VOISEY'S BAY NICKEL COMPANY
PROJECT DESCRIPTION

(IN ACCORDANCE WITH THE REQUIREMENTS OF THE CANADIAN ENVIRONMENTAL ASSESSMENT AGENCY)

AND

PROJECT REGISTRATION

(IN ACCORDANCE WITH THE REQUIREMENTS OF THE NEWFOUNDLAND AND LABRADOR DEPARTMENT OF ENVIRONMENT AND CONSERVATION)

FOR A COMMERCIAL PROCESSING PLANT

VOISEY'S BAY NICKEL COMPANY LIMITED

A subsidiary of Inco Limited

MARCH 16, 2006

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1.0 INTRODUCTION

This document has been prepared by Voisey's Bay Nickel Company Limited (VBNC) to comply with the requirements for a Project Description as defined under the *Canadian Environmental Assessment Act* and a Registration Document under the *Newfoundland and Labrador Environmental Protection Act* for the VBNC Commercial Nickel Processing Plant to be located at Long Harbour, Newfoundland and Labrador (Figure 1.1). It is proposed to locate the Plant on the south side of Long Harbour with an associated pipeline and residue pond (s) to the northeast of the harbour.

The purpose of the Project is to construct and operate a nickel processing plant to process either concentrate or matte (according to the terms of the *Voisey's Bay Development Agreement* (see Section 1.2.2)). Upon completion of the operation the processing facility will be decommissioned.

The Project is subject to both provincial and federal environmental assessment (EA) processes and must satisfy the conditions of both processes in a coordinated manner. In addition to the EA approvals, the Project must obtain a number of environmental approvals through the federal and provincial permitting processes. A complete list of relevant legislation and associated permits is contained in Appendix I.

1.1 Proponent

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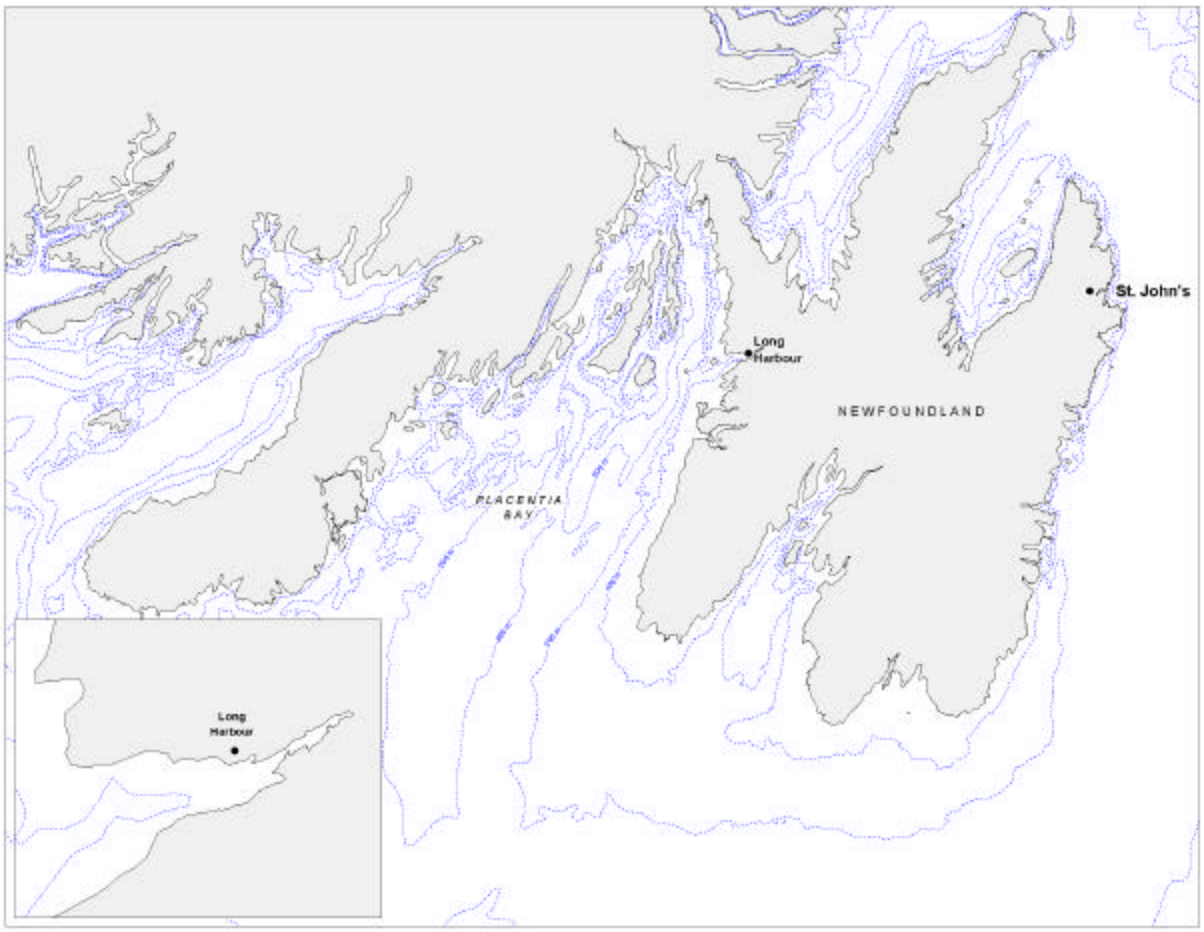

Figure 1-1. Location of Long Harbour, Newfoundland and Labrador

1.1.1 Corporate Description

Voisey's Bay Nickel Company Limited (VBNC) was established in 1995 and became a wholly owned subsidiary of Inco Limited (Inco) in 1996. VBNC is responsible for the development of the Voisey's Bay Project which involves the construction and operation of the mine and concentrator in Labrador and processing facilities in the province of Newfoundland and Labrador.

Inco is one of the world's premier mining and metals companies, mining globally with operations on four continents. It is a Canadian company headquartered in Toronto. Inco has been in operation for over 100 years and it employs over 10,000 people. Currently Inco is the world's second largest producer of nickel, and is also an important producer of copper, cobalt, and precious and platinum-group metals and a major producer of specialty nickel-based products.

Additional information about VBNC and Inco is available on their respective websites: www.vbnc.com and www.inco.com.

1.1.2 VBNC Health, Safety and Environmental Management System

All phases of the Long Harbour Commercial Nickel Processing Plant development will be subject to VBNC's Health, Safety and Environmental Management System (HSEMS) to effectively manage occupational hazards and environmental liabilities. VBNC is developing its HSEMS to be consistent with the criteria defined in the OHSAS 18001:1999 *Occupational Health and Safety Management Systems - Specification* and the ISO 14001:04 *Environmental Management Systems - Specification with Guidance for Use.* Inco has developed its integrated HSEMS framework to be consistent with the two international standards referenced above. This framework, applicable to all of Inco's operations requires conformance to the framework and each operation, including VBNC, must produce each year a letter of assurance of its conformance with the requirements. This letter of assurance must be presented to the President and Chief Operating Officer of Inco and must indicate any areas where there are possible deficiencies.

VBNC supports the concept of sustainable development, which seeks to enhance society through economic development and environmental protection. VBNC believes that mineral products are essential for the development of a sustainable economy. Protection of worker health and safety, the health of surrounding communities and the environment is an essential consideration in the management of its business.

VBNC views the development of its HSEMS from a life-of-project perspective. Following the project planning and construction phase, VBNC will operate, and ultimately decommission and rehabilitate the site and facilities. As such, the company's HSEMS will be dynamic and will evolve with the changing needs through the project life cycle. VBNC will review and update the HSEMS and its elements regularly, as well as at important milestones in the project life cycle.

Key documents to be developed for the implementation of the HSEMS include:

- *Environmental Protection Plan*
- *Environmental Effects Monitoring Plan*
- *Occupational Health and Safety Plan*
- *Rehabilitation and Closure Plan*
- *Waste Management Plan,* and
- *Emergency Response Plan*

1.2 The Undertaking

1.2.1 Nature of the Undertaking

The nature of the undertaking is to construct, operate and eventually decommission a nickel processing plant at Long Harbour, Newfoundland and Labrador to produce nickel, copper and cobalt for the commercial market.

VBNC is presently undertaking a research and development program to develop a technically and economically feasible hydrometallurgical[1] processing technology to process the Voisey's Bay nickel concentrate for the recovery of nickel and other valuable metals. The research and development program encompasses the testing of hydrometallurgical processes in a mini-plant at about one ten thousandth of the commercial plant scale processing plant and then constructing and operating a Demonstration Plant at about one hundredth of the commercial plant scale to fully test the technical and economic viability of the selected processes. This research and development program includes the definition of the chemical reactions, evaluation of chemical and mechanical engineering of the process, the specification of the mechanical equipment design and the method of operation of the hydrometallurgical process.

Inco has completed research and development test work on the Voisey's Bay nickel concentrate in the mini-plant facility, located adjacent to Inco's research center in Sheridan Park, Ontario. Based on the results of the mini-plant testwork, Inco recently completed construction and has begun operation of a Demonstration Plant located at Argentia, Newfoundland to conduct further testing of the hydrometallurgical processes for the treatment of the Voisey's Bay nickel concentrate. The Demonstration Plant underwent environmental assessment and review in 2002 under the *Environmental Protection Act of Newfoundland and Labrador (SNL 2002 E-142)* and the *Canadian Environmental Assessment Act 1999*.

If the hydrometallurgical process technology for processing of nickel concentrate is shown to be technically and economically feasible, then VBNC will design, construct, operate and maintain a hydrometallurgical processing plant (the "Hydromet Plant") at a site in Newfoundland and Labrador which will have a design capacity to produce annually approximately 50,000 tonnes of finished nickel product, together with associated cobalt and copper products. This requirement is in accordance with the terms of the *Voisey's Bay Development Agreement* (for full text of this Agreement, go to the following web link http://www.nr.gov.nl.ca/voiseys/legal.htm) and in keeping with the timing specified therein. It is the clear preference of VBNC to build the Hydromet Plant and all efforts are being made to ensure that a technically and economically feasible hydrometallurgical process technology is developed.

However, should the Hydromet Plant prove not to be technically or economically feasible, VBNC will construct an alternative hydrometallurgical commercial facility for processing of nickel-bearing matte (the "Matte Plant") incorporating a proven, state of the art technology to produce finished nickel product.

The *Voisey's Bay Development Agreement* requires that one of the two technologies (the preferred Hydromet Plant or the alternate Matte Plant) be selected for development by the end of 2008.

[1] A hydrometallurgical process technology is conventionally defined as a process in which metals-bearing minerals are processed in an aqueous phase for the separation and recovery of the valuable metals in the form of pure metals or as intermediate metal products. Vis-à-vis, a pyrometallurgical process technology is conventionally defined as a process in which metals-bearing minerals are treated directly in a smelter to upgrade and recover the valuable metals in the common form of mattes. The metals-bearing mattes are then treated further in a refinery process, which commonly utilizes a hydrometallurgical process technology to separate and recover the valuable metals in the form of pure metals or as intermediate metal products.

In accordance with the *Voisey's Bay Development Agreement*, VBNC intends to establish the Hydromet Plant, or alternatively, the Matte Plant at Long Harbour, Newfoundland and Labrador.

This submission by VBNC comprises the Registration of the Undertaking pursuant to the requirements of the *Environmental Protection Act (SNL 2002 E-142)* and notification for environmental assessment and review under the *Canadian Environmental Assessment Act 1999*.

1.2.2 Rationale for the Undertaking

By 1996, Inco had acquired the Voisey's Bay nickel, copper and cobalt deposit from Diamond Fields Resources Inc. and had begun to determine the best approach to develop the Voisey's Bay deposit as a viable commercial metal-producing project. A key aspect of this process was the environmental assessment of the mine/concentrator project at Voisey's Bay, Labrador. This project was released from the environmental assessment process in August 1999, with construction commencing at Voisey's Bay in 2002 after the conclusion of the *Voisey's Bay Development Agreement*.

There is currently a global shortage of nickel and the Voisey's Bay deposit constitutes one of the few deposits that have been identified for development during the past decade. Thus, developing the mine/concentrator and a processing facility to produce nickel from the concentrate that the mine/concentrator will produce is an important step towards addressing the current shortage of this important metal. Inco considers that developing the Voisey's Bay deposit is in the best interests of the global market for nickel. Thus, it has proceeded with the development of the mine/concentrator under the terms of the *Voisey's Bay Development Agreement*. The construction of a processing facility to produce nickel product is a required next step per the *Voisey's Bay Development Agreement*. Inco believes that not developing a processing plant is not a viable option.

The *Mineral Act (RSNL M-12)* requires that a person holding a mineral lease in the province complete primary production, in whole or in part, in the province, of a mineral ore extracted or removed under that lease subject to certain economic considerations. Further, the *Voisey's Bay Development Agreement* requires VBNC to build either a Hydromet Plant or, in the case where this is not technically or economically feasible, a Matte Plant in Newfoundland and Labrador.

Without the construction and operation of either a Hydromet Plant or, in the case where this is not technically or economically feasible, a Matte Plant, VBNC will not be able to continue to operate beyond the end of 2011 the mine/concentrator facility that it has constructed at Voisey's Bay at a cost of almost $1 billion.

Therefore, VBNC is proposing to undertake an environmental assessment of the two processes specified in the *Voisey's Bay Development Agreement*, namely a Hydromet Plant and a Matte Plant. This will permit the construction of a processing facility to proceed once the final selection between the two processing technologies has been made by the end of 2008.

1.3 Consultations

Consultations have been conducted with the public (six meetings/presentations), federal government (Canadian Environmental Assessment Agency (CEA Agency), Fisheries and Oceans Canada (DFO), Environment Canada and Transport Canada – total of ten meetings), and provincial government (Mines and Energy, Environment, Natural Resources, Justice – total of nine meetings). In addition, an information session for federal and provincial regulators on the Project Description/Registration Document was held on March 13, 2006. Twenty three persons representing three federal departments and four provincial departments were in attendance.

Contact with various government departments and the public regarding the environmental assessment of the commercial nickel processing facility began in 2003. Discussions with the provincial departments of Mines and Energy, Environment and Conservation, and Justice focused on the proposed schedule, approach, potential issues, plans for government and public consultation and initial baseline studies. Meetings with the CEA Agency, Transport Canada and DFO addressed schedule and approach as well as potential federal "triggers" under the *Canadian Environmental Assessment Act*. Subsequent meetings were held with DFO to discuss freshwater and marine baseline studies.

Public contact came through presentations on the environmental assessment (EA) at the Opportunity Argentia Conference in both 2003 and 2004, to the Newfoundland Environmental Industries Association in 2004, and to the Placentia Area/VBNC Community Liaison Committee in 2004 and 2005. The Placentia Area/VBNC Community Liaison Committee was formed in 2003 and has been meeting quarterly since that time. Its objectives are to foster communications between VBNC and local residents and to deal with issues of concern. Membership consists of municipal representatives of Placentia, Long Harbour, Fox Harbour, Ship Harbour and Point Verde; a number of key community economic/educational and other interests (e.g., Argentia Management Authority, Argentia Area Chamber of Commerce, Avalon Gateway Regional Economic Development Association, College of the North Atlantic, local environmental organization, and so forth) as well as representatives of various provincial and federal government departments. In addition, since September 2004 the company has provided numerous tours of the Demonstration Plant for a variety of stakeholders, government agencies and interest groups. Hundreds of people have availed of the opportunity to learn more about the hydrometallurgical process and to view the facility, including members of the Community Liaison Committee, various educational institutions, government representatives (municipal, provincial and federal), media, attendees of the 2005 Opportunity Argentia Conference and others.

VBNC maintains an information office in the Placentia Mall, which is open during regular office hours. The public can obtain project information and bring forth any concerns regarding any aspect of the company's operations.

VBNC has also issued two information brochures to all households in the region, including Long Harbour. While the focus has been on the Demonstration Plant, each brochure has included a section on the commercial facility and the upcoming EA process.

Consultations with the general public, stakeholder groups and government will continue throughout the EA process. The focus of these consultations will be on providing information to aid discussion and solicit feedback, and to respond to relevant issues and concerns. Consultations will include:

- Open house sessions to be held in Long Harbour, Placentia and Whitbourne;
- Distribution of information brochures to households in Long Harbour, Placentia, Whitbourne, and adjacent area;
- Maintenance of an information office in the Placentia area;
- Press releases and media briefings;
- Information sessions/discussions with the Community Liaison Committee and with municipal, provincial and federal government representatives.

2.0 DESCRIPTION OF THE UNDERTAKING

2.1 Geographical Location

The Plant will be located at Long Harbour, Placentia Bay, Newfoundland and Labrador (Figure 2.1) (see Topographic Map Argentia 1 N/5 at the following approximate coordinates: 47°25'N and 53°49'W – Figure 2.2). A general layout for the Hydromet Plant and the Matte Plant is shown in Figures 2.3 and 2.4, respectively.

Figure 2-1. Long Harbour, Placentia Bay

2.2 Land Use

The Town of Long Harbour (Placentia Bay) is situated on the north side of the harbour. The Project will be located partially on a "brown field" site (port and laydown infrastructure - Tier 1) on the south side of the harbour and partially on a "green field" site (processing facility - Tier 2) above the harbour on the south side. The lower site (Tier 1) and surrounding area were previously occupied from 1969 to 1989 by the ERCO/Albright and Wilson Americas' Phosphorus Plant (hereafter referred to as "the ERCO site"). The ERCO site occupied about 77 hectares on the southern shore of Long Harbour. Production operations covered about 20 hectares with an annual production rate of 50,000 tonnes of elemental phosphorus and a workforce of about 300. The site was decommissioned in the mid-1990s after undergoing an environmental assessment (AWA 1992). The land is now owned in part by Rhodia Canada, Inc.

and in part by the Long Harbour Development Corporation. A scrap metal dealer presently operates at the plant site.

The decommissioned ERCO site contains a wharf, a paved road, three buildings (administration, steam, and mud residue buildings), buried service lines, several landfills, a fenced hazardous waste disposal area, a phosphorus furnace slag stockpile and construction debris. It is presently a partially secure site because of contaminated material buried during decommissioning. The electrical substation that serviced the site is still in place. Inco and VBNC have conducted due diligence and selected areas of the site that are considered appropriate for the intended industrial use.

Other industrial activities within Placentia Bay include the Come by Chance oil refinery, Newfoundland Transshipment Terminal, CN Ferry Terminal, Port of Argentia, the Marystown Shipyard and Cow Head Fabrication Facility, and commercial fisheries (including several aquaculture operations) and associated processing plants.

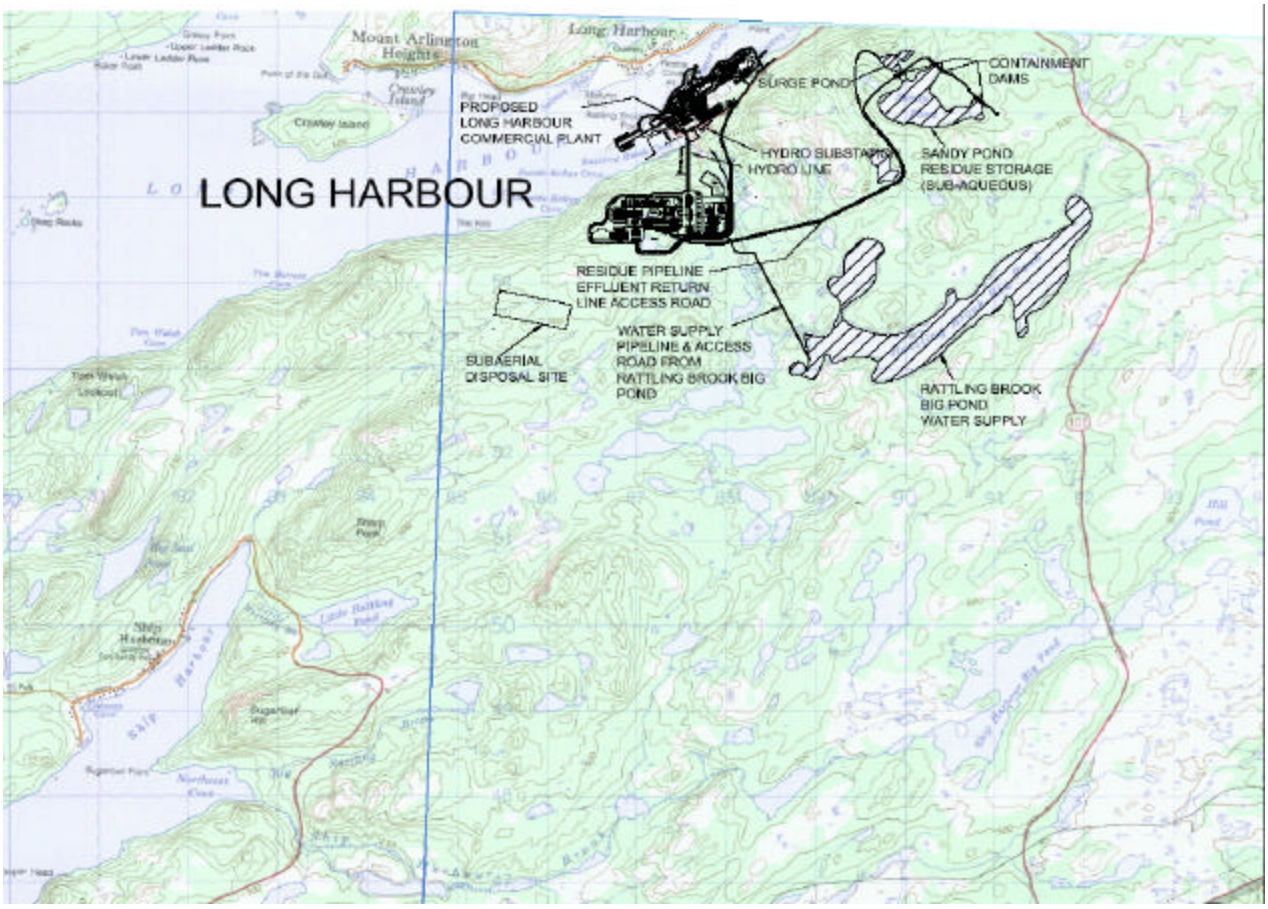

Figure 2-2. Topographic Map - Long Harbour

Figure 2-3. Hydromet Plant General Layout (Artist's Rendition)

A wide range of tourism, cultural and commercial and other business and personal services are available within the area. Key cultural and tourism facilities include Castle Hill National Historic Park, the O'Reilly House Museum, and active archaeological digs in Placentia. Other major sites and features of importance are the Cape St. Mary's Bird Sanctuary – about 70 kilometres to the south, and Ship Harbour, the site of the signing of the Atlantic Charter in 1941, about 44 kilometres by road or approximately 10 kilometres in a straight line. An international airport, major cultural facilities, international hotels, and shopping and central government services are available in St. John's, about 100 kilometres away.

There are no known aboriginal or historic resources associated with the Project Area in Long Harbour.

2.3 Infrastructure

Project infrastructure will include a wharf, laydown areas, preparation and process buildings, storage and transportation structures for raw materials, reagents, wastes, and finished products. The proposed plant layout is shown in Figure 2.3 and 2.4.

The existing wharf will be repaired and upgraded by additional infilling to a width of a maximum of 90 m to create a two-berth wharf that will accommodate two ships. There will be a requirement for some minor dredging in the area of the existing wharf to remove small volumes of infill sediment and some scrap steel. To ensure the safe docking of VBNC's concentrate carrier in all conditions, it is estimated that dredging of approximately 1.5 meters is required. All dredging activities will be carried out in accordance with regulatory requirements. The elemental phosphorus which is encapsulated in the existing dock will not be disturbed by project activity. VBNC will assume liability for it remaining encapsulated within the dock and will conduct regular monitoring. Existing roads on site will be upgraded and extended and new local driveways constructed as necessary. A road of approximately three kilometres in length will connect the lower tier site to the upper tier site, 120 m higher in elevation. Electrical power will be connected from the existing substation at the lower tier site.

The lower tier (Tier 1) of the Project will include the wharf and some level ground that was part of the ERCO site. This area will be used primarily for unloading and loading ships, container and product storage, laydown, and an administration building. The upper tier (Tier 2) will contain all the major processing facilities, storage areas, laboratories and main administrative offices.

The process water will be obtained from Rattling Brook Big Pond about two kilometres southeast of the site. A pumphouse and pipeline will be constructed to pump the water to the plant, which will be at approximately the same elevation as the intake. The need for constructing a dam on Rattling Brook Big Pond will be determined depending on the extent of any drawdown and the instream flows required to maintain fish habitat in Rattling Brook.

A pipeline will be constructed to convey neutralized slurry residue to a residue disposal pond located 3.3 km (3.8 km by pipeline) to the northeast (Sandy Pond is the preferred site) (see Figure 2.3). The residue disposal pond will require the construction of a large earthen dam at the outflow of Sandy Pond to provide sufficient capacity to contain all settled residue. A small, unnamed pond to the northwest of Sandy Pond would serve as a clarification pond and would require construction of two small dams. Clarified effluent from the clarification pond will be pumped back to the plant, treated as required, mixed with other treated effluents and discharged to the marine environment to the west of the proposed wharf. Runoff from the plant site will be collected in two stormwater ponds (one on the upper level and one on the lower level).

In the case of the Matte Plant, waste gypsum slurry would be transported by a pipeline to a storage site about two kilometres to the southeast of the plant site (see Figure 2.4). The storage site would be surrounded by a four-metre high containment berm. Excess water (run-off and leachate) would be collected in an adjacent clarification pond. From the clarification pond the effluent would be carried by a return pipeline back to the Matte Plant where it would be blended with other aqueous effluents and treated as required prior to ultimate discharge into the marine environment to the west of the proposed wharf.

2.3.1 Hydromet Plant Scenario

Nickel concentrate and limestone will be transported from the dock via unheated covered conveyors and stored in an unheated, ventilated, A-frame structure, which will be sized to provide concentrate storage for up to three months (65,000 dry tonnes). Limestone will be stored in the same building, but segregated from the concentrate. Some chemicals (e.g., solvents, acids, etc.) may be delivered by ship. Containment to prevent any spills from being released to the environment will be in place at all fuel and reagent storage areas.

2.3.1.1 Hydromet Production Capacity and Sizes

The Hydromet Plant will require an area of about 65 hectares (650,000 m^2). This area includes the infrastructure on both tiers, while the area required for the residue ponds and the residue pipeline will add an additional 85 hectares (850,000 m^2) to the overall site area. Approximate building locations (as per conceptual design) are provided in Figure 2.3.

Design production capacity will be 50,000 tonnes per year (t/y) of nickel, 3,270 t/y of copper, and 2,460 t/y of cobalt, each produced as electrowon metal.

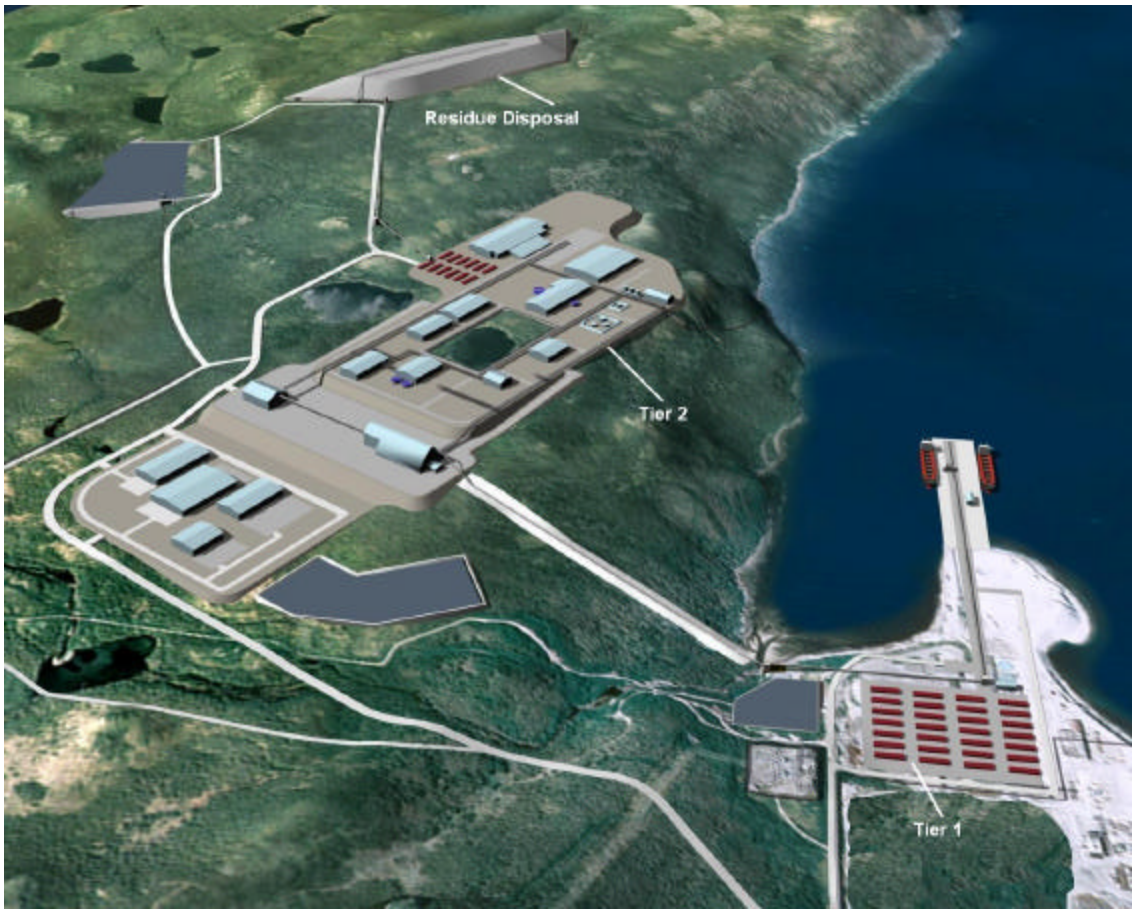

Figure 2-4. Matte Plant General Layout (Artist's Rendition)

2.3.2 Matte Plant Scenario

Nickel-bearing matte and limestone will be transported from the dock via unheated covered conveyors and stored in an unheated, ventilated, A-frame structure, which will provide matte storage for up to three months (approximately 20,000 dry tonnes). Limestone will be stored in the same building, but segregated from the matte. Some chemicals (e.g., solvents, acids, etc.) may be delivered by ship. Containment to prevent any spills from being released to the environment will be in place at all fuel and reagent storage areas.

2.3.2.1 Matte Plant Production Capacity and Sizes

The design capacity of the Matte Plant will be approximately 50,000 t/y of nickel, 17,800 t/y of copper, and 900 t/y of cobalt, each produced as electrowon metal.

The Matte Plant will require an area of about 65 hectares (650,000 m^2). This area includes the infrastructure on both tiers, while the area required for the sub-aerial disposal of the gypsum residue from the refinery would require an additional 40 hectares (400,000 m^2). Approximate building sizes and locations would be similar to the Hydromet Plant, with some differences in accordance with the amount of material that requires storage, handling and processing at each stage of the operation (see Figure 2.4).

3.0 PROJECT PHASES

The project phases include:

- Construction;
- Operations, and
- Decommissioning

The potential interactions of each of these phases with the environment will be assessed for impacts and where negative impacts are predicted, appropriate mitigation actions will be developed.

3.1 Construction Phase

The Construction Phase of the Project is expected to commence in early 2009, following the decision required in the *Agreement* at the end of 2008 as to whether a Hydromet Plant or a Matte Plant will be constructed to process the nickel from the Voisey's Bay mine/concentrator in northern Labrador. The Construction Phase will be similar for both of the proposed process plants. It is anticipated, in accordance with the *Voisey's Bay Development Agreement*, that the selected facility will be commissioned and operational by the beginning of 2012. Major construction activities will occur from 2009 to 2011 (Figure 3.1) and will include:

- Engineering Design and Procurement. Engineering design is expected to commence in 2008 and to continue through the Construction Phase of the Project. Engineering will be based on the knowledge gained from the construction and operation of the hydrometallurgical demonstration plant during the period November 2005 to mid 2007. Procurement will be an ongoing process through the Construction Phase of the Project.

- Site Preparation. Clearing of lower tier and upper tier sites, grading, leveling and infilling of the upper tier site.

- Wharf Expansion. Infilling on side of present finger wharf to allow for a second berth and sufficient infilled area to accommodate loading/unloading infrastructure and laydown area adjacent to the berths.

- Infrastructure Development. This will include the construction of a road to connect the lower and upper tiers, roads to the water supply and residue disposal site, the extension of the power supply from the existing substation at the lower tier site to the upper tier, development of the water supply for the Construction Phase and the provision of sewage treatment facilities.

- Construction of Plant Facilities. Construction of the facilities required to process the VBNC nickel, including requisite building and other structures, pipelines, residue containment dams and dams for regulation of flow for process water.

- Commissioning and Start-up of the Processing Plant. Testing and commissioning of each component including environmental controls to ensure that the plant will operate in a safe and environmentally compliant manner.

At the end of construction, the site will be rehabilitated.

3.1.1 Emissions, Effluents and Solid Wastes

Several construction activities such as construction of roads, dams and stream crossings, wharf expansion, and quarrying can lead to episodes of dust or stream sedimentation. Thus, particular attention will be paid to air emissions, water quality and the management of solid wastes during the Construction Phase. The use of dust suppression and sedimentation controls such as silt curtains as well as other strategies will be employed to control releases to the environment. It is anticipated that 3,000 person-years will be required for construction. A suitable potable water system capable of providing sufficient water for all construction-related needs will be provided from Rattling Brook Big Pond, also the operational water supply source. A sewage plant, capable of handling the requirements of the peak construction work will be provided. The sewage plant will be operated in accordance with the requirements of the Government of Newfoundland and Labrador for the discharge of effluent to the environment. Solid wastes, including hazardous wastes, will be handled by a certified waste handling contractor.

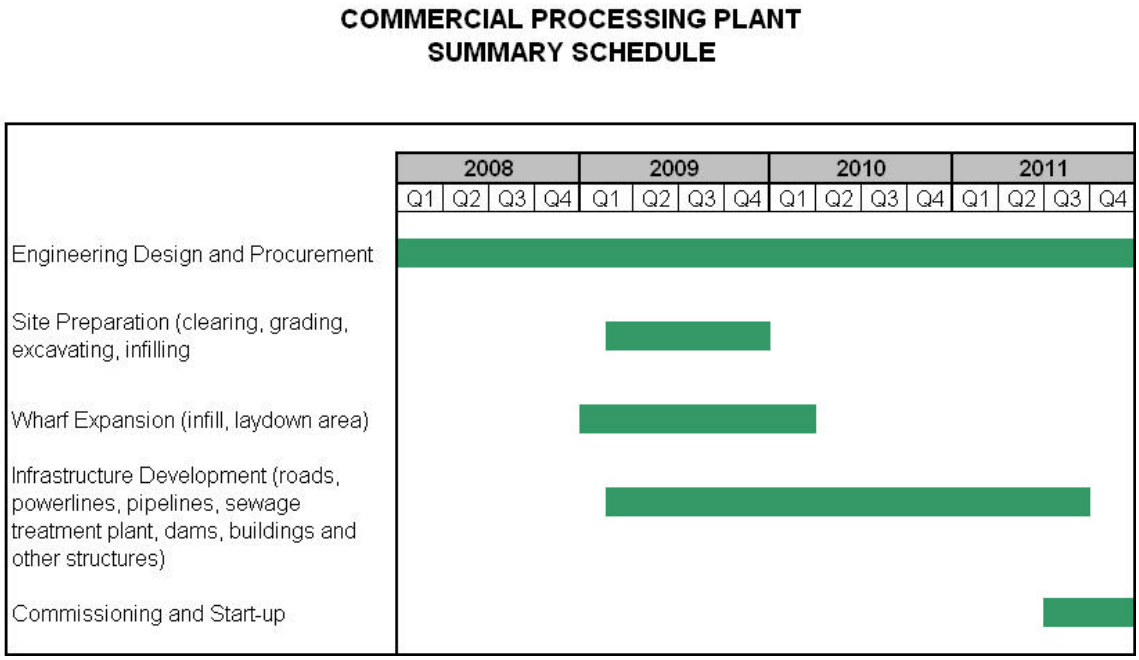

Figure 3-1. Construction Schedule

3.1.2 Excavation Requirements

The initial estimate for total area of clearing and grubbing for pipelines, site work and roads is approximately 1.3 million m^2. Associated excavation will be about 2.4 million m^3 of rock, including about 4,000 m^3 of trench blasting to accommodate pipelines. Required dredging at the wharf is estimated at about 9,000 m^3. Fill for the site leveling, road construction and dam construction will be developed on site where possible. If additional fill is required, it will be obtained from a permitted quarry site.

3.1.3 Environmental Monitoring

Consistent with its overall Health, Safety and Environment Policy, VBNC will maintain active ongoing monitoring programs during the Construction Phase. This monitoring will ensure compliance with appropriate legislation and internal requirements.

3.2 Operations Phase

3.2.1 Description of Production Processes

As per the *Voisey's Bay Development Agreement*, the Project will use one of two production processes which are both based on hydrometallurgical process technology (see footnote in Section 1.2.1 for definition). The hydrometallurgical process technology for the recovery of pure base metals is not new; this technology has been used commercially for many years to process zinc and copper concentrates and also nickel mattes (nickel that has been processed through a smelter). The primary difference between the hydrometallurgical process that will be utilized in the Hydromet Plant and the Matte Plant is the type of feed material:

(1) The Hydromet Plant will process nickel concentrate to recover nickel, copper and cobalt, while
(2) The Matte Plant will process a nickel-bearing matte, produced at a base-metal smelter[2], to recover nickel, copper and cobalt.

Besides the different feed materials, the two plants utilize somewhat different processing techniques. The Hydromet Plant process utilizes a chloride-sulphate medium while the Matte Plant process utilizes an entirely sulphate medium to extract the metal values. However, the finished products from the two process plants are the same, namely market-quality nickel, copper and cobalt. The major environment-related differences between the two processes are the types and quantities of residues that are produced and the method of their disposal. The Hydromet Plant produces a relatively larger volume of the primary leach residue which is best stored underwater (i.e., sub-aqueous) so that the elemental sulphur that is a component of the residue will not subsequently oxidize to form sulphuric acid. The Hydromet Plant also produces a

[2] A key distinction between concentrate and matte is that concentrate contains a significant amount of iron, which is almost entirely removed when the concentrate is processed in a smelting operation for the production of matte. Thus, while Hydromet Plant process residue contains a significant amount of iron as iron oxides, the Matte Plant process residue contains very little iron oxide.

second residue comprising of gypsum (calcium sulphate) and iron hydroxide which can be stored on dry ground (i.e., sub-aerial) or combined with the primary leach residue for sub-aqueous storage. The Matte Plant produces a relatively smaller volume of residue comprised entirely of gypsum which also can be stored on dry ground.

The Hydromet Plant and Matte Plant processes are described briefly below.

3.2.1.1 Hydromet Plant Process

The hydrometallurgical processing of nickel concentrates has only recently been developed (mid-1990s) and the specific process for the VBNC nickel concentrate is still under commercial development. As described earlier, Inco has demonstrated that the process can produce electrowon nickel, copper and cobalt at a mini-plant scale, at its test facility in Sheridan Park, Mississauga, Ontario. The process is presently being further evaluated at the Demonstration Plant located at Argentia, Newfoundland and Labrador. Eventually, following determination of the technical and economic viability of this hydrometallurgical process technology, VBNC plans to construct and operate a commercial Hydromet Plant at Long Harbour in Newfoundland and Labrador.

The VBNC Hydromet Plant would be designed to treat at least 260,000 dry tonnes per year of VBNC nickel concentrate analyzing (by percent weight): 20% nickel, 2.0% copper, and 1.0% cobalt, with the balance consisting essentially of iron and sulphur. The plant would produce at least 50,000 t/yr of nickel, 3,270 t/yr of copper and 2,460 t/yr of cobalt, each as pure electrowon metal.

The Process

The VBNC Hydromet process is a pressure oxidative leach process that consists of the primary steps shown in Figure 3.2. Nickel concentrate from the Voisey's Bay mine/concentrator is first crushed and wet ground to produce a slurry containing fine particles. The ground concentrate is then pre-leached at atmospheric pressure with chlorine gas that is recycled from the downstream nickel electrowinning process. The solids discharged from the pre-leach step are then further leached in an autoclave at elevated temperature and oxygen pressure, in the presence of nickel anolyte recycled from the nickel electrowinning step. The pressure leach process results in the dissolution of the three metals of interest (nickel, copper and cobalt) into a mixture of sulphate and chloride solution. Most of the iron in the feed is converted to insoluble ferric oxide, while a large portion of the sulphide in the feed is converted to molten elemental sulphur. The remainder of the sulphide reacts with oxygen to form sulphuric acid, which then acts as a reagent in the leaching reactions.

The autoclave discharge is de-pressurized and cooled, solidifying the molten sulphur. The leach solution is separated from the leach residue in a thickener and forwarded to the downstream processes for the recovery of the valuable metals. The leach residue is washed with water in a series of counter current decantation (CCD) thickeners. The washed and thickened leach residue slurry is neutralized to adjust the pH by addition of limestone and lime, blended with the iron hydroxide and gypsum residue from the downstream process and then piped to a residue holding

pond for long-term storage. The overflow solution from the residue holding pond is directed to a clarification pond before being returned by a pipeline to the process plant. The clarification pond effluent solution is blended with other process plant liquid effluents and neutralized further with limestone and lime to produce a solution that meets the effluent discharge requirements specified in the *Newfoundland and Labrador Environmental Control Water and Sewage Regulations, 2003* and to be compliant with Section 36(3) of the federal *Fisheries Act*. The neutralized solution is clarified prior to being discharged into the marine environment.

The autoclave leach solution is sent to the first iron removal circuit where nickel hydroxide, recycled from the downstream weak liquor neutralization step, is dissolved and thereafter, most of the iron in the product solution is precipitated by neutralization with limestone, lime and air. The precipitated iron hydroxide and gypsum are separated by thickening followed by two stages of washing and filtration. The washed solids are re-pulped and blended with the neutralized leach residue slurry prior to disposal of the mixed solids to the residue holding pond as described above.

The iron-free leach solution is forwarded to copper solvent extraction using an organic solvent, followed by electrowinning to produce pure copper cathodes. The copper-free solution (raffinate) discharged from the copper solvent extraction process is subjected to the second iron removal step where the remaining iron is precipitated using limestone, lime and air and recycled to the first iron removal and nickel hydroxide dissolution circuit.

Minor impurities such as lead, cadmium, and residual copper and iron are removed in an impurity solvent extraction process. The product solution (raffinate) now contains essentially only cobalt and nickel.

Cobalt is recovered next by solvent extraction and electrowinning to produce pure cobalt cathodes. The cobalt-free solution (raffinate) is then forwarded to the nickel electrowinning process, where about half of the nickel contained in the feed solution is recovered in the form of pure nickel cathodes, and the remaining nickel reports to the acidic spent solution (nickel anolyte). Chlorine gas, evolved during nickel electrowinning, is captured and recycled to the nickel concentrate pre-leach process described earlier. The nickel anolyte is recycled to the pressure leach process, with a portion diverted to the nickel hydroxide dissolution step, described earlier, and a portion forwarded, as a bleed, to the weak liquor neutralization process. Here, the nickel anolyte and wash liquors from other plant operations are treated with limestone and lime to precipitate the nickel and other contained metals as hydroxides, which are separated by thickening and then forwarded to the nickel hydroxide dissolution step. A part of the metals-free (barren) thickener overflow solution is used to wash the leach residue and to repulp the iron/gypsum filter cake. The remaining barren solution is blended with the clarification pond return solution and then treated to meet the effluent discharge requirements specified in the *Newfoundland and Labrador Environmental Control Water and Sewage Regulations, 2003* and to be compliant with Section 36(3) of the federal *Fisheries Act*. As described earlier, the treated solution is clarified and then discharged to the marine environment.

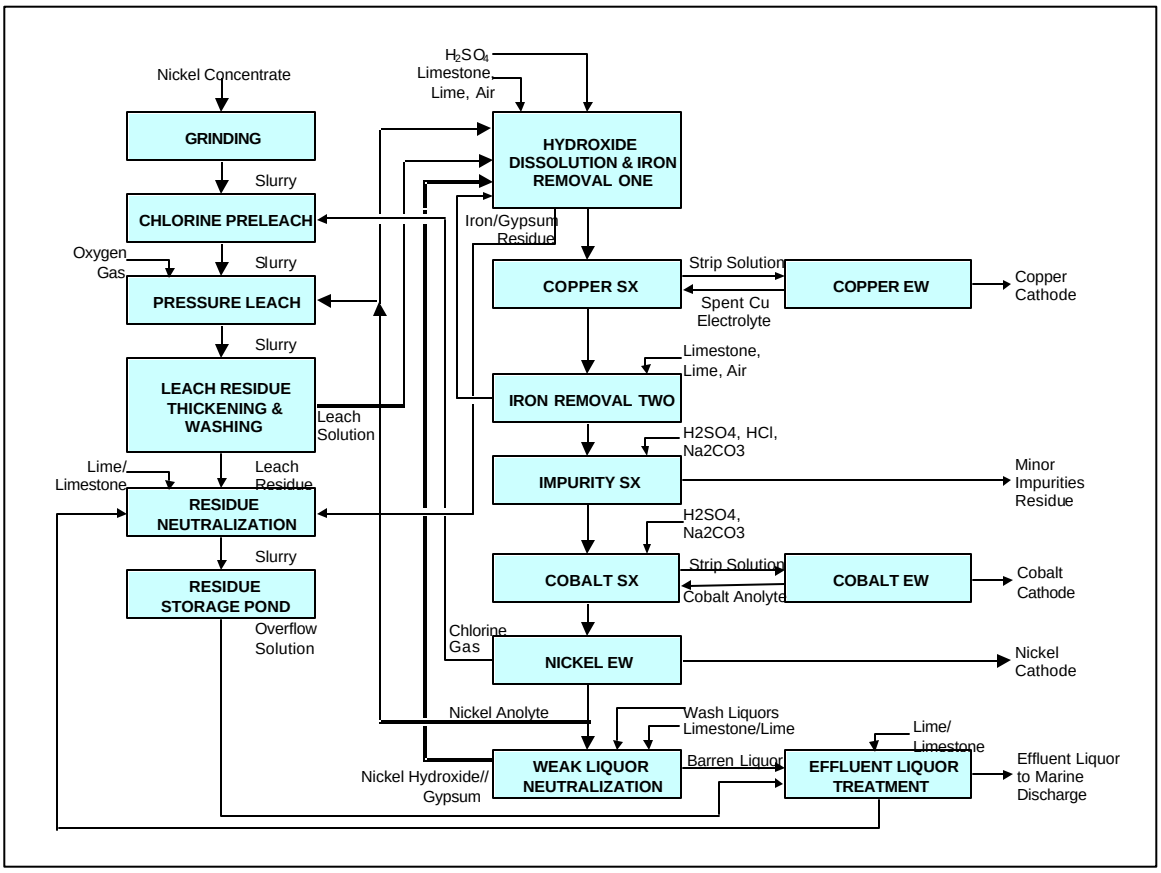

Figure 3.2. The VBNC Hydromet Plant Process

The major inputs to the Hydromet Plant process are summarized below:

- Nickel concentrate
- Oxygen
- Limestone
- Lime
- Air
- Sodium chloride
- Hydrochloric acid
- Sulphuric acid
- Sodium carbonate
- Electric power
- Water

Major outputs include:

- Nickel, copper and cobalt as pure metal products.
- A treated solid residue containing primarily iron oxides and hydroxide, elemental sulphur and gypsum with trace amounts of un-reacted nickel concentrate. The solid will be stored in the sub-aqueous residue holding pond (Sandy Pond).
- Treated liquid effluent (for release to the marine environment).

The commercial Hydromet Plant would produce approximately 375,000 t/yr (dry basis) of the combined leach and iron/gypsum residue, requiring a total storage capacity of 5.8 million m^3 with a design for more than that amount. The preferred storage site is Sandy Pond where two containment dams would be required at the northeast end of the pond.

3.2.1.2 Matte Plant Process

The VBNC Matte Plant process for the recovery of finished nickel product from matte feed is similar to that employed by several commercial hydrometallurgical plants currently in operation in South Africa and elsewhere. The nickel matte will be produced from concentrate in a smelter, such as Inco's smelters at Sudbury, Ontario or Thompson, Manitoba.

The commercial Matte Plant would be designed to treat approximately 93,700 dry tonnes per year of matte typically analyzing (by percent weight): 53.7% nickel, 19.2% copper, and 1.0% cobalt, with the balance consisting essentially of iron and sulphur. A small amount of valuable platinum group metals (PGM) are also present in the matte. The plant would produce approximately 50,000 t/y of nickel, 17,800 t/y of copper and 900t/y of cobalt, each as pure electrowon metal.

The Process

The VBNC Matte Plant process consists of the primary steps shown in Figure 3.3. The overall Matte Plant process may be sub-divided essentially into two major processing circuits; one circuit for the dissolution of nickel, cobalt and copper from the matte in a series of leaching steps, with the recovery of copper as pure electrowon metal, and the second circuit for the treatment of the nickel and cobalt-containing leach solution for the separate recovery of nickel and cobalt as pure electrowon metals. The Matte Plant process steps for the separation and recovery of the nickel and cobalt from the leach solution are very similar and, in some respects, identical to those employed in the Hydromet Plant process (see Figure 3.2).

The nickel matte is first wet ground to produce a slurry containing fine solids. Five successive leaching steps are then carried out on the ground matte:

1. Solution Purification,
2. Atmospheric Leach,
3. Iron/Copper Dissolution,
4. Nickel Pressure Leach; and
5. Copper Pressure Leach.

In the solution purification step, significant portions of metallic nickel and cobalt contained in the ground matte are dissolved by oxidative leaching in the acidic solution recycled from the subsequent atmospheric leach process and nickel anolyte recycled from the nickel electrowinning process, while copper and iron are precipitated. The copper and iron-free leach solution is separated and forwarded to the downstream metal recovery processes. The discharge solids from the solution purification step are reacted further in the atmospheric leach step with oxygen and acidic solution recycled from the nickel pressure leach step and nickel anolyte to extract more nickel. The basic nickel, iron, copper and some arsenic salts formed in the previous two process steps are separated and dissolved in the iron/copper dissolution step by the addition of acidic copper spent electrolyte and the nickel anolyte recycled from the respective electrowinning circuits. The product solution is separated and forwarded to an iron/arsenic (Fe/As) hydrolysis step where the iron and arsenic are precipitated at elevated temperature and under oxidative condition to form hematite and basic ferric arsenate, respectively. The relatively small amount of the iron/arsenic precipitate is separated, washed and stored in a lined pond. It is then either transferred to a secure landfill or shipped to another Inco facility for further treatment and environmentally safe disposal.

The remaining nickel contained in the residue from the iron/copper dissolution step is leached in the subsequent high temperature nickel pressure leach process by reaction with copper contained in the recycled copper spent electrolyte and the solution from the Fe/As hydrolysis process. The solids discharged from the nickel pressure leach process are separated and then treated with recycled copper spent electrolyte at elevated temperature and oxygen pressure in the copper pressure leach process, resulting in the dissolution of the copper and the remaining nickel, cobalt, iron and arsenic. The solids discharged from the copper pressure leach step, containing platinum group metals (PGMs) and low levels of base metals and impurities, is filtered, washed and shipped to a PGM recovery plant. The leach solution is sent to the Se/Te removal step where selenium and tellurium are precipitated as copper compounds by the addition of aqueous sulphur dioxide (SO_2). The precipitate is separated, washed and shipped to a selenium and tellurium recovery plant. The Se/Te-free solution is forwarded to the copper electrowinning process producing copper cathodes.

The nickel and cobalt-rich leach solution from the solution purification is now processed for the recovery of cobalt and nickel by the same processes used in the Hydromet Plant process. First the remaining minor amounts of impurities such as lead, copper and iron are extracted from the

leach solution by solvent extraction. Cobalt is then recovered from the solution by solvent extraction and electrowinning to produce pure cobalt cathodes. The cobalt-free solution is forwarded to the nickel electrowinning process where about half of the nickel contained in the feed solution is recovered as pure nickel metal cathodes, with the remaining nickel reporting to the acidic nickel anolyte. A portion of the nickel anolyte is treated with lime and limestone to precipitate the nickel as nickel hydroxide, with co-precipitation of gypsum. The precipitate is separated from the metals-free (barren) solution by thickening and filtration and then treated with the balance of the acidic nickel anolyte to dissolve the nickel. The nickel-rich solution is separated from the gypsum and forwarded to the solution purification and the atmospheric leach steps. After filtering and washing, the gypsum precipitate is slurried with the barren solution and transferred by a pipeline to a sub-aerial deposit. The solution run-off from the gypsum deposit is returned to the process plant, blended with the remaining barren solution and then treated with limestone and lime to adjust the pH such that it meets the requirements of the *Newfoundland and Labrador Environmental Control Water and Sewage Regulations, 2003* and Section 36(3) of the federal *Fisheries Act*. The treated solution is then discharged to the marine environment.

In summary, major inputs to the Matte Plant include the following:

- Nickel matte
- Oxygen
- Sulphuric acid
- Hydrochloric acid
- Limestone
- Lime
- Sodium carbonate
- Sulphur dioxide
- Electric power
- Water

And outputs include:

- Nickel, copper, cobalt as finished metal products
- Gypsum residue (for sub-aerial disposition)
- Iron/arsenic residue (for environmentally safe disposal)
- Selenium/tellurium intermediate (for further processing elsewhere)
- PGM intermediate (for further processing elsewhere)
- Treated liquid effluent (for release to the marine environment)

The commercial Matte Plant would produce approximately 5,900 t/y of iron/arsenic residue which will be stored in a lined pond adjacent to the process plant. It will then be disposed of in a secure landfill or sent to another Inco facility for further processing and environmentally safe disposal.

The gypsum residue represents the major effluent stream for the VBNC Matte Plant process. Total gypsum residue production will be approximately 106,000 t/y. It is proposed to store the gypsum in a sub-aerial deposit at a site adjacent to the process plant. This site will have a total storage requirement for 2.8 million m^3. The gypsum residue will require stabilization and the storage site will be designed to contain all drainage from the stacked gypsum. Collected drainage will be treated prior to release to the marine environment.

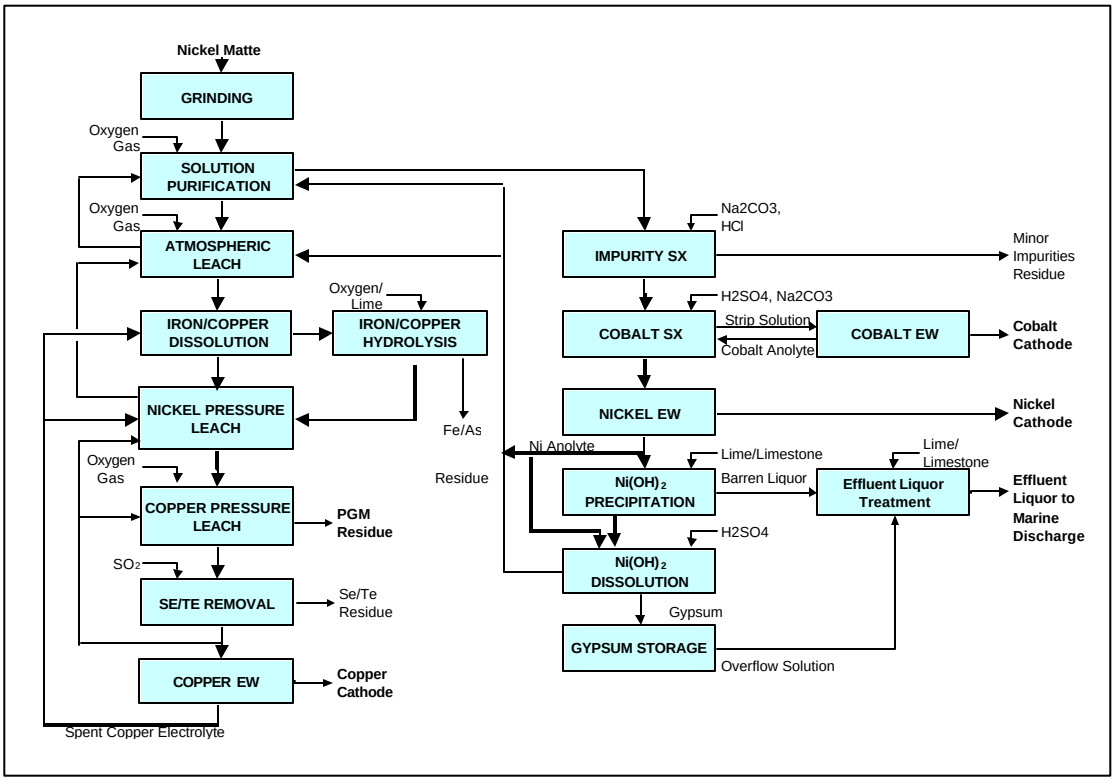

Figure 3.3. The VBNC Matte Plant Process

3.2.2 Raw Materials, Water and Energy Requirements

The requirements for the inputs and outputs of both the Hydromet Plant and the Matte Plant have been estimated. These estimates are provided here for purposes of providing a perspective of the two possible proposed technology options and indicate the similarities of the processes. It is emphasized that these are estimates based on preliminary engineering studies at this stage of the project development.

For planning and design purposes for the Hydromet Plant process, it was projected that water needs would be 600 m^3/h. A lesser amount of water will be required for the Matte Plant. Further studies will be undertaken to determine the need for a dam on Rattling Brook Big Pond to provide sufficient flow for fish habitat maintenance during low flow periods.

Material, water and energy requirements for the Hydromet Plant are shown in Table 3.1.

Table 3-1. Hydromet Plant Material, Water and Energy Requirements

Requirement	Amount	Units
Nickel concentrate	260,000	t/y
Oxygen	157,000	t/y
Sulphuric acid (93 wt% H_2SO_4)	19,400	t/y
Hydrochloric acid (36 wt% HCl)	7,200	t/y
Sodium carbonate (99 wt% Na_2CO_3)	9,500	t/y
Limestone (95 wt% $CaCO_3$)	38,000	t/y
Burnt lime (95 wt% $CaCO_3$)	41,000	t/y
Boric acid (99 wt% H_3BO_4)	210	t/y
Caustic soda (50 wt% NaOH)	453	t/y
SLS	34	t/y
Flocculant	324	t/y
LIX	3.6	t/y
DEPHA	9.3	t/y
Cyanex 272	5.5	t/y
SX Diluent (Escaid 110; type of kerosene)	240,000	L/y
Water	5,000,000	m^3/yr
Electrical power	370,000 (67)	MWh/y (MW)
Gasoline	201,500	L/y
Diesel	566,300	L/y
Fuel oil #6 (steam generation)	3,800	t/y

Material, water and energy requirements for the Matte Plant are shown in Table 3.2.

Table 3-2. Matte Plant Material, Water and Energy Requirements

Requirement	Amount	Units
Nickel matte	93,700	t/y
Oxygen	70,000	t/y
Sulphuric acid (93 wt% H_2SO_4)	2,100	t/y
Hydrochloric acid (36 wt % HCl)	7,500	t/y
Boric acid (99 wt% H3BO4)	240	t/y
Soda ash (99 wt% Na_2CO_3)	4,100	t/y
Caustic soda (50 wt% NaOH)	70	t/y
Limestone (95 wt% $CaCO_3$)	28,000	t/y
Burnt lime (95 wt% $CaCO_3$)	29,000	t/y
Sulphur dioxide	150	t/y
Flocculant	50	t/y
LIX	36	t/y
DEPHA	9	t/y
Cyanex 272	6	t/y
SX Diluent	240,000	L/y
Water	3,700,000	m^3/y
Electrical power	300,000 (55)	MWh/y (MW)
Gasoline	201,500	L/y
Diesel	566,300	L/y
Fuel Oil #6 (steam generation)	16,700	t/y

3.2.2.1 Feed Sources

Although initially the source of the nickel concentrate for the Hydromet Plant will be the Voisey's Bay mine/concentrator in Labrador, nickel concentrate from other sources will also be utilized. The nickel matte for the Matte Plant will come from other Inco facilities such as the Thompson, Manitoba or Copper Cliff, Ontario smelters or from the worldwide nickel market.

The source of the reagents will be the worldwide market. Reagents will be transported to Long Harbour in secure containers via commercial carriers using ships and/or trucks. All carriers will be required to meet appropriate standards. For example, all vessels used for shipping bulk products will be registered through a Protection and Indemnity Club (i.e, Lloyd's) and details such as ownership, casualty history and age (maximum vessel age of 15 years) will be examined by Inco's Risk Management Group. This data is used as a means to decide whether or not to accept an offered vessel before entering a shipping contract with the owners/operators. With respect to the shipment of containers, these will be shipped with major carriers. It is not anticipated at this time that container ships will call at Long Harbour, however in the event this may happen, the vessel(s) will be subject to the same scrutiny utilized in vetting bulk vessels.

The water will be extracted from Rattling Brook Big Pond and the power will be provided by the Newfoundland and Labrador Hydro infrastructure via an existing substation at Long Harbour.

3.2.3 Period of Operation

The Voisey's Bay mine life span is presently predicted to be 20 years. The planned lifespan of the proposed processing facility is 20 years. The design life for both plant types is a minimum of 30 years.

3.2.4 Solid, Liquid, Gaseous, Toxic/Hazardous Wastes or Byproducts

3.2.4.1 Hydromet Plant

The main waste of the Hydromet Plant will be an iron oxide (hematite)/sulphur/gypsum slurry (about 375,000 tonnes per year solids) that will be transferred by a pipeline to a sub-aqueous storage pond. Total liquid effluent released to the marine environment will be on the order of 3.0 million m^3 per year, including site runoff. All liquid effluent will be treated to meet the Newfoundland and Labrador standards for effluent discharge to the marine environment and to be compliant with Section 36(3) of the federal *Fisheries Act*. Waste stream estimates will be refined based on monitoring results obtained at the Demonstration Plant.

Air emissions from the hydrometallurgical process will include dust from the unloading and movement of concentrate on site and also the unloading of other materials such as lime and limestone. Precautions will be in place to minimize the release of dust during these activities, such as covered conveyers and dust collection systems at all drop points. While little air emissions are predicted during the normal operations of the Hydromet Plant, releases of gas may occur under upset conditions.

Of particular concern will be the handling of chlorine gas produced from the process. All precautions will be in place to prevent the release of this gas and to monitor its presence within the plant. Appropriate warning alarm systems and emergency safety procedures will be established to properly manage any accidental event involving chlorine.

Wastewater treatment involves site runoff collection and process effluent treatment prior to release to the marine environment. Site runoff is collected in one of two ponds located on the upper and lower tier sites. Both ponds have a depth of four metres including one metre of freeboard. Heat-traced 250-mm HDPE pipelines (500 m in length) have been included for the discharge of treated effluent solution into the marine environment.

The liquid effluent may contain very low levels of metals such as cadmium, chromium, beryllium, nickel, copper, manganese, cobalt, iron and aluminum. The effluent will be treated to be within the regulated limits before being discharged.

In addition to the above process wastes, solid and sanitary wastes will be produced that will be equivalent to other operations of this type and magnitude. The total workforce on-site will be about 400. A sewage treatment facility will be provided to accommodate the total workforce.

A certified waste handling contractor will be responsible for solid and hazardous waste disposal.

3.2.4.2 Matte Plant

The main waste materials produced by the Matte Plant are gypsum solids (106,000 tonnes per year) and neutralized liquid effluent (2.6 million m^3/y). The Matte Plant would require about 2.8 million m^3 for gypsum storage although the design will be for more than that amount. The waste would be stored as a paste or as "dry stacked" sub-aerial deposit. The liquid effluent would be treated to meet regulated limits and discharged into the marine environment. The iron/arsenic residue (about 5,900 t/y solids) would be disposed of at an approved site by a certified third party or shipped to other Inco facility for further treatment and environmentally safe disposal.

In addition to the above, solid and sanitary wastes will be produced that will be equivalent to other operations of this type and magnitude. The total workforce on-site will be about 350. A sewage treatment facility will be provided to accommodate the total workforce.

Air emissions for the Matte Plant would approximate that from the Hydromet Plant. The Matte Plant does not produce any chlorine gas, as compared to the Hydromet Plant.

A certified waste handling contractor will be responsible for solid and hazardous waste disposal.

3.2.5 Environmental Monitoring

Throughout the Operations Phase, VBNC is committed to environmental monitoring. Compliance monitoring will be conducted as required for any regulated discharges. An

environmental effects monitoring program will also be developed and implemented for the duration of the Project.

3.3 Decommissioning Phase

It is intended that the commercial processing facility will operate for at least 20 years commencing in 2012. The earliest that the Decommissioning Phase would begin would be 2032. Decommissioning is anticipated to take up to two years for the property with the exception of the residue storage pond and associated infrastructure. The residue storage pond, dams and pipeline from the residue storage pond to Long Harbour will remain and will be subject to ongoing environmental monitoring, inspection and maintenance for a number of years post-closure. The length of any post-decommissioning monitoring will be determined pending an assessment of the site and the requirements to restore it to an acceptable state, in consultation with the appropriate regulatory authorities.

A Rehabilitation and Closure Plan will be developed during the design phase of the Project. The Plan will meet the fundamental objective of protecting public health and safety, alleviating or eliminating environmental damage and liabilities, and allowing a productive use of the land similar to its original use or an acceptable alternative.

In anticipation of decommissioning of the property, the following would occur:

- the property would be inspected;
- preliminary site contamination/facility inventories would be developed;
- prior to operations, a draft conceptual plan would be developed that would identify information needs;
- site characterization would occur identifying concerns; and
- options would be considered and a preliminary reclamation plan developed.

The following activities will be addressed in the Rehabilitation and Closure Plan:

- removal and appropriate disposal of all hazardous chemicals, reagents and materials;
- drainage and cleaning of process vessels, pipelines and equipment;
- removal and appropriate disposal of all equipment, materials and supplies;
- demolition and removal of all buildings and other infrastructure no longer required once the commercial processing facility has closed;
- removal and appropriate disposal of all non-hazardous demolition debris;
- assessment of soil contamination in the area of buildings and other facilities and implementation of appropriate remediation measures to address any contaminated soils identified;
- closure of the residue storage pond; stabilization of dams; installation of barrier over residue if necessary; treatment of overflow if necessary;
- removal of fencing, scarification of road surfaces, removal of culverts and stream crossings and restoration of natural drainage patterns wherever practical;

- re-vegetation, where practical, to control erosion;
- potential long-term treatment of effluent from the residue storage pond; and
- monitoring programs to determine the effectiveness of the decommissioning.

The Rehabilitation and Closure Plan would be submitted to the appropriate government agencies for review and comment before finalization. A post-closure monitoring program will also be developed in co-operation with the appropriate authorities.

3.4 Occupations

An estimate of personnel requirements is shown below. It should be noted that these are estimates that could change somewhat as design details become available. There also may be some minor differences between the Hydromet Plant scenario versus the Matte Plant.

The Construction Phase will require approximately 3,000 person-years of employment in the following occupational categories:

- Engineering and technical
- Building trades
- Administration

The Operations Phase will require approximately 400 personnel for the Hydromet Plant and approximately 350 personnel for the Matte Plant. Estimated numbers are as follows:

	Hydromet Plant	**Matte Plant**
• Engineering and technical personnel	37	32
• Operations	232	203
• Maintenance	89	78
• Administration	42	37
Total	**400**	**350**

The Decommissioning Phase requirements are unknown but it is likely that this phase would involve lower numbers of personnel than the previous two project phases.

4.0 EXISTING ENVIRONMENT

The existing biophysical environment of the Project Area and surrounding region is very briefly summarized in the following sections.

4.1 Geology and Topography

The topography of the Avalon Peninsula is generally controlled by the underlying bedrock geology and shaped by the effects of glaciation and associated soil deposits. Elevations range from sea level to approximately 175 m. The terrain is generally hilly to very hilly, rocky terrain with sporadic bogs, fens and ponds. The coastline rises abruptly from the sea and is indented with many inlets.

The soils generally fall under the Patrick's Cove Soil series and are developed from stony, moderately coarse textured, dark brown glacial till derived from sandstone, siltstone and acidic volcanic rocks. Soils are quite acidic (pH 5.0) and are very low in plant nutrients. Surface drainage is impeded by moss and low shrub vegetation and internal drainage is poor. High precipitation rates provide excess moisture throughout the year.

Shorelines are dominated by gravel deposits, bedrock and cliffs, and sand-dominated beaches are rare.

4.2 Groundwater

Groundwater has been reported from 1.0 to >7.0 m below the surface at Long Harbour (AWA 1994). Groundwater quality of the ERCO site has been modeled and monitored for a number of years with emphasis on free cyanide, fluoride, and elemental phosphorus, and the potential for contaminating the harbour.

Groundwater from the ERCO site will not be used or disturbed by the Project (i.e., at the lower Tier 1) because of potential contamination. The upper part of the Project (Tier 2) will be located at a "green field" site on the hillside above Tier 1.

4.3 Climate

The Atlantic Provinces have a climate that is heavily influenced by the ocean and predominating westerly winds resulting in relatively cool springs and summers and relatively mild winters. Generally, coastal areas have stronger winds than inland locations. The maximum hourly wind speed for Long Harbour has been recorded at 79 km/h (Environment Canada 2005a).

Normal temperatures at Long Harbour range from –7.8°C in February to 19.5°C in August with extremes of –25°C recorded in February and 30.6°C recorded in August (Environment Canada 2005a). Although precipitation is well distributed throughout the year it is heaviest in the fall and winter. An extreme rainfall event of 119 mm has been recorded for Long Harbour in October (Environment Canada 2005a). Freezing precipitation that lasts for several hours or intermittently over a period of days is common, particularly in March.

The meeting of the Labrador Current with the warm humid air from the south produces fog that is prevalent in the Placentia Bay area, especially in July. The SE Newfoundland climate is unusual in that strong wind may accompany heavy fog.

4.4 Air Quality

Ambient air quality in the Project Area can probably be considered good based on sulphate loadings in precipitation monitors across the province, including Salmonier Nature Park approximately 45 km east of Long Harbour (Environment Canada 1995; Newfoundland Department of Environment and Labour 1996).

Potential sources of air contamination in the region include vessel traffic, the Come By Chance Oil Refinery, the Oil Transhipment Terminal, the Marystown Shipyard and Cowhead Fabrication Facility, and the Holyrood Thermal Generating Plant.

4.5 Bathymetry and Tides

Long Harbour Bay is oriented on a north-east axis on the northeast side of Placentia Bay (Figure1.1). The entrance to Placentia Bay is exposed to the southwest. Water depth in the middle of Placentia Bay is approximately 240 m (DFO 2003). The entrance of Long Harbour is protected by the Iona Islands behind which there is a good anchorage. The channel into the site ranges in depth from about 88 m in the main channel to 12 m in depth at the entrance to Rattling Brook Cove which lies on the east side of the existing wharf. The outer third of the cove has depths around 12.5 m, the middle third about 7.0 – 10.0 m, and the inner third ranges from 0 to 4.9 m in depth. Tides in Placentia Bay are semi-diurnal with a typical range less than 1.8 m.

4.6 Sea Ice

Placentia Bay is generally ice-free and capable of year-round shipping operations. The maximum mean sea ice edge rarely (<15%) extends far into Placentia Bay (Environment Canada 2005b based on 1971-2000 data; see http://ice-glace.ec.gc.ca).

4.7 Physical Oceanography

At least three water types can be distinguished in Placentia Bay: (1) a deep water layer with limited seasonal variation, (2) a surface water layer with seasonal variability, and (3) a surface/freshwater mixture which is seasonally variable. A thermocline develops in the warmer months at a depth of 50 to 60 metres which results in a stable water column with little vertical mixing in summer. More extensive mixing occurs during the winter due to winter storms. Salinities in the Western Channel are lower than those of the Eastern Channel as a result of fresh water input from Swift Current, which is the major source of freshwater into Placentia Bay.

The local current circulation pattern in Placentia Bay is complex but with a general counterclockwise pattern flowing north along the Eastern Channel and south through the Western Channel (Hodder, Parsons and Pippy 1972; Chevron et al. 1996).

4.8 Vegetation

The region lies within the Southeastern Barrens subregion of the Maritime Barrens Ecoregion (Damman 1983). This ecoregion is characterized by extensive barren areas consisting of dwarf shrub heaths, bogs and shallow fens. Balsam fir and black spruce dominate the forested sections of the surrounding region with eastern larch scattered throughout (Thompson et al. 1979). A scrub forest of less than five metres in height of these three species covers approximately a third of the region. Ground vegetation is characterized by heath shrubs.

Lichens occur in several different habitats in the region adjacent to Long Harbour. In particular, epiphytic lichens are associated with undisturbed balsam fir stands (60+ years). The lichen *Erioderma pedicellatum* is considered rare with the largest known populations in the world occurring in the Avalon Forest ecosystem. It has been reported from stands in the southeast section of the region (E. Conway, pers. comm.) and near Rattling Brook Big Pond. Other lichens occur in the coastal *Empetrum* heaths and inland on the ground in the *Kalmia* heaths.

The vegetation at the ERCO site has been impacted by the previous industrial activity and there are large areas of clearing, gravel, and asphalt as well as several buildings. Vegetation in the surrounding area has been affected by past air emissions from the phosphorus plant but has largely recovered in recent years.

The proposed Tier 2 site is considered a "green field" with natural vegetation typical of the western Avalon Peninsula.

4.9 Fish and Fish Habitat

4.9.1 Freshwater Resources

4.9.1.1 Sandy Pond

Sandy Pond will be the freshwater resource most affected by the Project as it is the proposed site for residue storage. It is located 126.5 m above sea level about 3.5 km east of the Tier 1 site and about two kilometres from the ocean. Sandy Pond has an area of approximately 38 hectares (0.38 km^2) with a catchment area of 1.9 km^2 and an average depth of about 7.5 m. A small pond to the northwest of Sandy Pond would be used as a surge pond.

Landlocked (non-anadromous) brook trout (known locally as mud trout) are known to occur in Sandy Pond.

4.9.1.2 Rattling Brook Big Pond

Rattling Brook Big Pond will be used as a water supply. The pond has an elevation of 107.3 m, a surface area of 1.8 km^2 and a catchment area of 21.6 km^2. It is located approximately 2.5 km from saltwater. A 3.4 km pipeline would be required to carry water from this pond to the plant. The pond is known to contain landlocked brook trout and arctic char.

4.9.1.3 Freshwater, Anadromous and Catadromous Fish

Common fish species that may occur in the region's streams and ponds include Atlantic salmon, brook trout, brown trout (an introduced species), arctic char, American eel, and sticklebacks. Banded killifish, a "listed species" under the provincial *Endangered Species Act*, has been reported in the region. Many of the ponds between Argentia and Long Harbour have been sampled for water quality, sediment quality, invertebrates and fish by VBNC's consultants and others (summarized in AMEC 2005). Anadromous forms are unlikely to occur in the small very steep brooks in, and adjacent to, the proposed Project Area.

4.9.2 Marine Fish

There are at least 30 commercial fish and invertebrate species in Placentia Bay including Atlantic cod, winter flounder, American plaice, capelin, lumpfish, Atlantic herring, American lobster, snow crab, scallops, blue mussels, and others. The two most important commercial species at present include snow crab and American lobster. Atlantic cod is also an important species in Placentia Bay and historically was the most important one.

4.10 Birds and Wildlife

Numerous species of birds and mammals inhabit the coast of Placentia Bay and surrounding waters. In summer, gannet-alcid-gull nesting and shearwater foraging communities characterize the inshore zone of Placentia Bay, and in winter, a significant waterfowl population occurs in the nearshore waters. Most marine mammals, including baleen and toothed whales that occur in Placentia Bay are seasonal visitors that forage upon species like capelin during the summer.

4.10.1 Terrestrial Mammals

Moose were introduced to the island of Newfoundland in the early 1900s and have since occupied most of the island and is now the most common large mammal on the island. Their preferred habitat is coniferous forest, especially near swamps and lakes in areas of secondary growth. Caribou may also occur in the area.

Common small mammals in the region include meadow vole, snowshoe hare, mink, foxes and masked shrews. Otter and muskrat may also frequent the regional area (ARG 1995).

4.10.2 Marine Mammals

Thirteen species of marine mammals are known to occur in Placentia Bay, including ten species of whales and three species of seals. Several additional species may also occur there very sporadically. Although most species are seasonal inhabitants, the waters of Placentia Bay and surrounding areas are important feeding grounds for some. There are no known resident populations of marine mammals in Placentia Bay.

Humpback, minke, and fin whale occur regularly in Placentia Bay whereas sei and blue whale occur less frequently (Marques 1996). Blue whale is listed as endangered under the federal *Species at Risk Act (SARA).*

4.10.2.1 Otters

Another important mammal in the Placentia Bay area, although strictly speaking not a marine mammal, is the northern river otter, which is a year-round resident. River otters in Placentia Bay are unusual because they spend a great deal of time in marine environments (Petro-Canada 1980). Placentia Bay supports one of Newfoundland and Labrador's largest river otter populations, with the greatest numbers occurring on the small islands west of Merasheen Island and in northern Placentia Bay (Chevron et. al. 1996). These otters inhabit local bays throughout the year and move inland during March and April to give birth to their young (Chevron et. al. 1996).

4.10.3 Birds

During 2004-2005, VBNC conducted seabird surveys on the eastern side of Placentia Bay. These data and other historical data are presently being compiled (B. Brown, pers. comm.). Placentia Bay provides important habitat for many species of birds, including important feeding, overwintering, and breeding sites.

4.10.3.1 Breeding Seabirds

Major seabird colonies are located near the mouth of Placentia Bay and smaller colonies are located along the inner islands and coastlines of the bay. The most significant breeding habitat is at Cape St. Mary's Seabird Ecological Reserve (also classified as an Important Bird Area or IBA), which is located at the mouth of Placentia Bay.

There are numerous seabird colonies which range considerably in size and diversity located along the inner islands and coastlines of Placentia Bay. Great and Double-Crested Cormorants are known to nest in small numbers at three colonies located in the southeastern portion of Placentia Bay. Cormorants are rare on the east and south coasts of the island of Newfoundland and are known to breed at only five sites in total (Lock et. al. 1994). All other colonies along the east coast of Placentia Bay, with the exclusion of Cape St. Mary's, are used mainly by breeding pairs of Herring Gulls, Great Black-backed Gulls, and Common or Arctic Terns (Cairns et. al. 1989). There are also a limited number of Leach's Storm Petrels, Ring-billed Gulls, and Black Guillemots found breeding along the east coast. Some shorebird species may breed near Argentia including Semi-palmated Plovers, Greater Yellowlegs, and Spotted Sandpipers.

4.10.3.2 Non-Breeding Sea-associated Birds

The coastal and nearshore waters of Placentia Bay provide summering habitat for non-breeding waterfowl and summer feeding and overwintering habitat for large numbers of seaducks and seabirds. Placentia Bay, and in particular Cape St. Mary's, is a significant wintering site for alcids, including Thick-billed Murres, Dovekies, and Common Murres. Many waterfowl species

overwinter in Placentia Bay, most notably at Cape St. Mary's, including Harlequin Ducks (listed as special concern by COSEWIC 2002), Common Eider, King Eider, Black Scoter, White-winged Scoter, Surf Scoter, and Oldsquaw. Concentrations of several thousand Common Eiders have been observed at Cape St. Mary's during winter (Goudie 1981).

The eastern half of Placentia Bay from Argentia to Cape St. Mary's, extending from the shoreline to 25 km offshore has been designated an IBA of global significance in large part to the high numbers of shearwaters that feed there. The concentrations of Greater Shearwaters are closely related to the movement of spawning capelin. The area between Argentia Harbour and Iona Islands and around Ship Harbour can host concentrations of Shearwaters (Greater and Sooty) depending on weather conditions (ADC 1983). Numbers of waterfowl in the area during the summer are generally low. Those present are most often found in sheltered bays and inlets and include migrants, transients and non-breeding summering birds. Species which may be present in the head of the bay during the summer months include Canada Goose, Black Duck, Ring-necked Duck, Greater Scaup, Common Goldeneye, Common Merganser and Red-breasted Merganser.

4.10.3.3 Raptors and Other Birds

The Placentia Bay area is one of the most productive areas for Bald Eagles on the island of Newfoundland. Bald Eagles are present year round in relatively large numbers, with most found in the inner/central portion of the bay and along the eastern shore of the bay. Osprey are also fairly common, but are only present in the region from spring to early fall. The portion of the bay around Merasheen Island has been designated as an "experimental area" for raptors and waterfowl.

A variety of terrestrial songbirds also inhabit the area and the southeastern part of the island of Newfoundland often receives stray species from Europe, the United States, and elsewhere.

4.11 Rare and Endangered Species

There are no known critical nesting, feeding, staging or overwintering areas of rare and endangered bird and mammal species in the immediate vicinity of Long Harbour.

Twenty-three species, subspecies and populations are listed under the provincial *Endangered Species Act*, including eight endangered, seven threatened, and eight vulnerable (Government of Newfoundland and Labrador 2005). Representative endangered species include the American marten (*Martes americana atrata*), Piping Plover (*Charadrius melodus melodus*), Barrens willow (*Salix jejuna*) and the lichen *Erioderma pedicellatum*. Many of the species are limited to very specific habitat types that do not occur in Long Harbour and thus are very unlikely to occur there.

A list of species that are listed under the federal *SARA* Schedule 1 and the provincial *Endangered Species Act* and that may occur in the Placentia Bay area is provided below.

Provincial Wildlife at Risk Species (as of 14 December 2005)

- Banded killifish (*Fundulus diaphanus*) (Vulnerable)
- Barrows Goldeneye (*Bucephala islandica*) (Vulnerable)
- Boreal felt lichen (*Erioderma pedicellatum*) (Vulnerable)
- Harlequin Duck (*Histrionucus histrionucus*) (Vulnerable)
- Red Crossbill (*Loxia curvirostra percna*) (Endangered)
- Short-eared Owl (*Asio flammeus*) (Vulnerable)

SARA Schedule 1 Threatened or Endangered Species (as of 14 December 2005)

- Blue whale (*Balaenoptera musculus*) (Endangered)
- North Atlantic right whale (*Eubalaena glacialis*) (Endangered)
- Red Crossbill *percna* subspecies(*Loxia curvirostra percna*) (Endangered)
- Ivory Gull (*Pagophila eburnea*) (Special Concern)
- Leatherback sea turtle (*Dermochelys coriacea*) (Endangered)
- Northern wolffish (*Anarhichas denticulatus*) (Threatened)
- Spotted wolffish (*Anarhichas minor*) (Threatened)

4.12 Fisheries

Placentia Bay corresponds more or less to NAFO Unit Area 3PSc (Placentia Bay). Between 2000 and 2004, approximately thirty species of fish and invertebrates were commercially landed here (DFO 2005). Recent commercial catch locations are shown in Figure 4.1.

The most important species include snow crab, lobster, Iceland scallop, sea scallop, sea urchin, Atlantic cod, lumpfish, Atlantic herring, capelin, winter flounder, American plaice. The primary gear types in Placentia Bay are fixed gill nets and traps for mobile species and dredges for sedentary species such as scallops. By far, most of the fisheries are conducted in the spring and summer.

4.13 Existing Contamination

The decommissioned ERCO site contains an *in situ* containment cell (for containing elemental phosphorus) and a hazardous waste disposal site (containing naturally occurring radioactive materials or NORM associated with phosphorus furnace waste), elemental phosphorus contained in a crib in the dock, four landfills (containing asbestos waste, demolition debris, industrial and municipal waste, sheet metal and some potentially radioactive material) and some potential petroleum hydrocarbon contamination. There is also buried infrastructure such as concrete, piping, electrical wiring and so forth.

In so far as is known at present, any contaminants from the ERCO site are not affecting aquatic biota and DFO has re-opened the commercial fishery in the inner section of Long Harbour. VBNC is presently conducting studies on water, sediment and mussels in the area.

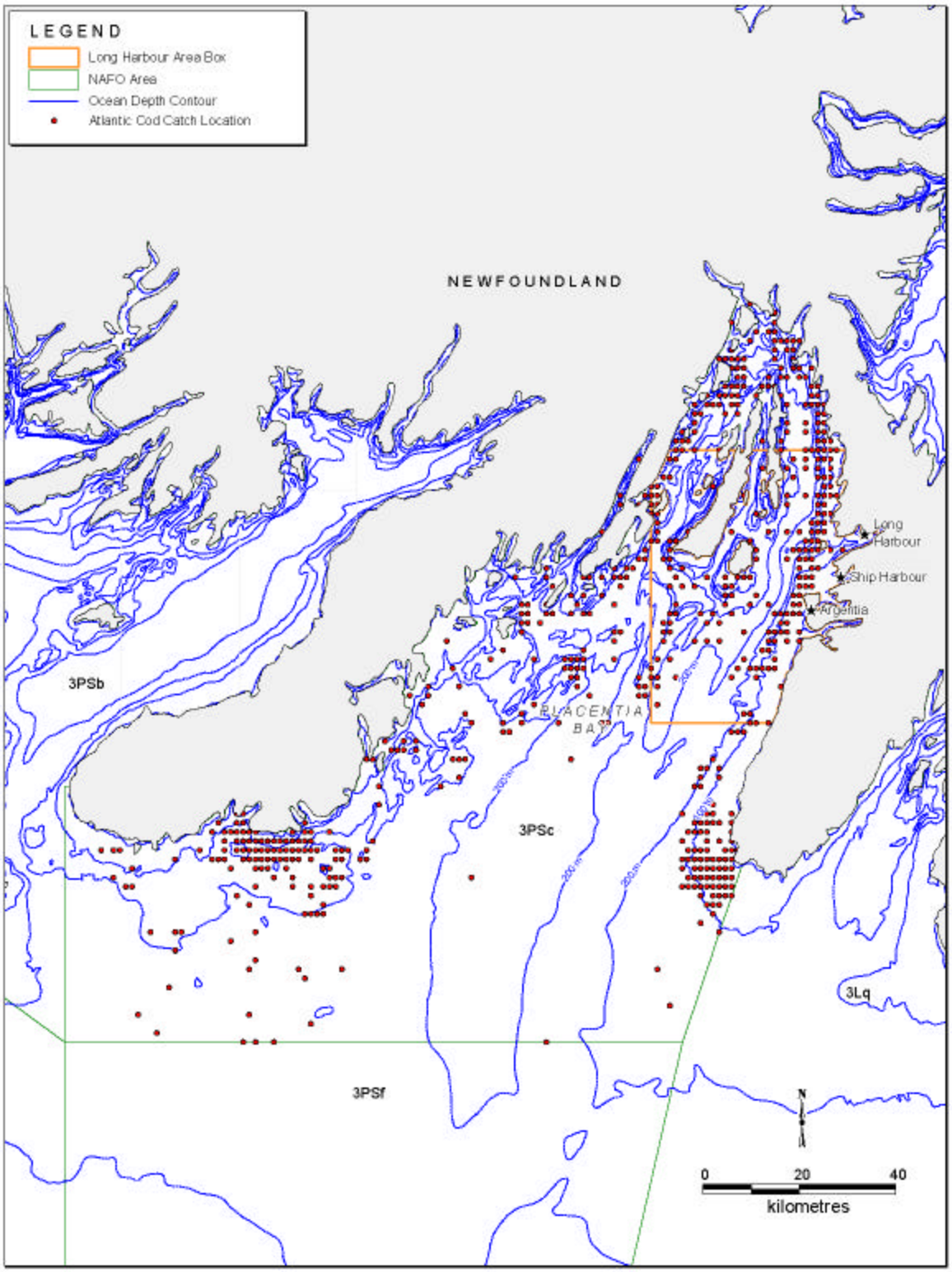

Figure 4-1. Atlantic Cod Fisheries Recent Catch Locations Based on DFO Data

4.14 Potential Resource Conflicts

4.14.1 Potential Interaction

Potential interactions with the Project include those associated with:

- Fish and fish habitat
- Resource harvesting (e.g. fisheries, hunting)
- Birds and wildlife (including marine and terrestrial species)
- Provincially and/or federally listed "species at risk", if present
- Socio-economic environment
- Air and water quality in the context of human and ecosystem health
- Others identified during scoping exercises

These interactions will be analyzed during the environmental assessment process which will include consultations and scoping.

4.14.2 Potential to Affect Fish and Fish Habitat and Navigable Waters

The Project has the potential to interact to varying degrees with fish and fish habitat and navigable waters during construction, operation, and decommissioning. Potential interactions with the marine environment may occur due to dock construction and operation, vessel traffic, ocean outfalls, site run-off, and residue pond overflow. Interactions with the freshwater environment may occur during pipeline and berm construction, residue storage and overflow. Disturbance to both environments may occur when Project infrastructure is removed during decommissioning.

Freshwater Environment

Sandy Pond is the proposed sub-aqueous residue disposal site for the Hydromet Plant. It is a 38 ha pond located at the top of a small watershed to the east of the existing industrial site. There are no streams flowing into Sandy Pond, therefore there is no requirement for diversion works. The outflow stream is intermittent with some underground sections and it ultimately drains into the upper reaches of Long Harbour. The development plan for Sandy Pond includes the construction of containment dams on the pond itself as well as on a small unnamed pond to the northwest which would function as a clarification pond. Between the Hydromet Plant and Sandy Pond there is a 3.8 km residue pipeline, access road and effluent return line with one stream crossing over Rattling Brook (Figure 2.2).

The use of Sandy Pond for the sub-aqueous disposal of residue from the Hydromet Plant would require approval from Fisheries and Oceans Canada (DFO) pursuant to Section 35(2) of the *Fisheries Act*. The construction of works in Sandy Pond also requires approval from Transport Canada pursuant to Section 5(1) and possibly Section 23 of the *Navigable Waters Protection Act*. The fish habitat and any navigation use in the entire pond would be lost. Habitat compensation for the loss of fish habitat in Sandy Pond would be have to be negotiated with DFO.

VBNC will undertake a habitat quantification exercise to determine the habitat loss associated with residue storage and transport. In addition to Sandy Pond and the adjacent unnamed pond, the habitat of the intermittent outflow stream and at the stream crossing at Rattling Brook will be characterized to determine the potential for loss of any riverine habitat.

While the Matte Plant does not require use of a pond for residue disposal, the area proposed for sub-aerial disposal will be carefully examined to determine the possibility of effects on fish habitat. There will be a requirement to direct runoff away from the disposal area and to construct a clarification pond downstream. Containment dam(s) would be required and there may also be a need to re-direct a portion of the watershed which could result in flow alterations in downstream portions of the basin. Depending on how substantial such changes are, there is the potential for harmful effects to fish and fish habitat. There are no stream crossings associated with the residue pipeline, access road and effluent return line between the sub-aerial residue disposal site and the Matte Plant.

The proposed water supply pond for both the Hydromet Plant and the Matte Plant is Rattling Brook Big Pond (Figure 2.2). Hydrological studies will be conducted to determine the extent of any drawdown associated with the water withdrawal and whether any damming is required. A habitat quantification exercise will be conducted in Rattling Brook Big Pond, its inflow streams and its outflow, Rattling Brook. This information will be used to examine potential effects on fish and fish habitat and to address instream flow needs. Any potential effects to navigation use will also be determined.

There are two small unnamed ponds at the process plant location on Tier 2, and these ponds will be filled in during project construction. These ponds will be studied in 2006 to determine whether they are inhabited by fish. If they are fish-bearing waters, the habitat will be included in the overall freshwater habitat quantification.

The road connecting Tier 1 and Tier 2 crosses Rattling Brook in one location. The habitat at the crossing location will be characterized and the crossing will be appropriately designed to minimize any potential effect on fish and fish habitat.

Marine Environment

Project features in the marine environment include an expansion of the existing port facility and a marine outfall into Long Harbour, in addition to shipping. A two-berth, 90 m wide wharf will be created at the site of the existing finger pier, and this will entail infilling and some minor dredging. A preliminary estimate of number of ships into the facility is 30 per year for the Hydromet Plant and 25 for the Matte Plant, for a total of 60 and 50 ship movements, respectively. There will be no requirement for ship anchorages. Ships carrying materials to and from the facility will all be fully compliant with the *Canada Shipping Act* and will travel via established shipping lanes. Arrangements will be made with the Atlantic Pilotage Authority for pilot service since Long Harbour falls within a compulsory pilotage zone.

All loading and unloading of ships will be conducted in such a manner as to minimize potential for spills into the marine environment, and appropriate contingency plans will be in place to address any accidental events. There are no plans for bulk loading of fuel in Long Harbour. Some domestic waste and hazardous waste from Voisey's Bay will be offloaded at Long Harbour and transported to approved facilities for handling of such products. General ship garbage will also be offloaded at Long Harbour and taken to the appropriate municipal landfill. All waste products will be handled in a manner to ensure compliance with provincial regulations.

Treated process effluent from the commercial plant will be combined with treated clarified effluent from the clarification pond adjacent to Sandy Pond (for the Hydromet Plant), or from the clarification pond adjacent to the sub-aerial residue disposal area (for the Matte Plant). This treated effluent will be discharged via a diffuser into the waters of Long Harbour to the west of the wharf. The design and exact location of the effluent diffuser will be determined subsequent to additional marine studies in Long Harbour, including habitat characterization, physical oceanography and modeling studies. Excess water and potential seepage from the site will be collected, clarified and treated prior to discharge to the marine environment. All discharges will be treated and monitored as per regulatory requirements.

The proposed port facility has the potential to affect fish and fish habitat as well as navigation. VBNC will conduct a habitat survey in the vicinity of the proposed port facility and will review commercial fish harvesting in the area. This information can be used by DFO to determine the potential for any harmful alteration, disruption or destruction of fish and fish habitat associated with the expansion of the existing port facility, and the need for approval pursuant to Section 35(2) of the *Fisheries Act*. If it is determined that there is a loss of marine habitat, VBNC will negotiate habitat compensation with DFO. Transport Canada's review of the plans for the port facility will lead to a determination regarding whether there is any interference to navigation and the need for approval pursuant to Section 5(1) of the *Navigable Waters Protection Act.*

5.0 OTHER PROJECT-RELATED INFORMATION

5.1 Project-related Documents

The primary Project-related documents relevant to this Project Description/Scoping Document include the *Argentia Hydrometallurgical Demonstration Plant Registration* (VBNC 2002) (for full report go to the following web link http://www.vbnc.com/Reports.asp) and the *Voisey's Bay Development Agreement*.

5.2 Permits and Approvals

The Project will be subject to the following primary environmental legislation.

Government of Canada

- *Canadian Environmental Assessment Act*
- *Canadian Environmental Protection Act*
- *Fisheries Act*
- *Species at Risk Act*
- *Navigable Waters Protection Act*
- *Transportation of Dangerous Goods Act*

Government of Newfoundland and Labrador

- *Environmental Protection Act*
- *Water Resources Act*
- *Endangered Species Act*
- *Occupational Health and Safety Act*
- *Boiler, Pressure Vessel and Compressed Gas Act*
- *Dangerous Goods Act*
- *Public Health Act*
- *Urban and Rural Planning Act*

In addition, the Project is subject to a legal agreement between the province and VBNC, the *Voisey's Bay Development Agreement*. A list of potentially required permits, licenses and authorizations is contained in Appendix I.

5.3 Schedule

The Project planning timeline spans 20 years. Construction is scheduled to commence by early 2009 and continue through 2011, in accordance with the *Voisey's Bay Development Agreement*. The design life of the plant (s) is 30 years although it will likely last longer than that. The earliest that the decommissioning Phase would commence would be about 20 years after the commencement of the Operations Phase.

5.4 Funding

There is no federal funding involved in the Project.

5.5 Federal Lands

There are no federal lands involved in the Project.

5.6 Cost Recovery

For Inco planning purposes and for provincial cost recovery, the cost of the Project is valued at about CAD$ one billion.

March 16, 2006
Date

Phil du Toit
Managing Director

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Personal Communication

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APPENDIX I

Legislation Relevant to the Project

Administering Department	Legislation
Government of Newfoundland and Labrador	
Environment and Conservation	Environmental Protection Act Water Resources Act Lands Act Endangered Species Act
Natural Resources	Forestry Act Wild Life Act Quarry Materials Act
Government Services	Occupational Health and Safety Act Radiation Health and Safety Act Workplace Health, Safety and Compensation Act Public Safety Act Buildings Accessibility Act Corporations Act Dangerous Goods Transportation Act Elevators Act Fire Prevention Act Food and Drug Act Public Health Act Urban and Rural Planning Act Waste Material Disposal Act Well Drilling Act Smoke Free Environment Act Tobacco Control Act
Municipal and Provincial Affairs	Municipalities Act
Tourism, Culture and Recreation	Historic Resources Act
Government of Canada	
Environment Canada	Canadian Environmental Assessment Act Canadian Environmental Protection Act Species at Risk Act
Fisheries and Oceans Canada	Fisheries Act Oceans Act Species at Risk Act
Transport Canada	Transportation of Dangerous Goods Act Navigable Waters Protection Act

Permit, Approval or Authorization	Activity	Administrator
Newfoundland Department of Government Services		
Asphalt Plant Operation/Setup Certificate of Approval	Paving of Roads On-Site	Operations
Boiler, Pressure Vessel:		
Contractor's Specifications for Registration of Pressure Piping Systems	Piping	Engineering & Inspection Services
Contractor's License to perform work on pressure piping systems	Piping	Engineering & Inspection Services
Certificate of Inspection	Piping	Engineering & Inspection Services
Install or Alter a Pressure Piping System (Permit)	Piping	Engineering & Inspection Services
Manufacturers' Specifications for all Types of Boilers (Registration)	Operation	Engineering & Inspection Services
Propane Gas Installation Examination for Propane System Installation Certificate	Operation	Engineering & Inspection Services
Certificate of Plant Registration - power, heating, refrigeration, compressed gas or combined plant	Operation	Engineering & Inspection Services
Boiler Pressure Vessel Fittings Fabricated in Newfoundland Statutory Declaration for Registration	Piping	Engineering & Inspection Services
Propane Plant License required for operating a gas dispensing unit for filling portable cylinders	Operation	Engineering & Inspection Services
Building Plans Commercial - Approval under the National Building/Fire/Life Safety Code	Site Buildings	Engineering & Inspection Services/ Operations

Permit, Approval or Authorization	Activity	Administrator
Newfoundland Department of Government Services (con't)		
Building Accessibility Design Registration - Public Buildings (Approval)	Site Buildings	Engineering & Inspection Services/ Operations
Building Accessibility - Exemption Registration	Site Buildings	Engineering & Inspection Services/ Operations
Develop Land: Application to Construct Extension or Accessory Buildings alongside all Protected Roads or within Protected Areas in the Province	Water Supply Pumphouse	Customer Services
Smoking in Public Buildings	All work	Operations
Blaster's Safety Certificate	Water/ Residue Pipelines & Dams	Workplace Safety Programs Division
Health & Safety Program	Construction and Operations	Occupational Health and Safety Division
Electrical: Electrical Contractor's Registration Certificate - is required to obtain Electrical Permit	Electrical Work	Customer Services/ Operations
Electrical Permit - Permit to Install or Repair Electrical Equipment or Inspection of Work	Electrical Work	Customer Services/ Operations
Electrical Maintenance Permit - Approval is required to maintain a building's electrical system	Operations	Operations
Elevators: Certificate of Inspection	Operations	Engineering & Inspection Services

Permit, Approval or Authorization	Activity	Administrator
Newfoundland Department of Government Services (con't)		
Elevators (continued): Approval is required for drawings and specifications before installation of, or major alterations to, an elevator	Commercial Facility	Engineering & Inspection Services
Food Establishment License: Is required for the sale, production, manufacturing, preparation, storage and/or distribution of food	Construction Camp	Operations
Fuel Storage and Handling: (GAP) Regulations - A Registration is required for the storage and handling of gasoline and associated products (underground or above ground)	Operations	Operations
A permit is required for flammable and combustible liquid Storage and for dispensing (above or below ground) and for bulk storage (above ground only) under the Fire Prevention Act	Operations	Operations
Permanent & Temporary Storage/ Remote Locations	Water Supply/ Construction Camp	Operations
Septic System Commercial - Certificate of Approval for septic systems > 4,500 L per day - in an unserviced area and not covered under a Municipality	Commercial Facility Construction Camp	Engineering & Inspection Services
Waste Management System, Certificate of Approval	Commercial Facility Construction Camp	Operations

Permit, Approval or Authorization	Activity	Administrator
Newfoundland Department of Government Services (con't)		
Waste Oil, Handling and Disposal	Construction and Operations	Operations

Newfoundland Department of Tourism, Culture and Recreation		
Archaeological Research Permit - Archaeological investigations on land or under water	Commercial Facility/Water Supply/Residue Disposal Area	Historic Resources Division

Newfoundland Department of Environment and Conservation		
Crown Lands – Applications/Licences	Commercial Plant Site, Residue Disposal Area, Water Supply	Crown Lands Administration Division
Construction (Site Drainage) Certificate of Approval	Site Work	Water Resources Division
Culvert Installation, Certificate of Approval	Site Work	Water Resources Division
Dams and Appurtenant Structures, Certificate of Approval	Water Supply, Residue Disposal Area	Water Resources Division
Industrial Processing Works, Certificate of Approval	Commercial Facility Operations - Control of Air Emissions, Effluent Discharges and Residue Storage	Pollution Prevention Division
Water and Sewer Works for private and municipal, Certificate of Environmental Approval	Site Water and Sewer Installation	Environmental Management Division

Permit, Approval or Authorization	Activity	Administrator
Newfoundland Department of Environment and Conservation (con't)		
Water Resources:		
Water Course Alterations, Certificate of Environmental Approval to Alter a Body of Water	Water Supply, Residue Disposal Area	Water Resources Division
Water Course Crossings, Certificate of Environmental Approval	Water Supply, Residue Disposal Area	Water Resources Division
General Application for Water Use Authorization - for all beneficial uses of water from any source	Water Supply	Water Resources Division
Licence to drill water wells	Geotechnical investigations	Water Resources Division

Newfoundland Department of Natural Resources		
Operating Permit - Fire Season - Crown or private land for a company or individual to operate during a forest fire season	Commercial Facility/Water Supply/Residue Disposal	Newfoundland Forest Service
Permit to Cut Crown Timber - A permit is required for commercial or domestic cutting on Crown Land	Commercial Facility/Water Supply/Residue Disposal	Newfoundland Forest Service
Permit to Burn	Commercial Facility/Water Supply/Residue Disposal	Newfoundland Forest Service
Sod Cutting Permit	Final Site work	Soil and Land Management Division
Quarry Permit	Site Work/ Residue Disposal Area	Mineral Lands Division

Permit, Approval or Authorization	Activity	Administrator
Fisheries and Oceans Canada		
Fish Habitat, Authorization for Works or Undertakings Affecting Fish Habitat (HADD)	Water Supply and Transmission, Residue Disposal Area, Effluent Outfall, Wharf	Regional Headquarters
Dredging Harbours and Ocean Dumping	Port Area	Area Habitat Office (also Environment Canada and Provincial Water Resources Division)
Application for Water Lease	Commercial Facility	Canadian Coast Guard
Vessel Safety Inspection Certificate	Commercial Facility	Canadian Coast Guard

Other Federal Departments		
Application for Construction within Navigable Waters	Wharf, Residue Disposal Area	Transport Canada, Navigable Waters Protection
Approval for Vessel Admission	Commercial Facility /Operations	Canada Customs and National Revenue
Magazine License, Temporary	Water Supply and Transmission Main	Mines and Energy Canada, Regional Explosives Inspector

Municipal		
Approval for Waste Disposal	Commercial Facility Operations	Town/ Community Council
Construction/Development Permit	Commercial Facility	Town Clerk
Occupancy Permit	Commercial Facility	Town Clerk

Environmental Assessment Legislation		
Environmental Assessment Regulations	Commercial Nickel Processing Project	Newfoundland Minister of Environment and Conservation
CEAA	Commercial Nickel Processing Project	Federal Minister of Environment