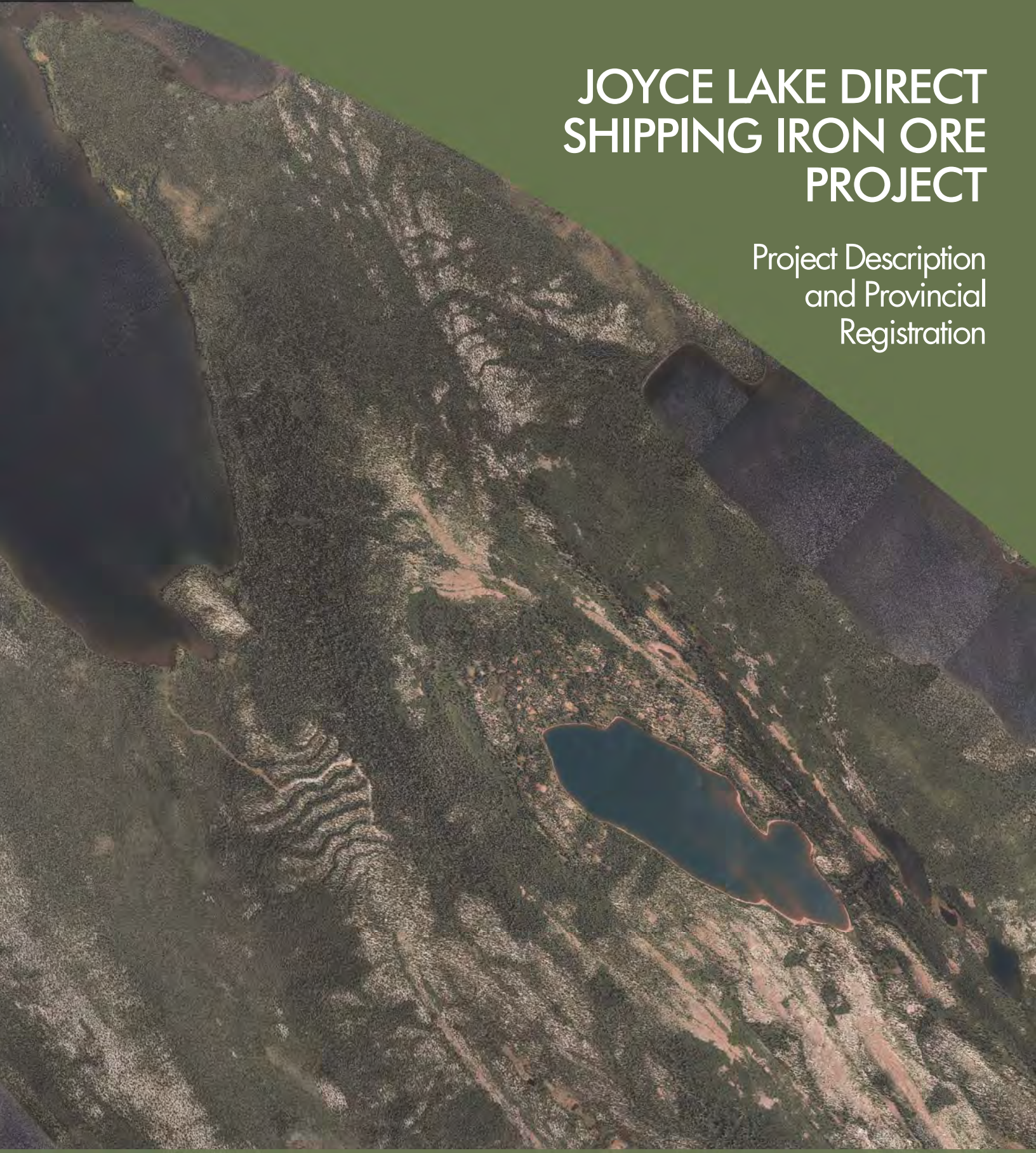
JOYCE LAKE DIRECT SHIPPING IRON ORE PROJECT

Project Description and Provincial Registration



Labec Century, a subsidiary of Century Iron Mines Corp.

November 5, 2012

Stassinu Stantec Limited Partnership

Joyce Lake Direct Shipping Iron Ore Project:
Project Description and Provincial Registration

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Project No. 121810649
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1.0 INTRODUCTION

Labec Century Iron Ore (Labec Century; the Proponent), a subsidiary of Century Iron Mines Corporation (TSX:FER), is proposing to develop an iron mine in western Labrador, approximately 20 kilometres (km) to the northeast of the Town of Schefferville, Québec. The mining prospect for the Joyce Lake Direct Shipping Iron Ore Project (the Project) lies on a peninsula of land in Attikamagen Lake and all the physical elements of the Project that will be subject to assessment lie within Labrador (Figure 1-1).

The mine will produce up to four million tonnes (Mt) of product per year. The ore will be transported to the existing rail owned by Tshiuetin Rail Transportation Inc. for transportation to the Port of Sept-Îles.

The Project will require approval from the Government of Newfoundland and Labrador and is subject to environmental assessment (EA) under the Newfoundland and Labrador *Environmental Protection Act* (NL *EPA*) and associated Environmental Assessment Regulations. Under the *Canadian Environmental Assessment Act, 2012* (*CEAA, 2012*) the Project is a Designated Project pursuant to Section 15(a) Regulations Designating Physical Activities and may require federal EA.

This Project Description and Provincial Registration document for the Project presents a description of the components that will comprise the mine and mine infrastructure: an open pit, waste rock disposal, tailings management, processing and support infrastructure, access and haulage roads, and a rail loop.

1.1 BACKGROUND

The Project is located on the eastern end of the Labrador Trough, a rich belt of iron ore that stretches through Labrador and northern Québec. Mining operations in the area began in the 1950s when the Iron Ore Company of Canada (IOC) began iron mining operations and established the Town of Schefferville. Although iron ore mining by IOC ceased in the area in the early 1980s, there has been a resurgence of interest in the recent decade, with several companies actively exploring and evaluating the iron potential. For example, Labrador Iron Mines (LIM) is pursuing the development of several properties in the Schefferville area, and their James Mine operation began producing in 2012. Likewise, Tata Steel and New Millenium (NML) are working together on three projects: the DSO (“direct shipping ore”) project at Elross Lake (under construction) and taconite iron deposits on former IOC property that straddles the two provinces: LabMag in Labrador, and KéMag in Québec (NML 2012).

Written references to mineral occurrences in the Schefferville area (originally known as Knob Lake) were first included in the diaries of missionary Louis Babel in 1854. Using those references, Albert Peter Low (A.P. Low) of the Canadian Geological Survey (CGS) began detailed mapping of the area in 1892 and continued the work in 1895/96. During that period, Low published a report which highlighted the existence of large iron ore deposits in the area.

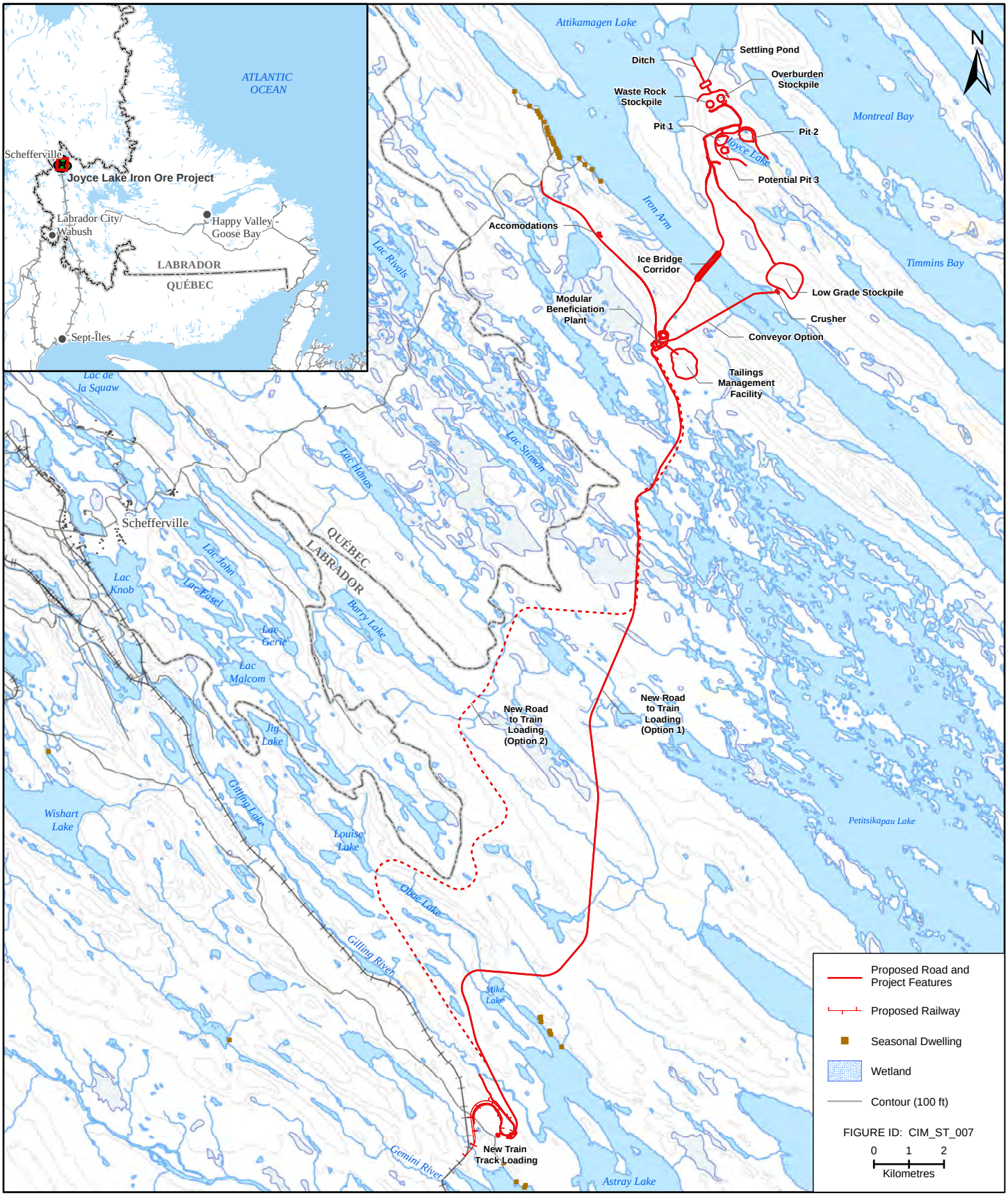
In 1937, Labrador Mining and Exploration (LM&E) explored the area between the Petitsikapau Lake and Iron Arm. At this time, work consisted of surface mapping and sampling. In 1951, IOC completed a geological mapping survey covering the area between Schefferville and Attikamagen Lake, including the Project area.

Other significant work in the area is outlined below.

- In 1952, IOC examined 100 km of iron formation near the Iron Arm, Dyke, and Snelgrove lakes.
- In 1953, IOC studied the area north of Attikamagen Lake. During the same year, LM&E completed 24 km of magnetic survey and collected 70 grab samples and one bulk sample on the Attikamagen Area.
- In 1960, LM&E completed a geological reconnaissance mapping and sampling covering the Lac Sans Chef and Joyce Lake areas.
- In 1979, LM&E drilled one diamond drill hole (6 metres (m)) at the northern end of the deposit. The borehole intersected cherty metallic iron formation, and undocumented assay samples reportedly yielded twenty-five to thirty percent iron.
- In 1980, LM&E completed a regional airborne geophysical survey over parts of the Labrador Trough. The survey consisted of 328 line-km over the Attikamagen Iron Project area. Additionally, limited ground spectrometer surveys identified a low-level uranium anomaly on the property.
- In 2007, Champion acquired the Attikamagen Iron Project (Labrador side) and conducted an airborne magnetic, gamma-ray and VLF-EM geophysical survey on the property, as well as a preliminary surface-mapping and a reconnaissance sampling program to provide ground reference samples for correlation with the geophysical data.

For exploration of the Joyce Lake prospect, Labec Century has undertaken the following activities since 2010:

- In March 2010, Labec Century completed a ground gravity survey of the Joyce Lake prospect in an attempt to discriminate between hematite and magnetite-bearing mineralization based on their density values at Joyce Lake. The data collected from the ground gravity survey were used to determine drill hole locations.
- In the fall of 2010, Labec Century drilled four diamond core boreholes (452 m) at the Joyce Lake prospect. The boreholes encountered very blocky conditions, with a very low core recovery rate. In these holes, both the core samples and the fine cutting sludge samples were collected to test the taconites and DSO. The iron assay results ranged from 27% TFe (total iron) to 60% TFe; it was the sludge that had a higher Fe content than the blocky core samples, indicating the potential for high grade DSO mineralization at the Joyce Lake prospect.
- In 2011, 40 boreholes were drilled at the Joyce Lake prospect for a total of 5,159 m. Of these holes, 32 holes totaling 3,917 m were drilled with reverse circulation (RC) drilling, mainly at the nose and hinge zones of the Joyce Lake Area Syncline, while 8 holes of diamond core drilling, totaling 1,242 m, were completed to test the flank and southern extension of the Joyce Lake Area Syncline.



CENTURY IRON MINES CORP.	FIGURE TITLE: **Project Location Plan**		Stassinu Stantec Limited Partnership
	CLIENT: **LABEC CENTURY IRON ORE INC.**		
	FIGURE ID: **FIGURE 1-1**	PROJECT NUMBER: **121810649**	FIGURE SOURCES: Project features provided by CIMA+. Basemap information from NRCan CanVec database and Newfoundland and Labrador Department of Natural Resources.

In addition to ongoing exploration activities in the Project area, Labec Century has undertaken a number of environmental studies in 2012 to provide baseline data to be used to support environmental approvals required for the Project to proceed. The following studies have been initiated and/or completed:

- flora and fauna;
- fish and fish habitat;
- water and sediment quality;
- hydrology;
- hydrogeology;
- historic and heritage resources;
- land and resource use; and
- baseline socio-economic environment.

1.2 PROJECT OVERVIEW

The Project consists of mining a high grade deposit of hematite iron in western Labrador, approximately 20 km to the northeast of Schefferville, as shown in Figure 1-1 (see aerial photo underlay in Appendix A). The physical works for the proposed Joyce Lake Project that are subject to assessment are located wholly in Labrador. The mine area lies within two map-staked licences (309 claims) covering 12,665 hectares (ha).

The estimated production of iron ore for the Project by year is provided in Table 1-1, and is based on current exploration information. The current target production estimate is 4 MT/yr of ore. The first three years of operation would focus on production of DSO which has a high iron content (~60% iron), with stock-piling of lower grade ore (< 60% iron) that would be beneficiated in Phase II to bring it up to the desired commercial grade.

Table 1-1 Estimated Production (by year) of Iron Ore in Phase I and Phase II for the Joyce Lake Project

Product	Unit	Estimated Production by Year							
		2014	2015	2016	2017	2018	2019	2020	2021
Phase I Ore (DSO; 60% Fe)	tonne		1,500,000	3,000,000	500,000				
Phase II Ore (55% Fe)	tonne					3,000,000	4,000,000	TBD	TBD
Waste Rock	tonne	200,000	600,000	1,200,000	250,000	1,200,000	1,600,000		
Overburden	tonne	500,000	300,000	600,000	100,000	600,000	800,000		
Notes: TBD - To be determined.									

The Project schedule is presented in Table 1-2.

Table 1-2 Project Schedule (note, dates are tentative for the end of Phase I and for all stages of Phase II)

	2012				2013				2014				2015				2016				2017				2018				2019				2020				2021-2024			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Exploration (starting 2010)																																								
Environmental Studies																																								
Preliminary Economic Assessment																																								
Initiate EA Process																																								
Projected Release from EA Process																																								
Permits																																								
Phase I Constuction																																								
Phase I Commissioning and Start-up																																								
Phase I Operation																																								
Phase II Construction																																								
Phase II Commissioning and Start-up																																								
Phase II Operation																																								
Initiation of Decommissioning and Rehabilitiation																																								

Phase I construction would begin upon release from environmental assessment and with receipt of the relevant permits. Throughout Phase 1, mining would be conducted during the winter period when the ice bridge is in operation, with beneficiation and ore shipment occurring during the non-mining months. At the present time, it is anticipated that Phase I would include three years of production (2015 to 2017), followed by three years of Phase II production. Construction of additional infrastructure for Phase II would begin during the last half of Phase I production. The total life-of-mine is anticipated to be up to seven years, and this timeframe may be adjusted as exploration proceeds.

The Joyce Lake mining prospect lies in an undeveloped area adjacent to the small Joyce Lake waterbody on a peninsula within Attikamagen Lake, in an area with a number of interconnecting large lakes. The prospect can be reached from the mainland by crossing a relatively narrow stretch of water, called Iron Arm. Currently, the prospect is accessed from Schefferville either direct by helicopter or first by ground on an existing road to Iron Arm and then by helicopter from there to Joyce Lake.

The physical elements of the Project include the Joyce Lake mining area, conveyance across Iron Arm, a beneficiation plant on the mainland, a new haul road (two options) to connect to a new rail spur near the existing railroad by Astray Lake, access roads, and an accommodation camp.

The mining operation will consist of removing ore from open pits adjacent to Joyce Lake using drilling and blasting, a hydraulic excavator and haul trucks. In Phase I, mining equipment will be brought to the mine site by barge over Attikamagen Lake in the ice free season and over an ice bridge in the winter. The pre-stripping of overburden at the open pit will start during the summer, with waste rock and low grade ore being stockpiled outside the pit limits.

For Phase I of the Project, DSO will be transported across Iron Arm on an ice bridge and otherwise stockpiled on the peninsula when the ice bridge is not in operation. The beneficiation plant on the mainland will include an ore stockpile, a crushing and washing plant, and a tailings management facility (TMF). For Phase I, DSO will need minimal processing prior to shipment, and processing will occur during the summer and shoulder seasons. Processing in Phase I will therefore include crushing and washing in the beneficiation plant to remove fines, which can otherwise be problematic for shipping and tramsfer. Rejected fines will be sent to the TMF. For Phase II, the ore will have lower iron content and will need to be beneficiated to raise the grade prior to shipping. Additional processing elements will be added to the beneficiation plant for Phase II and will be described in the environmental impact statement. These additional processing elements and options are being studied in parallel with ongoing exploration.

If feasible for Phase II, ore may also be transported via floating conveyor over Iron Arm (750 m) and an overland conveyor (2 km) to the beneficiation plant. For this option, ore would be crushed on the peninsula and then loaded onto the conveyor. The conveyor option would allow year-round transportation of ore from mine to plant and reduce the amount of haulage by truck. Phase II beneficiation will include additional elements beyond the crushing and washing facilities on the mainland.

For both phases, final product will be hauled by truck from the beneficiation plant to the rail yard, a distance of approximately 22 km along a new haul road (two optional routes). At the rail yard, the product will be loaded onto rail cars on a new 6 km rail loop that will connect to the existing Tshiuetin

Rail. The product will be taken south to Sept-Îles, Québec, where it will be stockpiled on Port Authority land prior to shipping to market.

Power for the Project will be provided by diesel generators using fuel stored mainly at the beneficiation plant, with smaller tanks at other locations where power is required. Other physical elements of the Project include stock piles for overburden, waste rock, and ore (pre- and post-processing), water supply systems, settling ponds with water treatment, domestic waste water treatment, drainage ditches, explosives storage facility, hazardous materials storage and management area, access roads, accommodation camp, ancillary buildings (*e.g.,* offices, workshops, warehouse/storage areas, worker facilities, mobile equipment storage).

All structures will be constructed so that they can be moved from the site and re-used elsewhere when no longer required for this Project.

1.3 DESCRIPTION OF THE PROPONENT

The Project Proponent is Labec Century Iron Ore (Labec Century; the Proponent), a subsidiary of Century Iron Mines Corporation. Century Iron Mines Corporation (TSX:FER) is Canada's largest holder of iron ore land claims by a public company, with interests in several properties in the Provinces of Québec and Newfoundland and Labrador. Labec Century Iron Ore Inc. is a subsidiary of Century Iron Mines, with investment from WISCO International Resources Development & Investment Limited and Minmetals Exploration & Development (Luxembourg) Limited.

Through this arrangement, Century Iron Mines is the proponent of three identified iron ore properties in the Labrador Trough of western Labrador and Eastern Québec: Attikamagen, Sunny, and Duncan. The Joyce Lake Project is an identified target within the Attikamagen Property.

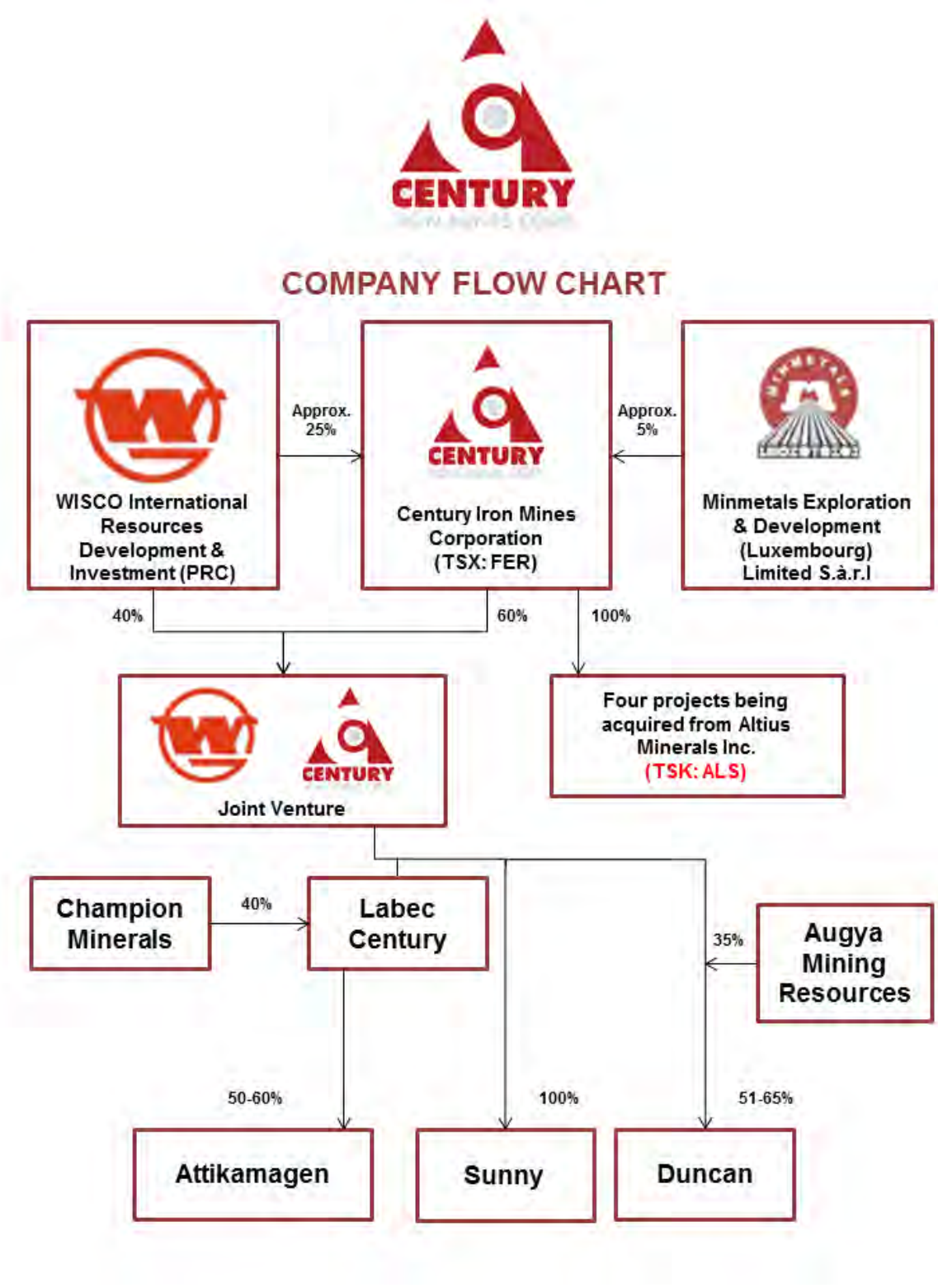
The company's organizational structure is shown in Figure 1-2. The numbers in the organizational chart represent percent ownership of Century Iron Mines in each of the properties.

1.3.1 Project Funding

Century Iron Mines, with its joint venture partner WISCO, will wholly fund the Project. No federal authority will be providing financial support for the Project.

1.3.2 Environmental Assessment Contact Information

CEO:	Sandy Chim, C.A., Director, President and CEO
Proponent Contact:	Hubert Vallée ing., Senior Vice President
Address:	Century Iron Mines Corporation 1200 Avenue McGill Collège, Bureau 1900, Montréal, QC H3B 4G7
Phone:	(514) 228-5030
Email:	hubert.vallee@centuryiron.com



Note: % represents ownership.

Figure 1-2 Century Iron Mines Organizational Structure

1.3.3 Proponent's Commitment to Sustainability

Century Iron Mines is committed to corporate responsibility and sustainability. To this end, a Sustainable Development Statement has been developed and states that:

> *Century is fully committed to a policy of corporate responsibility and sustainability in all aspects of its operations. This is grounded in Century's conviction that its commitment to these principles and to continuing dialogue concerning them with local communities will ensure their involvement and mutual cooperation and realize the full benefits that each project can bring to the community and in resolving their concerns*.

A special committee of the Board of Directors of Century will oversee the continuing development and implementation of these policies on an open and transparent basis to build cooperation and trust with the local community and stakeholders.

The Environmental Sustainability Committee of the Board of Directors of Century Iron Mines Corporation has three members: Maurice Strong (Chair), Howard Bernier and John Reynolds. They are required to meet at least two times per year, and more frequently as needed. The first meeting was held on June 18, 2012, and a second meeting was held on July 26, 2012.

1.4 REGULATORY CONTEXT

This document is intended to meet the requirements of both federal and provincial requirements to formally initiate both the federal and provincial environmental assessment processes, and as such is the joint "Project Description and Provincial Registration" document.

1.4.1 Federal

Federal environmental assessment is regulated under *CEAA, 2012*, which was passed by Parliament on June 8, 2012. Under *CEAA, 2012* only projects included in the Regulations Designating Physical Activities may require federal EA. The Project is a Designated Project pursuant to Section 15(a) of the Regulations as it involves the construction, operation, decommissioning and abandonment of a metal mine, other than a gold mine, with an ore production capacity greater than 3,000 t/d. The ore production target for the Project is up to 4 MT/yr, which is equivalent to up to 11,000 t/d on an annual basis, and up to 45,000 t/d, based on an anticipated 3 months period each year of active mining in Phase I. The Project may also be considered a Designated Project pursuant to Section 8 of the Regulations if the process water is sourced from groundwater wells (instead if Attikamagen Lake is planned; see Section 2.8.2.7) and is extracted at a rate that exceeds 200,000 m^3/a, . Water requirements are currently under study and will be described in the EIS.

Designated Projects require a "Screening" under the process described in Sections 8-12 of *CEAA, 2012*, to determine whether an EA is required. It is anticipated that the screening process will determine that an EA is required for the Project.

To initiate the federal process, a Project Description document is submitted to the CEA Agency by the proponent along with a Summary Document that is provided in both official languages. The Summary

Document is distributed by the CEA Agency to federal departments as appropriate and is posted on the CEA Agency website for access by the general public.

The federal decision-making and coordinating authority for a federal assessment is the CEA Agency. Other federal departments may also provide specialized knowledge or expert advice through both the federal and provincial EA processes. Departments providing expertise or knowledge to the environmental assessment process may include Fisheries and Oceans Canada (DFO), Transport Canada, Environment Canada, Health Canada, and Natural Resources Canada.

Where both federal and provincial EAs are required, the CEA Agency and the Department of Environment and Conservation (DOEC) Environmental Assessment Division typically work together to coordinate government work plans, review schedules, consultation and ministerial decisions.

Table 1-3 below is a Table of Concordance to show where information is provided in this document, as required by the Prescribed Information for the Description of a Designated Project Regulations under the *Canadian Environmental Assessment Act* (2012).

Table 1-3 Table of Concordance

General Information		
1	The project's name, nature and proposed location	Chapter 1
2	The proponent's name and contact information and the name and contact information of their primary representative for the purpose of the description of the project.	Section 1.3
3	A description of and the results of any consultations undertaken with any jurisdictions and other parties including Aboriginal peoples and the public.	Chapter 4
4	Other relevant information, including:	
4(a)	Environmental assessment and regulatory requirements of other jurisdictions; and	Section 1.4
4(b)	Information concerning any environmental study that is being or has been conducted of the region where the project is to be carried out.	Section 2.4.4
Project Information		
5	Description of the project, including the context and objectives of the project.	Chapter 2
6	Regulations designating physical activities setting out the designated activities.	Section 1.4.1
7	A description of the physical works related to the project including their purpose size and capacity.	Sections 2 to 2.8
8	Anticipated size or production capacity of the designated project and a description of the production processes to be used, the associated infrastructure and any permanent or temporary structures.	Section 1.2
9	Description of all activities to be performed in relation to the designated project.	Sections 2, 2.8
10	A description of any solid, liquid, gaseous or hazardous waste that is likely to be generated during any phase of the project and a plan to manage those wastes.	Sections 2.8.4, 2.8.1.6.
11	A description of the anticipated phases of and the schedule for the project's construction, operation, decommissioning and abandonment.	Sections 1.2, 2.8
Project Location Information		
12	A description of the project's location including:	
12(a)	Geographic coordinates;	Section 2.1
12(b)	Site maps produced at an appropriate scale in order to determine the project's overall location and the spatial relationship of the project components;	Figures 1-1, 2-1 to 2-4
12(c)	The legal description of land to be used for the project, including the title, deed or document and any authorization relating to a water lot;	Section 2.3
12(d)	The project's proximity to any permanent, seasonal or temporary residences;	Section 5.2.3, Figure 1-1
12(e)	The project's proximity to reserves, traditional territories as well as lands and resources	Section 2.6, Figures B1 to

Table 1-3 Table of Concordance

General Information		
	currently used for traditional purposes by Aboriginal peoples; and	B4
12(f)	The project's proximity to any federal lands.	Section 2.6.2
Federal Involvement		
13	A description of any financial support that federal authorities are, or may be, providing to the Project.	Section 1.3.1
14	A description of any federal land that may be used for the purpose of carrying out the project.	Section 1.4.1.1
15	Any federal legislative or regulatory requirements that may be applicable including a list of permits, licences or other authorizations that may be required in order to carry out the project.	Section 1.4.1
Environmental Effects		
16	A description of the physical and biological setting.	Section 5.1
17	A description of any changes that may be caused, as a result of carrying out the project, to:	Section 5.3
17(a)	Fish as defined in Section 2 of the *Fisheries Act* and fish habitat as defined in subsection 34(1) of that Act;	
17(b)	Aquatic species, as defined in sub-section 2(1) of the *Species at Risk Act; and*	
17(c)	Migratory birds, as defined in sub-section 2(1) of the *Migratory Birds Convention Act*	
18	A description of any changes to the environment that may occur, as a result of carrying out the project, on federal lands, in a province other than the province in which the project is proposed to be carried out or outside of Canada.	Section 2.6.2
19	Information on the effects of Aboriginal peoples of any changes to the environment that may be caused as a result of carrying out the project, including effects on heath and socio-economic conditions, physical and cultural heritage, the current use of lands and resources for traditional purposes or any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.	Section 5.3.1
20	A summary of the information required under Sections 1 to 19	Summary Document

1.4.1.1 Federal Land

Mining infrastructure, as shown in Figure 1-1, is located wholly on provincial Crown land. Ore is shipped on an existing rail to Sept-Îles and no changes to Port Authority or adjacent lands in Québec are required for this Project to proceed.

1.4.2 Provincial

All mining projects in Newfoundland and Labrador are subject to environmental assessment under the NL *EPA* and *Environmental Assessment Regulation*. The Project will enter the environmental assessment process via Project Registration with the provincial DOEC. The Environmental Assessment Division of the DOEC administers the process including:

- consulting at every stage with interested government departments and the public;
- evaluating submissions by proponents and reviewers;
- advising the Minister on potential environmental effects prior to decisions; and
- monitoring released projects to ensure compliance and effectiveness of mitigation.

An undertaking that is subject to the Act is required to be registered for examination by DOEC. The registration outlines the proposed project and describes how it will affect the bio-physical and socio-economic environment. Proponents must demonstrate in the registration document how the best practicable technology and methods will be used to minimize harmful effects.

At the conclusion of the review period, the Minister advises the proponent whether the undertaking will require an Environmental Preview Report (EPR), an Environmental Impact Statement (EIS), or if the undertaking has been released or rejected.

This document registers the Project with the Province, which will circulate the document (within seven days) to over 20 agencies and interested parties including relevant provincial and federal departments, as well as post it on the internet for public review. Federal agencies also receive the Project Registration, such as DFO, Environment Canada (including Canadian Wildlife Service (CWS)), Transport Canada, CEA Agency, and possibly others. Registrations for projects in Labrador are also provided to Aboriginal groups in the Province for their review and comment.

1.4.3 Other Legislative or regulatory requirements

In addition to federal environmental assessment and provincial environmental assessment, the following federal and provincial legislative and regulatory requirements listed in Table 1-4 may be required for the Project.

Table 1-4 Permits, Approvals and Authorizations Anticipated to be Required

Permit, Approval or Authorization	Issuing Agency
Provincial	
• Release from Environmental Assessment Process	DOEC – Environmental Assessment Division
• Permit to Occupy Crown Land	DOEC – Crown Lands Division

• Permit to Construct a Non-Domestic Well
• Water Resources Real-Time Monitoring
• Certificate of Environmental Approval to Alter a:
  ◦ body of water;
  ◦ culvert installation;
  ◦ fording;
  ◦ stream modification or diversion; and
  ◦ other works within 15 m of a body of water (site drainage, dewater pit, settling ponds)
	DOEC – Water Resources Management Division

• Certificate of Approval for Construction. • Certificate of Approval for Operation • Certificate of Approval for Generators • Certificate of Approval for Industrial Processing Works • Approval of Emergency Response Plan. • Approval of Waste Management Plan • Approval of Environmental Contingency Plan • Emergency Spill Response • Approval of Environmental Protection Plan	DOEC – Pollution Prevention Division
• Permit to Control Nuisance Animals	DOEC – Wildlife Division
• Pesticide Operators Licence	DOEC – Pesticides Control Section

Table 1-4 Permits, Approvals and Authorizations Anticipated to be Required

Permit, Approval or Authorization	Issuing Agency
• Blasters Safety Certificate • Magazine Licence • Approval for Storage and Handling Gasoline and Associated Products • Approval for Temporary Fuel Cache • Fuel Tank Registration • Approval for Used Oil Storage Tank System (Oil / Water Separator) • Approval for Fire, Life and Safety Program • Certificate of Approval for Waste Management System	Newfoundland and Labrador Government Service Center (GSC)
• Approval of Development Plan, Closure Plan, and Financial Assurance • Mining Lease • Surface Rights Lease • Quarry Development Permit	Newfoundland and Labrador Department of Natural Resources – Mineral Lands Division
• Operating Permit to Carry Out an Industrial Operation During Forest Fire Season on Crown Land • Permit to Cut Crown Timber • Permit to Burn	Newfoundland and Labrador Department of Natural Resources – Forest Resources
• Approval to Construct and Operate a Railway in Newfoundland and Labrador	Newfoundland and Labrador Department of Transportation and Works
Federal	
• Authorization for Harmful Alteration, Disruption or Destruction (HADD) of Fish Habitat, under the *Fisheries Act*	Fisheries and Oceans Canada
• Designation of a Tailings Impoundment Area	Environment Canada
• Approval to Interfere with Navigation	Transport Canada
• Aquatic Environmental Effects Monitoring	Environment Canada
• Licence to Store, Manufacture or Handle Explosives	Natural Resources Canada
• Approval to Construct a Railway	Canadian Transportation Agency

2.0 PROJECT INFORMATION

The Joyce Lake Project includes Construction, Operation, Closure, Decommissioning and Rehabilitation of the following primary components:

- open pits (Pit 1, Pit 2, potential Pit 3);
- waste rock and overburden stockpiles;
- modular beneficiation plant including a crushing and a washing process for Phase I and additional processing elements for Phase II;
- tailings management facility (TMF);
- ancillary infrastructure to support the mine and beneficiation plant, including a workshop, explosives magazine storage, office buildings, warehouse area and employee facilities, conveyors, stockpiles, sewage and water treatment units, power generator, fuel storage, mobile equipment, and drainage infrastructure (*i.e.,* ditches, settling ponds);
- haulage road between the beneficiation plant and rail yard;
- ice bridge corridor;
- barge for the open water season;
- potential conveyor; and
- a new rail spur and rail yard for loading ore.

These components are shown in overview in Figure 2-1, and insets with detail are shown in Figure 2-1 for the mine area, Figure 2-2 for the beneficiation plant and TMF, Figure 2-3 for the accommodation camp, and Figure 2-4 for the rail spur and rail yard.

The Project will be operated in two Phases, targeting two grades of iron ore. For Phase I, ore will be of DSO quality and will need minimal processing prior to shipment. Processing in Phase I will therefore include crushing and washing in the beneficiation plant to remove fines, which can otherwise be problematic for shipping and transfer. Rejected fines will be sent to the TMF. For Phase II, the ore will have lower iron ore content and will need to be beneficiated to raise the grade prior to shipping. Additional processing elements will be added to the beneficiation plant for Phase II. These additional processing elements and options are being studied in parallel with ongoing exploration and will be described in the EIS.

2.1 PROJECT COORDINATES

Project location coordinates are provided in Table 2-5.The coordinates for elements of the Project are provided in Table 2-1.

Table 2-1 Project Coordinates

Feature	Longitude (X)	Latitude (Y)
Beneficiation Plant	66˚ 34’ 06.906”E	54˚ 50’ 46.96”N
Rail Yard	66˚ 38’ 35.29”E	54˚ 38’ 46.78”N
Project Centre	66˚ 32’ 44.79”E	54˚ 52’ 33.16”N
Mine Site – Pit 2	66° 31' 26.783 W	54° 54' 0.768"N

2.2 MAPPING

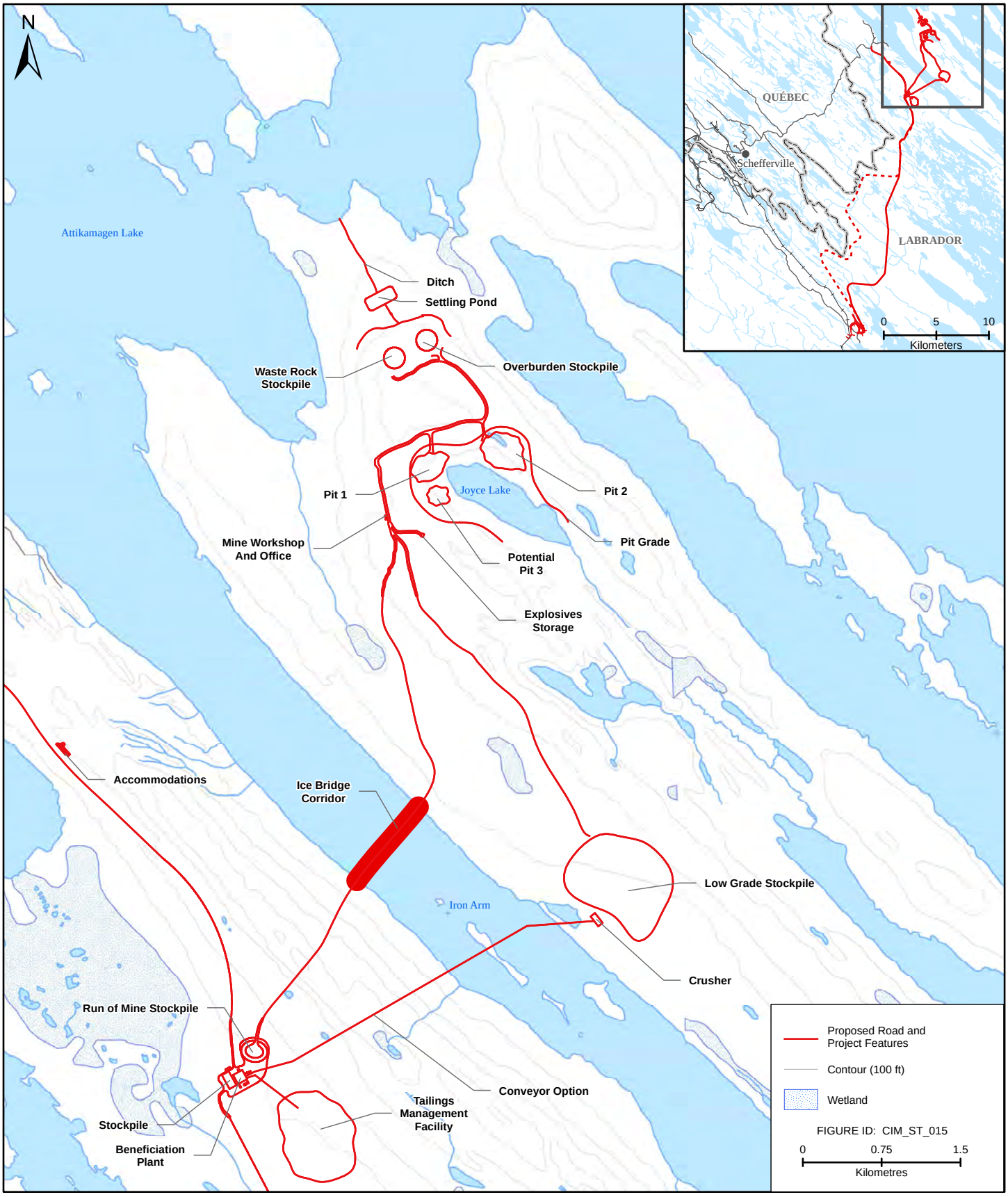
This report contains maps that illustrate the location of infrastructure components for the Joyce Lake Direct Shipping Iron Ore Project, as follows:

- Figure 1-1: Project Location Plan;
- Figure 2-1: Mine Site and Associated Infrastructure;
- Figure 2-2: Beneficiation Plant and Tailings Management Facility;
- Figure 2-3: Accommodation Camp;
- Figure 2-4: Rail Associated Infrastructure; and
- Figure 2-5: Aboriginal Communities.

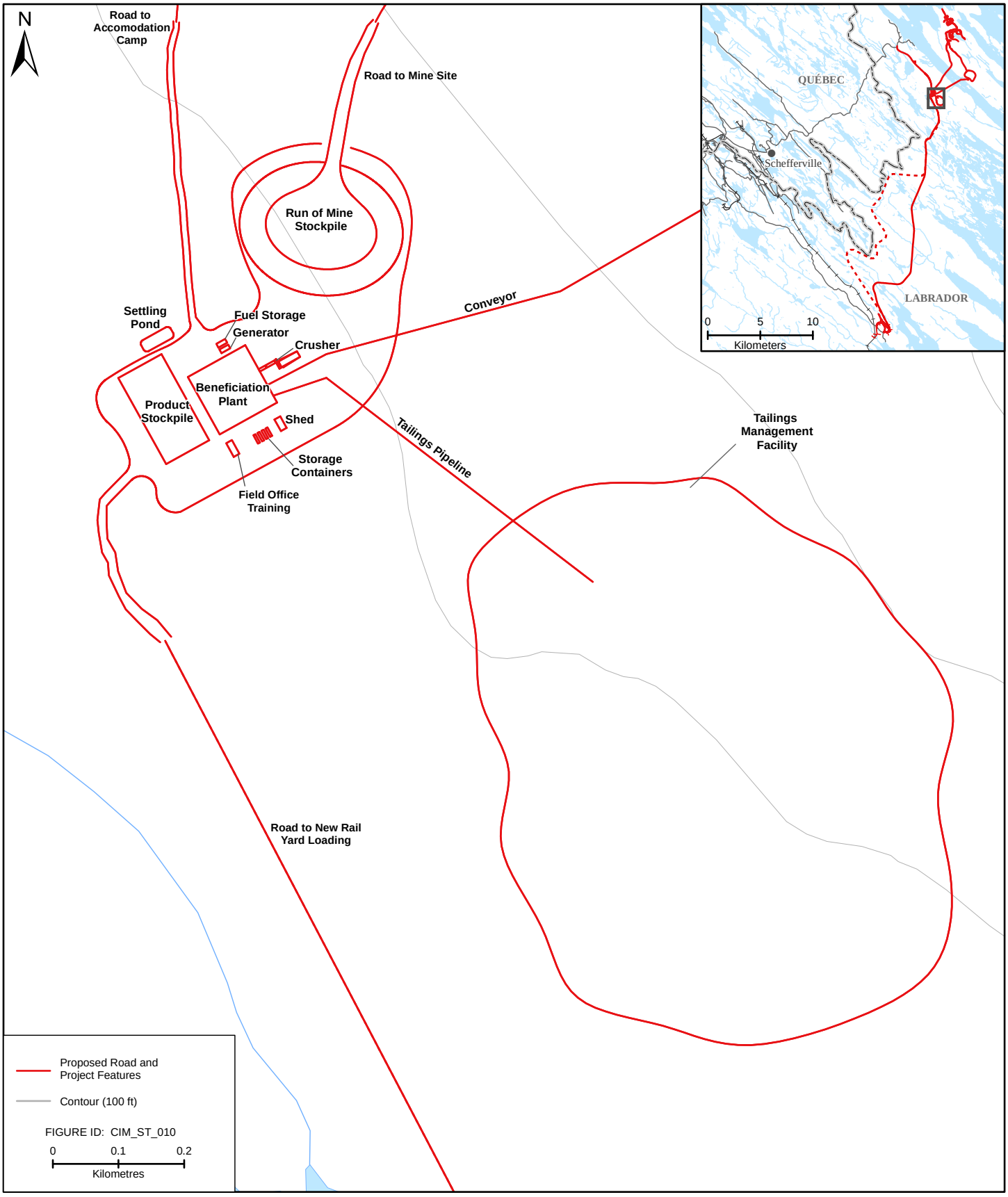
These maps also show other site features including the following:

- **Watercourses and Waterbodies:** each of the maps show named and un-named watercourses and lakes in proximity to the Project;
- **Linear and Other Transportation Components:** existing roads and railways are shown on the maps;
- **Permanent, Seasonal and Temporary Housing:** known dwellings are shown on Figures 1-1 and 2-4 as either dark squares within Schefferville, or as brown square for cabins;
- **Location of Aboriginal Communities:** these are shown on Figure 2-5;
- **Federal Lands:** see Figure 1-1; and
- **Provincial and International Boundaries:** the provincial boundary is shown on the relevant figures.

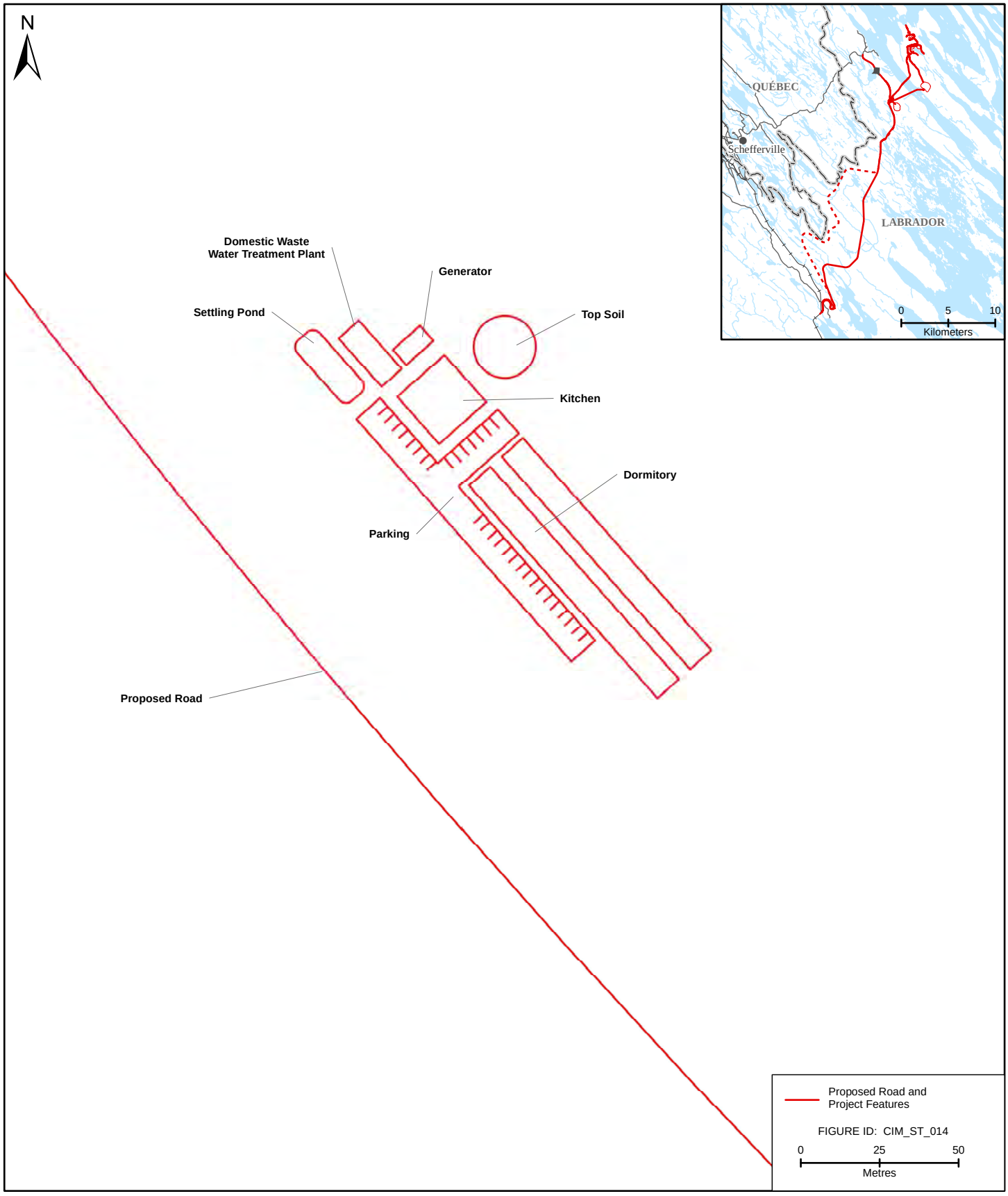
For other areas including land and resource use, fisheries and fishing areas, heritage and archaeological sites/features, and environmentally sensitive areas (other than wetlands), these are currently under study for inclusion in the environmental impact statement.



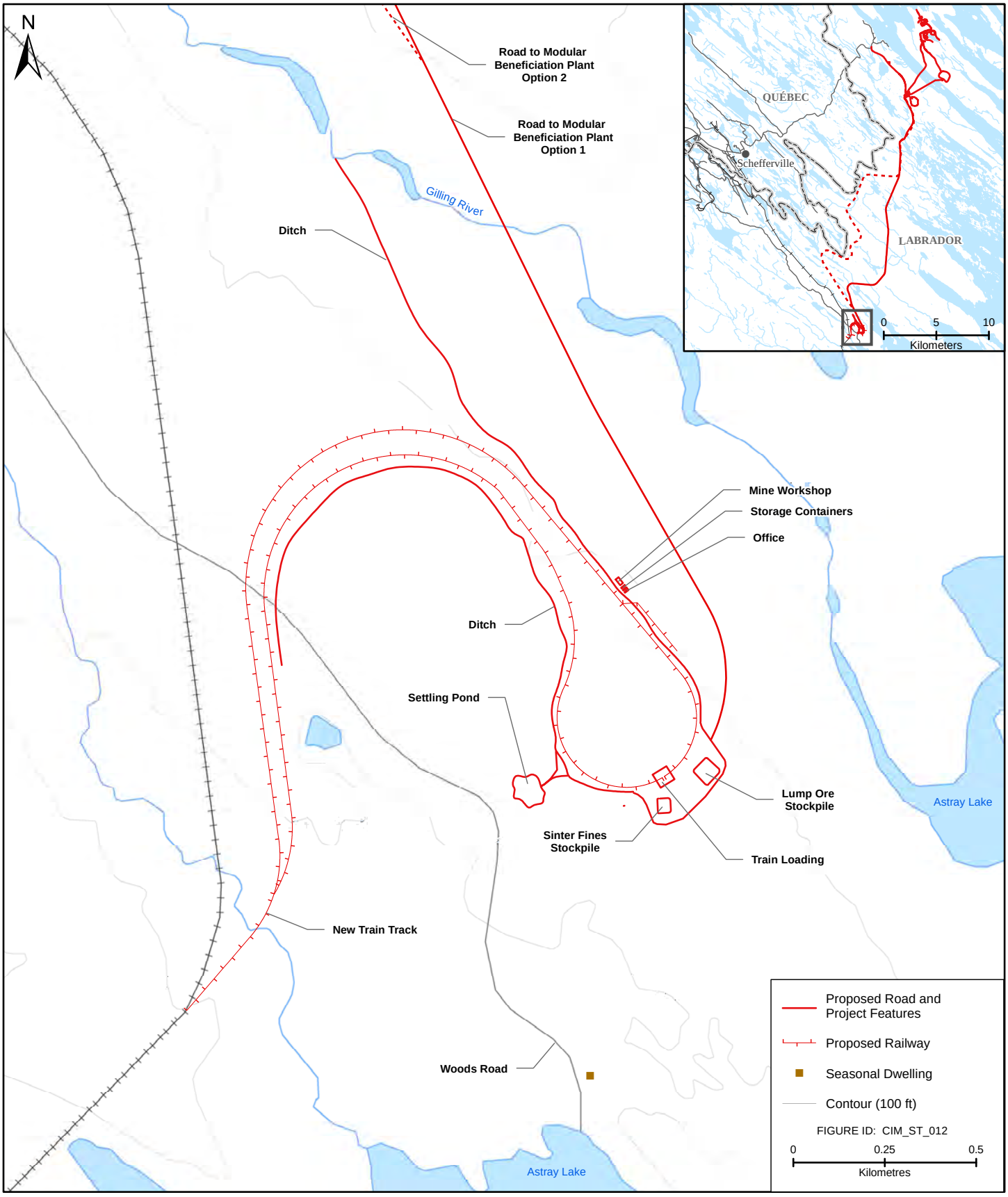
CENTURY IRON MINES CORP.	FIGURE TITLE: **Mine Site and Associated Infrastructure**		Stassinu Stantec Limited Partnership
	CLIENT: **LABEC CENTURY IRON ORE INC.**		
	FIGURE ID: **FIGURE 2-1**	PROJECT NUMBER: **121810649**	FIGURE SOURCES: Project features provided by CIMA+. Basemap information from NRCan CanVec database and Newfoundland and Labrador Department of Natural Resources.



CENTURY IRON MINES CORP.	FIGURE TITLE: **Beneficiation Plant and Tailings Management Facility**		Stassinu Stantec Limited Partnership
	CLIENT: **LABEC CENTURY IRON ORE INC.**		
	FIGURE ID: **FIGURE 2-2**	PROJECT NUMBER: **121810649**	FIGURE SOURCES: Project features provided by CIMA+. Basemap information from NRCan CanVec database and Newfoundland and Labrador Department of Natural Resources.



CENTURY IRON MINES CORP.	FIGURE TITLE: **Accomodation Camp**		Stassinu Stantec Limited Partnership
	CLIENT: **LABEC CENTURY IRON ORE INC.**		
FIGURE ID: **FIGURE 2-3**	PROJECT NUMBER: **121810649**	FIGURE SOURCES: Project features provided by CIMA+. Basemap information from NRCan CanVec database and Newfoundland and Labrador Department of Natural Resources.	



CENTURY IRON MINES CORP.	FIGURE TITLE: **Rail Associated Infrastructure**		Stassinu Stantec Limited Partnership
	CLIENT: **LABEC CENTURY IRON ORE INC.**		
FIGURE ID: **FIGURE 2-4**	PROJECT NUMBER: **121810649**	FIGURE SOURCES: Project features provided by CIMA+. Basemap information from NRCan CanVec database and Newfoundland and Labrador Department of Natural Resources.	

FIGURE TITLE: **Aboriginal Communities**			
CLIENT: **LABEC CENTURY IRON ORE INC.**			
FIGURE ID: **FIGURE 2-5**	PROJECT NUMBER **121810649**	FIGURE SOURCES: Project features provided by CIMA+. Basemap information from NRCan CanVec database and Newfoundland and Labrador Department of Natural Resources.	

2.3 OFFICIAL DESCRIPTION OF LAND

The infrastructure for the Project, as shown in Figure 1-1, is located wholly on Crown Land for which the surface property rights belong to the Government of Newfoundland and Labrador, with the exception of where the new rail spur will link up with the Tshiuetin Rail. Labec Century will submit an application for a mining lease on Crown Land from the Province in due course, and will enter into an agreement with Tshiuetin Rail Transportation for use of their land to connect to the new rail spur.

The Property in Newfoundland and Labrador is registered to Labec Century Iron Ore Inc. (56%) and Champion Minerals Inc. (44%) with Labec Century as the operator. The Project comprises two map-staked licences totaling 12,665 ha. A description of the Labec Century exploration licence holdings for the Project is provided in Table 2-2.

Table 2-2 Labec Century Licences: Joyce Lake Project Area

Licence	Claims	Area (ha)	NTS Areas	Issuance Date	Renewal Date	Report Date
020238M	253	6325	23J16 23J15	2005/11/07	2015/11/07	2013/01/07
020231M	256	6340	23J16 23J15	2005/11/07	2015/11/07	2013/01/07

2.4 LAND ZONING, TITLES AND LAND USE PLANS

2.4.1 Zoning

There is no zoning that applies to the Project area.

2.4.2 Land Titles

See Section 2.3, above.

2.4.3 Land Use Plans

The Project area lies outside of areas for which there is a land use plan.

2.4.4 Regional Environmental Studies

The proponent is not aware of any regional environmental study that has been or is currently being undertaken for the Project area.

2.5 PROXIMITY TO OTHER PROJECTS

Table 2-3 lists other iron ore projects either in development or in production, which are in proximity to the Joyce Lake Project.

Table 2-3 Joyce Lake Iron Ore Project in Relation to Iron Ore Projects in the Schefferville Area

To	Company	Distance from Joyce Lake(km)
Elross Lake	Tata Steel Minerals Canada (joint venture between Tata Steel and NML)	50
KéMag	NML and Tata Steel	60.5
LabMag	NML and Tata Steel	57
James Property	LIM	24
Houston Property	LIM	25

2.6 PROXIMITY TO FEDERAL LAND

Mining infrastructure, as shown in Figure 2-1, will be located wholly on provincial Crown land. Ore will be shipped on an existing rail to Sept-Îles and no changes to Port Authority or adjacent lands in Québec are required for this Project to proceed.

The proximity of the Project area to federal lands such National Parks, Indian Reserves and Canadian Force Bases is shown in Table 2-4 below.

Table 2-4 Proximity of Project Area to Federal Lands

Nearest Federal Lands	Approximate Distance from Joyce Lake (km, via straight line)
Newfoundland and Labrador	
Torngat Mountains National Park Reserve	430
5 Wing Goose Bay (Canadian Forces Base)	435
Sheshatshiu (Aboriginal community)	442
Québec	
Kawawachikamach (Aboriginal community)	13
Lac John (Aboriginal community)	19
Matimekush (Aboriginal community)	21
Mingan Archipelago National Park Reserve	563
3 Wing Bagotville (Canadian Forces Base)	792

2.7 PROXIMITY TO FIRST NATIONS RESERVES, TRADITIONAL TERRITORY AND LANDS AND RESOURCES CURRENTLY USED BY ABORIGINAL PERSONS

Public consultation and preliminary research has identified five Aboriginal groups with asserted land claims or traditional territory near the Project (Figure 2-5) of which only one, the Innu Nation of Labrador, has had its land claim accepted for negotiation by the federal and provincial governments. Maps showing Aboriginal asserted rights are presented in Appendix B and referenced below.

Aboriginal Groups with Land Claims to the Project Area in the Process of Negotiation

Innu Nation of Labrador

The Innu Nation of Labrador is the political organization that represents the members of the Sheshatshiu Innu First Nation (SIFN) of Sheshatshiu and the members of the Mushuau Innu First Nation (MIFN) of Natuashish in land claims negotiations. The Innu Nation has made several important advances in land claims negotiations with the Government of Canada and the Government of Newfoundland and Labrador. In 1978, the Innu Nation land claim was accepted for negotiation by the federal government; a Framework Agreement between the Innu Nation of Labrador and the provincial and federal governments was signed in 1996 (NLDLAA 2012). In 2008 the Tshash Petapen (New Dawn) Agreement was signed by the Innu Nation, the Government of Newfoundland and Nalcor Energy, which included the framework for a Land Claims Agreement-in-Principle; the Agreement-in-Principle was ultimately signed by the Innu Nation and the Governments of Canada and Newfoundland and Labrador and ratified by Innu Nation of Labrador members in 2011.

The Tshash Petapen Agreement and the Agreement-in-Principle identified Category I, II and III lands, as well as Innu Nation economic development zones. The Project is located in the Western Labrador Economic Major Development Impact and Benefit Agreement Area (WLEMDIBAA) as set out in the 2011 Land Claims Agreement-in-Principle (Appendix B, Figure B-1). Upon a final land claims agreement being signed, the proponent of any major development in the WLEMDIBAA will be required to enter into an IBA with the Innu Nation. In its draft Consultation Policy dated May 25, 2012, as well as in its usual review process of major developments in Labrador, the Government of Newfoundland and Labrador takes the view that until a final land claims agreement is entered into the Innu Nation must be consulted in respect of projects within the 1978 asserted land claim area which includes the WLEMDIBAA. Labec Century's ongoing Aboriginal Consultation Program will identify contemporary land use of the Labrador Project area by Innu Nation members.

Aboriginal Groups with Asserted Land Claims to the Project Area (Not Currently Accepted for Negotiation)

NunatuKavut Community Council

NunatuKavut is administered by the NunatuKavut Community Council (NCC). Formerly known as the Labrador Metis Nation, the NCC has asserted a land claim in Labrador since the 1980s (Appendix B, Figure B-2). However, this claim has not been accepted for negotiation by the federal or provincial governments, which have yet to formally recognize the Labrador Métis as a distinct Aboriginal people. According to the NCC, NunatuKavut's traditional territory primarily encompasses south/central Labrador and extends to western Labrador (NCC 2010a, 2010b). NunatuKavut communities identified by the NCC include Labrador City and Wabush (NCC 2010b), located approximately 200 km south from the Project site.

Naskapi Nation of Kawawachikamach

The Naskapi Nation of Kawawachikamach (NNK) mainly comprises the residents of the village of Kawawachikamach, located approximately 15 km northeast of Schefferville, Québec. The NNK land claim in Québec was settled through the Northeastern Québec Agreement (NEQA), signed by the

Government of Québec in 1978. The NEQA designates Naskapi lands, which included a large area of northern Québec, extending south to Fermont (NNK 2011). NNK members continue to pursue land and resource use activities within the territory established by the NEQA. There have also been reports of some contemporary land use in Labrador, including travel routes and campsites along the Trans Labrador Highway (Henriksen 1978; CAM 1982). In 1995 the NNK submitted a land claim to a large portion of Labrador (Appendix B, Figure B-3), which has not yet been accepted for negotiation by either the federal or provincial governments. In 2010 the Naskapi provided a submission to the Joint Review Panel for the Lower Churchill Project outlining the territory in the Province of Newfoundland and Labrador for which they asserted a land claim and which includes the Project area.

Innu First Nation of Matimekush-Lac John

The Innu First Nation of Matimekush-Lac John includes two communities near Schefferville. The Matimekush reserve is located on the shore of Lac Pearce, adjacent to Schefferville, while the Lac John reserve is located approximately 3.5 km to the northeast. The Innu of Matimekush-Lac John share ancestral territory with the Innu of Uashat mak Mani-Utenam, who reside approximately 500 km to the south, near Sept-Îles, Québec. The asserted traditional territory for both groups extends from the Québec North Shore to north of Matimekush-Lac John, encompassing much of western Labrador and eastern Québec. Previous land use and occupancy studies have indicated contemporary land use by the Innu of Matimekush-Lac John within lands adjacent to the two Reserves (CAM 1983).

Innu First Nation of Uashat mak Mani-Utenam

The Innu First Nation of Uashat mak Mani-Utenam is located on two separate reserves, Uashat and Mani-Utenam, in the Sept-Îles area. Together they form a single Indian band represented by the Conseil Innu Takuaikan mak Mani-Utenam (ITUM). The Innu of Uashat mak Mani-Utenam engage in land use activities within the large traditional territory shared with the Innu of Matimekush-Lac John. However, traditional harvesting activities are typically pursued in accessible areas such as the coast of the St. Lawrence River and adjacent to Route 138 (Uashaunnuat *et al.* 2010).

Since 2005 ITUM and the Innu of Matimekush-Lac John are jointly represented in land claims negotiations by the Ashuanipi Corporation. Although the land claims negotiations have been ongoing in Québec since 2006, and the parties have agreed on a negotiation process, an Agreement-in-Principle has yet to be signed (Secrétariat aux affaires autochtones 2010). In Bureau d'audiences publiques sur l'environnement (BAPE) hearings in Québec in 2007 and 2010 both ITUM and the Innu of Matimekush-Lac John have described their traditional territory for which they asserted a land claim as including land in the Province of Newfoundland and Labrador, which includes the Project site (Appendix B, Figure B-4).

2.8 PROJECT STEPS AND ACTIVITIES

2.8.1 Construction

To prepare for the surface site works, Labec Century will develop protocols to facilitate the execution of the proposed works in an environmentally responsible and safe manner.

General construction activities for the Project components will include:

- site preparation (*i.e.,* clearing of vegetation and excavation);
- construction of infrastructure;
- installation of utilities; and
- commissioning.

The areas requiring site surface preparation include waste rock disposal areas, mine infrastructure area, beneficiation plant site, rail loop, rail loading yard, all new roads, Run of Mine (ROM) ore stockpile, the TMF, and all ancillary infrastructure such as buildings, drainage infrastructure, fuel storage, sewage and water treatment units. Site grading is required to support the installation of the required site facilities, and this will include the installation of all necessary sedimentation and erosion control measures, including drainage infrastructure. Ongoing monitoring of these control measures will be conducted throughout the Construction stage.

Construction activities at each of the Project areas are described in the sections below.

2.8.1.1 Joyce Lake Mine Area

The layout for the mine area infrastructure is shown in Figure 2-1 and the main elements are described below.

2.8.2 Site Buildings

A number of site buildings will be constructed in the mine area, including:

- mobile trailer with an office, lunch room, and worker refuge for use in inclement weather and as a muster point;
- storage container for small equipment and supplies;
- power generator and fuel storage;
- fuel distribution area (pad and pump) for the mine equipment, machinery, and trucks;
- workshop in a fabric structure shed (approximate dimensions 20 m x 40 m); and
- explosives storage facility, located away from other buildings and near the mine; this building will be installed and managed by a licenced explosive vendor / contractor.

The buildings will be installed on gravel pads beside the mine access road, except for the explosives storage, which will be installed on level bare ground with enclosure walls and a roof.

2.8.2.1 Conveyance Across Iron Arm

The layout for conveyance infrastructure is shown in Figure 2-1.

Barge

A modular barge assembly will be used to move construction equipment, supplies, and workers to and from the work camp and mine site across Iron Arm. This barge will have a designated landing site at both sides near to the ice bridge corridor and will be maintained through the Operation and Maintenance, and Decommissioning stages of the Project. The roads used to access the barge will be the same roads used to access the ice bridge. The barge will be used during the open water season when the ice bridge is not in operation and will allow the on- and off-loading of equipment and supplies using a ramp extending from the barge to the shore above the water line.

Ice Bridge Road Corridor

The ore will be hauled to the beneficiation plant using two ice bridges across Iron Arm at a crossing point approximately 750 m in length. The bridges will be located within a corridor approximately 300 m wide to accommodate two ice bridge roads that are each 40 m wide (rolling surface 15 m wide and 40 m at the base) and at least 130 m apart for stability of the ice. The ore will be hauled by a mixed fleet of 64 t off-road trucks and 40 t articulated trucks. The ice bridge roads will be designed, constructed and managed to suitable engineering standards as used in other provincial / territorial jurisdictions and in agreement with the Newfoundland and Labrador Department of Transportation and Works.

Option – Floating Conveyor

The use of a floating conveyor is an alternative to the use of ice bridges to convey iron ore across Iron Arm and then overland directly to the beneficiation plant. This conveyor would allow the year-round transport of iron ore from the mining operation to the beneficiation plant, thus extending the transportation period to include summer months and shoulder seasons when the ice bridges are not in operation. The conveyor system would be constructed to “float” on the surface of the water / ice of Iron Arm and could also be supported across islands within Iron Arm. The conveyor option will reduce the haulage distance of mining trucks. This option requires that the iron ore be crushed on the peninsula near the stockpile prior to loading onto the conveyor.

The conveyor option will require the following elements:

- crusher plant and loading area on the peninsula;
- ROM live stockpile – 6,000 t capacity and an area of 1,600 m^2;
- generator with fuel storage;
- floating conveyor (over the Iron Arm) – approximately 750 m long; and
- conveyor over the ridge to the beneficiation plant – approximately 2 km long.

This option is being considered for commissioning after the mine is in operation for Phase I, and it would operate in addition to the ice bridge roads. The ice bridge roads would be used during the Construction stage of the Project and would remain in operation throughout the life of the Project for conveyance of iron ore during the initial Phase I of the Project and thereafter for moving traffic, workers, equipment, and supplies across Iron Arm to and from the mine area.

2.8.2.2 Roadways

A number of access roads and haulage roads will be constructed for the Project. Roadway construction will be undertaken as listed below:

- haulage road from Joyce Mine to low grade stockpile – 30 m wide and approximately 2.4 km long;
- haulage road from the mine area to the ice bridge corridor and barge landings – 30 m wide and 2 km long;
- two ice bridge roads across Iron Arm (Section 2.8.2.1) – each 15 m wide (40 m at the base) and approximately 750 m long;
- haulage road from ice bridge corridor to the beneficiation plant – 30 m wide and approximately 2.15 km long;
- access road from beneficiation plant to existing road – 30 m wide and approximately 4.3 km long; and
- haulage road (two options being considered) from beneficiation plant to train loading – 30 m wide and approximately 22 km long.

On land road construction will involve surveying, clearing, grubbing (as necessary), and applying a suitable gravel-based surface. The gravel material for road bed and pad construction will be sourced from borrows pits that will be developed within the Project area alongside road routes. Borrow pit locations will be identified when road routes are surveyed and when the final haulage road option is chosen. Road alignments will be planned to minimize the number of watercourse crossings, to minimize (to the extent practicable) habitat disturbance of sensitive habitat such as wetlands, and to avoid direct and indirect effects on species of conservation concern. Management of surface runoff and drainage will include construction of roadside ditches, where needed, and construction of structures (*e.g.,* culverts) at watercourses and wetlands to allow drainage to freely pass underneath the roadway.

For the existing road linking Iron Arm to Schefferville, no changes to the road alignments or infrastructure are anticipated to be required as a result of the Project, other than maintenance activities such as surface management (*e.g.,* grading, top-dressing with gravel) and drainage management (*e.g.,* culvert management).

2.8.2.3 Beneficiation Plant

The beneficiation plant will be operated during the summer months and shoulder seasons when the water temperature is suitable for processing. Processing equipment will be installed outside or inside a modular enclosure within a yard (Figure 2-2). As noted in Sections 2.4 and 2.7, beneficiation in Phase I of the Project will include crushing and washing processes. For processing of lower grade iron ore in Phase II, additional processes will be included in the beneficiation plant to raise the iron ore content of the final product to market grade for shipment. Processing details for Phase II have not yet been determined and options are being studied in parallel with ongoing information coming in from exploration activities. The reject material from the beneficiation process will be sent to the TMF for management.

The following elements will be constructed in the beneficiation plant area:

- beneficiation plant yard – 65,000 m^2;
- ROM stockpile pad to accommodate 1.5 Mt (75,000 m^2) to 3 Mt (150,000 m^2);
- emergency reject pond – 1,000 m^2;
- overburden stockpile pad to accommodate 3,500 m^2;
- trailer office and lunch room and worker refuge – 750 m^2;
- storage container for small equipment and supplies;
- plant workshop – 600 m^2;
- water supply (Section 2.8.2.7);
- warehouse for equipment and larger supplies – 500 m^2;
- generator;
- TMF - 500,000 m^2, including tailings ditch leading to the tailings storage area;
- fuel storage pad and system;
- fuel distribution pad and pump; and
- settling pond for pad/site runoff.

Figure 2-2 shows details of the beneficiation plant area. Gravel pads will be constructed for buildings including the modular plant. All structures will be temporary in nature, constructed from materials brought in by rail and truck, and assembled on site. The settling pond will be engineered to accommodate the drainage and treat the water to meet regulated limits prior to release.

Power generation is discussed in Section 2.8.2.8. The power generator for the beneficiation plant will be installed next to the processing equipment to minimize installation and power loss.

2.8.2.4 Tailings Management Facility

Reject material from the beneficiation processes in Phase I and Phase II will be directed to the TMF via a pipeline (Figure 2-2). The TMF will be engineered to accommodate the reject material and treat overlying or process water to meet regulated limits prior to release. The nature of the tailings and tailings supernatant is currently under study and will be described in the EIS. Based on similar mining operations in the Schefferville vicinity, it is anticipated that the tailings supernatant will be inert, with metal and chemical levels that require minimal or no treatment to meet regulated limits. The likely water quality issue will be suspended solids or "red water" which is common to iron ore mines in western Labrador. The TMF will be designed to settle out particulates and suspended solids to meet regulated limits at the discharge point. Water will be recycled back to the beneficiation plant process water tank.

The preliminary design area for the TMF is 500,000 m^2 and it will be located near the beneficiation plant in an area so as not to interfere with existing watercourses. Diversion ditching for surface runoff will be constructed around the TMF facilities, and this ditching will be maintained during the operation and maintenance stage of the mine. Additional detail regarding the TMF design will be described in the EIS.

2.8.2.5 Accommodation Camp

The accommodation camp will be operational year-round and will accommodate approximately seventy workers (Figure 2-3). The mine workers will use it during the winter, while the beneficiation plant and rail yard workers will use it during the summer months and shoulder seasons. The camp will be built in a remote location along the access road to the beneficiation plant in order to avoid the noise that may be associated with the beneficiation processes.

The following elements will be included in the accommodation camp area:

- dormitory building(s);
- kitchen building;
- generator with small fuel storage supply;
- domestic waste water treatment plant;
- drainage ditch around the pad; and
- settling pond.

A gravel pad will be constructed for the accommodations camp. Construction supplies and equipment will be shipped via rail and truck and assembled on site. Modular buildings will be used where possible to simplify the construction process.

2.8.2.6 Rail Track and Loop

The iron ore produced for shipment at the beneficiation plant will be trucked to a new rail yard approximately 22 km south of the beneficiation plan, and just north of Astray Lake, as shown in Figure 2-4, where it will be loaded onto train cars. A new 6 km track loop will connect to the existing rail owned by Tshiuetin Rail Transportation Inc. and the loop will be constructed so as to align with the existing railway as much as possible, and thereby minimize the new footprint. The train will be loaded during the summer months and early fall as the beneficiation plant processes the material. The stockpile area in the loading yard will be sized to contain at least one month of production.

Each rail car will be loaded by wheel loaders and the new track loop will accommodate the loading of up to 240 rail cars. The rail yard site will include a field office (including lunch room and worker refuge), two storage containers for small equipment and supplies, a generator, and small fuel storage (providing fuel for up to three days).

The drainage water coming from the gravel pad for the rail yard will be collected by a perimeter ditch and directed to a settling pond. The settling pond will be engineered to accommodate the drainage and treat the water to meet regulated limits prior to release.

The following elements will be constructed for the rail yard:

- rail track with loop – approximately 6 km long;
- pad for Stockpile No. 1 to accommodate 100,000 t: 3,600 m^2;
- pad for Stockpile No. 2 to accommodate 50,000 t: 1,600 m^2;
- trailer office, lunch room, and worker refuge – 250 m^2;
- two (2) storage containers – approximately 250 m^2 each;
- generator and small fuel storage supply;
- drainage ditch around the pad – approximately 8 km long; and
- settling pond.

2.8.2.7 Water Supply

There will be three types of water supply requirements for the Project.

- **Toilet Water Supply –** this water will be extracted from groundwater wells that are constructed locally and installed where required, such as near the mine, at the beneficiation plant, the accommodation camp, and the rail yard.

- **Potable Water Supply –** water treatment units will be installed at the accommodation camp to treat groundwater from wells for the potable water supply, shower and toilet; potable water and hot water tanks will be appropriately sized for peak requirements; additional potable water treatment units will be installed at the mine site, beneficiation yard, and rail yard for workers to access during the work day.

- **Process and Fire Suppression Water Supply (Surface) –** mine and process plant water supply will be extracted from Attikamagen Lake and stored in water reservoirs prior to use. Water will be reclaimed and recycled where possible from the TMF. Water will be kept pressurized at the pumping station for the beneficiation plant for fire suppression.

2.8.2.8 Power and Fuel Supply

All the power required for the Project will be supplied by local generators which will run on diesel fuel. The main power generation will be at the beneficiation plant and the central fuel storage for the Project will be in the beneficiation area. The other Project sites (*i.e.,* mine site, accommodations camp, rail yard) will each have power generator(s) and a fuel supply for up to 3 days of generation. All ASTs will be equipped with secondary containment and installed as per the *Gasoline and Associated Products* (GAP) *Regulations* (2003).

Fuel will be transported by rail from Sept-Îles. It will be unloaded into unloading from rail cars into fuel trucks. Fuel for the Project will be transported from the central depot to the other Project locations via a dedicated fuel truck.

2.8.3 Operation and Maintenance

Operation and Maintenance activities for the Project will be conducted in two phases. Phase I consists of mining the high grade iron ore (DSO) that needs the minimum of beneficiation to produce iron ore for the market. In Phase II, the lower grade ore will be stockpiled in order to be beneficiated to raise the iron ore content to desired commercial grade.

For Phase I, mining activities will occur during the winter season and the iron ore will be conveyed across Iron Arm via the ice bridge roads, as described in Section 2.8.2.1. The beneficiation plant will operate from June to October and the ore product will be hauled by truck over the new road to the new rail yard. Conveyance of equipment, supplies, and other materials across Iron Arm will be as described in Section 2.8.2.1.

For Phase II, a lower grade iron ore will be mined and the results of this will require additional beneficiation processes to raise the grade for market. The options for additional processes are being studied in parallel with the results of testing rock during ongoing exploration in the mine site area. Conveyance across Iron Arm of iron ore, equipment, supplies, and other materials will be as described in Section 2.8.2.1.

2.8.3.1 Open Pit

The three iron ore open pits will be mined with drilling, and blasting will be used as required. Loading of iron ore into haulage trucks will be accomplished using a shovel and wheel loader. The design for pit slopes is currently being determined.

Operation and maintenance requirements for the open pit mining are summarized as follows:

- **Control of precipitation and groundwater will be conducted using in-pit sumps.** Collected water will be pumped out of the pit to an engineered settling pond for treatment of suspended solids and residual chemistry to meet regulated limits prior to release to Attikamagen Lake.
- **Haulage road maintenance.** Winter snow clearing and traction control (gravel) will be required as well as summer dust suppression (water). Occasional grading and leveling of these roads will be required.
- **Access road maintenance.** Winter snow clearing and traction control (sand) will be required as well as summer dust suppression (water). Occasional grading and leveling of the access roads will be required.
- **Diversion ditching.** Surface runoff diversion ditching will require regular inspection and occasional maintenance. During maintenance, cleanout and grading, drainage water will be pumped to a settling pond prior to release.
- **Dust Suppression.** In addition to dust associated with access roads, dust will be suppressed at the open pit and other exposed areas as required.

2.8.3.2 Overburden and Waste Rock Stockpiles

The total volume of overburden and waste rock estimated to be generated during operation of the mine is 3 Mt and 5 Mt, respectively (Table 1-1). An ascending construction sequence will be used to allow for rock placement and progressive rehabilitation to be completed in sections, with clearing and grubbing carried out on only on the next section when waste is being placed.

Drainage around the pads will be collected in a perimeter ditch and directed to a settling pond. The settling pond will be engineered to accommodate the drainage and treat the water to meet regulated limits prior to release.

2.8.3.3 Process Description and Beneficiation Plant Design

The beneficiation process is outlined in Figure 2-6. The beneficiation process for Phase II using a lower grade of iron ore (<60% iron) will require additional processing, which will be determined based on test work to be conducted.

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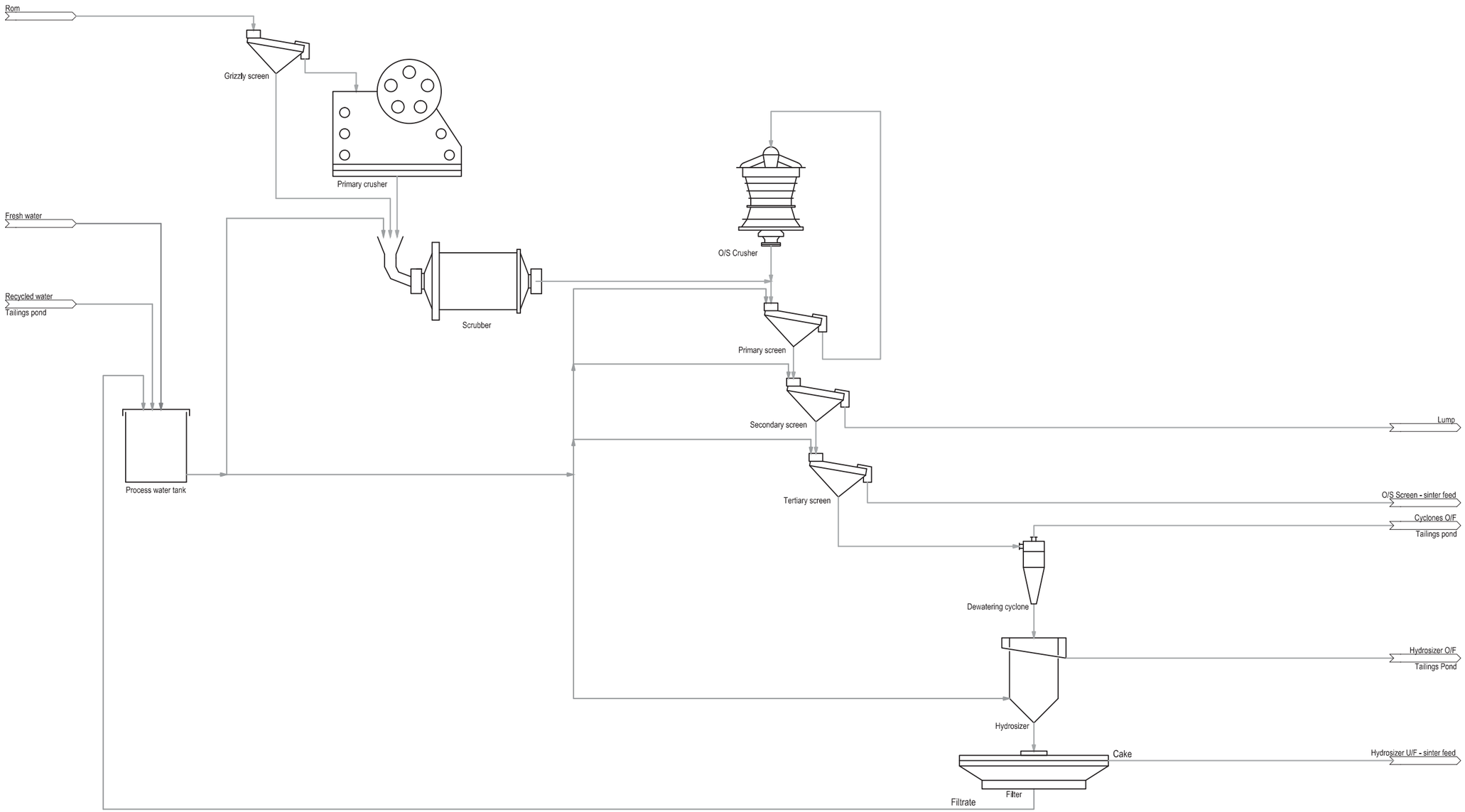


NOTES

SEAL:

REV	DESCRIPTION	BY	DATE
AA	ISSUED FOR INFORMATION	MG	24/08/2012

REFERENCE DRAWINGS

DESIGNED:	M. GIRARD	10/08/2012
DRAWN:	H. G.-TREMBLAY	10/08/2012
CHECKED:	M. GIRARD	24/08/2012
APPROVED:		
SCALE:	NOT TO SCALE	FORMAT B

CENTURY IRON MINES CORP.

SOUTEX

SOUTEX PROJECT: 2359

CLIENT PROJECT:
LABEC CENTURY IRON ORE
JOYCE LAKE DSO PROJECT

Figure 2-6 Beneficiation Process for DSO (Phase I) Flow Diagram

DRAWING NUMBER:	PAGE	REV
2359-PFD-001	1/1	AA

The beneficiation plant is designed to process up to 4 Mt/yr of iron ore as shown in Table 1-1. The yearly production will follow a ramp-up from 1.5 Mt for the first year to 4 Mt/yr after 4 years of production. The desired annual production for Phase I is 2.0 Mt/yr, and the material produced is lump ore and sinter fines. To achieve the desired production, an average run-of-mine feed of 3.2 Mt/yr up to a maximum design of 4.0 Mt/yr must be fed to the beneficiation plant. The beneficiation process will produce tailings in the order of 1.2 Mt/yr. Tailings will consist of fines smaller than 600 µm diameter with most being finer than 150 µm diameter. An optional fines upgrading may be included to increase the average annual production to 2.2 Mt/yr and decrease the tailings production to 1.0 Mt/yr.

The beneficiation process is based on size segregation, assuming that particles bigger than 600 µm are already iron-rich enough after the scrubbing step to be sold as lump ore or sinter feed. The optional fines upgrading processing component would use the density separation process to concentrate the iron-rich particles.

The beneficiation plant production will be split into two similar lines. Beneficiation plan operation is based on 200 days per year with an overall plant operating time of 80%. The beneficiation plant will consist of three sections: crushing, screening and fines upgrading. The beneficiation buildings and equipment are semi-mobile so that layout adjustments can be made in the future, as required (*i.e.,* for Phase II).

The general process and plant design criteria for the concentrator are based on the following:

- **Crushing:** The ROM ore is first classified using screens; ore bigger than 100 mm is sent to primary crushing. The ROM ore that passes the screens and the primary crushed ore are sent to scrubbers to remove the clayish materials from the carrying over to the screening stages.

- **Screening:** Three screening steps constitute the screening circuit. The purpose of the first screening step is to send oversized particles to a dedicated crusher in a closed circuit to respect lump ore product specifications. The undersized particles from the primary screening step is sent to the secondary screening step and oversized particles vacuum. The undersized particles from the secondary screening step are then screened at the tertiary screening step. Tertiary screening oversized particles are is a sinter feed product, and the undersized particles are sent as rejects to the tailings pond or to the optional fines upgrading section.

- **Optional Fines upgrading:** The undersized particles for the tertiary screening step are dewatered in cyclones and sent to a density separation process. Overflow water is sent to the tailings pond. The dewatering cyclones underflow is fed to hindered settlers. Iron rich particles concentrate in the underflow and the overflow is sent to the tailings pond. Hindered settler underflow is filtered. The filtration cake is a sinter feed product and the filtrate is recirculated to the process water tank.

- **Process Water:** Process water will be provided as raw water from a suitable freshwater source (surface or groundwater, to be determined) and the balance will be provided from the tailings area by reclamation and by harvesting runoff.

2.8.3.4 Explosives Storage

An appropriately permitted explosives storage facility will be located near the mine and away from other buildings. This facility will be installed, monitored, and maintained according to permit requirements by a licenced explosive vendor and contractor. All transportation of explosives will be compliant with applicable regulations.

2.8.3.5 Mining Equipment

The anticipated requirements for major mining equipment are listed in Table 2-5. Specific requirements for each equipment type will be determined as design progresses.

Table 2-5 Anticipated Major Mining Equipment Requirements

Equipment Type or Equivalent	
Haulage Truck - Cat-775	Mechanic truck
Excavator - PC-1250	Pick-up
Drill - Sandvik- D25KS	Water Trucks
Wheel loader - Cat 980	Forklift
Track Dozer - Cat-D7	Dewatering Pumps
Grader - Cat 12M	Mobile Pumps
Boom Truck	Portable Generators
Fuel / Lube Truck	

2.8.3.6 Beneficiated Ore Haulage

The beneficiated ore will be stockpiled beside the beneficiation plant into two different stockpiles: one for lump ore and one for sinter fines. These stockpiles will be reclaimed by wheel loaders and loaded in haulage trucks for transportation over the haulage road a distance of approximately 22 km to the rail yard. At the rail yard, the beneficiated ore will be stockpiled prior to loading by wheel loaders into rail cars for shipment south to the Port of Sept-Îles for eventual shipment to market.

2.8.3.7 Rail Component

The iron ore concentrate will be suitable for shipment in the standard 35 foot open gondola cars typically used in Labrador for iron ore rail service. Each train will consist of 240 gondola cars in accordance with standard QNSL train size for new clients. Each car will be capable of handling 108 t of iron ore concentrate.

2.8.4 Employment

Labec Century is committed to employment equity and providing local benefits throughout the life of the Project. As such, Labec Century will prepare a Women's Employment Plan, in consultation with the Women's Policy Office, and a Benefits Plan, in consultation with the provincial Department of Natural Resources. These will include employment and contracting policies for the Project and Labec Century will work with its contractors to implement the requirements of these plans through its supply chain and contract chain. The numbers provided below are a preliminary estimate only. These numbers will be refined in consultation with major contractors as Project design proceeds.

2.8.4.1 Construction Employment

The estimated person hours over the Construction period are provided in Table 2-8 by occupation type, including National Occupational Classification (NOC) codes for 2011. Certain positions, such as management, will be required throughout the Construction stage, while other occupations will be required for short periods of time.

Table 2-6 Construction Phase Employment

Discipline	Position	NOC Code	Estimated Number of Employees
Concrete	Concrete Finisher	7282	2
	Driller / Blaster	7372	2-4
	Concrete Form Helper	7611	1
	Heavy Equipment Operator	7521	8-12
	Construction Labourer	7611	4-8
	Foreman / Woman	8221	1
Civil	Civil Engineer	2131	1
	Bridge Engineer	2131	1
	Construction Engineer	2131	1
	Civil Engineering Technician	2231	1-2
Electrical	Construction Electrician	7241	1
	Electrical Engineer	2133	1
	Electrical Engineering Technician	2241	2-4
	Foreman / Woman Construction Electrician	7202	2
	Mine Electrician	7242	1-2
Mechanical	Mechanical Engineer	2132	1
	Mechanical Engineering Technician	2232	2-4
Piping	Contractor, Pipefitting	7203	2
	Pipefitter / Apprentice Pipefitter	7252	1-2
	Foreman / Woman, Pipefitter	7203	1
Structure	Structural Engineer	2131	1
	Construction Inspector	2264	1
Telecom	Telecommunications Line / Cable Worker	7245	2
	IT Consultant / Systems Consultant	2171	1
	Computer Network Technician	2281	1
	Instrument Technician	2243	1
	Automation Technologist	2232	1
Accommodations	Cooks	6322	2
	Canteen Helper	6322	3-5
	Housekeepers	6731	3-5
	Janitor	6733	2
		Total	**54-75**

Notes:
The number of employees indicated is an estimate that is subject to change based on the outcome of the Preliminary Economic Assessment, which is underway and not yet completed.

2.8.4.2 Operation and Maintenance Employment

The number of employees over the operation and maintenance phase are provided in Table 2-9 by occupation type, including NOC 2011 codes. These estimates include a total of a rotation of two crews (Run 1 and Run 2), with each crew including a day and night shift.

Table 2-7 Estimated Operation and Maintenance Stage Phase Stage Employment

Discipline	Position	NOC Code	Estimated Number of Employees
General and Administration	General Manager	1221	1
	Secretary	1241	1
Mine - Century Employee	Chief Engineer	2143	1
	Senior Engineer	2143	1
	Geologist	2113	3-5
	Mine Technician	2212	3-5
Mine - Contractor Employee	Truck Drivers	7511	55-65
	Excavator Operator	7521	10-15
	Drill Operator	7372	3-5
	Heavy Equipment Operator	7521	8-14
	Mechanic	7312	8-12
DSO Plant - Century and/or Contractor Employee	Process Engineer	2143	1
	Plant Foreman	8221	3-5
	Operators	7521	10-14
	Labour	8611	3-5
	Mechanic - Electric	7333	4-8
	Laboratory Technician	2211	3-5
	Loader Operator	7521	12-18
Infrastructure - Century Employee	Foreman	8221	3-5
	Labour	7612	6-10
Catering - Contractor	Cook	6322	2
	Cateen Helper	6322	3-5
	Room Cleaning	6731	3-5
	Janitor	6733	2
Ore Haulage – Contractor	Truck Drivers	7511	26-30
H&S – Contractor	Officer	0112	3-5
Rail Yard - Century and/or Contractor Employee	Labour	7622	6-10
	Loader Operator	7521	6-10
		Total	**190-265**

Notes:
The number of employees indicated is an estimate that is subject to change based on the outcome of the Preliminary Economic Assessment, which is underway and not yet completed.

2.8.5 Emissions, Discharges and Waste Management

A number of emissions, discharges and water will be generated during the Project stages; these are summarized in Table 2-8.

Table 2-8 Waste, Discharges and Emissions to be Potentially Generated

Facility / Activity	Solid	Liquid	Air/Gas	Hazardous
Mine Site				
Construction	• Residual construction materials (various). • Domestic solid waste.	• Mine water from pit perimeter diversion ditches, in-pit pumps, perimeter dewatering wells, and associated settling pond(s). • Overburden and waste rock stockpile drainage. • Sewerage.	• Greenhouse gases from machinery exhaust and from explosives use. • Dust from machinery use, blasting, loading and dumping of ore and waste rock and overburden. • Noise from machinery, drilling, blasting, loading, dumping activities.	• Used oils and lubes. • Used solvents and grease. • Batteries.
Operation and Maintenance	• Domestic solid waste.	• Mine water from pit perimeter diversion ditches, in-pit pumps, perimeter dewatering wells, and associated settling pond(s). • Overburden and waste rock stockpile drainage. • Sewerage.	• Greenhouse gases from machinery exhaust and from explosives use. • Dust from machinery use, blasting, loading and dumping of ore and waste rock and overburden. • Noise from machinery, drilling, blasting, loading, dumping activities.	• Used oils and lubes. • Used solvents and grease. • Batteries.
Beneficiation Plant and Tailings Management Facility				
Construction	• Residual construction materials (various). • Domestic solid waste.	• Drainage water from around the yard and TMF perimeter ditches and associated settling ponds. • Drainage water from around the ROM and product stockpiles. • Sewerage.	• Greenhouse gases from machinery exhaust. • Dust from machinery use. • Noise from machinery and assembly of plant.	• Used oils and lubes.
Operation and Maintenance	• Domestic waste.	• Drainage water from around the plant yard and TMF perimeter ditches and associated settling ponds. • Drainage water from around the ROM and product stockpiles. • Hydrocarbons. • Sewerage.	• Greenhouse gases from machinery and equipment exhaust. • Dust from machinery use, loading and dumping of ROM and product ore, TMF. • Noise from machinery use, loading and dumping activities.	• Used oils and lubes. • Used solvents and grease. • Batteries.

Table 2-8 Waste, Discharges and Emissions to be Potentially Generated

Facility / Activity	Solid	Liquid	Air/Gas	Hazardous
Accommodations Camp				
Construction	• Residual construction materials (various).	• Drainage water during construction of perimeter ditches and associated settling pond.	• Greenhouse gases from machinery exhaust. • Dust from local traffic.	• None anticipated.
Operation and Maintenance	• Domestic solid waste, including food waste.	• Drainage water from perimeter ditches and associated settling pond. • Sewerage.	• Greenhouse gases from equipment exhaust. • Dust from local traffic.	• Used oils and lubes. • Batteries.
Roadway to Rail Yard and Access Roads				
Construction	• Residual construction materials (various).	• Drainage water from perimeter ditches and associated settling pond.	• Greenhouse gases from machinery exhaust. • Dust from machinery. • Noise from machinery.	• Used oils and lubes.
Operation and Maintenance	• None anticipated.	• Drainage water from roadside ditches.	• Dust from machinery traffic. • Noise from machinery traffic.	• None anticipated.
Rail Yard and Rail Spur				
Construction	• Residual construction materials (various).	• Drainage water from construction of ditches around the rail yard and associated settling pond.	• Greenhouse gases from machinery and train exhaust. • Dust from machinery. • Noise from machinery.	• None anticipated.
Operation and Maintenance	• Domestic solid waste.	• Drainage water from around the rail yard perimeter ditches and associated settling pond. • Hydrocarbons. • Sewerage.	• Greenhouse gases from machinery and train exhaust. • Dust from machinery, and from loading of product. • Noise from machinery and equipment.	• Used oils and lubes. • Used solvents and grease. • Batteries.

A comprehensive Waste Management Plan (WMP) will be developed to include documentation of emissions, discharges and wastes and will include a description of procedures for management and monitoring of each waste stream, roles and responsibilities for waste management will be clearly identified. Appropriate and standard mitigations will be put into place to avoid release of untreated discharge into the natural environment.

The following sections provide an overview of how the various wastes, discharges and emissions will be managed.

2.8.5.1 Mine Water

Water management for the open pit will include pit perimeter diversion ditches, in-pit pumps, and perimeter dewatering wells. The collected water will be pumped to settling ponds that are appropriately sized, and treated to meet regulated limits prior to discharge. Hydrology and hydrogeology studies, as well as geochemistry studies on overburden rock, waste rock, and ore are underway to determine the engineering requirements for these features, which will be described in detail in the EIS. Testing, treatment, and monitoring will be conducted in compliance with relevant legislation.

2.8.5.2 Site Drainage

Site drainage will be managed through the following activities:

- Runoff from stockpiled material areas (*i.e.,* overburden, waste rock and ore) will be managed and captured through the use of diversion ditches and local appropriately sized settling ponds, with appropriate treatment to meet regulated limits prior to discharge.
- Around site infrastructure areas, diversion ditches and small appropriately sized settling ponds will be constructed to collect and treat site runoff to meet regulated limits prior to discharge. These areas will include:
  - all garage areas, fueling stations, fuel storage areas, warehouses;
  - accommodations and other employee facilities (*e.g.,* offices, lunch rooms, refuges); and
  - beneficiation plant and TMF.

2.8.5.3 Domestic Wastewater Treatment

Domestic wastewater treatment facilities will be installed in four locations for the Project, including the mine site, the beneficiation plan, accommodations camp, and the rail yard. The treatment facilities will be engineered for anticipated peak loads. Maintenance of the facilities will be conducted in compliance with applicable legislation.

2.8.5.4 Mine/Process Waste

Sections 3.2.1 and 3.2.2 address how tailings and overburden / waste rock will be handled. Tailings will be placed within the TMF and waste rock will be placed in appropriate waste rock disposal areas.

In terms of potential for acid rock drainage (ARD), metal leaching, particle size, “red water”, and ammonia (from use of explosives), and other potential water quality concerns, Labec Century is conducting testing in 2012/early 2013 to provide information to support the design of appropriate waste management and treatment facilities.

2.8.5.5 Domestic Solid Waste

Domestic solid waste sources for the Project include waste from office and lunchroom activities, and construction wastes. All domestic solid wastes will be disposed of in compliance with the applicable Newfoundland and Labrador regulations.

2.8.5.6 Hazardous Waste

Hazardous waste materials will be handled and stored in compliance with applicable regulatory requirements and industry best practices. Hazardous waste generated through construction and operation activities is expected to be minimal and include small amounts of waste oils and solvents. Hazardous waste will be stored on site in a separate temporary hazardous waste storage area provided with full containment. Hazardous wastes will be removed from site by a licenced contractor and disposed of at an approved facility. Other control measures for hazardous waste include preparing and implementing an Emergency Spill Prevention and Response (contingency) Plan to avoid effects from release of potentially hazardous materials.

2.8.5.7 Used Oil Storage

A used oil storage tank will be located at the mine garage facility and at the beneficiation plant. Used oil will be collected for recycling or reuse according to the *Used Oil Control Regulations*, and will be stored, transported, and disposed of according to applicable legislation.

2.8.5.8 Dust/Air Quality

For mining operations, the emissions of concern for air quality are for the most part restricted to:

- particulate emissions from road dust, material handling, blasting (pits and/or quarries), processing (crushing, screening), wind erosion;
- exhaust emissions from vehicle engines; and
- gaseous emissions from blasting, including carbon monoxide.

Emission of particulate matter is a concern given the amounts that may be released by the Project in relation to generally low background levels. For this Project, the mining-related activities are generally remote from residential / recreational public areas and, in this situation, particulate matter is likely to be the only measurable air-emission contaminant of concern.

Dust will be managed at the waste rock disposal areas and TMF primarily through best-in-practice design, construction, and dumping / deposition practices as well as progressive rehabilitation techniques. As required, water trucks will be available on site for dust suppression at these locations and for roadways.

Waste rock disposal areas will be developed in smaller, manageable areas to minimize the waste exposure area, thereby minimizing dust lift-off during dry periods and in the working equipment areas. Water and other approved dust suppression methods will be incorporated as required. Disposal areas will be developed in an ascending sequence with abandoned safety benches prepared and seeded to promote natural revegetation, thereby reducing dust.

The TMF will be designed and operated to minimize active sub-aerial deposit areas, maximize the pond area and to create areas where tailings can be covered and seeded to stabilize the tailings surface and minimize dust.

An air quality study has been initiated in 2012 to identify the background levels to support the environmental assessment of potential effects of the Project on air quality.

2.8.5.9 Noise

During the Construction stage, it is anticipated that there will be periodic increases in ambient noise levels at the site. Noise will be generated by site works including blasting, excavation, grading, installation / construction of facilities and buildings, construction of roadway and railway. These activities typically involve heavy machinery. Trucks and rail cars will also be used to deliver equipment, materials, and supplies, and to haul away waste materials. Noise will also be generated by smaller equipment. The noise produced can be steady or episodic and may be audible outside the immediate construction area.

During the Operation and Maintenance stage, noise will be generated by activities such as drilling, blasting, crushing and washing, load-out, and operation of haul trucks and rail cars. A baseline acoustic study has been initiated in 2012 to identify background noise levels to support the environmental assessment of potential effects of Project noise on sensitive receptors, such as residents of local camps.

2.8.5.10 Hazardous Materials

Hazardous materials will be used in small amounts for the Project. All staff will be appropriately trained in handling, storage, and disposal of hazardous material. Chemical storage and handing will be conducted in accordance with manufacturer recommendations and in compliance with applicable legislation. Hazardous materials to be used will include the following:

- fuels and oils;
- solvents and grease; and
- batteries.

A site-specific Emergency Response Plan (ERP) will be put into place to minimize, contain, and control potential releases of hazardous materials.

2.8.6 Mine Closure

A Rehabilitation and Closure Plan will be prepared and submitted, as required under the Newfoundland and Labrador *Mining Act*, Chapter M-15.1, Sections (8), (9) and (10). In accordance with the Act, this Plan will describe the process of rehabilitation of a project at any stage of the project up to and including Closure. The Rehabilitation and Closure Plan is directly linked to mine development and operation over the life of a mine and therefore must be considered a "live" document, with review and update as needed throughout the life of a project. For each year of the mining lease term, the work plans for project rehabilitation must be submitted to the province as prescribed in the *Guidelines to the Mining Act* (http://www.nr.gov.nl.ca/nr/department/guidelines.pdf).

The final review of the Rehabilitation and Closure Plan generally occurs once the mine closure schedule is known, and typically 12 months or more before end of mining. This final review forms a Closure Plan which defines in detail the actions necessary to achieve the Rehabilitation and Closure objectives and requirements.

2.8.6.1 Progressive Rehabilitation

Progressive rehabilitation is the life-of-mine process used to achieve the final land use objectives for the site.

Development / Construction Stage

Aspects of mine development including mine design, infrastructure location and design, and operations planning will be conducted with consideration of available progressive rehabilitation opportunities and closure rehabilitation requirements. An environmental monitoring program will be conducted as part of the mine development and the resulting information will be used to evaluate the progressive rehabilitation program on an ongoing basis.

Mine Operation Stage

Once the mine advances from the development to the operational stage, progressive rehabilitation activities can begin. Progressive rehabilitation opportunities for the site during the operational stage may include the following:

- rehabilitate construction-related buildings and laydown areas;
- conduct revegetation studies and trials;
- grade and revegetate the tailings;
- stabilize and revegetate waste rock disposal areas; and
- develop and implement an integrated WMP.

Mine Closure Steps

The final review and update of the Rehabilitation and Closure Plan is conducted approximately one year prior to the end of operation. The final review of the Plan will provide the detailed closure rehabilitation design and procedures to fully reclaim the mine site.

Closure rehabilitation will generally include the following activities:

- hazardous chemicals, reagents and materials are removed;
- equipment is disconnected, drained and cleaned, disassembled and stored for future reuse in another project, or sold;
- potentially hazardous equipment is removed from the site and disposed of in accordance with appropriate regulations;
- buildings and infrastructure are dismantled and removed or disposed of;
- material and equipment with salvage value are removed and sold for its value;
- concrete foundations are removed and buried in place if possible, or disposed of in an appropriate manner;
- fuel storage and dispensing facilities are removed;
- soil and groundwater conditions are assessed in areas that warrant assessment (*e.g.,* fuel dispensing facility, chemical storage buildings, ore storage areas) and remedial measures are implemented, where necessary;
- tailings are left in place, and the surface area that has not been progressively remediated is graded and vegetated;
- dewatering wells and groundwater monitoring wells are decommissioned;
- barricades and signage are installed around the open pit in areas not completed during the operation stage, as necessary;
- site drainage patterns are re-established, as near as practical, to natural, pre-development conditions or otherwise to meet land use objectives;
- disturbed areas are grading and/or otherwise scarified or landscaped to control erosion and sedimentation; and
- special rehabilitation requirements associated with the site are addressed, such as removal of culverts and infilling of drainage or diversion ditches which are no longer required.

2.8.6.2 Post-Closure Monitoring

A post-Closure monitoring program will continue beyond the operational monitoring program incorporating appropriate changes to the program. The post-Closure monitoring program will continue for an anticipated period of five years after final closure activities are completed or earlier should Labec Century and the appropriate regulatory bodies be satisfied that all physical and chemical characteristics are stable. When the site is considered to be physically and chemically stable, the land will be relinquished to the Crown.

2.8.7 Accidental Events and Contingency Plan

A Contingency Plan will be developed to respond to and deal with incidents that may arise during the Construction, Operation, and Rehabilitation and Closure of the Project site. Incidents which may possibly occur include accidents, spills, property damage or dangerous situations.

The objectives of these contingency plans are as follows:

- to identify site-specific hazards to enable all site workers and emergency responders to be fully informed and to respond appropriately and safely to anticipated emergencies at the site. An emergency arises from any incident on the site that has the potential to result in a fatality, injury, property damage or adverse environmental effect. This includes, but is not limited to:
    - personal injury or fatality;
    - vehicle and/or equipment accident;
    - breakage of, or damage to, utility services;
    - spills or leaks of hazardous substances;
    - explosion or fire;
    - criminal activity; or
    - disruption by weather events (*e.g.*, lightning, ice, wind, rain).
- to inform emergency services of the information necessary to respond to emergencies on the site in a safe and effective manner; and
- to provide the public with an awareness of the potential emergency situations and the expected responses.

Plans to be developed will include, a WMP, an ERP (for hydrocarbon spills / incidents and effluent releases), Operational Plans.

Emergency situations will be further described in the plans. The plans will be reviewed and updated on a regular basis in relation to regulatory requirements.

3.0 PROJECT PURPOSE AND ALTERNATIVES ASSESSMENT

3.1 PROJECT PURPOSE

The purpose of the Project is to develop the iron ore deposit by Joyce Lake to produce iron ore concentrate suitable for export sales to international steel markets. There is strong demand for iron ore and steel on the world market. Other proponents in western Labrador and nearby in northern Québec are also actively developing iron ore deposits. Importantly, community, transportation, and port infrastructure is already in place to support the growing iron ore producing industry, and will be used by Labec Century to support its endeavours to produce iron ore for the world market. The Construction and Operation of the Project will generate direct and indirect employment and business opportunities for the local residents, and provide the various levels of government with revenues through taxes and royalties.

3.2 PROJECT ALTERNATIVES

3.2.1 Tailings Management

A review of options for tailings management will be conducted as part of the feasibility study, which has been initiated in quarter 4 of 2012. The feasibility of each option will be evaluated based on technical / operational aspects, economic implications and potential effects on the physical and ecological environment (terrestrial, aquatic).

3.2.2 Waste Rock Management

A review of potential waste rock disposal options was conducted as part of the conceptual planning stage. The overall feasibility of the options was evaluated based on technical / operational aspects, economic implications, and potential effects on the physical and ecological environment. The following alternative waste rock management approaches were considered:

- co-disposal of tailings and waste rock;
- using waste rock as construction aggregate; and
- backfilling of the open pits with waste rock during active pit operations or at Closure.

Based on the preliminary assessment, it was determined that storage of waste rock in designated disposal areas adjacent to the open pit is the preferred option. Further consideration of storage in exhausted areas of the open pits will be given as mine planning progresses.

3.2.3 Transportation

Options are currently being considered for conveyance of iron ore across Iron Arm, as described in Section 2.8.2.1 regarding the potential conveyor option in Phase II in addition to the ice bridge roads.

Two optional road alignments are being considered for the haulage road between the beneficiation plant and the rail yard. The preferred option will be selected based on environmental considerations (*e.g.,* sensitive habitat or water crossings), and also based on operational considerations (*e.g.,* road grade, practicality of construction).

The existing road between Iron Arm and Schefferville was not considered to be an option for moving ore product from the beneficiation plant to a rail yard for shipment for several reasons:

- Safety considerations for residential traffic:
  - the existing road serves as a local residential road from Schefferville to cottages at Iron Arm and this introduces a major safety concern for residential traffic if it was also to serve as a haulage road for ore product; and
  - the haulage trucks would need to pass through Schefferville to reach a rail yard facility for loading and this introduces a safety concern for residential traffic within an near Schefferville.
- Noise and dust:
  - hauling ore product through Schefferville and would raise the noise and dust levels associated with traffic for residents and businesses within and near Schefferville; and
  - loading ore onto rail cars near Schefferville would have the potential to raise the noise and dust levels for residents and businesses within and near Schefferville.
- Availability of a rail yard for loading ore product:
  - use of an existing rail yard would require negotiation with existing users and has the potential to constrain the existing users of the rail yard and rail way; and
  - there is very limited land in or near Schefferville available for construction of a new rail yard to accommodate the loading of ore product from this Project.

Due to the nature of the product and the distance from existing transportation infrastructure, no alternatives have been identified for the transportation of the ore product to Sept Îles. The only option that is considered to be feasible from technical, economic and environmental perspectives is shipment by railway direct to Sept-Îles.

3.2.4 Power

Onsite power generation using fuel-driven generators is the only option considered for the Project. No other power source exists in the Schefferville area or Project area that could supply the power requirements for the Project.

4.0 CONSULTATIONS

Since 2010, Century has been meeting with Aboriginal people, government agencies, and public stakeholders to discuss various projects it is pursuing in the Scheffferville area.

Century has engaged in a preliminary consultation program related to the company's general operations in western Labrador. To date, identified comments or concerns have been related to general mining activities in the region.

A comprehensive Consultation and Engagement Plan specific to this Project is currently being implemented. This includes engagement with Aboriginal peoples, residents of communities potentially affected by the Project, government agencies with regulatory or permitting responsibilities related to the Project, and other interested parties. An update on the engagement and consultation process, including results obtained, will be provided in the EIS.

Century will take into consideration all the concerns expressed by Aboriginal groups, government agencies, and public stakeholders regarding the planned Project. Century will continue to meet with these parties to provide information on the planned Project, to gather information on the biophysical and social environment, to obtain feedback, and to document interests and concerns.

A summary of consultations to date is provided in the sections below.

4.1 CONSULTATION WITH ABORIGINAL GROUPS

As the proponent for the subject Project, Labec Century is committed to fair and honest dealings with all Aboriginal groups, to respecting the terms of any formal consultation process outlined by the Government of Newfoundland and Labrador and the federal government, and to entering into negotiations towards mutually beneficial relationships with those groups with established aboriginal rights.

The location of Aboriginal communities in relation to the Project is shown in Figure 2-5. As outlined in Section 2.7 preliminary research has identified five Aboriginal groups with asserted land claims or traditional territory near the Project of which only one, the Innu Nation of Labrador, has had its land claim accepted for negotiation by the federal and provincial governments. The remaining four groups have asserted land claims that have not, as yet, been accepted for negotiation: NunatuKavut Community Council, Naskapi Nation of Kawawachikamach, Innu First Nation of Matimekush-Lac John and the Innu First Nation of Uashat mak Mani-Utenam. Contact information for these Aboriginal groups is provided in Appendix C.

Century has hosted a number of meetings with the local Chiefs and Band Councils to discuss the planned projects. A list of recent meetings and discussion sessions with these groups is provided below.

- November 18, 2010 – Received support letter from the Naskapi Chief for the 2010 drill program in Lac Sans Chef.

- March 1, 2011 – Meeting with Chief Réal Mckenzie and council members from Conseil de Ia Nation Innu Matimekush-Lac John in Schefferville to provide an introduction to Century and its interests in the area.

- March 7, 2011 – Letter sent to Rosario Pinette and the Conseil de Ia Nation Innu, Takuaikan Uashat Mak Mani-Utenam regarding March 4, 2011 meeting in Sept-Îles for corporate introduction copied to Chief Georges-Ernest Grégoire and Mr. Ken Rock.

- March 7, 2011 – Letter sent to Chief Réal Mckenzie to summarize the meeting on March 1, 2011.

- March 26, 2011 – Letter sent to Chief Réal Mckenzie and Band Council regarding the camp building in Rainy Lake.

- March 2011 – During Prospectors & Developers Association of Canada (PDAC) 2011 Meeting, meeting with Chief Gregoire and Band council member plus Armand Mckenzie from Conseil de Ia Nation Innu, Takuaikan Uashat Mak Mani-Utenam at Century office for introductory meeting with Mr. Sandy Chim, CEO of Century.

- May 11, 2011 – Introductory meeting with the Naskapi Chief and Naskapi Nation of Kawawachikamach Band Council in Kawawachikamach.

- May 22, 2011 – Meeting with Jean Pierre Family in the presence of Paco Vachon (Councillor) and Jean Gauthier (former Chief) from Conseil de Ia Nation Innu Matimekush-Lac John in Schefferville regarding past and future work in the Lac Le Fer area.

- March 2012 – During PDAC, meeting with Chief Réal McKenzie and Chief Ernest Gregoire, preliminary agreed to host joint IBA discussions in future.

- June 6, 2012 – Meeting with the lawyers from O'Reilly et Associés representing Conseil de Ia Nation Innu, Takuaikan Uashat Mak Mani-Utenam in Montreal to start the Pre-production agreement negotiation.

- June 20, 2012 – Century Team met in St John's with Grand Chief Joseph Riche of the Innu Nation of Labrador and council members to give a corporate update and begin the IBA discussion.

- June 13, 2012 – Meeting with Nadir Andre lawyer for the Conseil de Ia Nation Innu Matimekush-Lac John on Rail strategy in Montreal.

- July 11, 2012 – Exploration Program update with Chief Réal McKenzie and his Band council members in Schefferville.

- July 12, 2012 – Exploration Program update to Band Council members of Naskapi Nation of Kawawachikamach Band Council in Kawawachikamach; follow-up with site tour with the council members to Iron Arm Camp, Joyce Lake and Rainy Lake exploration site.

- July 7 and 19, 2012 – Meeting with the Dan Gabriel and Ben Mckenzie Family regarding the Rainy Lake 2012 drill program.

- Jul 18, 2012 – Meeting in Toronto with Chief Louis Einish and council members.

4.2 CONSULTATION WITH GOVERNMENTS

The following government agencies have been engaged by Century and / or by its consultants regarding the Project, and additional meetings are being planned:

- **Federal Government:**

  - September 25, 2012: Canadian Environmental Assessment Agency (CEA Agency): meeting to introduce the planned Project prior to submission of the Project Description; and

  - July 2012: Fisheries and Oceans Canada (DFO): engagement to obtain a Scientific Licence for fish surveys in 2012.

- **Newfoundland and Labrador Government:**

  - May to July, 2012: Department of Environment and Conservation (NLDOEC) - Environmental Assessment Division and Department of Natural Resources (NLDNR) – Mineral Lands Division; bulk sampling program;

  - September 2012: Department of Tourism, Culture, and Recreation – Provincial Archaeology Office: discussions, permit application, and permit issuance for baseline archaeology program;

  - September 20, 2012; NLDOEC – Environmental Assessment Division; pre-registration meeting;

  - Spring 2010, 2011, 2012: NL DNR – Mineral Lands Division - exploration program; and

  - June and September 2012: Intergovernmental and Aboriginal Affairs Secretariat (NL IAAS) - engagement plan with Aboriginal groups.

- **Québec government:**

  - January 2012: Ministre de Ressources Naturelles, (MNRF) – met with Minister and staff to provide an update on general status of plans for Century projects and discussed the need for engagement of Aboriginal peoples;

  - April 18, 2012: MNRF- met with MNRF and other stakeholders in Sept-Îles regarding Century plans for several projects and use of the port facilities; and

  - February 8, 2012: department du Développement économique, de l'Innovation et de l'Exportation – met with Minister and staff to provide an update on general status of plans for Century projects.

- **Port in Sept Îles:**

  - April 18, 2012 – met with staff of various stakeholder groups, including MNRF (see above), Port of Sept-Îles, Ville de Sept-Îles, Economic Development Board of Sept-Îles regarding Century plans for several projects and use of the port facilities. :

4.3 CONSULTATION WITH THE GENERAL PUBLIC AND OTHER STAKEHOLDERS

Century has met with representatives of two railway companies: Tshiuetin Rail Transportation (starting in summer of 2011) and Québec North Shore and Labrador (QNS&L) Railway (starting in spring of 2012), and meetings are ongoing on at least a bimonthly basis. Century has also met with two business owners in Schefferville and a former administrator of Schefferville, starting in summer of 2011 and ongoing in 2012. These meetings have been to discuss Century's interests in the area, its exploration activities, its operational needs, and has included specific discussions on the Joyce Lake Project.

The proposed Project is located in a remote area of western Labrador and, because of this, consultation with the general public has thus far focused on the nearby community of Schefferville, approximately 20 km from the Project location. Going forward, Labec Century will consider consultation with the general public in Labrador City and Wabush, over 200 km to the south of the Project. As the current center of mining activities in Labrador, these two communities have the potential for interaction with the Project in terms of supplies and labour.

5.0 EXISTING ENVIRONMENT

5.1 PHYSICAL AND BIOLOGICAL ENVIRONMENT

5.1.1 Physical Environment

Climate

The Schefferville area experiences a subarctic climate with long, severe winters and cools to mild summers. The daily mean temperatures during the coldest months of January and February average from -24 ˚C and -22 ˚C and the average snowfall is 57 cm and 43 cm. During the warmest months, July and August, the daily mean temperatures are 12 ˚C and 11 ˚C, respectively. July is the wettest month and averages 107.2 mm of rainfall.

A summary of the daily average, daily maximum and daily minimum temperatures on a monthly basis over the period 1971 to 2000 is presented in Table 5-1. The annual average temperature is -5.3 ºC.

Table 5-1 Schefferville Area: Average, Maximum and Minimum Temperatures (1971 to 2000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Daily Average (ºC)	-24.1	-22.6	-16	-7.3	1.2	8.5	12.4	11.2	5.4	-1.7	-9.8	-20.6	-5.3
Daily Maximum (ºC)	-19	-16.9	-9.8	-1.5	6	13.7	17.2	15.8	8.9	1.3	-6.1	-15.9	-0.5
Daily Minimum (ºC)	-29.2	-28.1	-22.2	-13.1	-3.6	3.3	7.6	6.5	1.7	-4.6	-13.5	-25.2	-10

A summary of the monthly average rainfall, snowfall, total precipitation (as equivalent rainfall based on a conversion factor for snowfall to equivalent rainfall of 0.1) and average snow depth on a monthly basis over the period 1971 to 2000 is presented in Table 5-2. The annual average total precipitation for the area is about 823 mm.

Table 5-2 Schefferville Area: Average Monthly Precipitation (1971 to 2000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Rainfall (mm)	0.2	0.2	1.6	8.4	27.7	65.4	106.8	82.8	85.3	24.4	4.5	0.9	408.1
Snowfall (cm)	57.4	42.6	56.6	54.8	22.9	8	0.5	1.7	12.7	57.2	70.7	55.4	440.5
Precipitation (mm)	53.2	38.7	53.3	61.4	52.1	73.7	107.2	84.5	98.4	80.5	69.4	50.7	822.9
Average Snow Depth (cm)	62	70	71	69	18	0	0	0	0	7	26	49	31

Average wind speed and directionality is presented in Table 5-3. The annual average wind speed is about 17 km/h and the most frequent wind direction, on an annual basis, is from the northwest.

Table 5-3 Schefferville Area: Average Wind Speed/Direction (1971 to 2000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Speed (km/h)	16.4	16.8	17.4	16.5	16	16.2	15.1	15.6	16.9	17.8	17.3	16	16.5
Most Frequent Direction	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW
Maximum Hourly Speed (km/h)	85	97	83	77	66	97	65	61	80	89	84	80	80
Maximum Gust Speed (km/h)	134	148	148	130	101	126	103	117	137	137	142	153	131
Direction of Maximum Gust	W	W	SW	W	W	W	W	W	SW	SW	SW	SW	SW
Days with Winds ≥ 52 km/h	.7	1.4	1.9	1.1	0.9	0.4	0.6	0.4	0.8	1.1	1.8	2.1	13.9
Days with Winds ≥ 63 km/h	0.7	0.5	0.4	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.3	0.6	3.3

Local conditions including weather, elevation, presence of water bodies, snow depth and density, as well as vegetation cover influence the presence and thickness of permafrost in the Schefferville area. While there have been observations of permafrost 120 m thick in the Schefferville region (Brown 1979), permafrost is this region is discontinuous and the depth and thickness are variable. Thom (1969) suggests thick permafrost (up to 60 m) is likely in areas where snow cover is less than 0.4 m during the winter months of January and February.

Due to its high latitude location, the Schefferville area has short daylight in winter and extended daylight hours in summer. Mining and processing activities are scheduled around the most appropriate seasonal conditions. For example, extended daylight hours allows for longer work days while early and late winter conditions are appropriate for ground geophysical surveys and drilling operations.

Permafrost conditions in northern Québec and Labrador are shown in Figure 5-1, from Brown (1979). Nicholson's (1978) research on permafrost distribution in the Schefferville area indicates that deep permafrost underlies areas of exposed high elevation, where vegetation cover consisted of tundra. The depth of the permafrost ranged from 60 to 100 m, and entirely unfrozen areas occurred in the valleys and within 30 m from permanently covered shoreline. Earlier research found that permafrost was not present on less exposed and low-lying wood covered ground surfaces and was not expected to exist beneath water bodies that are too deep to freeze solid during the winter (Nicholson and Lewis 1976).

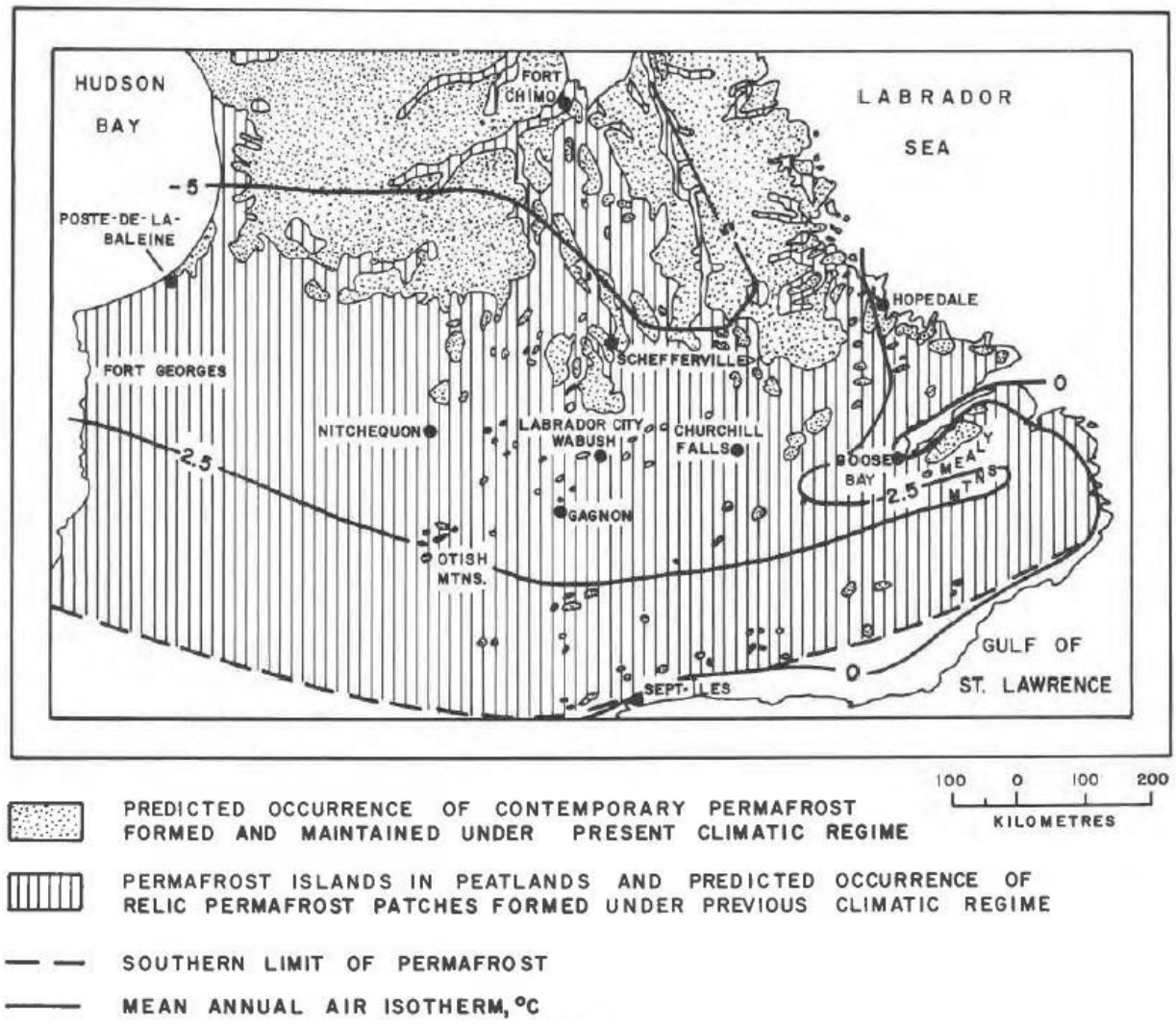


Figure 5-1 Permafrost Distribution in Northern Québec and Labrador (Source: Brown 1979)

Physiography and Surficial Geology

The Joyce Lake Property is located within a relatively rugged physiography with rolling hills and valleys reflecting the structure of the underlying bedrock. Elevation in the Project Area can vary from 472 m on the shores of Iron Arm up to 564 m at the high point about 350 m north of Joyce Lake.

The natural overburden material in the area is mapped as 'undifferentiated till' (Klassen *et al.* 1992), and glacial deposits are present throughout the area, except for ridgelines. Overburden in the mine area of the Project is typically thickest in depression zones. Most drill hole locations have less than 3 m overburden and the thickest overburden encountered with drilling to date is 13 m.

Bedrock and Structural Geology

The Project is located on the extreme western margin of the Labrador Trough adjacent to Archean basement gneisses, as shown in Figure 5-2. The Labrador Trough, otherwise known as the Labrador-Québec Fold Belt, extends for more than 1,000 km along the eastern margin of the Superior craton from the Ungava Bay to Lake Pletipi, Québec. The belt is about 100 km wide in its central part and narrows considerably to the north and south.

The Labrador Trough is a sequence of Proterozoic sedimentary rocks including iron formation, volcanic rocks and mafic intrusions forming the Kaniapiskau Supergroup. The Kaniapiskau Supergroup is comprised of the Knob Lake Group in the western part and the Doublet Group which is primarily volcanic in the eastern part. The Knob Lake Group rocks underlie the Project.

Regional geology and stratigraphy is described in a technical report by SRK Consulting (2011) and summarized here. The Project area is underlain by Proterozoic sedimentary rocks that are sub-divided into eight formal geological units included within the Knob Lake Group. The lowermost unit rests unconformably over Archean gneisses of the Ashuanipi Complex. From oldest to youngest, the rock units are the Seward, Lac Le Fer, Denault, Fleming, Dolly, Wishart, Sokoman and Menihek Formations.

To the west of Schefferville, rocks of the Knob Lake Group lie unconformably on Archean gneisses, and to the east they pass into the eugeosynclinal facies of the Labrador Trough. The Kaniapiskau Supergroup has been intruded by numerous diabase dikes known as the Montagnais Intrusive Suite. These dikes along with the Nimish volcanic rocks are the only rock types representing igneous activity in the western part of the central Labrador Trough.

The southern part of the Labrador Trough is truncated by the Grenville Front. Rocks of the Labrador Trough extend south of that line into the Grenville Province but are highly metamorphosed and complexly folded. Iron deposits in the Grenville part of the Labrador Trough include Lac Jeannine, Fire Lake, Mont-Wright, Mont-Reed and the Luce, Humphrey and Scully deposits in the Wabush area. The high-grade metamorphism of the Grenville Province is responsible for recrystalization of both iron oxides and silica in primary iron formation producing coarse-grained sugary quartz, magnetite, and specular hematite schists.

Metamorphic grade increases from sub-greenschists assemblages in the west to upper amphibolite to granulite assemblages in the eastern part of the Labrador Trough (Dimroth and Dressler 1978; Hoffman 1988). Thrusting and metamorphism occurred between 1,840 and 1,829 million years (Machado 1990).

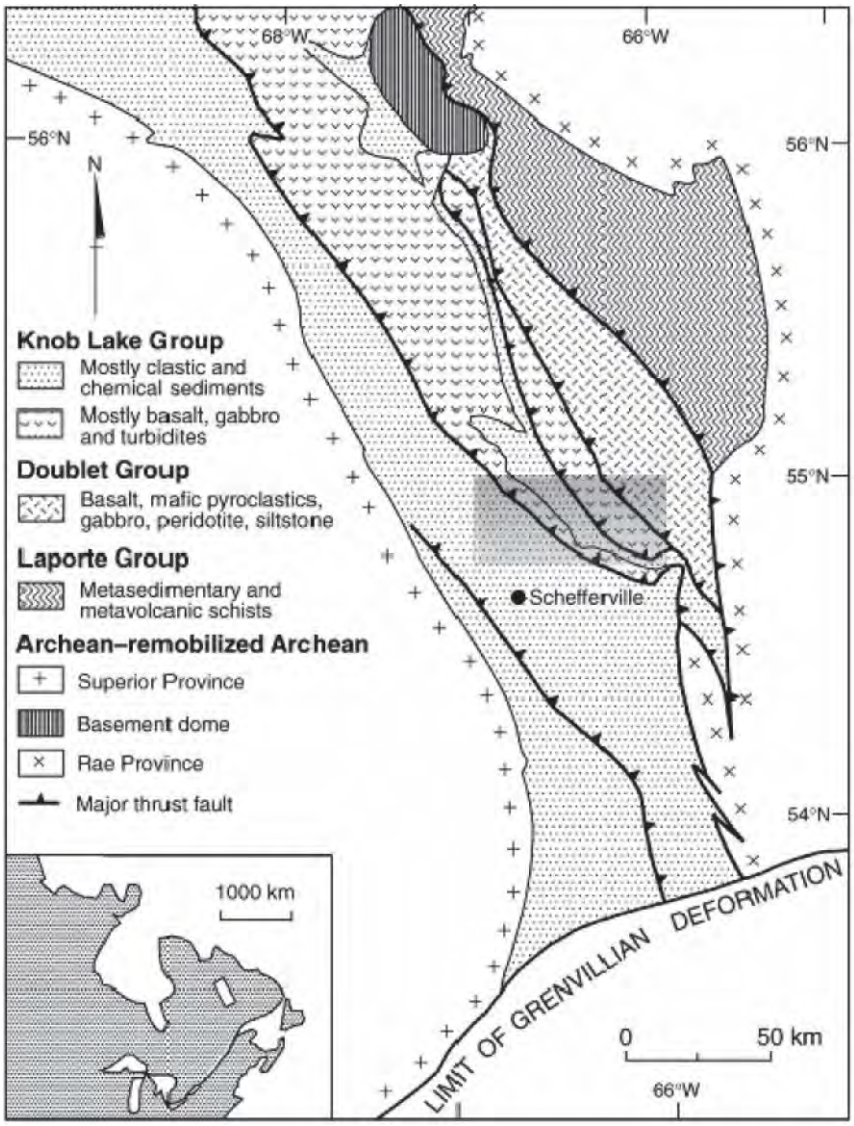


Figure 5-2 Lithotectonic Subdivisions of the Central Labrador Trough (from Williams *et al.* 2000, as cited in SRK 2011)

Seismicity

The Project is located within a relatively low seismic hazard area, referred to as the "stable central region", according to the available seismic hazard map information from the Geological Survey of Canada 2010 Seismic Hazard Maps (NRCAN 2012). This means that there has been no record of significant earthquakes, and there are relatively low predicted ground accelerations.

5.1.2 Atmospheric Environment

Regional Air Quality

There is no industry within 25 km of the Project area and background concentrations of air contaminants are expected to be minimal. Regionally, air quality is likely to approach that of a pristine environment.

The nearest recent study on ambient air quality to the Project was conducted at the Houston deposits by Labrador Iron Mines between August and October 2009 to monitor average daily concentrations of total suspended particulate (TSP) levels. Of the nine 24-hour TSP samples obtained over size days, all but one of the samples were well below (no more than 41% of) the provincial DOEC ambient air quality standard for TSP (120 µg/m^3). The remaining sample, from October 7th, 2009, was slightly above the TSP standard, at 139 µg/m^3. The LIM study indicates that there was no drilling on that day and testing can be considered to represent ambient conditions (LIM 2011).

A search of the National Air Pollution Surveillance (NAPS) Network data records was conducted, however it was determined that there were insufficient data available to determine background air quality for other air contaminants in the vicinity of the proposed operations. The nearest available sources of ambient air quality monitoring data are in Happy Valley-Goose Bay and Labrador City, both of which are more than 200 km from the site location.

An atmospheric environment study has been initiated in 2012 to collect the data required to assess potential environmental effects. Given the remote location of the site, it is expected that background air quality in the area would generally be within "Desirable" levels, based on National Ambient Air Quality Objectives.

Acoustic Environment

Exploration activity in the area requires the use of heavy equipment and helicopters. It is not expected that residential and commercial areas will be significantly affected based on the remote location of the Project area. However there are seasonal camps along Iron Arm that will need to be considered. A baseline acoustic environment assessment is underway in 2012 to determine the background noise in the Project Area. Noise modeling will be conducted to determine if there is the potential for a noise impact on sensitive receptors.

5.1.3 Terrestrial Environment

Terrestrial surveys were undertaken in 2012 in the Project area to describe the existing vegetation, wildlife, and bird communities and identify any species of conservation concern, in accordance with the federal *Species at Risk Act,* the federal *Migratory Birds Convention Act*, and the provincial *Endangered Species Act*. The outcome of these surveys will be described in the EIS, and an overview is provided in the sections below. Existing published literature for the general area was reviewed in advance of the field work.

Please note that although only one species of conservation concern was identified in the 2012 field surveys (Rusty Blackbird, see Section 5.1.3.3 below), further research is being done to determine the potential for other species of conservation concern in the Project area.

5.1.3.1 Vegetation

The Project lies in the Mid-subarctic Forest and the High Subarctic Tundra Ecoregions where the climate is harsh, the precipitation levels are low, and the growing season for plants is short. Characteristics of these two ecoregions are found in the vegetated Project area, with some species

assemblages more typically boreal and other assemblages principally associated with arctic environments.

Glacial moraine, drumlins, eskers, scattered rock debris and talus are features common to the region. Soils are characterized by a thin layer of glacial till overlying the bedrock. Soil types in the region are principally orthic humo-ferric podzols, orthic dystric brunisols and stony fibrisols with rocky outcrops (Protected Areas Association of Newfoundland and Labrador 2008).

The vegetation is mainly influenced by surface deposits, altitude, slope, and soil moisture regime. On summit and rocky outcrops, where the soil is thin, the vegetation is stunted and composed of white spruce (*Picea glauca*), bog blueberry (*Vaccinium uliginosum*), black crowberry (*Empetrum nigrum* subsp. *nigrum*), northern mountain cranberry (*Vaccinium vitis-idaea* subsp. *minus*), and various lichens. Alpine shrubs, such as mountain alder (*Alnus viridis* subsp. *crispa*) thickets, resin birch (*Betula glandulosa*) and Labrador tea (*Rhododendron groenlandicum*), are found on well drained slopes in the low alpine shrub zone. This zone is frequently punctuated by the presence of white spruce where it merges with denser stands of white spruce on well-drained areas, and with black spruce (*Picea mariana*) and larch (*Larix laricina*) on damper sites.

Large areas of glacial outwash are present in lowlands and consist of large boulders with no soil supporting very little vegetation except lichens. These zones are interspersed with forested areas of spruce with lichens on drier sites and black spruce and tamarack on more moist locations. On river floodplains, there are shrub fens where willows (*Salix* spp.) and mountain alder are the main species. Stands with large white spruce and/or larch can be found on floodplains and at the border of lakes and fast flowing streams. Large areas are affected by frequent forest fires. Thus, regenerating stands can be abundant in the region. Wetlands can be found throughout the region, particularly in areas of low local relief and on the border of lakes and streams. String bogs and ribbed fens bordered by black spruce-sphagnum forest stands occur over large areas. Soil nutrient regimes in these peatlands is driving the species composition. Rare and uncommon species assemblages are usually associated with mineral sites or rarely occurring landforms.

Vegetation surveys were undertaken in 2012 in the Project area to describe the existing vegetation communities and identify any plant species of conservation concern. The outcome of these surveys will be described in the EIS.

5.1.3.2 Wildlife

Wildlife species likely to be observed in the study area or nearby are typical of the northern portion of the boreal forest, and are the same species that were listed for the Elross Lake Iron Ore Mine project (NML 2009), as follows:

- migratory caribou (*Rangifer tarandus caribou*);
- moose (*Alces alces*);
- black bear (*Ursus americanus*);
- grey wolf (*Canis lupus*);

- beaver (*Castor Canadensis*);
- river otter (*Mustela americana*);
- American mink (*Mustela vison*);
- ermine (*Mustela ermina*);
- red fox (*Vulpes vulpes*);
- red squirrel (*Tamiasciurus hudsonicus*);
- muskrat (*Ondatra zibethicus*);
- snowshoe hare (*Lepus americanus*);
- American marten (*Martes americana*);
- porcupine (*Erethizon dorsatum*);
- northern flying squirrel (*Glaucomys sabrinus*);
- woodchuck (*Marmota monax*); and
- Canada lynx (*Lynx canadensis*).

In addition to these mammal species, the Elross Lake Iron Ore Mine project also listed two bat and five amphibian species as possible to occur in the area (NML 2009), and this would also apply for the Joyce Lake Project area. During the 2012 field studies for the Project, four mammal species were noted based on sight or sign: caribou, moose, beaver and wolf. In addition, the wood frog was observed.

5.1.3.3 Birds

Surveys conducted in spring and summer 2012 identified 63 bird species in the Project area (Table 5-4). The following groups were observed:

- 4 raptor species;
- 12 waterfowl species;
- 7 shorebird species;
- 3 other aquatic bird species; and
- 37 terrestrial bird species.

Table 5-4 Bird species observed in the Project area (2012 field surveys)

Group	Common Name	Migratory Bird[1]
Waterfowl	Canada Goose	x
	American Black Duck	x
	Mallard	x
	Ring-necked Duck	x
	Lesser Scaup	x
	Surf Scoter	x
	White-winged Scoter	x
	Bufflehead	x
	Common Goldeneye	x
	Hooded Merganser	x
	Common Merganser	x
	Red-breasted Merganser	x
Diurnal Raptors	Osprey	
	Bald Eagle	
	Red-tailed Hawk	
Shorebirds	Spotted Sandpiper	x
	Solitary Sandpiper	x
	Greater Yellowlegs	x
	Least Sandpiper	x
	Short-billed Dowitcher	x
	Wilson's Snipe	x
	Red-necked Phalarope	x
Other Aquatic Birds	Common Loon	x
	Herring Gull	x
	Tern sp.[2]	x
Nocturnal Raptors	Great Horned Owl	
Terrestrial Birds	American Three-toed Woodpecker	x
	Spruce Grouse	
	Northern Flicker	x
	Yellow-bellied Flycatcher	x
	Alder Flycatcher	x
	Northern Shrike	x
	Red-eyed Vireo	x
	Gray Jay	
	Common Raven	
	Tree Swallow	x
	Boreal Chickadee	x
	Red-breasted Nuthatch	x
	Ruby-crowned Kinglet	x
	Gray-cheeked Thrush	x
	Swainson's Thrush	x
	Hermit Thrush	x
	American Robin	x
	Cedar Waxwing	x
	Snow Bunting	x
	Northern Waterthrush	x
	Tennessee Warbler	x
	Orange-crowned Warbler	x

Table 5-4 Bird species observed in the Project area (2012 field surveys)

Group	Common Name	Migratory Bird[1]
	Yellow Warbler	x
	Blackpoll Warbler	x
	Yellow-rumped Warbler	x
	Wilson's Warbler	x
	Savannah Sparrow	x
	Fox Sparrow	x
	Lincoln's Sparrow	x
	Swamp Sparrow	x
	White-throated Sparrow	x
	White-crowned Sparrow	x
	Dark-eyed Junco	x
	Rusty Blackbird	x
	Pine Grosbeak	x
	White-winged Crossbill	x
	Pine Siskin	x

Notes:
[1] Migratory bird under the *Migratory Birds Convention Act.*
[2] Arctic or Common Tern.

By comparison, 43 bird species were identified during surveys for the Elross Lake Iron Ore Mine project (NML 2009). The Rusty Blackbird (*Euphagus carolinus*) is the only listed species at risk noted during the 2012 surveys for the Joyce Lake Project. An active bald eagle nest was found near Hollinger Lake and Iron Arm during the 2012 raptor and waterfowl survey for the Project.

5.1.4 Aquatic Environment

The lakes, ponds, and streams in this part of western Labrador form part of the Churchill River watershed. The Attikamagen Lake drains south to Petitsikapau Lake via Iron Arm, then into Dyke Lake, Ashuanipi River, and finally into the Smallwood Reservoir. The Smallwood Reservoir is the main source of water to the Churchill River. In the southern part of the aquatic environment study area, streams drain into Astray Lake which then drains to Dyke Lake.

Aquatic baseline surveys were undertaken in 2012 in the Project area to describe the fish communities and identify any species of conservation concern, in accordance with the federal *Species at Risk Act* and the provincial *Endangered Species Act*. The field work was conducted under a Scientific Licence in accordance with the federal *Fisheries Act*. The outcome of these surveys will be described in detail the EIS. Existing published literature for the general area was reviewed in advance of the field work.

Based on a fish sampling campaign carried out within the Project area in 2012, and also based on similar work conducted for the Elross Lake Area Iron Ore Mine Project (NML 2009), there are at least 14 fish species that are confirmed or likely to be present in the Project area, including:

- brook trout (*Salvelinus fontinalis*);
- lake trout (*Salvelinus namaycush*);
- burbot (*Lota lota*);

- lake chub (*Couesius plumbeus*);
- lake whitefish (*Coregonus clupeaformis*);
- rounded whitefish (*Prosopium cylindraceum*);
- longnose sucker (*Catostomus catostomus*);
- white sucker (*Catostomus commersoni*);
- northern pike (*Esox lucius*);
- pearl dace (*Margariscus margarita*);
- slimy sculpin (*Cottus cognatus*);
- mottled sculpin (*Cottus bairdii*);
- threespine stickelback (*Gasterosteus aculeata*); and
- ouananiche (Landlocked Atlantic salmon; *Salmo salar*).

None of these species are listed under *SARA* or the NL *ESA*.

Figure 5-3 illustrates waterbodies likely to be affected by the project and fish species found during the 2012 field campaign. Table 5-5 provides an overview of watercourse crossings that were included in the 2012 field campaign. These crossings were identified based on locations where Project infrastructure was likely going to cross the watercourses. Appendix D provides a photo series showing the waterbodies that were studied.

Table 5-5 Watercourse Crossings in the Project area (July 2012 field surveys)

Watercourse Crossing #	Project Crossing Infrastructure	Average Depth (m)	Approximate Average Width (m)	Fish Species
CR01	Road	0.4	0.9	No fishing effort.
CR02	Road	0.3	0.5	No fishing effort.
CR03	Road	0.4	20.0	No capture; small northern pike observed.
CR04	Road	1.0	3.5	No fishing effort.
CR05	Road	0.6	1.5	No fishing effort.
CR06	Road	Intermittent; dry during field survey.		No fishing effort.
CR07	Road	1.0	3.0	No fishing effort.
CR08	Road	0.3	30.0	No fishing effort.
CR09	Road	Intermittent; dry during field survey.		No fishing effort.
CR10	Road	>1.5	6.0	No fishing effort.
CR10A	Road	0.8	50.0	No fishing effort.
CR10B	Road	0.7	10.0	No fishing effort; small northern pike observed.
CR11	Road	0.5	1.5	No capture.
CR12	Road	0.4	3.0	No capture.

Table 5-5 Watercourse Crossings in the Project area (July 2012 field surveys)

Watercourse Crossing #	Project Crossing Infrastructure	Average Depth (m)	Approximate Average Width (m)	Fish Species
CR13	Road	0.3	3.5	No fishing effort; brook trout observed.
CR14	Road	0.7	1.5	Brook trout.
CR15	Road	0.4	2.5	Lake chub, longnose sucker, brook trout.
CR16	Road	0.5	0.8	No fishing effort.
CR17	Road	0.5	15.0	No fishing effort.
CR18	Railway	0.4	2.5	Lake chub, longnose sucker, brook trout, mottled sculpin, burbot.
CR19	Road	Intermittent; a few water pockets.		No fishing effort.
CR20	Road	0.2	10.0	No capture; small northern pike observed.
CR21	Road	Intermittent; dry during field survey.		No fishing effort.
CR22	Road	0.4	2.8	No fishing effort.
CR23	Road	0.5	2.0	No fishing effort; un-identified young of year observed.

5.1.5 Environmentally Sensitive Areas

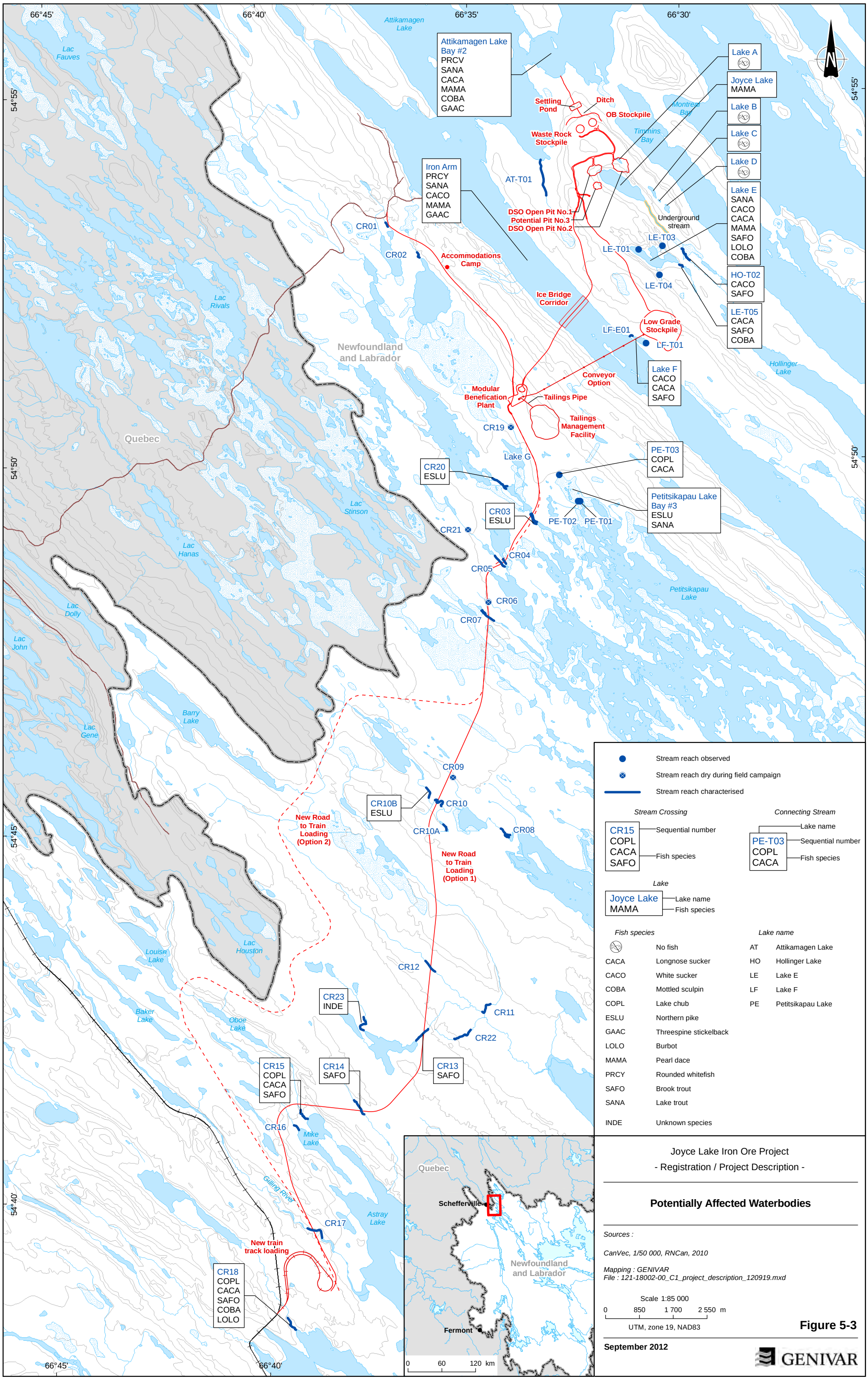
There are no designated sensitive areas or special areas in the Project Area, including designated wildlife areas, stewardship zones, parks and natural areas. Sensitive areas can include those areas that are important to species of conservation concern, and these can include wetlands. There are a number of wetland areas in the Project area, and these and other potentially sensitive areas will be documented and evaluated in the EIS.

5.1.6 Water Resources

Hydrology and hydrogeology studies are underway in 2012 to describe the existing environment for water resources as well as to contribute to engineering requirements for the Project planning and feasibility studies.

5.2 SOCIO-ECONOMIC ENVIRONMENT

The Project is expected to contribute to sustainable economic and social benefits in western Labrador. The areas most likely to interact with the Project include primary places of residence of the Project labour force: western Labrador (*i.e.*, Economic Zone 2, which includes Labrador City, Wabush and Churchill Falls), as well as Schefferville, Matimekush-Lac John, and Kawawachikamach in Québec. While construction and operation activities for the Project will occur entirely in Labrador, baseline socio-economic conditions are included for adjacent communities in Québec because it is anticipated that some Project labour, goods and services may also be sourced from these areas.


66°45'
66°40'
66°35'
66°30'
54°55'
54°50'
54°45'
54°40'
Attikamagen Lake
Lac Fauves
Lac Rivals
Lac Stinson
Lac Hanas
Lac Dolly
Lac John
Barry Lake
Lac Gene
Louise Lake
Lac Houston
Baker Lake
Oboe Lake
Mike Lake
Gilling River
Astray Lake
Hollinger Lake
Petitsikapau Lake
Montreal Bay
Timmins Bay
Underground stream
Lake G
Newfoundland and Labrador
Quebec
Attikamagen Lake Bay #2
PRCV
SANA
CACA
MAMA
COBA
GAAC
Iron Arm
PRCY
SANA
CACO
MAMA
GAAC
Lake A
Joyce Lake
MAMA
Lake B
Lake C
Lake D
Lake E
SANA
CACO
CACA
MAMA
SAFO
LOLO
COBA
HO-T02
CACO
SAFO
LE-T05
CACA
SAFO
COBA
Lake F
CACO
CACA
SAFO
PE-T03
COPL
CACA
Petitsikapau Lake Bay #3
ESLU
SANA
PE-T02
PE-T01
CR01
CR02
CR03
ESLU
CR04
CR05
CR06
CR07
CR08
CR09
CR10
CR10A
CR10B
ESLU
CR11
CR12
CR13
SAFO
CR14
SAFO
CR15
COPL
CACA
SAFO
CR16
CR17
CR18
COPL
CACA
SAFO
COBA
LOLO
CR19
CR20
ESLU
CR21
CR22
CR23
INDE
AT-T01
LE-T01
LE-T03
LE-T04
LF-E01
LF-T01
Settling Pond
Ditch
OB Stockpile
Waste Rock Stockpile
DSO Open Pit No.1
Potential Pit No.3
DSO Open Pit No.2
Accommodations Camp
Ice Bridge Corridor
Low Grade Stockpile
Conveyor Option
Modular Benefication Plant
Tailings Pipe
Tailings Management Facility
New Road to Train Loading (Option 2)
New Road to Train Loading (Option 1)
New train track loading
Scheffervillle
Fermont
0 60 120 km
Stream reach observed
Stream reach dry during field campaign
Stream reach characterised
Stream Crossing
CR15 COPL CACA SAFO
Sequential number
Fish species
Connecting Stream
PE-T03 COPL CACA
Lake name
Sequential number
Fish species
Lake
Joyce Lake MAMA
Lake name
Fish species
Fish species
No fish
CACA Longnose sucker
CACO White sucker
COBA Mottled sculpin
COPL Lake chub
ESLU Northern pike
GAAC Threespine stickelback
LOLO Burbot
MAMA Pearl dace
PRCY Rounded whitefish
SAFO Brook trout
SANA Lake trout
INDE Unknown species
Lake name
AT Attikamagen Lake
HO Hollinger Lake
LE Lake E
LF Lake F
PE Petitsikapau Lake
N
Joyce Lake Iron Ore Project
- Registration / Project Description -
Potentially Affected Waterbodies
Sources :
CanVec, 1/50 000, RNCan, 2010
Mapping : GENIVAR
File : 121-18002-00_C1_project_description_120919.mxd
Scale 1:85 000
0 850 1 700 2 550 m
UTM, zone 19, NAD83
Figure 5-3
September 2012
GENIVAR

5.2.1 Labrador

In 2011, there were 26,728 people residing in Labrador, which represented 5.2% of the provincial total (Statistics Canada 2012). This marked a slight increase (1.4%) from 2006, when the population of Labrador stood at 26,364. Similar to the provincial population, the population of Labrador declined steadily from the 1990s until recently, falling by 13.2% between 1991 and 2006.

The population of western Labrador (9,862) represented 36.8% of Labrador's population in 2011, with the majority living in Labrador City (Statistics Canada 2012). Production mining is the main activity in western Labrador and in 2006 the labour force consisted of 5,745 individuals (Community Accounts, no date). Employment conditions in western Labrador are generally favourable; in 2006 the unemployment rate stood at 8.6%. The participation rate was higher in western Labrador (72.5%) than for Labrador (68.8%) or the province as a whole (58.9%) (Community Accounts, no date).

In Labrador City, the number of occupied dwellings increased by 3.2% between 1991 and 2006, from 2,695 to 2,780. In 2006, 78.8% of these were owned and 21.4% were rented. By 2011, the number of occupied private dwellings increased 2.8% to 2,859. The average value of a home in Labrador City in 2006 was $107,604 and the average monthly rent was $521 (Statistics Canada 2007; 2012).

Between 1991 and 2006, the number of occupied private dwellings in Wabush increased from 680 to 690 (1.5%). The majority (84.1%) was owned and 15.2% was rented in 2006. By 2011, the number of occupied private dwellings increased 6.2% to 733. The average value of a home in Wabush was $86,216 in 2006 and average monthly rent was $401 (Statistics Canada 2007; 2012). Rental properties have increased their rates, as well. In 2010, renters were paying between $900 and $1,200 each month (Labrador West Chamber of Commerce 2010).

In recent years, many new people have been drawn to western Labrador due to increased mining activity in the area. This has led to a shortage of housing and a major increase in housing prices. In 2011, the average sale price of all housing types in Labrador City and Wabush was approximately $250,000 (Labrador West Housing and Homelessness Coalition 2011). Rental properties have increased their rates, as well. In 2010, renters were paying between $900 and $1,200 each month (Labrador West Chamber of Commerce 2010). There are reports that, in the spring of 2011, a bungalow was renting for $4,500 per month and homes that sold for $150,000 a few years before were selling for over $300,000 (Cleary 2010). In response to the rising cost of housing in Labrador City and Wabush, the Newfoundland and Labrador Housing Corporation raised the income threshold to qualify for social housing in those communities; the maximum allowable income to qualify is now $65,000, which is twice the limit for the rest of the province (CBC News 2012).

5.2.2 Québec

In 2011, there were 1,360 people residing in the four communities near the Project that are located in eastern Québec (Statistics Canada 2011). This represents an increase of 9.7% since 2006, when the combined population of these four communities was 1,315 (Statistics Canada 2012).

The Naskapi Nation of Kawawachikamach (NNK) comprises the Kawawachikamach reserve, approximately 16 km northeast of Schefferville, and a larger uninhabited territory to the northeast of the reserve. Kawawachikamach is the largest community in the area, with a total population of 586 people in 2011 (Statistics Canada 2012). The population of Kawawachikamach increased by 3.0% between 2006 and 2011. In 2011, there were slightly less women (48.7%) than men (51.3%) living in Kawawachikamach (Statistics Canada 2012).

The NNK labour force was 170 people in 2006 (Statistics Canada 2007). The participation rate for the NNK stood at 46.6%, with an unemployment rate of 20.6%. Unemployment was greater for men (33.3%) than for women (11.8%). Trades, sales and services were the most common occupations for Kawawachikamach in 2006. Men were much more involved in trades, while the most common occupation for women was in sales and services (Statistics Canada 2007).

The Innu First Nation of Matimekush-Lac John comprises two communities: the Matimekosh reserve (540 people) on the edge of Pearce Lake adjacent to Schefferville, and the Lac John reserve, located 3.5 km from Matimekosh and Schefferville. In 2006, there were more women in (52.8%) than men (47.2%) living in Matimekosh. Between 2006 and 2011, the population of Matimekush grew by approximately 2.3%.

The Matimekush and Lac John reserves are jointly administered by Conseil de la Première Nation des Innus de Matimekosh-Lac John, which oversees health and social services, education, employment services and other projects for both communities. In 2011, the population of Lac John was 21, representing an increase over 30% since 2006, when the population was 16 (Statistics Canada 2012).

Combined labour force statistics for the Innu Nation of Matimekush-Lac John indicated a population of 375 people aged 15 years and over (*i.e.*, working-age) in 2006. The participation rate stood at 61.8%, while unemployment was high with an unemployment rate of 31.9%. There was a notable difference in the unemployment rate for women (36.0%) and men (28.6%) (AANDC 2011). In 2006, the most common occupations for women were related to sale and services, followed by government and management (AANDC 2011). The most common occupations for men in 2006 were in trades, followed by sales and services and government (AANDC 2011).

Schefferville is located approximately 2 km from the Labrador-Québec border, on the north shore of Knob Lake. It was established by IOC in 1954 to support mining operations in the area. The municipality is adjacent to the Matimekosh reserve, and the two communities are closely linked. Between 2006 and 2011, the Schefferville population increased by approximately 5.4% from 202 people in 2006 to 213 people in 2011 (Statistics Canada 2012).

In 2006, the Schefferville labour force was composed of 120 people. The community had a relatively low unemployment rate (12.5%) compared to the First Nations communities discussed above. The majority of employment in the community was provided through the sales, services, education and health care industries (Statistics Canada 2007).

5.2.3 Land and Resource Use

Land and resource use in the Project area is being documented in consultation with local residents and Aboriginal groups, and will be described in the EIS. It is known that residents of western Labrador pursue angling in the summer and ice fishing in the winter. Brook trout is widely distributed in streams while lake trout is commonly found in regional lakes. According to NML (2009), ouaniche migrate every year up Howell River to spawn; Howell River discharges into Astray Lake in the southern part of the Project area.

During IOC operation in the area in the 1950s to early 1980s, a number of cabins were constructed on the northwest bank of Iron Arm (Figure 1-1). Cabins are also found along Astray Lake (Figures 1-1 and 2-4). Ownership of these dwellings has not been established at this time, but they are known to be occupied by members of Aboriginal groups in the area. The effects of the Project on the use of these cabins will be documented in the EIS.

5.2.4 Archaeology and Heritage Resources

The Project may interact with archaeological or heritage resources, based on the presence of a well-developed hydrology network in the Project area, as well as past and current human occupation in the region. A study of archaeological and heritage potential, including a field survey, has been undertaken to define the potential for these resources, and the results will be assessed in the EIS.

5.3 ENVIRONMENTAL EFFECTS

Valued Environmental Components (VECs) have been identified and defined based on the understanding of the Project Area and potential environmental interactions. The definition, basis for selection, assessment boundaries (including proposed data sources and limitations), and potential interactions with Project components are presented in Table 5-6. The VECs will be further refined during the course of the environmental assessment based on results of additional data gathering, analysis and consultation.

VECs being considered are:

- Atmospheric Environment;
- Water Resources;
- Wetlands;
- Rare Plants;
- Freshwater Fish and Fish Habitat;
- Birds and Wildlife;
- Species at Risk;
- Historic and Heritage Resources;

- Land and Resource Use by Aboriginal Persons for Traditional Purposes;
- Current Land and Resource use by Other Users;
- Communities; and
- Economy, Employment and Business.

5.3.1 Aboriginal Peoples

As shown in Table 5-6 below, the environmental assessment will specifically consider the potential effects to Aboriginal Peoples in terms of historic resources, land and resource use, physical and social effects (including health) on their communities, and economy, employment, and business. As indicated in Section 4, Century will continue to meet with Aboriginal groups to provide information on the planned Project, to gather information on the biophysical and social environment, to obtain feedback, and to document their interests and concerns. As indicated in Section 5.2, baseline studies will be undertaken to collect information regarding Aboriginal Peoples in terms of socio-economic conditions, land use, and heritage and historic resources. Baseline information will be collected through meetings with Aboriginal groups and governments (Section 4), information available from published sources (*e.g.,* StatsCanada, Provincial Archaeology Office), and field studies.

5.3.2 Potential for Changes to the Environment on Federal Lands, Other Provinces, and Outside of Canada

Given that the Project lies more than 10 km away from the nearest federal lands (see Table 2-4), it is considered unlikely that changes to the environment will occur on federal lands as a result of carrying out the Project; the potential for such changes will be assessed in the EIS. Given the close proximity (within 1 km) of some of the Project infrastructure to the provincial border with Québec, such as the haulage road option, it is considered possible that changes to the environment (*e,g,*, effects to air quality, acoustic environment, wildlife) could occur in Québec as a result of carrying out the Project. The potential for such changes to occur in Québec will be assessed in the EIS. It is not anticipated that changes to the environment could occur in provinces other than Québec or in other countries as a result of carrying out the Project.

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Table 5-6 Potential Valued Environmental Components to be Assessed in the Joyce Lake Iron Ore Project Environmental Assessment

VEC	Definition	Basis for Selection	Information Source(s) Boundaries	Potential Interactions (Before Mitigation)			
				Construction	Operation and Maintenance	Decommissioning	Malfunctions and Accidental Events
Atmospheric Environment	• Ambient air quality. • Acoustic environment (noise).	• Protection of human health and safety, as well as ecological health and aesthetics. • Potentially sensitive human and wildlife receptors. • Provisions of federal *Canadian Environmental Protection Act* and *Air Quality Regulations* under the NL *EPA.* • Concerns with greenhouse gas emissions.	• Ambient noise monitoring to assess baseline conditions. • Air pollutant and noise dispersion modeling to determine zone of influence for operating emissions. • Spatial boundaries limited to within areas that can reasonably be affected by the Project (*i.e.*, sensitive receptors). • Scope of assessment limited to air and noise emissions from Project activities at the mine site, including access roads and all related infrastructure (*i.e.* beneficiation, ice bridge, rail spur, and conveyor option). • Project scope does not include any potential emissions that may be associated with end-use of products from the Project.	• Effects on ambient air quality from dust and construction vehicle emissions. • Effects of noise from Construction.	• Effects on ambient air quality (including air pollutants and greenhouse gases) due to mining operations and transportation of concentrate from the site. • Effect on ambient sound levels due to mining and concentrating operations and transportation of concentrate from the site. • Air / noise emissions associated with rail transportation.	• Effects on ambient air quality from dust and vehicle emissions. • Effects of noise from decommissioning activities.	• Effects on ambient air quality (including air pollutants and greenhouse gases). • Fugitive emissions (*i.e.*, dust, smoke).
Water Resources	• Quality and quantity of groundwater and surface water resources in the vicinity of the Project.	• Concerns regarding potential for release of hazardous materials on-site and potential contamination associated with mine and process water management. • Possible lowering of water table and effects on surface water / groundwater interactions (*e.g.*, wetlands). • Possible de-watering of Joyce Lake.	• Assessment based on site-specific information. • Spatial boundaries include the Project property boundary and relevant watersheds.	• Potential effects related to erosion and sedimentation associated with on-site construction and modification of the hydrologic regime.	• Potential effects related to mine water management as well as effects on water quality from discharges. • Potential effects related to water use (demand).	• Potential effects related to erosion and sedimentation associated with on- site decommissioning activities.	• Potential for accidental releases of hazardous materials related to construction or operation (petroleum, oils, lubricants). • Malfunction of water treatment and erosion and sediment controls.
Wetlands	• Wetlands are commonly referred to as marshes, swamps, fens, bogs, and shallow water areas that are saturated with water long enough to promote wetland or aquatic processes.	• Wetlands represent a sensitive habitat type that often supports a diversity of species.	• Assessment based on existing information and field survey. • Spatial boundaries include footprint of the Labrador project components and areas that could reasonably be affected by the Project. • Efforts will be made to avoid effects on wetlands during detailed design phase of the Project.	• Site grading and filling and/or alteration of hydrology can affect wetland habitat directly or indirectly.	• Indirect habitat degradation or alteration with alteration of local hydrology.	• N/A	• Habitat degradation or alteration from hazardous materials releases and uncontrolled surface runoff.
Rare Plants	• Rare vascular plants and uncommon species assemblages	• Protection of species biodiversity and critical habitat. • *SARA.* • NL *ESA.*	• Assessment based on existing information and field survey Spatial boundaries include footprint of the Labrador Project components and areas that could reasonably be affected by the Project.	• Site grading and filling and/or alteration of hydrology can cause the loss of rare plants and/or uncommon species assemblages	• N/A	• N/A	• Habitat degradation or alteration and direct mortality of plants from hazardous materials releases and uncontrolled surface runoff.
Freshwater Fish and Fish Habitat	• Effects on habitat quality and species in freshwater bodies.	• Protection of aquatic species diversity. • *Fisheries Act*. • *SARA.* • NL *ESA.*	• Assessment based on existing information and field survey. • Spatial boundaries limited to areas that could reasonably be affected (*i.e.*, hydrological impacts) by the Project. • Efforts will be made to avoid effects on freshwater bodies and watercourses and habitats.	• Habitat degradation or alteration and direct mortality associated with construction (*e.g.*, siltation of watercourses). • Indirect habitat degradation or alteration of local hydrology.	• Potential for turbidity, siltation and contamination from surface runoff. • Indirect habitat degradation or alteration of local hydrology.	• Habitat degradation or alteration and direct mortality associated with decommissioning (*e.g.*, siltation of watercourses).	• Habitat degradation or alteration and direct mortality of freshwater aquatic species from uncontrolled site runoff or hazardous materials spills.
Birds and Wildlife	• Migratory and non- migratory birds with a focus on species with special status (see below) potentially feeding, breeding, moving and/or migrating through the Project Area, and their habitat. • Includes critical habitats such as waterfowl gathering areas.	• Concern with protection of species biodiversity and critical habitat. • *Migratory Birds Convention Act.* • *SARA.* • NL ESA.	• Assessment based on existing information and field surveys. • Spatial boundaries limited to footprint of the facility (*i.e.*, cleared areas) and areas that could reasonably be affected by the mine (*e.g.*, through noise and visual stimulus or hazardous materials spills).	• Habitat loss, degradation or alteration and direct mortality associated with facility construction (*e.g.*, clearing construction). • Disruption of feeding, breeding, movement and/or migratory patterns due to noise and presence of construction activity and fencing.	• Loss of habitat • Disruption of feeding, breeding, movement and/or migratory patterns due to presence of facility (*e.g.,* lights, noise).	• Potential hazardous materials spills (*e.g.,* fuel) or non- authorized ship discharges. • Habitat degradation or alteration and direct mortality from hazardous materials releases and uncontrolled surface runoff.	• Potential hazardous materials spills (*e.g.,* fuel) or non- authorized ship discharges. • Habitat degradation or alteration and direct mortality from hazardous materials releases and uncontrolled surface runoff.

Table 5-6 Potential Valued Environmental Components to be Assessed in the Joyce Lake Iron Ore Project Environmental Assessment

VEC	Definition	Basis for Selection	Information Source(s) Boundaries	Potential Interactions (Before Mitigation)			
				Construction	Operation and Maintenance	Decommissioning	Malfunctions and Accidental Events
Species at Risk	• includes species and their critical habitats (where defined) listed as extirpated, endangered, threatened or special concern under the Federal *Species At Risk Act*, or listed as endangered, threatened or vulnerable in the Newfoundland and Labrador *Endangered Species Act*.	• Concern with protection of species biodiversity and critical habitat. • *SARA.* • NL ESA	• Assessment based on existing information and field surveys. • Spatial boundaries limited to footprint of the facility (*i.e.*, cleared areas) and areas that could reasonably be affected by the mine (*e.g.*, through noise and visual stimulus or hazardous materials spills).	• Habitat loss, degradation or alteration and direct mortality associated with facility construction (*e.g.*, clearing construction). • Disruption of feeding, breeding, movement and/or migratory patterns due to noise and presence of construction activity and fencing.	• Loss of habitat • Disruption of feeding, breeding, movement and/or migratory patterns due to presence of facility (*e.g.,* lights, noise).	• Potential hazardous materials spills (*e.g.* fuel) or non- authorized ship discharges. • Habitat degradation or alteration and direct mortality from hazardous materials releases and uncontrolled surface runoff.	• Potential hazardous materials spills (*e.g.* fuel) or non- authorized ship discharges. • Habitat degradation or alteration and direct mortality from hazardous materials releases and uncontrolled surface runoff.
Historic and Heritage sources	• Per the NL *Historic Resources Act*, a historic resource refers to a work of nature or of humans that is primarily of value for its archaeological, prehistoric, historic, cultural, natural, scientific or aesthetic interest, including an archaeological, prehistoric, historic or natural site, structure or object.	• Concern with effective management and preservation of archaeological and heritage resources. • NL *Historic Resources Act.*	• Based on existing information (*e.g.*, previous assessment and site records) and field survey. • Spatial boundaries limited to footprint of area to be disturbed by Labrador Project activities.	• Disturbance to and loss of archaeological and heritage sites from site clearing, grubbing and grading.	• Not applicable.	• Not applicable.	• N/A
Land and Resource Use by Aboriginal Persons for Traditional Purposes	• Lands and resources of specific social, cultural or spiritual value to Aboriginal communities of Labrador and Québec with documented use of Project area.	• Concerns for Aboriginal interests (*i.e.*, current use of lands for traditional purposes). • *Canadian Environmental Assessment Act.*	• Based on existing information and information that Aboriginal groups may provide, the spatial boundary is the Property within Labrador.	• Effects on land and resource use from construction activities.	• Effects on land and resource use from presence of facility.	• Not applicable.	• Effects on land and resource use from accidental releases of hazardous materials.
Current Land and Resource Use by Other Users	• Existing land development (industrial, commercial, residential), recreation, and areas of special community or social value. Includes discussion of land ownership.	• Important socio- economic component. • Municipal land use plans. • Concerns of local cabin owners. • *Navigable Waters Protection Act.*	• Based on existing information and on-going consultation with land and resource users, including cabin owners.	• Exclusion / promotion of development (industrial, commercial, residential). • Exclusion of recreation sites (*e.g.*, recreational fishing areas) or elimination of areas of special community or social value.	• On site waste disposal (*e.g.*, waste piles and water treatment systems) could affect future development of site after decommissioning.	• N/A	• Spills or accidents could affect land use or recreation.
Communities	• Physical and social infrastructure of communities in close proximity to the Project.	• Important socio- economic component for Aboriginal Peoples and others.	• Assessment based on existing information supplemented by interviews with physical and social service providers (*e.g.*, healthcare professionals, educational institutions). • Spatial boundaries limited to the communities in western Labrador and in the Schefferville area of Québec due to proximity to the Project.	• Work force in-migration could result in increased pressure on physical and social infrastructure.	• Work force in-migration could result in increased pressure on physical and social infrastructure. • Potential changes to community health, including Aboriginal peoples.	• Pressure on physical and social infrastructure will be reduced with the reduction of the work force. • Potential changes to community health, including Aboriginal peoples.	• Spills or accidents could affect physical and/or social infrastructure.
Economy, Employment and Business	• Employment levels and the supply and service business community of western and central Labrador including analysis of local (Newfoundland and Labrador) financial benefits from the Project.	• Important socio- economic component for Aboriginal Peoples and others.	• Assessment based on existing information (*e.g.*, census data), interviews with employment and economic development professionals, and Project requirements. • Spatial boundaries limited to the Western and Central Labrador Regional Development Zones as the Project has the potential to affect the business community and employment in western and central Labrador.	• Exclusion / promotion of development (industrial, commercial, residential). • Increased opportunities for employment and contracting.	• Exclusion / promotion of development (industrial, commercial, residential). • Increased opportunities for employment and contracting.	• Opportunities for employment and contracting will return to baseline levels.	• N/A

6.0 DATE AND CEO SIGNATURE

November 5, 2012

Date

Sandy Chim, C.A.
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Toronto, ON M5H 3B3
Tel: (416) 977-3188

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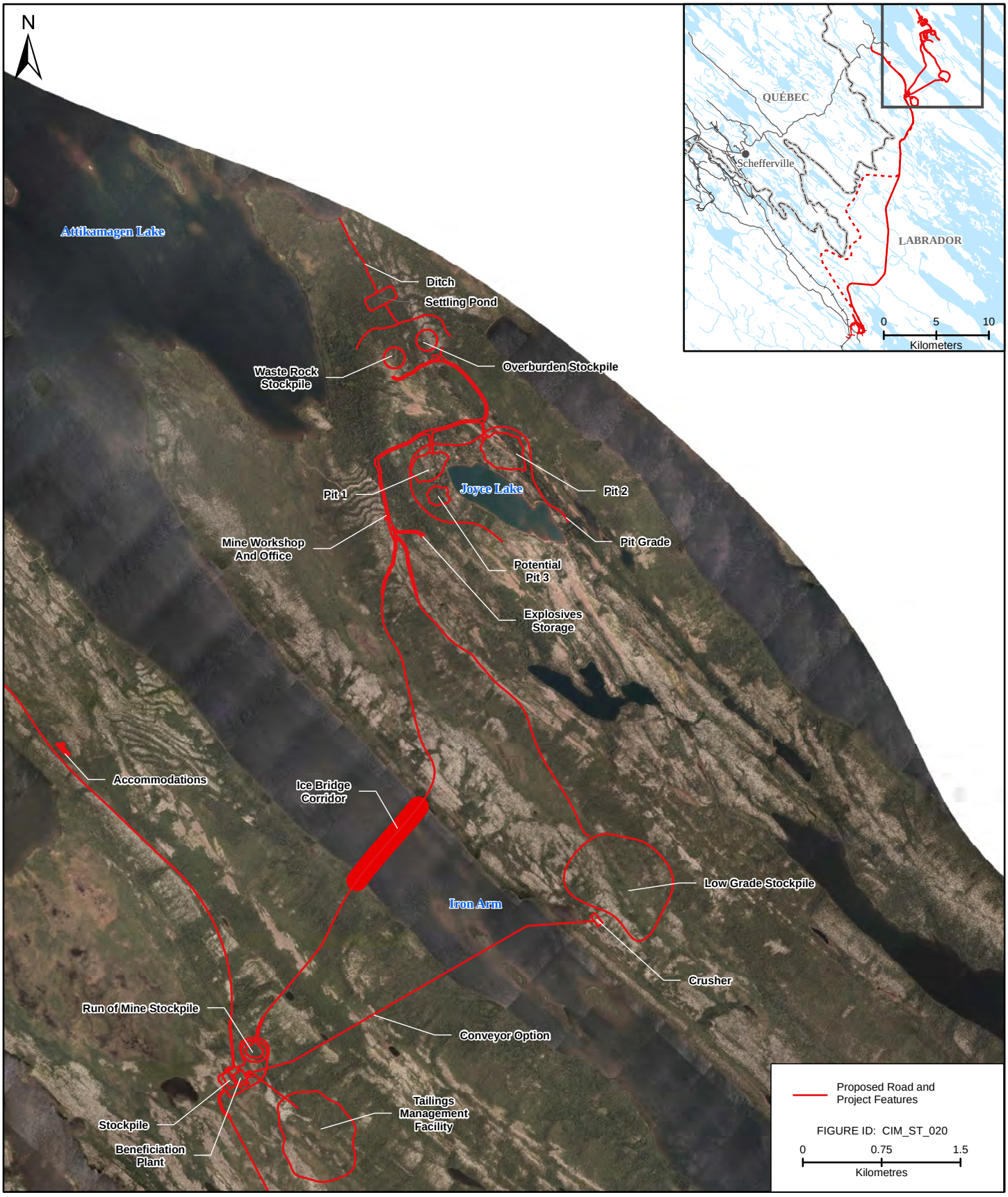
Appendix A

Mine Site with Aerial Photo Underlay (2012)

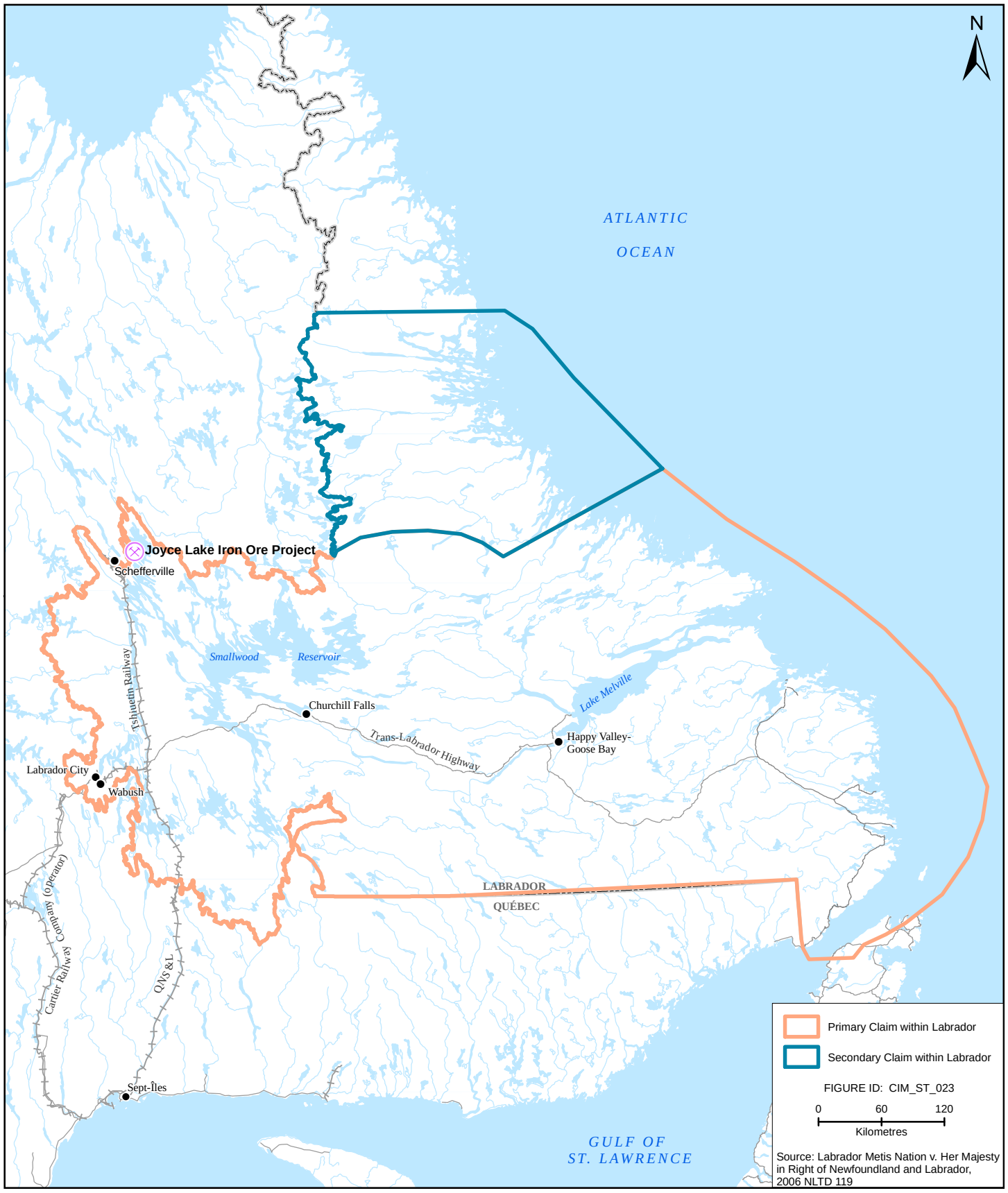


CENTURY IRON MINES CORP.	FIGURE TITLE: **Mine Site and Associated Infrastructure**		Stassinu Stantec Limited Partnership
	CLIENT: **LABEC CENTURY IRON ORE INC.**		
	FIGURE ID: **FIGURE A-1**	PROJECT NUMBER: **121810649**	FIGURE SOURCES: Project features provided by CIMA+. Basemap information from XEOS Imaging

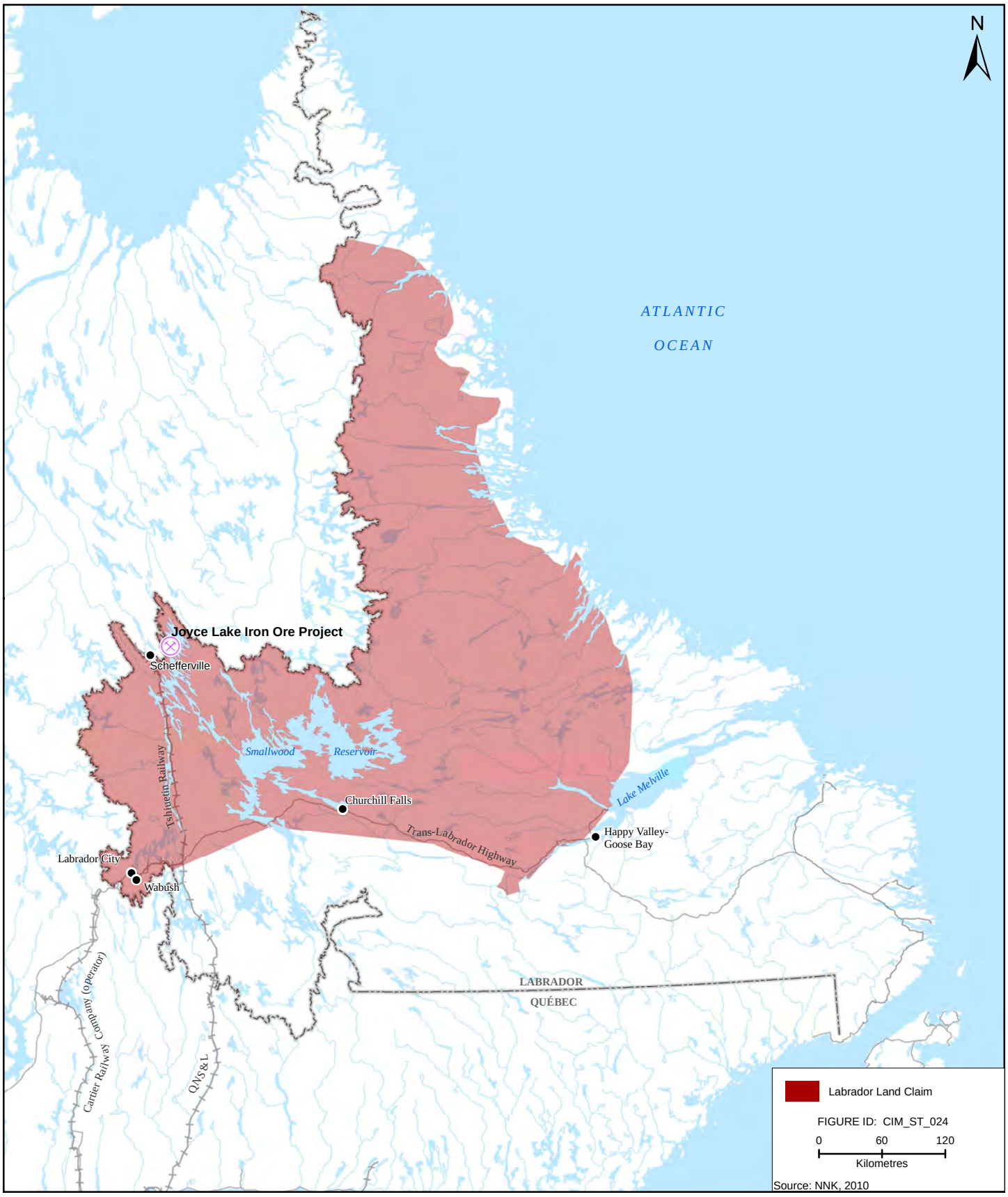
Appendix B

Maps Showing Aboriginal Asserted Rights

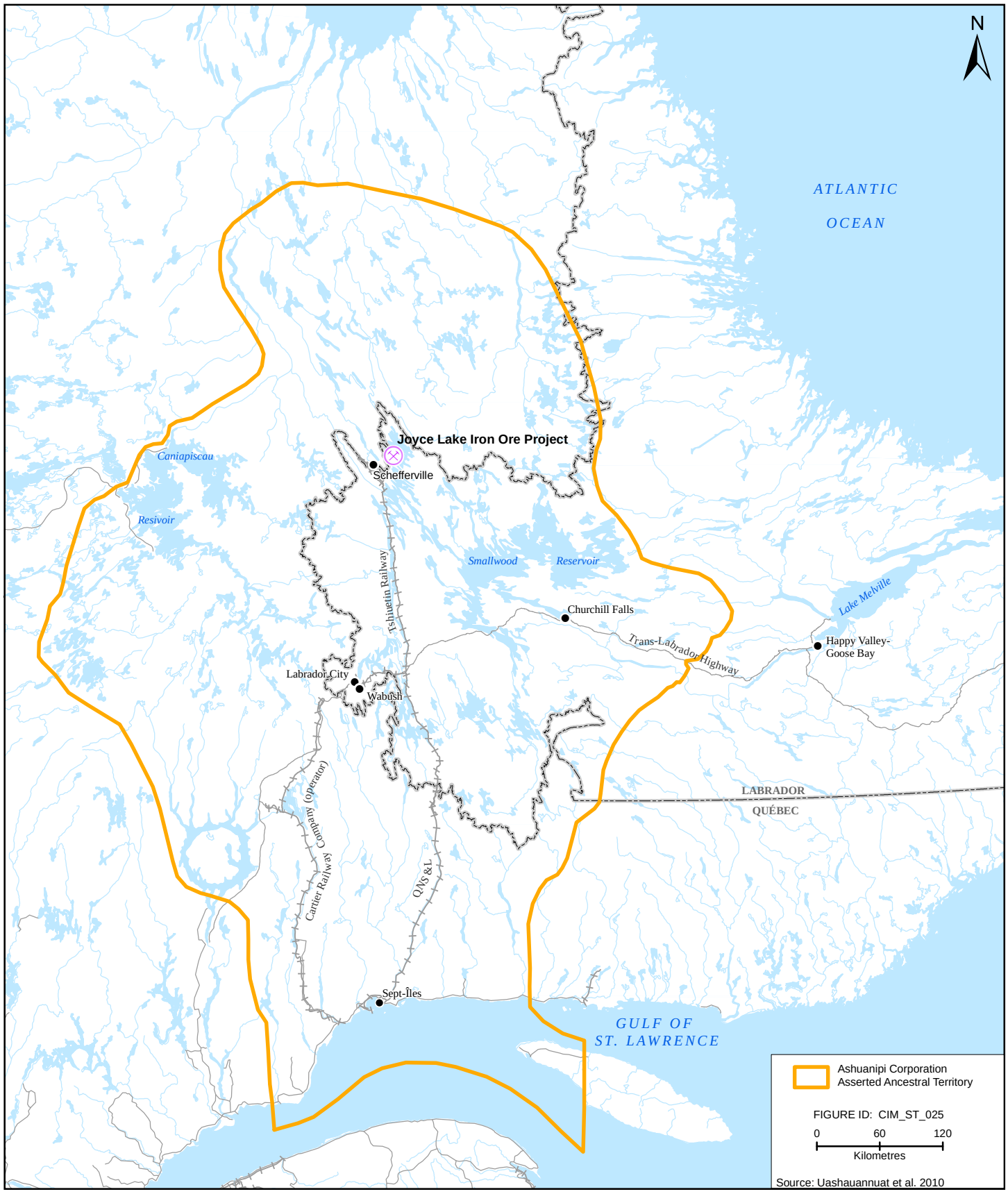
CENTURY IRON MINES CORP.	FIGURE TITLE: **Western Labrador Economic Major Development Impact and Benefit Agreement Area**		Stassinu Stantec Limited Partnership
	CLIENT: **LABEC CENTURY IRON ORE INC.**		
	FIGURE ID: **FIGURE B-1**	PROJECT NUMBER: **121810649**	FIGURE SOURCES: Basemap information from NRCan CanVec database and Newfoundland and Labrador Department of Natural Resources.



CENTURY IRON MINES CORP.	FIGURE TITLE: **NCC (NunatuKavut) Asserted Land Claim Area**		Stassinu Stantec Limited Partnership
	CLIENT: **LABEC CENTURY IRON ORE INC.**		
	FIGURE ID: **FIGURE B-2**	PROJECT NUMBER: **121810649**	FIGURE SOURCES: Basemap information from NRCan CanVec database and Newfoundland and Labrador Department of Natural Resources.



CENTURY IRON MINES CORP.	FIGURE TITLE: **NNK (Kawawachikamach) Asserted Land Claim**		Stassinu Stantec Limited Partnership
	CLIENT: **LABEC CENTURY IRON ORE INC.**		
	FIGURE ID: **FIGURE B-3**	PROJECT NUMBER: **121810649**	FIGURE SOURCES: Basemap information from NRCan CanVec database and Newfoundland and Labrador Department of Natural Resources.



CENTURY IRON MINES CORP.	FIGURE TITLE: **ITUM/Ashuanipi Corporation Asserted Land Claim**		Stassinu Stantec Limited Partnership
	CLIENT: **LABEC CENTURY IRON ORE INC.**		
	FIGURE ID: **FIGURE B-4**	PROJECT NUMBER: **121810649**	FIGURE SOURCES: Basemap information from NRCan CanVec database and Newfoundland and Labrador Department of Natural Resources.

Appendix C

Contact Information for Aboriginal Groups with Asserted Land Claims Near the Project Area

Innu Nation
P.O. Box 119
Sheshatshit, NL A0P 1M0

Conseil de bande ITUM
C.P. 8000
265 Boul. Des Montagnais
Uashat, QC G4R 4L9

Conseil de bande Matimekush-Lac John
CP 1390
Schefferville, QC G0G 2T0

Naskapi Nation of Kawawachikamach
P.O. Box 5111
Kawawachikamach, QC G0G 2Z0

Nunatukavut Community Council
370 Hamilton River Road
P.O. Box 460, Stn. C
Happy Valley-Goose Bay, NL A0P 1C0

Appendix D

Photo Appendix of Waterbody Features;
Joyce Lake Project July-August 2012

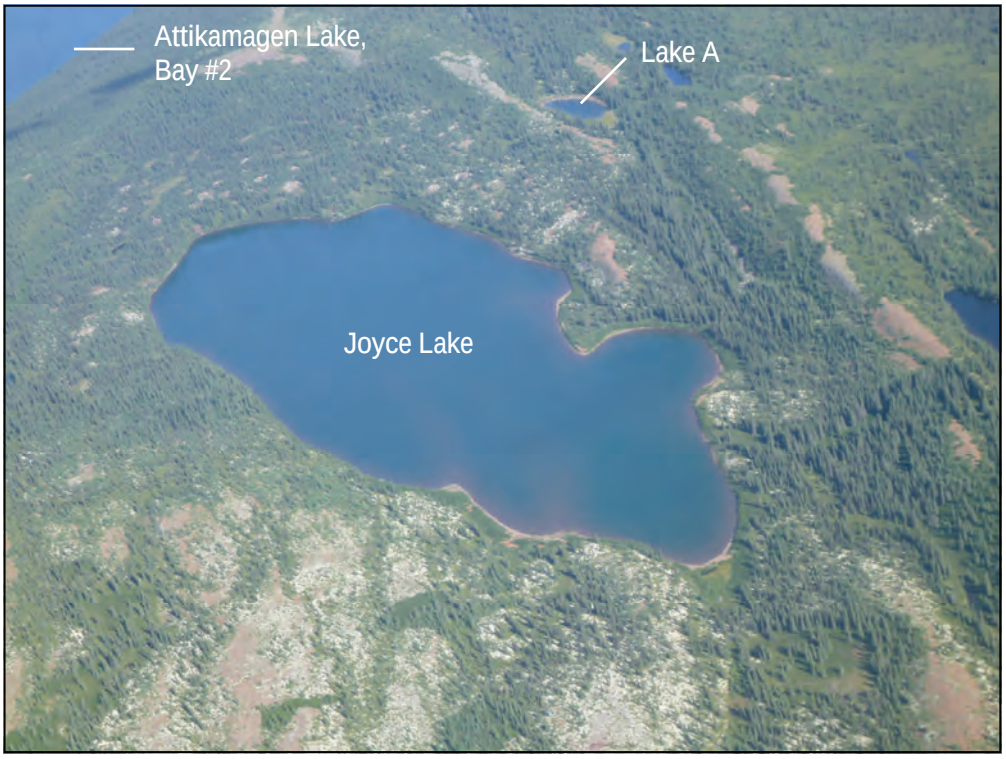


Photo 1. Aerial view of Joyce Lake and Lake A

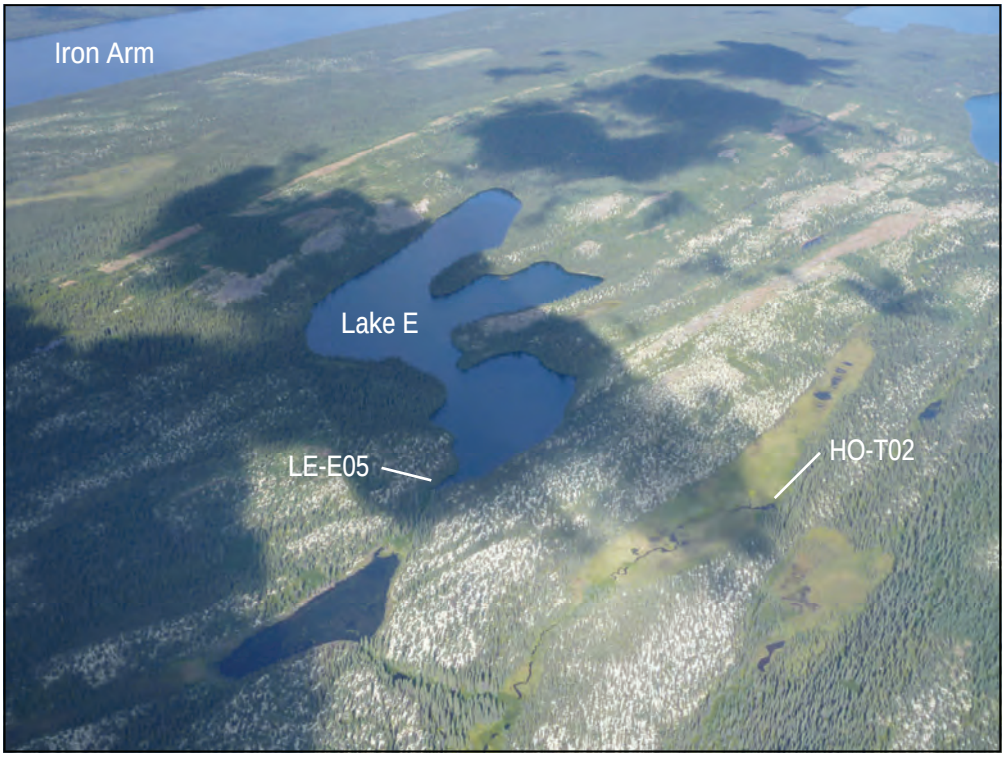


Photo 2. Aerial view of Lake E, and connecting streams LE-E05 and HO-T02

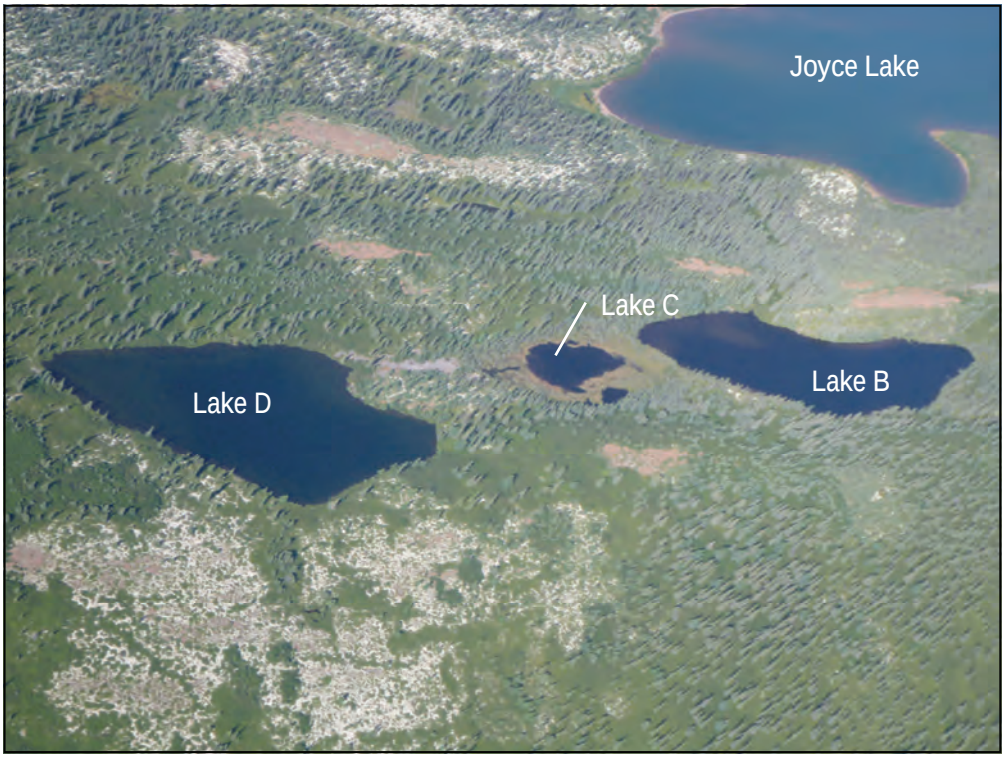


Photo 3. Aerial view of Lakes B, C, and D

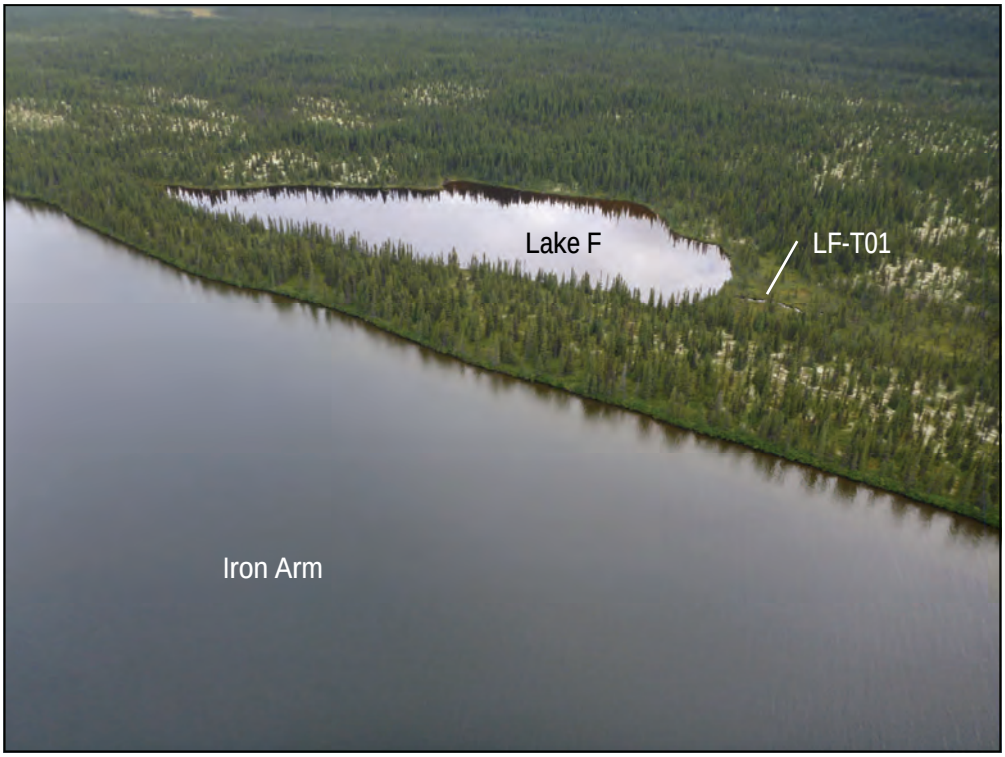


Photo 4. Aerial view of Lake F

Photo 5. Aerial view of Iron Arm (towards Attikamagen Lake)

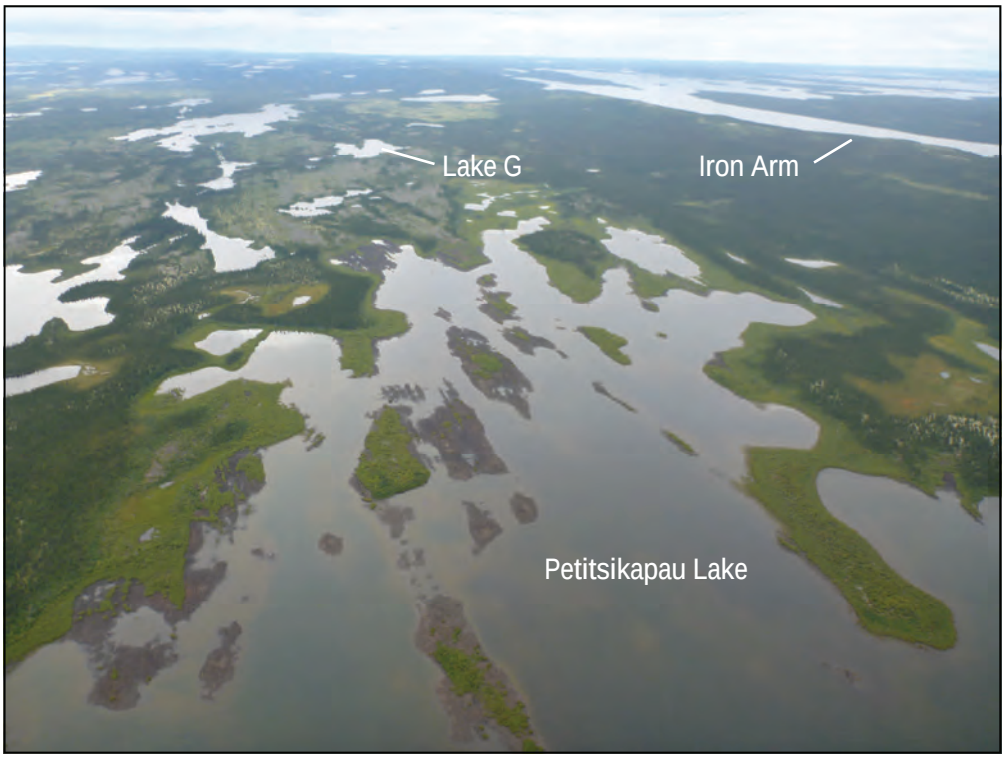


Photo 6. Aerial view of Bay #3 in Petitsikapau Lake

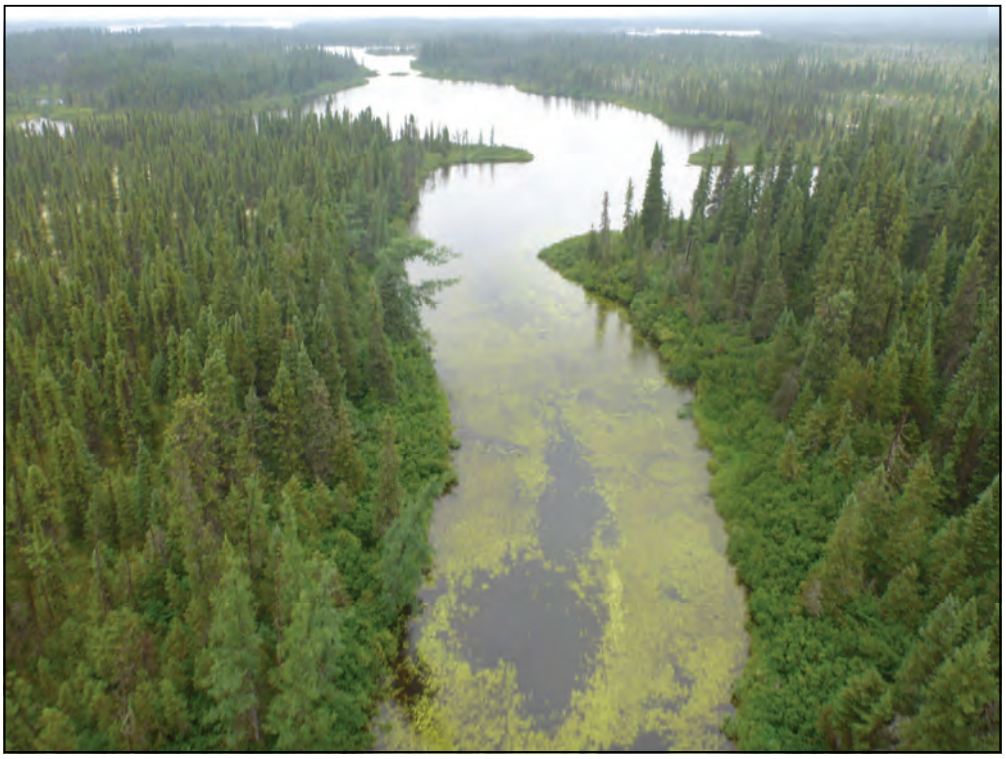


Photo 7. Stream crossing CR03

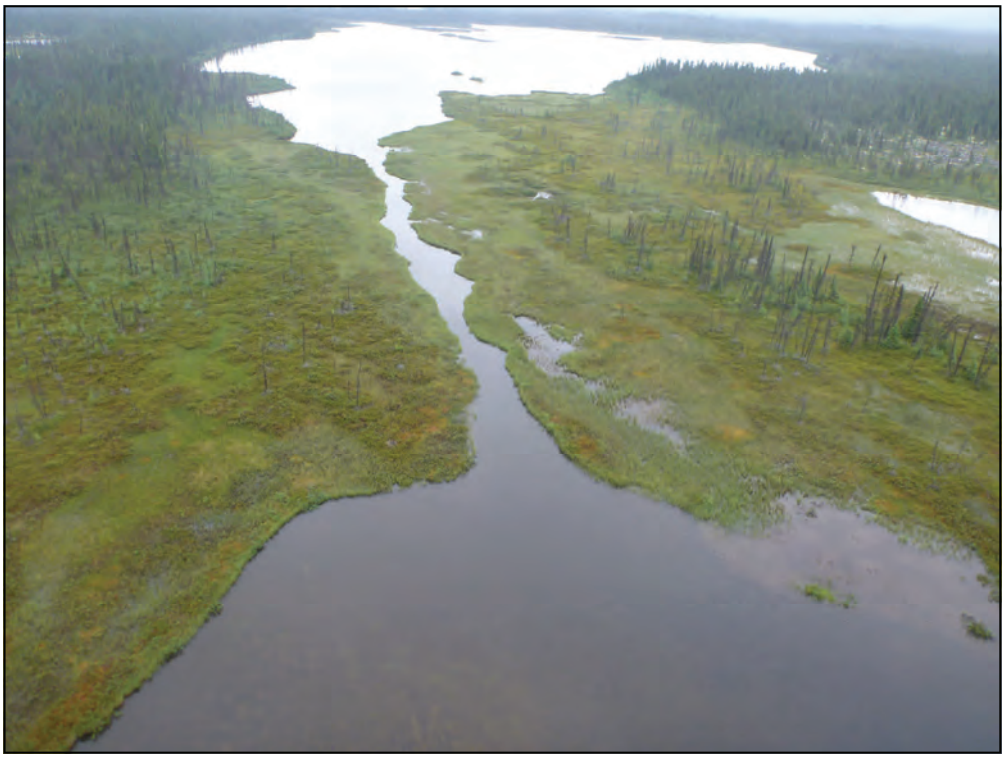


Photo 8. Stream crossing CR04

Photo 9. Stream crossing CR05

Photo 10. Stream crossing CR07

Photo 11. Stream crossing CR08

Photo 12. Stream crossing CR10

Photo 13. Stream crossing CR11

Photo 14. Stream crossing CR12

Photo 15. Stream crossing CR13

Photo 16. Stream crossing CR14

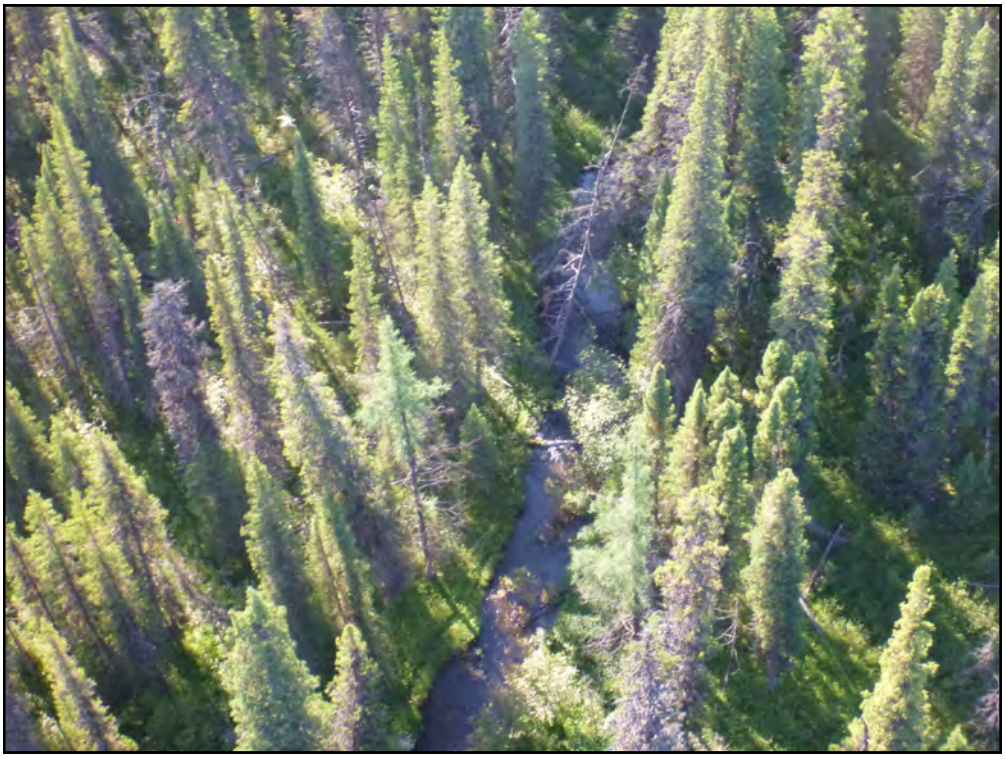


Photo 17. Stream crossing CR15

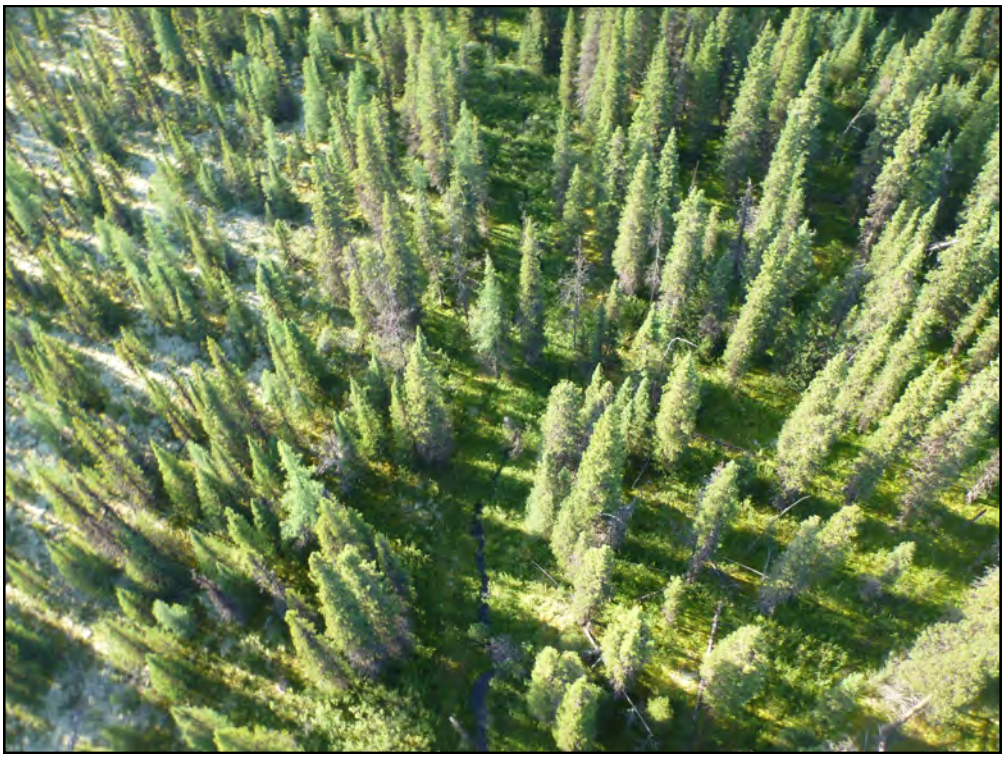


Photo 18. Stream crossing CR16

Photo 19. Stream crossing CR17

Photo 20. Stream crossing CR18, near the existing railway

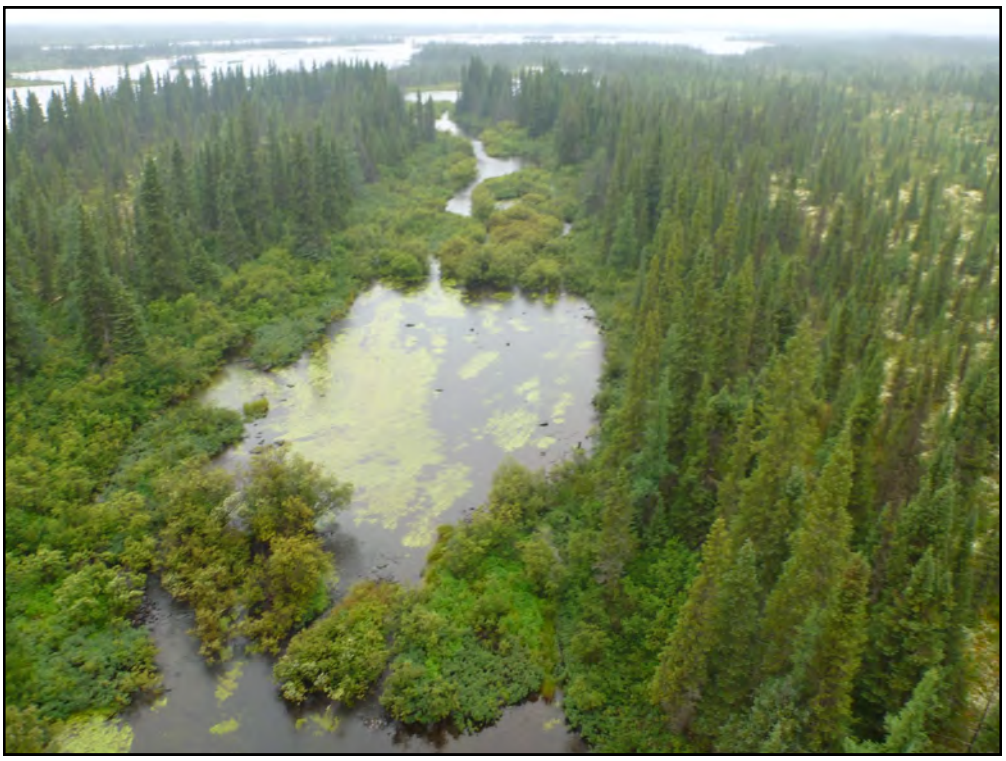


Photo 20. Stream crossing CR20

Photo 21. Stream crossing CR22

Photo 21. Stream crossing CR23