In 2002, Falconbridge operated four mines in Sudbury and the Raglan mine in Quebec, together producing 52,500 t of nickel in concentrates, which were smelted at the company's Sudbury smelter and exported in matte form to Norway for refining.

The only other nickel producer in Canada is Sherritt International Corporation. Sherritt operates a hydrometallurgical refinery in Alberta, which produced a record 31,700 t of nickel in 2002.

In Canada's three nickel producing areas, nickel occurs with varying amounts of sulphur, iron and copper, plus smaller amounts of other important by-product metals such as cobalt, gold, silver and platinum group metals and are referred to as sulphide ores. Sulphide ores are usually found in deeply extending veins, and therefore require underground mining.

The greatest demand for nickel is in the production of a wide range of stainless steels used in chemical and food-processing equipment, transportation equipment, construction as building facings and other architectural applications, and a vast array of consumer items. Over 60% of primary nickel production is used to make stainless steel. The second most important requirement for nickel is in the production of high-nickel alloys, used in high-temperature and

[4] Natural Resources Canada. "Canadian Minerals Yearbook, 2002"

[5] Natural Resources Canada, http://www.nrcan.gc.ca/mms/scho-ecol/main_e.htm#nickel

[6] Nickel in concentrates refers to nickel produced at the initial mining and milling stages of production. The totals may not add for finished nickel because of the movement of intermediate products (concentrates from milling and matte from smelting) around the world. By way of comparison, Voisey's Bay is expected to produce up to 66,000 t of nickel in concentrates, or approximately 33% of current Canadian production.

very corrosive environments, particularly in the chemical, nuclear and aerospace industries. Nickel is also used in many other ways including batteries and fuel cells, and as a catalyst in the hydrogenation of fats and oils.

The world mine production of nickel is relatively small (1.1 million tonnes/year) compared to other base metals.

The Mining Supply and Service Industry

Canada's mining industry is a world leader in many respects. From a production perspective, Canada is a leading producer of many commodities. Canada is also a world leader in the junior exploration industry and is a significant source of exploration capital for the very important junior mining industry. As a result of Canada's stature as a world leader in mining and mineral exploration, Canadian industry has grown to become one of the world leaders in the supply of goods and services to the mining industry.

Mining products, which are the input goods or services consumed by mining companies in their various activities are subdivided into two major categories: specialized products and other products.

Specialized products are mainly of a scientific or technical nature and are specialized to the mining industry. Other products, such as financial services, transportation services and energy, are essentially non-technical in nature and are not restricted to the mining industry. Furthermore, applications of these products in mining are often little different from applications in other sectors of the economy.

In 1999, Natural Resources Canada (NRCan) commissioned a study entitled "Canadian Suppliers of Mining Goods and Services". This study attempted to assess the impact that mining operations had on Canadian suppliers. It also attempted to profile the mineral industry supply sector. A summary of the findings of this report include the following:

- There are more than 2,200 firms in Canada that may be called “mining suppliers” with over 75% located in Ontario, Quebec or British Columbia;
- Half of these companies depend on sales to mining companies for 50% or more of their total revenues;
- Almost ¼ of the mining supply firms employ engineers, geologists, geophysicists, geochemists, chemists, process engineers, environmentalists or members of related disciplines;
- Canadian suppliers sell in all the major markets. In 1994, they sold to 179 countries;
- Exports account for 30% to 50% of Canadian mining suppliers’ revenues;
- There is a close correlation between the country markets for Canadian mining suppliers and countries where Canadian mining companies are the most active.
- The global demand for goods and services for mine operations is estimated at over US$200 billion per year.
- The demand for goods and services for the construction of new mines currently planned around the world is well in excess of US$50 billion.

- The market for goods and services required for mineral exploration varies depending on market conditions and was worth US$3.0 billion in 2002, down from $3.4 billion in 2001
- Canada is a world leader in the mining industry with more mining companies based in Canada than in any other country. Over the past 10 years in particular, Canadian mining companies have expanded their operations around the globe through the acquisition of mineral properties at all stages of development. As a result, Canadian companies have become the largest players in mineral exploration, accounting for one third of the activity around the globe.
- Goods account for 55% of revenues from sales of specialized products to mining companies, while services account for the remaining 45%.
- In 1997, Ontario mining companies spent 30% of their production value on goods and services for production; of that 77% was acquired from Ontario firms with 40% from firms located within 80 kms of the mining operations
- Both urban and remote centres benefit from supplying mining companies.
- Canadian firms supply thousands of specialized mining products, but have considerable depth in products related to underground mining, the environment, exploration, feasibility studies, mineral processing and mine automation.
- The United States, the United Kingdom, Germany, Canada and Australia are the leading suppliers of specialized mining goods and services.

Industry Procurement Trends

There are a number of procurement trends that are prevalent in the mining industry. This section examines the major trends and their implications for the Voisey's Bay mine/concentrator operations. It is important for Newfoundland and Labrador businesses to understand these industry trends and how they may effect the ability of Newfoundland and Labrador businesses to obtain contracts with VBNC.

Quality Standards

The requirement for suppliers to have quality certifications is standard throughout the industry. Most mining companies require its suppliers to be certified with the relevant quality-related certifications. These would include ISO 9001 standards, Canada Standards Association (CSA) standards and other standards agencies. Given the importance of such certifications, it is important for suppliers to be aware of the relevant standards and how to go about attaining the required certifications.

The following quality standards are recognized by SNC-Lavalin for the Voisey's Bay project:

The following websites provide information on quality standards relevant to VBNC's current requirements:

- Canadian Standards Association - www.csa.ca/Default.asp?language=English

- International Organization for Standardization - www.iso.ch/iso/en/ISOOnline.frontpage

All potential Newfoundland and Labrador suppliers to the project should be aware of these standards and should put in place procedures to become accredited by these organizations if necessary. Without such certifications, certain project supply opportunities will be unattainable.

Just-in-Time Inventory

Maintaining an inventory is a costly undertaking for any business. To many businesses, inventory is perceived as dead capital or money that is held up with no return or tangible benefits. As such, companies in all industries, including mining, are attempting to reduce their inventory holdings. For many types of businesses such as retailers and wholesalers, this means keeping their inventory of goods for sale at a minimum without creating product shortages.

For a mining company, reducing inventory involves a reduction in their spare parts and supply inventories that are required in the course of their operations, as opposed to retailers whose inventory is for resale. In a mine operation such as that in Sudbury, it is easier for Inco to keep a minimal inventory because their suppliers are well established and located in the community. For a remote site such as Voisey's Bay, however, keeping inventory down to minimal levels without compromising the continuity of operations is a delicate balancing act.

VBNC, like all mining companies today, will be making an effort to minimize the size of its inventory. This is a common trend that is being used more often and one that will be initiated from the beginning at the Voisey's Bay mine/concentrator operations. This will be accomplished by maintaining space on site for contractors to store spare parts and supplies that the company will draw upon and use as required on a consignment basis. Specific details of such arrangements for the Voisey's Bay operations have not been finalized yet by VBNC.

Standardization

Standardization involves attempting to limit the type of components used to standard types. For example during the Voisey's Bay procurement for construction of the mine/concentrator, all electric motors were supplied by one manufacturer. This allows the operation to be more efficient over time as only one type of electrical motor will need to be serviced and maintained. Other benefits of standardization include a reduction in the number of suppliers and human resource efficiencies as personnel will have the skills required to service all similar products

e-Procurement

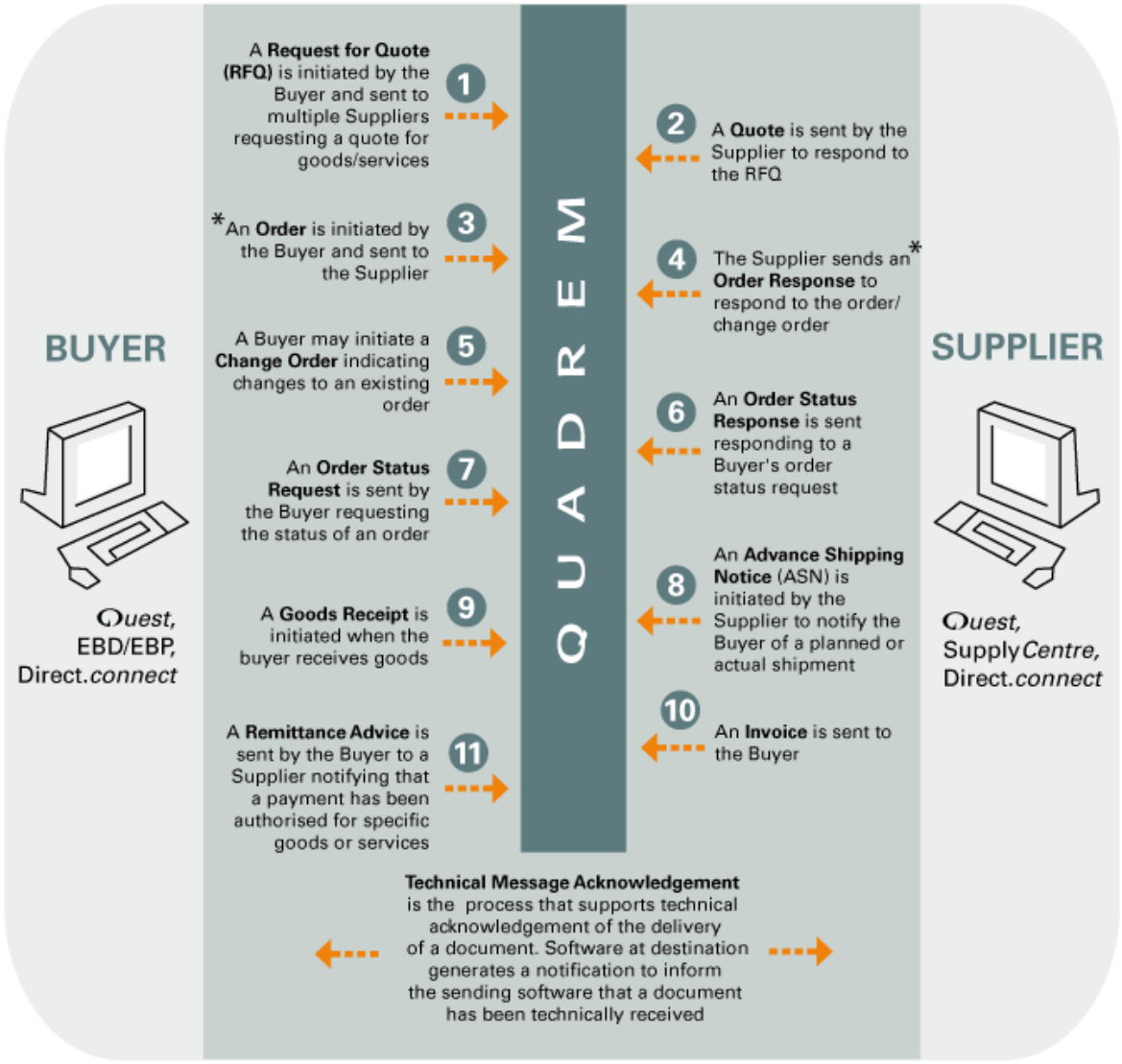
Electronic procurement or e-procurement as commonly called is an attempt to streamline the purchase process via paperless transactions using web-based systems that allows for faster transactions, access to a global database of suppliers and overall improved supply chain efficiencies.

E-procurement has evolved as a result of the need for mining companies to reduce their costs of doing business, including the costs of procurement. The emergence of the Internet has also fuelled the growth in e-procurement.

One of the leading e-procurement initiatives for the mining industry is the Quadrem.com website. Quadrem was formed by some of the world's leading mining companies, including Inco. It is a system focused on servicing the needs of the international mining marketplace. It provides its users with seamless end-to-end (from pre-qualification to invoice payment) paperless system for improving efficiencies throughout the supply chain.

Figure A-1 illustrates the steps in the purchasing process that can be maintained by Quadrem.

Figure A-1
Business Processes Supported by Quadrem Business Platform



Source: www.Quadrem.com

The extent to which e-procurement will be used for the Voisey's Bay Mine/Concentrator operations has not yet been determined. Based on e-procurement trends in the mining industry, local supplier companies that are prepared to cooperate with mining operators in the quest for lower operating costs will be the winners in the long run[7]. For this reason, potential suppliers should not only register on VBNC's own supplier database, but they should also consider Quadrem as part of their longer term relationship with not only VBNC, but with the global mining sector. The Iron Ore Company of Canada is also apart of this system and uses Quadrem to support its operations in Labrador West.

[7] Atlantic Canada Opportunities Agency, Newfoundland and Labrador Chamber of Mineral Resources and the Government of Newfoundland and Labrador, "E-Procurement and Supplier Development in the Mining Industry", April 2002.

Appendix B
Selected Companies Awarded VBNC Construction Contracts
and
Registered Companies with Labrador Inuit Association and Innu Nation

Below is a list of companies generated from the vbnc.com website that have been awarded contracts. Companies with offices in Newfoundland and Labrador are highlighted in ***bold italic***:

A. Harvey & Co. Ltd.
ABB Inc
Aivek Holdings Inc.
Amaguk Construction Limited
ASC Innu Security Ltd. (ASCIS)
Atlantic Industries Limited
Bay Bulls Marine Terminal Inc.
Bowringer Engineering Limited
Bruce Sutherland Associated Limited
C&W Industrial Fabrication & Marine Equipment Ltd.
CARBO-TECH Environmental Group Inc.
CIBA Specialty Chemicals Canada Inc.
Contro Valve Inc
CSI Fabricators Limited
Dorr-Oliver Eimco
Eastern Valve and Control Specialties Limited
EMS-Tech Inc.
Eriez of Canada Limited
FFE Minerals Canada Ltd.
Flotech Enterprises Ltd.
Flowserve Canada Inc c/o Sansom Equipment
Hayward Gordon Ltd.
HOB Associates, c.o. Laurentide Controls
Hoffman Industries of Canada Limited
Horton CBI Limited
IKC-Borealis Constructors
Industrial Equipment Co. Ltd.
Innu Mikun Limited Partnership
Innu Supply Outlet Ltd.
Innu-Med Inc.
Innunuk Traders Limited Partnership
Iskueteu, a Limited Partnership
Island Waste Management Inc.
Kuka - Hunts Transport Inc.
Labrador Catering Limited Partnership
Labrador Motors Limited
Larox Canada Inc.
Liannu Limited Partnership
McLellan Equipment Inc.
Metso Minerals Canada Inc.
Minaskuat Limited Partnership
MinnovEX Technologies Inc.
Mista-Shipu Construction Limited/Liannu Limited Partnership
Nortech Holdings Limited
North Shore Roofing Ltd.
Outokumpu Technology
Parkson Corporation
Pressure Pipe Steel Fabrication Ltd.
Pumps Plus c/o ITT Industries - Industrial Pump Group
Sandvik Tamrock Canada
Sango Enterprises Inc c/o Metso Minerals Canada Inc.
Sanitherm Engineering Limited
Shuashim Group c/o Performance Fluid Equipment Inc.
Shuashim Group Inc./ Continental Conveyor & Machine Co.
Skyline p.h.p. Canada Ltd.
Super Products Corp.
Teco-Westinghouse Motors (Canada) Ltd
Teueikan Ready Mix Ltd.
Thermo MeasureTech
Torngait Services Inc.
Toromont CAT
Toromont CAT Power Systems
Toromont Energy Systems
TSI/INNUVATIONS
United Rentals of Canada Inc.
Weir Pumps Canada/Division of Peacock Inc.
Western Star Trucks Newfoundland Limited
Woodward's Oil Limited

Note: This list was compiled from the vbnc.com website. It is meant to be representative of some of the businesses that have been awarded contracts to date. It is not meant to be an exhaustive list and nor does it indicate any particular preference for the companies listed.

In addition to the list of companies available from VBNC's supplier database, both LIA and Innu Nation maintain databases of registered Aboriginal suppliers. The following is a list of LIA-registered businesses found on the Labrador Inuit Association's website (http://www.nunatsiavut.com):

1) Construction
D & J Construction (1995) Ltd.
Ray Ford Construction
Amaguk Construction Limited

2) Logistics/Expediting
Aivek Holdings Inc.
CAI Logistics
Torngait Services Inc.
Labrador Logistics Limited

3) Transportation
East End Holdings Inc.
Webb Services Ltd.
CJ Webb Inc.

4) Shipping
Torngait Transport Inc.

5) Environmental
Sikumiut Environmental Management Ltd.

6) Manufacturing
Labrador Ceramic Tile
Pressure Pipe Steel Fabrication Ltd.
Northern Oxygen Limited
Inuit Allstar Rebar Fabricators Inc.
Labrador Inuit Mechanical Structural Aurora Ltd.

7) Mining
Torngait Ujaganniavingit Corporation

8) Retail
Hayne's Store Ltd.
Per-mit Enterprises Ltd. (Paint Shop)

9) Electrical
Switch Electrical Inc.
Northern Connections

10) Services
MRB Photo Communications
Nanuk Diving Inc.
Nortech Holdings Limited
Nunatsiavut Office Equipment Inc.
Lyall's Interpreter/Translator Service
HOB Associates
Labrador Safety Inc.
Oopik Medical Services Inc.
J and J Michelin and Associates
Torngait Pumps, Sales & Services Ltd.
Iglutek Information Technology Systems Inc.

11) Lumber/Hardware
Lyall Enterprises Ltd.
Post Mill Lumber Inc.

12) Real Estate/Accommodations
Northern Transport Ltd. (Aurora Hotel)
MACS Enterprises Inc.
White Bear Enterprises Inc.
Blake's Efficiency Units

13) Tourism
Campbell Adventure Tours
Inuksuk Services Inc.

14) Economic Development
Labrador Inuit Development Corporation

The following is a list of Innu-registered businesses and Joint Ventures:

- Aboriginal HVAC Plumbing Limited/Trails North Limited
- ASC Innu Security Limited/Atlantic Safety & Security
- Atiku Foods Limited/Uncle Sams Butcher Shop
- CWD Nunajack Limited/Industrial Supplies/Carol Wabush Distributing
- G.P. Automotive & Small Motor Repair
- Hunts/ Kuka Transport Inc./Hunt's Transport Limited
- Innu Cartwright Drilling Inc./Cartwright Drilling Inc
- Innu Concrete Works Limited/Lewis Concrete Forming
- Innu Consultation Services
- Innu Med Limited/Health and Medical Services/Medcan Health Management Inc
- Innuvations Limited Partnership/Fujitsu Consulting Canada ltd
- Innu Supply Outlet Limited/NOSO
- IDLP Properties Limited Partnership
- Innu Environmental/Guylaine Joncas-Bennett
- Innu Kiewit Contractors/Peter Kiewit & Sons
- Innu Mikun Fuels Limited Partnership/Provincial Airlines
- Innu Mikun Airlines/Provincial Airlines
- Innu Project Management Limited/Labrador Project Management
- Innunuk Traders/Harris and Roome Supply
- Iskueteu Limited/Industrial/commercial/G.J Cahill Electric
- Labrador Innu Waste Management Limited/Island Waste Management
- Labrador Catering Limited Partnership/East Coast Catering
- Liannu Limited/M&M Engineering Ltd
- Mashua Capital Limited Partnership
- Minaskuat Limited Partnership/Jacques Whitford Environmental Limited
- Mikupishan Office Supplies Limited/Mokteck 2000
- Mista Metshu Aviation Services
- Mista Shipu Construction Limited/Colby Construction
- Mushuau Innu Translation Services
- Nat-She Construction Limited

- Nikau-Wood Limited/Hilliers Trade Limited
- Petapan Rewinding Inc./Labrador Rewinding Inc.
- PIIK Inc./Mining Explosives/Orica Explosives
- Sango Enterprises Inc.
- Sango Drilling Limited/Diamond Drilling/Major Drilling
- Sheshatshiu P. Mckenzie Construction Ltd.
- Shipanu Marine Transport Inc./Canship Limited
- Shuashim Group Limited Partnership/J& B propane Ltd.
- Performance Fluid Equipment (distributor)
- Continental Conveyor & Machine Works
- Skidoo Innu & Recreation
- Teueikan Construction Limited/Labrador Construction
- Teueikan Ready Mix Concrete Inc./C&T Enterprises
- Transport Innu Bus And Taxi
- Tshikapisk Foundation
- Uinepeuk Limited Partnership/TRC Hydraulics/NFLD Hydraulics

Appendix C Equipment List for Voisey's Bay Mine/Concentrator (Awarded as of May 2004)						
Package #	**Equipment**	**Qty**	**Supplier**	**Description**	**Function**	**Operation and Maintenance Opportunities**
45-0028	Motor grader	1	Toromont Cat	160 kW diesel powered, 4.27 standard blade length, snow wing with hydraulic rear brace, Balderson V-plow	Road maintenance	Replace wear parts and tires as required and perform regular preventive maintenance as recommended by manufacturer.
45-0028	Skid steer loader	1	Toromont Cat	Bobcat 863; 60 kW Diesel powered, bucket rated capacity 0.40 m3	Light duty utility work	Replace wear parts and perform regular preventive maintenance
45-0028	Integrated tool carrier	1	Toromont Cat	149 kW diesel powered, static tipping load 12 900 kg, breakout force 125 kN	Utility vehicle	Replace wear parts and tires as required and perform regular preventive maintenance as recommended by manufacturer.
45-0028	Pneumatic tire forklift	1	Toromont Cat	Hyster H60M; 3 tonne capacity counter-balanced propane powered(electric option)	Utility vehicle	Replace wear parts and perform regular maintenance as recommended by manufacturer.
45-0028	Pneumatic tire forklift	1	Toromont Cat	7 tonne capacity (at 24") diesel powered	Utility vehicle	Replace wear parts and perform regular maintenance as recommended by manufacturer.
45-0028	Pneumatic tire forklift	1	Toromont Cat	Cat V250B; 15 tonne capacity (at 24") diesel powered	Utility vehicle	Replace wear parts and perform regular maintenance as recommended by manufacturer.
41-0001	Submersible pumps	?	Innu Supply Outlet Ltd.	Various sizes of pumps to convey water from ponds around the site	Process equipment	Light maintenance equipment
41-0002	Water reclaim barge	1	Chamco Industries Inc	Barge containing 3 vertical turbine pumps c/w motors and ancillary equipment, valves, transformer, switchgear and starters	Process equipment	Light maintenance item.
41-0003	Potable water pumphouse	1	Liannu Limited Partnership	Pumphouse c/w booster pumps, chlorination equipment, horizontal storage tanks, valves and fittings, instrumentation and fire alarm system.	Site service equipment	Supply of water treatment chemicals and regular maintenance for pumps and electrical equipment
41-0004	Fuel unloading/load dispensing system	1	Liannu Limited Partnership	Fuel load and dispensing/metering system c/w meters and electronic control system	Site service equipment	Regular equipment maintenance
41-0005	Sewage treatment plant	1	Sanitherm Eng. & Flotech Ent.	Modular plant complete with mechanical and electrical equipment	Site service equipment	Pumps, tanks and chemical handling system are generally low maintenance.
41-0011	Mine water pumps	?	Torngait Pumps	Diesel driven dewatering pumps	Process equipment	Regular engine maintenance. Engine and pump overhaul as required.
41-0013	Port firewater pumphouse	1	Chamco Industries Inc.	Pumphouse c/w pumps and diesel motor	Site service equipment	Regular engine maintenance. Engine and pump overhaul as required.
45-0001	Double roll crusher	2	Oldenburg Stamler USA	Heavy duty dual roll	Reduce material size	High maintenance item. Wear parts need constant maintenance and frequent replacement.

Appendix C Equipment List for Voisey's Bay Mine/Concentrator (Awarded as of May 2004)						
Package #	**Equipment**	**Qty**	**Supplier**	**Description**	**Function**	**Operation and Maintenance Opportunities**
45-0002	Mill conveyors	2	Shuashim/Continental Conveyor	Conveyors c/w chutes, tail and head ends, drive and take-up units, floor grating and electrics	Feeds ore from crusher to SAG mill	Conveyors drive mechanism, bearings, seals and gear set would be replaced or repaired based on predictive maintenance indicators. Belts and pulley lagging on the coarse ore side would have to be replaced in 2 to 3 years. Troughing, return, and impact idlers are replaced in 2 to 3 years.
45-0003	Apron feeder	3	Industrial equipment	Heavy duty	Recovers controlled feed from crushed bin	Routine service inspection by electrical and mechanical trades. Major jobs include replacement of wear parts pans and chain about once per year. Liners in the feed chute will be replaced at the same frequency
45-0005	Rotary screw air compressors	12	Ingersoll-Rand	Compressors c/w inlet filters, outlet filters and dryers	Process equipment	Regular maintenance and filter replacement.
45-0006	Flotation air blowers	4	Gardner Denver	Centrifugal pressure blowers	Process equipment	Regular maintenance
45-0011	Overhead cranes	6	Bowringer Engineering	Heavy duty overhead traveling crane ranging in sizes from 6 – 30 tonne	Process and utility	Regular maintenance and safety inspections.
45-0011	Hoists	12	Bowringer Engineering	Trolley hoists ranging in capacity from 1 – 5 tonne	Process and utility	Regular maintenance and safety inspections.
45-0012	Dust collector	3	Cabro-Tech Environmental	Dust collectors c/w fan, baghouse and rotary air lock	Process (materials handling)	Regular inspection of filters to ensure proper operation. Motors require regular maintenance.
45-0013	Incinerator	1	Labrador Innu Waste Mgmt.	Incinerator c/w controls	Site services	Regular maintenance for control system.
45-0014	Rock breaker	1	Sandvik Tamock	Hydraulic	Process (reduce material size)	High maintenance equipment. Wear parts require regular replacement.
45-0016	Self-cleaning magnet	1	Eriez of Canada	Belt magnet	Process equipment	Minimal maintenance
45-0017	Belt weigh scale	1	Innunuk Trades	Used on a 1500 tonne per hour belt conveyor	Process equipment	Minimal maintenance
45-0021	Mechanical shop equipment			Full range of tools and equipment required for a large repair and overhaul facility	Equipment maintenance shop	Regular maintenance and replacement of tools and equipment as required
45-0022	Motor grader	1	Toromont Cat	205kw grader c/w snowplow attachment	Road maintenance	Replace wear parts and regular maintenance
45-0022	Excavator	1	Toromont Cat	184kw	Mine operation	Replace wear parts and regular maintenance
45-0022	Bulldozers	2	Toromont Cat	142 - 306kw	Mine operation	Replace wear parts and tires as required. Perform regular maintenance and overhaul as recommended by manufacturer.
45-0022	Loaders	2	Toromont Cat	3.5 – 11.5 cu. Meter	Mine operation	Replace wear parts and tires as required. Perform regular maintenance and overhaul as recommended by manufacturer.

Appendix C Equipment List for Voisey's Bay Mine/Concentrator (Awarded as of May 2004)						
Package #	**Equipment**	**Qty**	**Supplier**	**Description**	**Function**	**Operation and Maintenance Opportunities**
45-0022	Mobile loader	1	Toromont Cat	c/w with lump breaker	Mine operation and process	Replace wear parts and tires as required. Perform regular maintenance and overhaul as recommended by manufacturer.
45-0022	Skid steer loader	1	Toromont Cat	Propane powered	Light duty utility work	Replace wear parts and regular maintenance
45-0022	Haul trucks	4	Wajax Industries	91 tonne	Mine operation (material handling)	Replace wear parts, tires and regular maintenance and overhaul as recommended by manufacturer.
45-0022	Rubber tire bulldozer	1	Toromont Cat	235kw	Mine operation	Replace wear parts, tires and regular maintenance and overhaul as recommended by manufacturer.
45-0022	Integrated tool carrier	1	Toromont Cat	152kw c/w tire changer	Service equipment	Regular maintenance
45-0022	Bulldozer	1	Toromont Cat	142kw	Mine operation	Replace wear parts and perform regular maintenance and overhaul as recommended by manufacturer.
45-0022	Loaders		Toromont Cat	8.6M3	Mine operation	Replace wear parts, tires and perform regular maintenance and overhaul as recommended by manufacturer.
45-0025	Flatbed trailer	4	Western Star Tks.	40 foot length	Site services	Minimal maintenance
45-0025	Low boy trailer	1	Western Star Tks.	50 tonne capacity	Site services	Minimal maintenance
45-0025	Truck	2	Western Star Tks.	350 hp fifth wheel standard transmission, 4:11 rear end	Site utility vehicle	Regular maintenance
45-0025	Truck	2	Western Star Tks.	300 hp single axle diesel dump, standard transmission c/w snow plough attachment	Site utility vehicle	Regular maintenance
45-0025	Boom truck	1	Western Star Tks.	350 hp diesel standard transmission, 20 tonne rear capacity, 30 tonne roll off hoist	Site utility vehicle	Regular maintenance
45-0025	Container	4	Western Star Tks.	55 cubic yard roll-off		Minimal maintenance
45-0025A	Truck	1		Mechanical truck c/w crane	Site utility vehicle	Regular maintenance
45-0025A	Low boy	1		100 Tonne	Site utility vehicle	Minimal maintenance
45-0025A	Truck	1		Blast service	Utility vehicle	Regular maintenance
45-0025A	Truck	1		Fuel/lube service	Utility vehicle	Regular maintenance
45-0025A	Truck	3		Concentrate handling	Mine operation (material handling)	Replace wear parts, tires as required and perform regular maintenance and overhaul as recommended by manufacturer.
45-0025A	Truck	2		Fuel tanker trailer	Service vehicle	Minimal maintenance
45-0025A	Truck	1		Heavy pull tractor c/w 600 hp Cummins	Utility vehicle	Regular maintenance
45-0031	Truck	1	Super Products Corp.	Super duty cube van body c/w spill kits and personnel protection kits	Utility vehicle	Regular maintenance for vehicle and re-supply kits as required

Appendix C Equipment List for Voisey's Bay Mine/Concentrator (Awarded as of May 2004)						
Package #	**Equipment**	**Qty**	**Supplier**	**Description**	**Function**	**Operation and Maintenance Opportunities**
45-0031	Truck	1	Super Products Corp.	Super duty truck chassis c/w 250 amp. welding machine and accessories and ½ tonne capacity jib crane	Utility vehicle	Regular maintenance
45-0031	Truck	1	Super Products Corp.	Super duty cube van body c/w diesel powered positive displacement pump producing 3,000 psi @ 10 gpm and 800,000 btu diesel fired water heater	Utility vehicle	Regular maintenance
45-0031	Truck	1	Super Products Corp.	300 hp diesel standard transmission c/w 3600 gal vacuum system	Utility vehicle	Regular maintenance
45-0031	Vacuum truck	1	Super Products Corp.	2600 gal. vacuum system (sanitary)	Service vehicle	Regular maintenance
45-0031	Fuel truck	1	Super Products Corp.	20,000 L capacity	Service vehicle	Regular maintenance
45-0031A	Sanitary equipment	2	Super Products Corp.	1 sanitary trailer 1 portable wash unit	Site service unit	
45-0031A	Wash unit	1		Portable, trailer mounted	Site service unit	
45-0033	Crane	1	Toromont Cat	40 tonne rough terrain with telescoping boom	Site operation	Regular maintenance
45-0033	Crane	1	Toromont Cat	120 tonne rough terrain with telescoping boom	Mine operation	Regular maintenance
45-0033	Crane	1	Toromont Cat	Manitowoc 4100 series 2 c/w 200 ft. boom	Mine operation	Regular maintenance
45-0033	Boom truck	1	Toromont Cat	300 hp diesel, standard transmission c/w 20 tonne capacity telescoping boom	Mine operation	Regular maintenance
45-0033	Z-Boom	1	Toromont Cat	Articulating with 220 lb. capacity, 11m working height, 6.4m horizontal reach	Site service equipment	Regular maintenance
45-0033B	Carry deck crane	1	Atlantic Materials Handling	8 tonne, 30 ft. boom, propane powered	Site service equipment	Regular maintenance
45-0037	Fire truck	1	Labrador Conversion	Diesel powered with foam and water capability	Site emergency vehicle	Regular maintenance for vehicle and re-supply of foam as required. Possible opportunity for operation.
45-0037	Ambulance	1	K&D Pratt	Diesel powered type III 4 wheel drive c/w medical and emergency equipment	Site emergency vehicle	Regular maintenance for vehicle and re-supply of medical equipment as required. Possible opportunity for operation.
45-0038	Bus	4	Kuka-Hunts Transport	Diesel powered 40 passenger	Site service vehicle	Regular maintenance
45-0039	Pick-up truck	8	Labrador Motors	Supercab long bed diesel c/w all terrain tires	Service vehicles	Regular maintenance
45-0039	Van	1	Labrador Motors	6 passenger diesel, automatic, 4 wheel drive	Service vehicle	Regular maintenance
45-0039	Bus	4	Labrador Motors	Diesel powered 40 passenger	Site service vehicle	Regular maintenance

Appendix C Equipment List for Voisey's Bay Mine/Concentrator (Awarded as of May 2004)						
Package #	**Equipment**	**Qty**	**Supplier**	**Description**	**Function**	**Operation and Maintenance Opportunities**
45-0043	Boat	1	C&W industrial Fabrication	14 foot aluminum c/w 15 hp. diesel outboard	Service equipment	Minimal maintenance
45-0045	Generator	5	Toromont Cat	600V, 30 kw portable	Service equipment	Regular maintenance
45-0045	Compressor	1	Toromont Cat	Portable rotary screw, diesel 500 cfm	Service equipment	Regular maintenance
45-0045	Heater	6	Toromont Cat	Herman Nelson Frost Fighter; Portable indirect fired, 400,000 btu output at 2800 cfm	Service equipment	Minimal maintenance
45-0045	Light tower	4	United Rentals	Portable, diesel powered, 9 meter height, 6 kw generator, pneumatic tires	Service equipment	Minimal maintenance
45-0047	Port conveyors	3	Bonem Corp.	Conveyors c/w chutes, tail and head end, drive and tripper units, grating and electrics	Material handling equipment	Conveyors drive mechanism, bearings, seals and gear set would be replaced or repaired based on predictive maintenance indicators. Belts, pulleys, idlers and rollers require periodic replacement.
45-0050	High angle conveyor	1	Shuashim/Continental Conveyor	Heavy duty high angle	Material handling equipment	As above
45-0051	Dust collector	5	CWD Nunajack	Bag house type c/w fans, rotary airlocks and screw conveyor	Process (material handling)	Regular cleaning and maintenance
45-0053	Shiploader	1	EMS-Tech	Fixed slewing c/w ancillary systems	Process (material handling)	Conveyor drive mechanism, bearings, seals and gear set would be replaced or repaired based on predictive maintenance indicators. Belts, pulleys, idlers and rollers require periodic replacement.
45-0054	Fuel dispenser	1	Liannu Limited Partnership	Fuel unload/transfer system c/w pumps, meters and electronic control system	Service equipment	Regular maintenance for pumps and control system.
45-0056	Reach stacker	2	Top Lift Enterprises Inc.	40 tonne capacity top lift container handlers with side shift capability	Container handling equipment	Regular maintenance
45-0057	Blast hole drill	3	Reedrill Canada Inc.	2 primary & 1 secondary diesel powered	Mine equipment	Pneumatic drills require hose replacement and hammers require frequent overhauls.
45-0059	Truck wash	1	Interclean Equipment Inc.	Automatic concentrate haul truck wash system c/w - wash recycle module, including cyclone separator, wash and recirculation pumps - local pushbutton panels - remote sensing device - spray arches - tire wash arches - solids/oil/water separation	Service equipment	Regular maintenance
45-0060	Pontoon boat	1				
45-0061	Lifts	3		2 scissor lifts to service roof lighting 1 man lift s-boom type, 4WD minimum 18.3 m lift	Utility equipment	Minimal maintenance

Appendix C Equipment List for Voisey's Bay Mine/Concentrator (Awarded as of May 2004)						
	Equipment		**Supplier**	**Description**	**Function**	**Operation and Maintenance Opportunities**
45-0062	Snowmobile	4	Skidoo Innu/Notre Dame Ind.	2 cylinder, 436.6 cc engine, 381mm x 3962mm track	Utility equipment	Regular maintenance
45-0062	All terrain vehicle	3	Skidoo Innu/Notre Dame Ind.	660cc, 4-stroke, SOHC, 5-valved, liquid cooled engine, 4 wheel drive	Utility equipment	Regular maintenance
45-0064	Heat transfer fluid			200,000 litres 50% inhibited ethylene glycol – 50% water		
47-0001	Diesel generator	5	Toromont Energy	5 kV low speed diesel	Service equipment	Regular maintenance and overhaul
47-0002	4.16 kV Medium voltage starters	?	Innunuk Traders	Allan Bradley; Starters driving 4000V induction motors, rated at 5 kV with an interrupting rating of 48.6 kA @ 4.16 kV (350MVA) c/w 6 motor RTD inputs	Process equipment	Minimal maintenance
47-0003	600V Low voltage MCC's	?	Innunuk Traders	Allan Bradley	Process equipment	Minimal maintenance, replacement of electrical components as required
47-0004	4.16Kv-25Kv substation equipment	?	Innunuk Traders	Cutler Hammer	Service equipment	Minimal maintenance, replacement of electrical components as required
47-0005	5Kv medium voltage switchgear	?	Innunuk Traders	Cutler Hammer	Service equipment	Minimal maintenance, replacement of electrical components as required
47-0006	600V Variable frequency drive	?	ABB Inc.	ABB; Microprocessor based, pulse with modulated (PWM) switching	Process equipment	Minimal maintenance
47-0008	600V Unit substation	?	Innunuk Traders	Cutler Hammer	Service equipment	Minimal maintenance, replacement of electrical components as required
47-0010	Uninterruptible power supply	1	Innunuk Traders	c/w battery charger, battery bank and inverter, automatic transfer switch and manual bypass transfer switch	Service equipment	Minimal maintenance, replacement of electrical components as required
47-0013	Electrical shop equipment			Full range of equipment required for the electrical maintenance workshop	Maintenance devices and tools	Minimal maintenance and periodic replacement
47-0014	Generator	4	Toromont Energy	500 – 600 kW 600V c/w synchronizing and paralleling controls	Service equipment	Regular maintenance and overhaul
47-0015	Low voltage motors	456	Teco-Westinghouse	Westinghouse - 176 motors range 0.5 - 10 hp - 90 motors range 15 - 25 hp - 120 motors range 30 - 50 hp - 30 motors range 60 - 100 hp - 34 motors range 125 - 200 hp - 6 motors range 250 - 300 hp	Process related equipment	Minimal maintenance and cleaning. Replace electrical components as required

Appendix C Equipment List for Voisey's Bay Mine/Concentrator (Awarded as of May 2004)						
Package #	**Equipment**	**Qty**	**Supplier**	**Description**	**Function**	**Operation and Maintenance Opportunities**
47-0016	Medium voltage motors	16	Teco-Westinghouse	Westinghouse Inverter rated 15 motors range 250 - 500 hp 1 motor 1000 hp squirrel cage TEFC 4000 V	Process related equipment	Minimal maintenance and cleaning. Replace electrical components as required
47-0021	Life safety & security system	1	Innunuk Traders	Microprocessor controlled intelligent reporting fire alarm equipment	Safety	Maintain electrical components
48-0001	Plant control system	3	HOB Assoc	Delta V Emerson Based on DCS platform c/w hardware components, system configuration software and control room furniture	Process	Maintain and replace or upgrade electrical components as required. I T adjustment as required
48-0002	Pressure, temp. and flow transmitters		Iskueteu Limited Partnership	Transmitters and elements including process seals, manifolds and thermowells	Mill process	
48-0003	Ultrasonic level transmitters & switches		Innunuk Traders	Miltronics c/w aiming switches	Mill process	
48-0004	Nuclear density/level transmitters		Thermo Measure Tech	c/w source, source holder and detector	Mill process	
48-0006	PH, oxygen reduction potential and conductivity analyzer		Iskueteu Limited Partnership	c/w element cable and protection/mounting tube	Mill process	
48-0008	Automated valves modulating		Contro Valve Inc.	c/w actuators and positioners, air filters and regulators, solenoid valves	Mill process	
48-0009	Automated valves pinch		Innunuk Traders	c/w actuators	Mill process	
48-0011	Automated knife gate valve		Aivek Holdings	c/w actuators and solenoid valves	Mill process	
48-0012	Motor operated valve		Eastern Valve and Control Specialties		Mill process	
48-0015	Level switches-resistance		HOB Associates		Mill process	
48-0017	Conductivity and capacitance level switch		Innunuk Traders	c/w calibration certificate	Mill process	

Appendix C Equipment List for Voisey's Bay Mine/Concentrator (Awarded as of May 2004)						
Package #	**Equipment**	**Qty**	**Supplier**	**Description**	**Function**	**Operation and Maintenance Opportunities**
48-0018	Pressure & temperature gauges/switches		Innu Supply Outlet	c/w thermowells and process isolation rings or diaphragms as specified	Mill process	
48-0019	Flow gauge		Iskueteu Limited Partnership	c/w calibration certificate	Mill process	
48-0020	Solenoid valve		Iskueteu Limited Partnership		Mill process	Minimal maintenance and cleaning
48-0024	Water knife gate valve		Aivek Holdings	c/w actuator and solenoid valve	Mill process	
48-0026	Radar level transmitter		Nortech Holdings	c/w aiming device and calibration certificate	Mill process	
48-0027	Thermal mass flow meter		CWD Nunajack	c/w probe, transmitter, sizing calculation and calibration certificate	Mill process	
49-0001	Thermal mass flow meter	87	Pumps Plus c/o ITT Industries-Industrial Pump Group	Pumps ranging in size from 63x63mm (2.5x2.5in)to 305x254mm (12x10in) 65 with replaceable rubber lining 22 with high chromium white iron casing or replaceable high chromium lining c/w v-belt drives and guards c/w common pump-motor base plate for side mounting motor	Mill process	Frequent maintenance
49-0001A	High pressure horizontal slurry pumps	87	Liannu Limited Partnership	Ranging in size from 63mm x 63mm to 305mm x 254mm 65 with replaceable rubber lining 22 with high chromium white iron casing c/w v-belt drives	Mill process	Pump wet ends (impeller, suction side liners and shell) require frequent replacement depending on the abrasive nature of the slurry.
49-0001B	Tailings duty horizontal slurry pumps	87	Liannu Limited Partnership	Ranging in size from 63mm x 63mm to 305mm x 254mm 65 with replaceable rubber lining 22 with high chromium white iron casing c/w v-belt drives	Mill process	Pump wet ends (impeller, suction side liners and shell) require frequent replacement depending on the abrasive nature of the slurry.
49-0002	Sump pump	24	Sango Enterprises	Pumps ranging in size from 25mm (1in) to 100mm (4in) discharge 9 with replaceable rubber lining 15 with high chromium white iron casing or replaceable high chromium lining c/w cantilevered shaft design and side mounted motor c/w v-belt drives and guards	Mill process	Frequent maintenance and overhaul. Regular replacement of impeller and bearings

Appendix C Equipment List for Voisey's Bay Mine/Concentrator (Awarded as of May 2004)						
Package #	**Equipment**	**Qty**	**Supplier**	**Description**	**Function**	**Operation and Maintenance Opportunities**
49-0003	Vertical tank pump	25	Sango Enterprises	Rubber lined c/w rubber lined tank, screen to remove trash from feed slurry, shaft design and side mounted motor, belt drives and guards	Mill process	Frequent maintenance and overhaul. Regular replacement of impeller and bearings
49-0004	Gyrator crusher	1	FFE Minerals	Approx. 1067mm x1778mm (42in x 70 in) c/w crusher shell and main shaft assembly, drive and auxiliary motors, gear, eccentric and spider lubrication system, hydraulic setting system and dust seal blower	Mill process. Reduce size of ore	Regular mechanical and electrical inspections. Regular replacement of wear parts (bowl & mantel)
49-0005	Sag/ball mill	2	Outokumpu Technology	One 6700 mm (22ft) diameter inside shell by 2740 mm (9ft) effective grinding length gate discharge semi-autogenous grinding One 4900 mm (16ft) diameter inside shell by 6700 mm (22ft) flange to flange length trunnion overflow discharge with discharge trommel screen c/w single pinion drive, helical tooth pinion and ring gears, sole plates, skid mounted hydrostatic trunnion lubrication system, skid mounted pinion lubrication system, air-actuated gear spray lubrication system, fabricated steel jacking cradles, retractable feed chute assembly, clutch and guard c/w common hydraulic jacking system and common inching drive for use with both c/w three identical 3500 HP low speed synchronous motors designed for variable speed operation c/w sag mill variable frequency drive c/w local control panels with PLC based lubrication system controls, clutch controls and bearing temperature monitoring	Mill process. Reduce particle size	Requires Liner replacement (head & shell) on an annual basis (2 yrs for ball mill). This is performed using a liner handler designed for that purpose. In addition the gears (drive and pinion) will have an annual inspection for wear or damage. Bearings and lubrication are critical and monitored by maintenance trades by oil analysis and filter pressures.
49-0006	Liner handling machine	1	McLellan equipment Inc.	Suitable for removal and placement of shell, gate and end liners - completely self propelled, four wheel steering - direct acting hydraulic controls for all boom motions - main boom extension and retraction into integral telescopic cylinder - variable speed power trolley for liner transport into and out of sag mill - control cabinet and operator console c/w hydraulic controls and instruments	Mill process.	Minimal maintenance

Appendix C Equipment List for Voisey's Bay Mine/Concentrator (Awarded as of May 2004)						
Package #	**Equipment**	**Qty**	**Supplier**	**Description**	**Function**	**Operation and Maintenance Opportunities**
49-0007	Vertical mill	3	Metso Minerals Canada Inc.	Vertical stirred grinding mills - two concentrate regrinding mills c/w product separating tanks, drive motors and gear reducers, drive guards, liners, mill control systems, skid mounted lubrication systems - one lime slaking mill c/w product separating tank, vapour hood, feed pre-mix chamber, wet scrubber and fan, motors and drives, drive guards, liners, mill control system and skid mounted lubrication system	Mill process. Reduce particle size	Regular maintenance
49-0009	Hydrocyclone	3	Weir Pumps Canada	Hydrocyclone clusters c/w - feed pipe and distributor - vortex finders, fixed apexes, liners and overflow pipes - overflow launder - underflow launder - knife gate isolation valves - control panel and interconnecting tubing for opening/closing isolation valve - plugged apex sensor for each maintenance access platform surrounding and covering overflow launder	Mill process	Regular maintenance
49-0010	Sampler	20	Health & Sherwood (1964) Ltd.	- 12 linear traversing type primary samplers, suitable for use on gravity flow piping with slurry flows ranging from 20 m3/hr to 350 m3/hr - 8 pressure pipe thief type primary samplers suitable for vertical mounting in discharge piping of horizontal centrifugal slurry pumps having discharge diameters ranging from 100 – 200 mm (4-8 in)	Mill process	Minimal maintenance
49-0011	Particle size analyzer	1	Outokumpu Technology	Analyzer to measure on a continuous basis the solids size distribution and slurry density of grinding circuit product c/w - sample conditioning equipment if required - secondary sample splitting facilities if required - sample cutting equipment - calibration system - controls and control panel - interface to DCS/PLC plant control system	Process (testing)	Minimal maintenance

Appendix C Equipment List for Voisey's Bay Mine/Concentrator (Awarded as of May 2004)						
Package #	**Equipment**	**Qty**	**Supplier**	**Description**	**Function**	**Operation and Maintenance Opportunities**
49-0012	On-Stream analyzer	1	Outokumpu Technology	X-ray analysis system c/w - ability to analyze 24 streams in maximum time of 15 minutes - secondary sample splitting facilities - sample multiplexers and de-multiplexers - sample cutting equipment - sample conditioning equipment - liquid nitrogen generation system if required - centrally located computer system - interface to DCS/PLC plant control system	Process (testing)	Minimal maintenance
49-0013	Flotation cell	48	Dorr-Oliver Eimco	Mechanically agitated, forced air flotation cells - 22 with capacity of 38m3 - 26 with capacity of 8.5m3	Mill process	Impellers in floatation cells are the major maintenance issue. They would most likely be rubber or urethane and spares would be kept on site and the worn parts sent out for repair. Tanks, launders and piping are subject to corrosion and maintenance (patch or replace) after 8 to 10 years.
49-0014	Column flotation cells	4	MinnovEX Technologies Inc	2 – 3500mm diameter and 2 – 3100mm diameter c/w - self supporting tank with internal partitioning and launders - slurry feed, concentrate discharge, tailing discharge and launder water connection - froth wash water system - air sparging system - slurry level, air flow volume and froth wash water flow volume - monitoring instrumentation - interface to DCS/PLC plant control system	Mill process	Regular maintenance
49-0015	Pressure filter	4	Larox Canada Inc.	Capable of continuous, fully automatic cycling c/w - hydraulic systems and cake pressing systems with necessary motors - valving and piping - platforms, stairs, wash stations, enclosures, and lifting devices - instrumentation and self-contained control system - drip trays and troughs	Mill process	Regular maintenance

Appendix C Equipment List for Voisey's Bay Mine/Concentrator (Awarded as of May 2004)						
Package #	**Equipment**	**Qty**	**Supplier**	**Description**	**Function**	**Operation and Maintenance Opportunities**
49-0016	Thickener mechanisms	4	Outokumpu Technology	3 high-rate design bridge supported suitable for installation in 9.1m diameter by 3.0m side wall height tanks 1 high-rate design bridge supported suitable for installation in 22.9m diameter by 3.0m side wall height tank c/w - feed piping - auto-dilution feed well - discharge cone or alternate discharge equipment - mechanical or hydraulic thickener drive with motors, couplings and guards - drive shaft, rakes and discharge cone scrapers - steel beam support bridge including walkway, handrail, maintenance monorail - motorized rake lifting device - local control panel and controls - interface to DCS/PLC plant control system	Prepares slurries to the density required	Drive mechanism requires normal electrical and mechanical service. Major replaces of rakes 5 to 6 years. Structure and tanks should operate 20 years before major work is required.
49-0017	Flocculant preparation package	2	CIBA Specialty Chemicals Canada Inc.	Pre-assembled skid-mounted c/w - bag lifting frame for direct use of bulk bag - feed hopper suitable for use with a bulk bag system - equipment and associated feed piping - wetting assembly and agitated aging tank - drives, motors and guards - DCS/PLC based control system - interface to DCS/PLC plant control system	Mill process	Regular maintenance
49-0018	Horizontal solution pumps	27	Flowserve Canada Inc.	Ranging in size from 25mm (1 in) to 200mm (8 in) discharge including ANSI standard pumps, double-suction pumps, and API standard pumps c/w - wetted components and mechanical seals - direct drive arrangement	Mill process	Regular maintenance

Appendix C Equipment List for Voisey's Bay Mine/Concentrator (Awarded as of May 2004)						
Package #	**Equipment**	**Qty**	**Supplier**	**Description**	**Function**	**Operation and Maintenance Opportunities**
49-0019	Reactor clarifier mechanism	1	Dorr-Oliver Eimco	Suitable for year-round operation in 26.0m dia. by 5.0m side wall height tank c/w - feed piping - solids-contact feed well - discharge cone or alternate discharge equipment - mechanical or hydraulic rake drive with motors, couplings, guards - drive shaft, rakes and discharge cone scrapers - steel beam support bridge including walkway, maintenance monorail - motorized rake lifting device - local control panel and controls - interface to DCS/PLC plant control system	Mill process	Regular maintenance
49-0020	Lamella clarifier	1	Parkson Corporation	c/w - flash mix tank and agitator - flocculation tank and agitator - clarifier tank with lamella packs, discharge launders and sludge hopper - rake drive mechanism - instrumentation, controls and panel - platforms	Mill process	Regular maintenance
49-0022	Vibrating screens	3	Metso Minerals Canada Inc.	2 double deck SAG discharge screens 800 by 4300 mm (6 by 14 ft) 1 single deck trash screen 1800 by 3700 mm (6 by 12 ft) c/w drives and motors	Mill process	Screens are high maintenance items in both the feed and discharge end of SAG mill. Screens must be replaced frequently.
49-0023	Agitator	21	Hayward Gordon Ltd.	11 bridge mounted 10 rim mounted c/w - removable impeller - solid or extra-heavy wall pipe shaft - gear reducer drive assembly with motor	Mill process	Regular maintenance
49-0024	Progressing cavity pump	9	Shuashim Group	Single or multi-stage c/w - motor and speed reducer suitable with VFD - viton stator and stainless steel, hard chrome plated rotor	Mill process	Regular maintenance

Appendix C Equipment List for Voisey's Bay Mine/Concentrator (Awarded as of May 2004)						
Package #	**Equipment**	**Qty**	**Supplier**	**Description**	**Function**	**Operation and Maintenance Opportunities**
49-0025	Diaphragm metering pump	8	Innu Supply Outlet Ltd.	Piston-diaphragm c/w - reciprocating gear driven piston - flow control devices - flow rate adjustable manually and from DCS - Teflon diaphragm - Calibration tube - Interface to DCS/PLC plant control system	Mill process	Regular maintenance
4B-0002	Hot water boiler	2	Bruce Sutherland Associates Ltd.	Oil fired heating boilers c/w - management control system - lead/lag control system - low fire hold - efficiency monitoring system - low NOx emission control - boiler trim - forced draft burner - burner, piping and fuel trains - oil atomizing system - prefabricated boiler stack system	Process	Electrical controls to be maintained and upgraded as required. Tubes, pumps and burners require regular replacement or rebuild.

Appendix D

Classification of Mining Goods and Services from Inco's Commodity Listing

The following list of goods and services categories originated from a list obtained from Inco's Ontario Division. This list was reduced to remove items primarily related to underground mining, smelting and refining to reflect those items used primarily in an open pit mine and concentrator. The estimated annual amounts were prepared based on the Study Team's experience and are not meant to be definitive estimates.

1) Abrasives

Description

- Materials for grinding, polishing, blasting, either in loose form or bonded to form wheels, bricks, or files, or applied to paper and cloth by glue or resin. Natural abrasives include emery, corundum, garnet, sand, flint, etc. Metallic shot and grit are also used as abrasives in cleaning castings. Used to wear down and smooth out rough surfaces, such as sandpaper.

Deployment

- Used by tradespeople in the maintenance of all project facilities and equipment.

Examples

- Abrasives
- Diamond Cutting Wheels
- Emery Cloth
- Grinding Stones
- Grinding Wheels
- Sandpaper

2) Adhesives, Coatings and Sealants

Description

- Adhesives are s substance capable of holding materials together by surface attachment. Various descriptive adjectives are used with the term adhesive to indicate certain characteristics: physical (liquid adhesive, tape adhesive), chemical type (silicate adhesive, resin adhesive), materials bonded (paper adhesive), and conditions of use (hot-set adhesive).
- Coatings are paints, varnishes, lacquers or other finish used to create a protective and/or decorative layer. Coatings is generally used to refer to paints and coatings applied in an industrial setting as part of the original equipment manufacturer's (OEM) process.
- Sealants is a generic term for a multitude of materials used to seal joints or junctures against moisture or weather.

Deployment

- Used by tradespeople in the maintenance of all project facilities and equipment.

Examples

- Adhesives (e.g. glue)
- Belt Dressing
- Coatings
- Compounds
- Creosote
- Devcon
- Dressing Belt
- Epoxy
- Graphite – Flake
- Lead White
- Loctite
- Nordbak
- Plumbers Oakum
- Sealants - i.e. Dow Corning
- Tar and Creosote
- White Lead

3) Aggregates

Description
- Sand and gravel, crushed rock and other bulk materials used in the construction industry for purposes such as the making of concrete, mortar, asphalt or for roadstone, drainage or bulk filling

Deployment
- Mill, Mine, and Port roads construction and maintenance.

Examples
- Asphalt - Road
- Clay - Swamp
- Crushed Stone
- Gravel
- Salt - Sand Mix

4) Agricultural Equipment and Supplies

Description
- Equipment and supplies related to agriculture, including lawn care.

Deployment
- Primarily used during reclamation activities and in Sudbury for their environmental remediation activities.

Estimated Voisey's Bay Mine/Concentrator Requirements
- Not a major commodity, however, there will be some used during ongoing progressive remediation and during operations in the maintenance of the site. >$2,000 per year

Examples
- Agricultural Equipment & Supplies
- Limestone - Agricultural

5) Automotive Electrics

Description
- Automotive parts and accessories with electrical functions.

Deployment
- Used in the maintenance of all vehicles, including on and off-road vehicles.

Examples
- Alternators - Automotive
- Automotive Electrics (i.e. spark plugs, seal beams etc.)
- Distributors Automotive
- Electrical Wire & Cable - Automotive
- Gauges - Automotive
- Generators Automotive
- Pullers (Terminal - Whittaker)
- Seal Beams - Automotive
- Solenoids Automotive
- Spark Plugs
- Starters Automotive
- Stewart Warner Gauges
- Tachometers - Engine
- Whittaker Cable

6) Automotive Powertrain and Brakes

Description
- Automotive supplies and parts related to powertrain and brakes.

Deployment
- Used by the maintenance shops for maintaining both on and off-road vehicles, including heavy equipment.

Examples
- Brakes and Brake Lining
- Clutches - Automotive
- Differentials - Automotive
- Dynamometer - Engine
- Engine Dynamometers
- Transmission Automotive
- U-Joints - Automotive
- Universols - Automotive
- Wheel Studs

7) Batteries and Chargers

Description
- Batteries, chargers and parts.

Deployment
- Used by the maintenance shops for maintaining both on and off-road vehicles, including heavy equipment.

Examples
- Batteries - All (Except for OEM Instrumentation Equipment)
- Battery Chargers – All
- Battery Parts

8) Building and Building Materials

Description
- Includes all building materials used for new construction, renovations and maintenance.

Deployment
- Maintenance of all buildings, offices for mill, mine and port.

Examples
- Arborite Masonite Boards
- Asbestos Cloth (Insulation)
- Brushes - Paint (including paint rollers)
- Building Brick
- Building Tile
- Buildings - Prefab Sheds Butler Portable Offices
- Cloth - Asbestos
- Corrugated Steel (Sheeting)
- Crayons (Including Lumber Crayons)
- Door Closers
- Doors - Wooden Rolling Overhead (Not Vent)
- Eavestrough
- Excelite (Plastic Sheeting)
- Fiberfax Blanket Insulation
- Flooring - Tile Vinyl Marble Wood (excluding carpet)
- Gangway and Handrails
- Hand Rails
- Insulation (Building Pipe)
- Paint - Including Rollers & Brushes
- Roofing (Shingles Roll Roofing Flashing)
- Shellac
- Siding - Vinyl - Asbestos - Aluminum - Steel
- Snap Ties
- Weatherstripping
- Windows (Includes Replacement Glass except Automotive)

9) Castings

Description
- Castings for primary crusher wear parts.

Deployment
- Mill primary crushing circuit.

Examples
- Crusher - Castings to VBNC Patterns
- Grate Bars

10) Cement and Concrete Products

Description
- Includes all cement and concrete products, including machinery and equipment for using concrete, both pre-set blocks and cement mix.

Deployment
- Maintenance and alterations to mill, mine and port facilities such as equipment foundations, sumps and buildings.

Examples

- Rock Bolt Resins
- Blocks (Cement)
- Celtite (Roof Bolt Resin)
- Cement - Bagged Portland (Excluding Refractory)
- Cement - Bulk
- Cement - Portland Fondu Grout Shotcrete (bagged)
- Concrete Additives
- Concrete Blocks & Lockstone
- Concrete Mixers
- Formwork Parts - Ties Clamps Anchors & Roofing
- Grouting Compound - Including Rock Bolt Resins
- Gunite Mix & Gunite Machines
- Lockstone
- Sakrete
- Shotcrete & Machines

11) Chemicals

Description

- Includes all chemicals used in the mining ad milling process such as reagents (e.g. lime, xanthate, flocculants, etc.).

Deployment

- Used primarily for the milling operations.

Examples

- Alcohol
- Ammonia
- Barite
- Carbon (except carbon filters)
- Caustic Soda
- Chemicals - (Non-Metallic)
- Chemicals - Including Lime Reagents etc.
- Graphite Tubes
- Javex
- Lime
- Reagents (except cleaners & degreasers)
- Salt - Bulk and Bags
- Soda Ash

12) Industrial Cleaning Agents

Description

- Cleaning agents and supplies used for industrial purposes.

Deployment

- All areas

Examples

- Battery Cleaners
- Battery Terminal Cleaners
- Chemicals - Cleaning Supplies
- Contact Cleaners
- Degreasers
- Exterminators
- Linseed Soap
- Machinery Cleaners i.e. Magnus
- Pipe Cleaner – PVC
- Powdered Acid Cleaners (dewatering pump water pump desealing)
- PVC Pipe Cleaner
- Rubber Cleaners

- Leather & Saddle Soap
- Solvents

13) Cleaning Contracts

Description
- Includes cleaning contracts provided to 3rd party janitorial firms.

Deployment
- Housing facilities and offices

Examples
- Carpet - Rugs - Cleaning - VBNC Owned
- Cleaners Vacuum
- Cleaning of VBNC owned coveralls drapes rags rugs
- Clothing & Uniforms - Cleaning - VBNC Owned
- Curtains/Drapes - Cleaning - VBNC Owned
- Wipers - Cleaning - VBNC Owned

14) Cleaning Machines

Description
- Includes a wide variety of machinery used for cleaning, both portable and fixed. Most of the requirement will be purchased as part of the capital project.

Deployment
- Mill, offices and living facilities.

Examples
- Brushes for Cleaning Machines
- Cleaning Machines
- Cleaning Machines - Janitorial
- Degreasing Equipment
- Dip Tank
- Floor Polisher
- High Pressure Water Cleaning Systems
- Jenny Steam
- Power Sweepers
- Sandblasting Equipment & Machines
- Steam Cleaners
- Sweeper - Power
- Tennant Sweepers
- Vacuum Cleaners
- Water Spray Cleaners

15) Computer Equipment and Supplies

Description
- Includes all computer-related equipment and supplies. Some will be upgrades to process control (DCS) supplied by OEM

Deployment
- Offices and process control equipment

Examples

- Cathode Ray Tubes (C.R.T.'s)
- Computer Supplies (Including Software)
- Timers

16) Electrical Instrumentation

Description

- Electrical and instrumentation parts and components required to maintain electrical equipment and high voltage distribution system

Deployment

- Maintenance of mine, mill and port electrical and instrumentation system.

Examples

- Arrestors - Lightning
- Controls - Traffic
- Electrical Tape
- Bin Indicators - Electrical
- Controls - Level Mercoid Combustion and Utilities
- Counters - Electrical
- Electronics
- Indicators Bin
- Instruments - Electrically Powered
- Load Centres and Panelboards
- Meters - Electrical
- Meters - Watthour
- Pens for Instruments
- Potentiometers
- Potheads
- Push Button Stations
- Sub-Stations
- Temptips for Instruments
- Testers - Electronic
- Thermocouples
- Transducers

17) Electrical Insulation and Lighting

Description

- See Item 16

Deployment

- See Item 16

Examples

- Cap Lamps & Accessories
- Electrical Generators - ONAN
- Flashlights
- Illumination (light bulbs and fixtures)
- Insulation - Electrical (Tape Sheet Rod)
- Tape - Electrical Insulation

18) Electrical Powered Devices

Description

- See Item 16

Deployment
- See Item 16

Examples
- Air Horns - Electrical
- Alarms - Fire Electrical (Edwards)
- Appliances - Electric (Fridges stoves etc not cleaning machines)
- Appliances Including Auto & Video Equipment
- Audio Equipment
- Brakes - Electrically Operated-Includes Crane Brakes Sterns etc
- Brushes - Carbon
- Cassettes - Audio & Video Blank
- Clocks - Electrical
- Coffee Maker - Electric
- Communication Systems
- Fire Alarms - Electrical (Edwards)
- Gear Motors
- Generators - Electrical - i.e. ONAN (excluding automotive)
- Motors - Electrical
- Motors - Gear
- Ovens - Warming (Food)
- Phones
- Refrigerators
- Signalling Equipment i.e. horns - chimes
- Starters - Electrical (Not Automotive)
- Telephones

19) Electrical Transfer and Interrupt Devices

Description
- See Item 16

Deployment
- See Item 16

Examples
- Controls Relays & Switches
- Breakers - Circuit (High Voltage Transformers)
- Breakers - Circuit All
- Breakers Circuit (Panelboards ITE)
- Capacitors - Power Factor
- Contactors
- Fuses - All
- Panelboards - Electrical (I.T.E.)
- Pressure Switches
- Rectifiers
- Relays
- Resistors - Electrical
- Rheostats
- Solenoids not Automotive
- Splitter Trough
- Switches
- Switchgear
- Thermostats - Electrical
- Transformers

20) Electrical Wire Cable and Service Entrance

Description
- See Item 16

Deployment
- See Item 16

Examples

- Boxes & Covers - Crouse-Hinds - Kondu
- Cable - Wire Electrical
- Cable Ties
- Cable Trays & Support Systems
- Cantrough
- Conduit Pipe & Fittings
- Connectors - Electrical (Incl. splice & termination kits)
- Electrical Wire & Cable (Excluding Automotive)
- Electrovert Cable Trays
- Fittings - Electrical
- Junction Boxes
- Plugs & Receptacles - Electrical
- Pole Line Hardware
- Receptacles - Electrical
- Staffel Cable Tray
- Trolley Line Hardware

21) Engineering, Geological and Environmental

Description

- Survey equipment, and sampling equipment for water discharge

Deployment

- Mine and mill

Examples

- Booms - Pollution Control
- Engineering Geological & Environmental Supplies
- Magnetometers
- Stop Watches
- Surveying Equipment & Supplies (unless otherwise identified)

22) Engines, Small

Description

- Replacement motors for small equipment

Deployment

- Mill and port

Examples

- Blowers - Snow
- Motors - Hydraulic i.e. Char Lynn - Vickers
- Motors - Outboard

23) Explosives

Description

- Explosives & blasting supplies including loading equipment.

Deployment

- Mine

Estimated Voisey's Bay Mine/Concentrator Requirements

- Amount required varies depending on mine plan, however, explosives are expected to be a significant cost in the open pit mining operations. An estimate based on tonnage of ore moved is $0.50 per tonne or $3,000 per day or approximately $1,000,000 per year.

Examples

- Analoaders & Loading Pipes
- Anfoloaders
- Blasting Machines
- Explosives & Blasting Supplies
- Explosives and Accessories
- Galvanometers Voltohmeters - Blasting
- Loader
- Polychains

24) Fasteners - Rock Bolts

Description

- Fasteners required for the maintenance of equipment and facilities.

Deployment

- All areas

Examples

- Anchor Bolts
- Bolts
- Cap Screws - All Grades
- Carriage Bolts
- Cotter Pins
- Dowel Pins
- Dowel Rods
- Elevator Bolts
- Eye Bolts
- Fasteners - Other
- Hex Bolts
- Lag Screws
- Machine Screws
- Nails - All Types
- Nuts - All Types
- Plow Bolts
- Rivets
- Rock Bolt Plate Washers - Metal
- Rock Bolts
- Roll Pins
- Screws - Cap - Machine - Set - Wood etc.
- Self Tapping Screws
- Set Screws
- Springs (except if identified to a place of equipment)
- Stove Bolts
- Studs
- Taper Pins
- Thread Repair Inserts
- Threaded Rod
- Toggle Bolts
- U-Bolts
- Washers - All types except wooden
- Wood Screws

25) Powered Fastening Systems

Description

- Power fasteners such as Hilti, Huck bolts and rivets required in maintenance and construction work.

Deployment
- All areas

Examples
- Fastener Systems (Powered)
- Flexco Systems Including Fasteners
- Hilti Systems (Including Fasteners)
- Huck Systems (Including Fasteners)
- Nails for Hilti System
- Ramset Systems (Including Fasteners)
- Red Head Systems (including fasteners)
- Rivet Systems (Including Fasteners)

26) Filters and Media

Description
- Filters for mobile equipment, dust collectors, water, and process press filter cloth.

Deployment
- Mill, mine and surface facilities.

Examples
- Automotive Filters
- Bags - Filter
- Dust Bags
- Filter Cloth
- Filters - Airline (Excluding Respiratory Filters)
- Filters - Automotive and Mobile
- Filters - Environmental
- Filters - Industrial
- Filters - Mobile Equipment
- Filters – Water
- Gaskets - Filter (Mobile)
- Industrial Filters
- Polypropylene used for filtration

27) Finished Product Handling

Description
- Containers and packaging materials

Deployment
- Shipping and materials handling.

Examples
- Band-It Tools
- Containers - Drums etc.
- Corrugated Paper
- Corrugated Paper & Edgeboard used for shipping products
- Packaging & Strapping Systems
- Plastic Containers - Drums etc. for shipping product
- Seals - Strapping (Acme Signode etc.)
- Signode Seals
- Steel - Containers (cans and drums)
- Strapping & Guns

- Pallets - All

28) Foodstuffs and Confectionery

Description
- Food, and kitchen supplies for camp and catering.

Deployment
- Surface facilities

Examples
- Cups - Paper Styrofoam
- Aluminum Foil
- Coffee Supplies (Including Styrofoam Cups)
- Coffee
- Cornmeal
- Donuts
- Foil – Aluminum
- Groceries
- Paper Wax (Household)
- Saran Wrap (Household)
- Utensils
- Vending Machines

29) Fuels, Gases and Lubrication

Description
- Fuel oil, diesel fuel, Acetylene, Lubricants etc.

Deployment
- All areas

Examples
- Acetylene
- Additives & Conditioners (Fuel Oil & Gas line etc.)
- Antifreeze
- Appliances - Propane
- Bardahl
- Charcoal
- Conditioners (Fuel Oil Gas Line etc.)
- Fuel Oil
- Gases (Oxygen Propane Acetylene etc.)
- Gasoline
- Gum Solvent for Engines
- Kleenflo
- Lubricants - Oil & Greases
- Oxygen
- Procon 2209 (Preservative for mothballing equipment)
- Propane Stoves & Appliances
- Propane

30) Hardware

Description
- Various supplies such as keys, string, snap ties, etc.

Deployment
- All areas

Examples
- Annealed Wire (Hay Wire Piano Wire)
- Awning Pulleys
- Bag Ties
- Bottles - Glass (except for oil sampling)
- Cord - String
- Finishing Hardware - Hinges Hangers Handles
- Garbage Cans
- Hooks - Carpentry
- Jugs - Thermos
- Keys - Padlock
- Locks
- Netting – Poultry
- Pails
- Rope (Sisal Polypropylene Nylon)
- Sash Cord
- Tape (all except Dymo and Electrical)
- Twine
- Glass
- Mirrors
- Screening - Window
- Ties – Snap

31) Heating Equipment (Building)

Description
- Heaters, boilers and furnaces. This type of equipment will be purchased as part of the capital project.

Deployment
- All areas

Examples
- Boiler - Industrial
- Burners
- Dampers
- Fire Eye Test Kits (Including Fluid)
- Furnaces - Heats (Oil & Gas Fired) (Not used in Production)
- Gaskets – Boiler
- Heat Exchangers
- Heater - Unit (Bldg. Heating Steam Gas Electric & Baseboard)

32) Janitorial Supplies

Description
- Supplies used in the cleaning and maintenance of the accommodations complex and administrative offices.

Deployment
- Buildings and offices.

Examples
- Brooms - Including Switch Brooms
- Brushes
- Chlorinated Lime
- Decomposers
- Lime - Chlorinated
- Lye - Granulated
- Lysol
- Metal Cleaners

- Deodorant - Urinal Blocks
- Deodorizer
- Disinfectant
- Drain Cleaners
- Floor Cleaners (Oil Absorbent & Dustbane)
- Floor Strippers
- Glass Cleaner
- Household Cleaners
- Mops and Mop Buckets
- Mouse Traps
- Oven Cleaners
- Pads - Cleaning
- Polish
- Powder - Cleaner
- Toilet Cleaner
- Wax

33) Laboratory Supplies

Description
- Laboratory supplies for processing samples from the mine and mill.

Deployment
- Mine and mill

Examples
- Crucibles
- Discs Filter (Lab)
- Electrodes - Laboratory
- Electrodes & Graphite Plates
- Furnaces - Laboratory
- Glass Ware e.g. beakers test tubes flasks etc.
- Laboratory Instruments
- Laboratory Ovens
- Laboratory Reagent Chemicals
- Laboratory Scales
- Laboratory Supplies
- Magnification Equipment
- Pulverizers - Lab
- Samplers - Lab
- Stills
- Surface Grinders & Polishers - Field Exploration
- Testing Machines - Lab
- Tubing - Tygon

34) Lubricating Equipment

Description
- Included in Item 26

Deployment
- See Item 26

Examples
- Alemite Grease Fittings
- Barrel Pumps
- Cans - Oil Gas Oiling
- Centralized Oil & Grease Systems e.g. Alemite
- Funnels
- Gasoline Cans
- Grease Cups
- Grease Guns (Alemite Lincoln)
- Line Oilers
- Lubricators - Alemite Gardner Denver Wills Etc.
- Oil Cups
- Oil Fog Lubricators
- Oil Line Regulators
- Protecto - Seal Containers

- Grease Fittings - Alemite - Lincoln

35) Lumber, Timber and Wood Products

Description
- Lumber and timber.

Deployment
- All areas

Examples
- Cedar Balls
- Core Trays
- Ladders (All)
- Line Poles
- Lumber & Timber
- Plugs - Wooden
- Plywood
- Round Logs
- Sawdust & Shavings
- Stakes – Wood
- Washers - Wood
- Wedges – Wood
- Wood Tanks

36) Material Handling

Description
- Equipment used for storage and handling of material. Conveyor systems, magnets and overhead cranes will be purchased and installed as part of the capital project.

Deployment
- Mine, mill and port

Examples
- Air Cylinders - All except mobile equipment
- Blocks - Snatch Slusher Chain & Sheave
- Cable Hoists
- Casters
- Chain Blocks & Trolleys
- Come-A-Long Lever Hoists
- Conveyor Systems - Excluding Belting
- Cranes - Truck Mounted Rail Mounted
- Dredges
- Elevators i.e. Otis also Alimak Raise Systems
- Feeders
- Floor Trucks
- Hydraulic Cylinders - All Except Mobile Equipment
- Hydraulic Power Systems
- Idler - Conveyor
- Jacks
- Load Cells
- Magnets - All Types
- Material Handling Equipment - Dollies Drum Cradles etc.
- Overhead Cranes & Hoists (except mobile cranes)
- Rack – Shelving
- Redirack
- Scaffolding & Platforms
- Scales - Except Lab
- Shovels (not hand i.e. B.E.)
- Trollies for Chain Blocks
- Vibrators
- Wheelbarrows
- Wheels for Material Handling Equipment
- Winches

37) Medical Supplies

Description
- First aid and other medical supplies required to meet all health and safety standards.

Deployment
- Medical support services and at first aid stations throughout the site

Examples
- First Aid Supplies
- Medical Supplies for Clinic

38) Metal Fabrication and Forgings

Description
- Mill liners, 1" 2" & 4" grinding balls, chute liners, expanded metal and other miscellaneous steel products.

Deployment
- All areas

Examples
- Welded Wire Screening (Underground)
- Bull Horns
- Fabrications (Misc. - Support Steel not identified to equip)
- Fencing (All) and Gates
- Gate Liners (Chute)
- Grating (Floor)
- Grinding Media
- Hoppers - Loading (Mine)
- Liners - Crusher Stn. Loading Hopper Loading Stn
- Liners - Gate (Chute)
- Liners - Mill Crusher (Process Equipment)
- Scaling Bars - Gads - Bull Horns - Timber Dogs
- Steel - Cold Finished
- Steel - Forgings (raw or unfinished)
- Steel - Mesh (expanded)
- Tanks - Fabricated to a drawing - Steel
- Timber Dogs
- Wire Mesh

39) Metals

Description
- Other metals not included in Item 38.

Deployment
- All areas

Examples
- Angle Iron
- Mercury

- Bar Copper.
- Barb Wire - Fencing
- Brass Rod Sheet etc.
- Copper-Bar Flat Round Sheet Bus etc.
- Ferro Silicon
- Lead Pipe (Conversion)
- Lead Sheet
- Steel - Hot Rolled
- Steel – Stainless
- Steel - Structural
- Steel – Tool
- Steel Alloy
- Steel Billets

40) Office Equipment Supplies and Services

Description

- Office Supplies including stationery, furniture and miscellaneous items.

Deployment

- Mine, mill, & port offices

Examples

- Air Photos
- Name Plates
- Stamps & Stencils
- Beds
- Business Machines - (Calculators Typewriters Word Processors)
- Cabinets (Furniture)
- Calculators
- Cameras
- Carpet - Rugs
- Chalk
- Conversion Tables - Metric
- Curtains/Drapes - Purchase
- Dymo Tape
- Frames - Pictures
- Furniture
- Lockers & Baskets
- Moving Expenses for Employees
- Pens - Except for Instruments
- Stationery (not including paper)
- Tape – Dymo
- Tapewriter and Tapes

41) Off-Road Vehicles

Description

- Operation of mobile equipment purchased as part of the capital project.

Deployment

- Site services

Examples

- Air Craft
- Boats
- Bucket Wear Parts
- Bulldozers
- Ditch Cleaners
- Engines - Gas Diesel Propane (Automotive)
- Loader Tractors
- Snow Plows
- Snowmobiles
- Surface & Underground Vehicles (All Terrain Equipment)
- Swinger Loader
- Teletrams

- Forklift Trucks
- Graders
- Haulpak
- Tractors – Mining
- Trailers
- Utility Trucks

42) On-Road Vehicles

Description
- Includes vehicles that are not heavy equipment; usually pick-up trucks.

Deployment
- Site services

Examples
- Automobiles
- Car Washes
- Dump Trucks
- Pick Ups

43) Personal Hygenics and Sanitation

Description
- Personal hygiene and sanitary products required for the accommodations facilities.

Deployment
- All areas

Examples
- Bar Soap
- Barrier Creams
- Dispenser Soap
- Gel Soap
- Goggle Cleaner
- Hand Cleaners
- Insect Repellants i.e. Raid
- Insecticides
- Lens Cleaning Stations
- Personal Hygienics
- Pest Control
- Sanitation - Insecticides Exterminators
- Soda (gas masks bag filters)
- Napkins and Dispensers

44) Pipe and Fittings

Description
- Steel and polyurethane pipe and fittings in sizes from 16” to ½” required for maintenance of plant equipment and facilities

Deployment
- All areas

Examples
- Boiler Tubes
- Mineways

- Coupling - Pipe
- Culverts (Corrugated Pipe)
- Fittings - Pipe i.e. elbows tees nipples
- Gaskets - Coupling
- Gaskets - Flange Ring
- Gaskets - Pipe
- Hose - Metal Braided
- Pipe (Plastics Steel Copper Cement)
- Reducers – Pipe
- Rubber Lined Pipe and Valves
- Strainers - Pipe (Y Pattern)
- Tube Fittings
- Tubing - Mechanical - Copper
- Welding Flanges & Fittings (Pipe)

45) Plastics

Description
- Materials and supplies made from plastic.

Deployment
- All areas

Examples
- Bags - Plastic
- Bottles - Plastic
- Container Lining - Plastic Thin Sheeting
- Containers - Plastic (bottles drums etc. except shipping products)
- F.R.P. Fabrication (Excluding Ductwork)
- Fiberglas - Except filter media
- Film - Polyethylene (not photographic or engineering)
- Plastic Bags
- Plastic Covers & Tanks
- Plastic Film
- Plastic Plugs (I.T.H. Marker)
- Plastic Sheeting
- Plastic Tubing
- Polyethylene Sheeting Tubing (not including vent ducting or pipe)
- Polypropylene Sheeting tubing (not including vent ducts or pipe)
- Tanks - Fabricated to a drawing - FRP (Plastic)
- Vinyl Tubing

46) Plumbing

Description
- Plumbing supplies

Deployment
- Maintenance.

Examples
- Chemical Toilets
- Gesters
- Heater - Water
- Hot Water Tanks
- Plumbing & Fixtures
- Plumbing Supplies (including Water Coolers)
- Water Coolers
- Water Meters

47) Power Transmission Industrial

Description
- Maintenance parts for rebuilding power transmission equipment.

Deployment
- Mill and mine maintenance shops.

Examples
- Backstops Shaft Mounted Reducers
- Bearings
- Bushings - Gear Reducers Sheaves Coupling Sprockets
- Chain Roller
- Clutches - Industrial
- Collars - Shaft
- Coupling - Industrial
- Gaskets & Materials
- Gear Reducers
- Gears
- Gib Keys
- Mechanical Seals
- Oil Seals
- O-Rings
- Packing - Teflon
- Packing & Gaskets
- Pulley – Belt
- Retaining Rings - Truarc etc.
- SCR Speed Controls
- Seals - Oil Mechanical
- Sheaves
- Speed Increasers
- Speed Reducers
- Sprockets
- Teflon Packing
- Turbines i.e. Delavl - CGE
- Variable Speed Drives
- Woodruff Keys

48) Process Equipment

Description
- Process equipment most will be purchased as capital cost and will not require replacement for 10 to 20 years. Liners for mill and cyclone cones are exception and could be classed as wear items.

Deployment
- Mill

Examples
- Agitators
- Cells - Flotation
- Centrifuges
- Chlorinators
- Classifiers
- Crushers
- Cyclones
- Dryers - Process (Used to Dry Product)
- Flotation Cells
- Launders, Flotation
- Mill Liners - Rubber – Steel
- Mills - Rod - Ball – Pebble
- Rubber Lining - Mill
- Samplers - Process
- Screens - Metal and Rubber
- Screens (Vibrating and Woven)
- Separators
- Thickeners

49) Promotional Supplies

Description

- Various promotional materials such as clothing and stationary with corporate logo.

Deployment

- All areas

Examples

- Advertising
- Ashtrays
- Awards (Knives Pens Rules etc.)
- Banners
- Brushes and Paint - Artist - Portraits
- Calendars (Except Daytimers)
- Cards (Christmas)
- Christmas Decorations
- Decals (Including Brady Markers Electrovert)
- Dues
- Educational Courses
- Educational Films
- Electrovert Markers
- Flags
- Gifts - Sets of Glasses Pens etc.
- Key Chains
- Letraset & Letrasign
- Markers (Electrovert Brady etc.)
- Memberships
- Paint - Artists - Portraits
- Photographic Supplies
- Photo's Air
- Pins
- Plaques
- Posters - Safety
- Printing (Business Cards)
- Promotional Materials
- Safety Awards (Gifts Presentations etc.)
- Signs (including wire markers - Electrovert and Brady)
- Suitcases
- Trophies
- Books
- Subscriptions

50) Pumps

Description

- Process pumps will be purchased as part of the capital project. Rebuild is frequently required in the mill and tailings slurry application. Water, sewage, and steam require less frequent rebuilds.

Deployment

- Mill, utilities and port. Maintenance of pumps is a major expense in a milling operation.

Examples

- Diaphragm - Pump
- Hydraulic Pumps (if identified)
- Pump parts
- Impellers - Pump

51) Rock Drilling

Description
- Rock drilling supplies include drill bits and steel.

Deployment
- Drilling of ore and waste in pit and underground

Examples
- Bits - Buttons Carbine Diamond Percussion
- Blocks - Knock-Off (For Bits & Steel)
- Chassis & Parts for all Drills
- Diamond - Industrial
- Diamond Drill Parts - Clinometer Culture Tubes Column Parts etc.
- Drill Steel & Accessories
- Drill String
- Drills - In-The-Hole Down-The Hole GO.60
- Drills - Jumbo
- Drills - Rock (Airlegs Longhole Stopers)
- Drills - Rotary (Bucyrus-Erie C.I.R.)
- Getman
- Jacklegs
- Plugs – Grout
- Pullers - Steel Hand Pneumatic (Tractodrill-Flottmann)
- Scissor Lifts - Mobile Drilling Platforms
- Stopers
- Timberjack
- Tuyere Punchers

52) Rubber, Industrial

Description
- Rubber lining, hoses, tires and belting

Deployment
- Mine, mill and port for replacement and consumable parts

Examples
- Aeroquip Hose & Fittings
- Belting - "V"
- Belting - Conveyor
- Coupling - Hose
- Fabreeka
- Gaskets - Hose
- Hose & Fittings
- Hose Clamps & Tools i.e. Punchlok Oetikker
- Lining - Linatex - Launder
- Rims – Tire
- Rubber Belting
- Rubber Scraper
- Rubber Skirtboard
- Shapes - Moulded (Rubber)
- Skirtboard - Rubber
- Tires & Tubes - Repairs and Contracts
- Wedges - (Urethane Rubber etc.)
- Welding Hose

53) Safety and Fire Protection

Description
- Fire protection will be installed as part of capital project. Miscellaneous supplies and replace items as listed below will be replaced as required.

Deployment

- All areas

Examples

- Alarms - Other
- Aprons - Canvas Chrome Leather etc.
- Clocks - time (Detex)
- Clothing & Uniforms (Purchase Rental Alterations)
- Drager Gas Detectors
- Filters - Breathing Air
- Fire Alarms - Other
- Fire Equipment
- Fire Systems - Other (not electrical)
- Footwear
- Nozzles - Fire Hose
- Safety Apparel
- Safety Instruments i.e. Bacharach Bendix Samplers
- Safety Supplies
- Smoke Detectors

54) Shop Equipment

Description

- Machine and maintenance shop equipment that will be purchased as part of the capital project.

Deployment

- Mine, mill and port

Examples

- Balancing Machines
- Bending Machines (Sheet Pipe)
- Boring Machines (NC Horizontal)
- Broaching Machines - Centering Machines
- Chucking Machines - Cut-off Machines
- Deburring Machines
- Diamond Tools
- Disintegrators
- Drill Machines Shop (Bench Radial Turret)
- Drill Press Shop
- Forging Equipment - Crimping
- Grinders (Bench Pedestal etc.)
- Honing Machines - Keyseating Machines
- Hose Making (Assembling) Machines
- Lathes (Axle & Wheel Bench Engine)
- Machining Centres
- Milling Machines (Duplex Planer)
- Ovens (Burnoff Bearing Heaters)
- Presses (Hydraulic Punch) Sanders
- Sanders Shop
- Shop Equipment
- Spraying Equipment - i.e. Binks Devilbiss Mistral
- Tapping Machines - Threading Machines
- Test Benches

55) Textiles and Hides

Description

- Various types of clothes and fabrics.

Deployment

- All areas

Examples

- Bags - Burlap
- Nylon

- Bags - Fabrene
- Blankets & Bedding etc.
- Brattice - Cloth
- Burlap
- Canvas
- Cheese Cloth
- Cloth - Brattice
- Cotton
- Dynel (Thread)
- Fabrene - Powder Bags Cloth
- Felt - Except filter media
- Hides
- Rags – Industrial & Janitorial
- Sheep Skin
- Silk
- Synthetic Fibres
- Tarpaulins - Including Canvas Products
- Thread
- Tool Bags
- Towels - All types except paper
- Waste – Wool
- Wipers (All except paper)
- Wool – Waste
- Glass Fabric

56) Tools

Description

- Hand and power tools required by maintenance and operating personnel.

Deployment

- All areas

Examples

- Air Guns
- Air Whistles
- Benders Rail
- Chainsaws
- Clamps - Tool
- Clamps (C & Toggle)
- Cleaners Tube - Air Electric (Boiler etc.)
- Crimping Tools
- Cutter Wheels (Pipe)
- Cutters (all)
- Files
- Hammers
- Hand Tools
- Hot Air Guns
- Measuring Tapes - Lufkin etc.
- Pipe Groovers
- Power Tools - Gas Air Battery & Electrically operated
- Rail Benders
- Reamers
- Rerailers
- Rules & Tapes
- Saws - All types including Air and Electric and Chain
- Scalers Needle
- Screwdrivers
- Silphos
- Tachometers (except Engine)
- Taps and Dies
- Tools - Crimping
- Tools - Hand Tools Power Tools etc.
- Track Tools (Benders Pullers Rerailers)
- Tube Cleaners - Air - Electric (Boiler etc.)
- Wheels for Pipe Cutters
- Whistles – Air
- Whistles - Signal
- Wrenches

57) Valves and Flow Controls

Description

- Various valves used to control process flows. Range of sizes from 16" to ½ " diameter

Deployment
- Mill, port and surface facilities

Examples
- Actuator - Valve (Tufline etc.)
- Air Regulators
- Air Valves
- Anemomters
- Counters - Except Electrical
- Dillon Dynameters (Traction Tension Weighing)
- Dynamometer - Dillon Industrial
- Gas Meters
- Gauges - Industrial
- Gauges - Pressure
- Hydrants
- Meters (All types - water gas except Watthour)
- Nozzles - Spray - Industrial
- Regulators - Water
- Rubber Lined Valves
- Solenoid Valves
- Sprinklerheads
- Thermometers
- Valve Actuator - (Tufline etc.)
- Valves (Including air diaphragm & solenoid valves)

58) Ventilation Equipment

Description
- All part of capital equipment purchases

Deployment
- Mill

Examples
- Air Conditioners (except filters)
- Air Movers & Air Curtains
- Blowers
- Compressors - Industrial
- Condenser - Industrial
- Cooling Towers
- Dryers - Environmental
- Dryers - Industrial - Air
- Dust Collectors
- Fans (all types)
- Inflatable Air Stoppers
- Refrigeration Units
- Stoppers - Inflatable (Air)
- Vacuum Pumps

59) Welding Equipment

Description
- Welding and burning equipment, and supplies

Deployment
- All areas

Examples
- Burning Torches - Heads - Tips
- Regulators - Oxygen Welding Acetylene &
- Sprayfuse Equipment
- Welding Electrodes and Rods

Specialty Gas
- Soapstone Welding
- Welding Machines - Supplies - Burning Eqt.

60) Wire Rope Chain and Fittings

Description
- Slings, cable and cable fitting required by Maintenance and Operating for rigging and slinging work.

Deployment
- All areas.

Examples
- Cable Bolts
- Chain (Not Roller Chain)
- Clamps - Wire Rope
- Grab Hooks
- Hoisting Cable
- Round Hooks
- Shackles
- Slings (chain rope nylon pol.)
- Slusher Cable
- Turnbuckles
- Wire Rope (Including Aircraft)
- Wire Rope Eye Bolt Assemblies
- Wire Rope Fittings