The Maritime Link Transmission Project:

Registration Document

November 30, 2011

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

LIST OF ACRONYMS

AOI	Area of Interest
asl	Above Sea Level
CBRM	Cape Breton Regional Municipality
CEAA	*Canadian Environmental Assessment Act*
CEA Agency	Canadian Environmental Assessment Agency
CEPA	*Canadian Environmental Protection Act*
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CSA	Canadian Standards Association
CSR	Comprehensive Study Report, Section 21 of *CEAA*
DFO	Fisheries and Oceans Canada
EA	Environmental Assessment
EBSA	Ecologically and Biologically Significant Area
EC	Environment Canada
ECBC	Enterprise Cape Breton Corporation
EIS	Environmental Impact Statement
EMF	Electromagnetic field
EMP	Environmental Management Plan
ENL	ENL Maritime Link Inc.
EPP	Environmental Protection Plan
EPR	Environmental Preview Report
FNI	Federation of Newfoundland Indians
GHG	Greenhouse Gas
HADD	Habitat Alteration, Disruption or Destruction
HC	Health Canada
HDD	Horizontal Directional Drilling
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
IBA	Important Bird Area
KMKNO	Kwilmu'kw Maw-klusuaqn Negotiation Office
kV	Kilovolt
LCA	Lophelia Conservation Area
LOMAs	Large Ocean Management Areas
MEKS	Mi'kmaq Ecological Knowledge Study
MFN	Miawpukek First Nation
MI	mass impregnated
MPAs	Marine Protected Areas
MW	Megawatt
NAFO	Northwestern Fisheries Organization
NCNS	Native Council of Nova Scotia
NEB	National Energy Board
NLEPA	*Newfoundland and Labrador Environmental Protection Act*
NRCan	Natural Resources Canada
NSDNR	Nova Scotia Department of Natural Resources
NSE	Nova Scotia Environment
NSEA	*Nova Scotia Environment Act*

NSMNH	Nova Scotia Museum of Natural History
NSPI	Nova Scotia Power Incorporated
NOC	National Occupational Classification
PC	Parks Canada
PWGSC	Public Works and Government Services Canada
RA	Responsible Authority
RES	Renewable Energy Standard
ROV	Remotely Operated Vehicle
RoW	Right of Way
SARA	*Species at Risk Act*
TC	Transport Canada
TWh	Terawatt Hours
UINR	Unama’ki Institute of Natural Resources
WMP	Waste Management Plan
XLPE	cross-linked polyethylene

EXECUTIVE SUMMARY

ENL Maritime Link Inc., a wholly owned subsidiary of Emera Newfoundland and Labrador Holdings Inc., is proposing to design, consult, obtain environmental assessment and regulatory approvals, develop and operate the *Maritime Link Transmission Project* between the Island of Newfoundland and Cape Breton, Nova Scotia. The *Maritime Link* is a new 500 MW, +/-200 to 250 kV high voltage transmission system that includes the following elements and associated infrastructure:

- transmission corridors;
- subsea cables;
- shore grounding facilities;
- two converter stations and adjoining substations;
- two transition compounds (for converting underground subsea cables to overhead transmission conductors); and
- other potential infrastructure, as required.

There are three main components to the Project:

1. In southwestern Newfoundland, a new transmission line between Cape Ray and Bottom Brook along an existing transmission corridor, and Bottom Brook to Granite Canal in a combination of existing and new corridors.
2. Across the Cabot Strait, two subsea cables spanning approximately 180 km from Point Aconi (or Lingan), Nova Scotia to Cape Ray, Newfoundland (exact location to be determined).
3. In Cape Breton, Nova Scotia, a new transmission line (approximately 50 km in length) parallel to the existing transmission corridor centerline between Point Aconi (or Lingan) and Woodbine.

The Lower Churchill Hydroelectric Generation Project will significantly contribute to the increasing production of renewable energy in the province of Newfoundland and Labrador, to the point where after meeting current and foreseeable energy requirements, surplus energy will be available. This surplus energy will be available for export through the *Maritime Link* to the existing mainland power grid in Cape Breton, Nova Scotia.

The Project has the benefits of leveraging new renewable energy, reducing the need for non-renewable energy projects (and associated potential environmental effects of those projects) in Nova Scotia while providing capacity for more renewable energy to be delivered to the Atlantic region.

The environmental assessment process for the *Maritime Link* will involve federal regulators, as well as provincial regulators from both Newfoundland and Labrador and Nova Scotia, and is expected to require approvals under the federal, Newfoundland and Labrador, and Nova Scotia environmental assessment processes as well as other provincial and municipal authorizations.

This Project Description is intended to initiate the environmental assessment process both federally and provincially and contains the following information:

- general information about the Project including the Proponent, consultation and the environmental assessment process;
- Project information including context, purpose, and objectives, as well as components and activities; and
- preliminary information regarding environmental features, land use and socioeconomics, and Aboriginal groups.

Consultation with interested stakeholders will occur throughout the environmental assessment process. Initial consultations have already been undertaken with interested parties to inform them of the basic design of the Project. To date, there has been engagement with federal and provincial regulators, commercial fishers and Mi'kmaq leaders in Nova Scotia. Specific details on the engagement process with Aboriginal groups on the Island of Newfoundland will be determined through the environmental assessment process.

Project activities associated with construction of the *Maritime Link* include:

- access and clearing;
- distribution of materials;
- construction of high voltage converter stations (HVAC/HVDC);
- tower installation;
- stringing of conductors;
- installation of grounding facilities;
- preparation of the marine substrate; and
- laying of the subsea cable.

The construction workforce will be housed in nearby lodgings, accessible to the construction site. If lodging is required in remote locations, or where a larger workforce is required, accommodations will be provided through small temporary facilities established in the vicinity of the construction site. A workforce will be required in both provinces throughout the construction process, which is expected to span approximately two years.

Project construction is scheduled to begin in 2014 and first power planned for delivery in late 2016 or early 2017. Operation and maintenance activities will include regular inspection, repair and vegetation management along the right of way. Decommissioning is not contemplated at this time as the *Maritime Link* is expected to be in operation for an indeterminate time period.

The Project footprint in southwestern Newfoundland covers portions of three ecoregions where vegetative communities vary and are largely determined by the level of exposure to environmental conditions. Shallow soil and bedrock, deeply scoured by glaciers, have resulted in numerous lakes and ponds, and short, swift-flowing rivers. Terrestrial and aquatic life is varied and there are wildlife species that may occur within the Project area that have provincial and/or national conservation status including: American marten, piping plover, rusty blackbird, red crossbill, short-eared owl, harlequin duck, Eskimo curlew, gray-cheeked thrush, red knot, banded killifish, American eel, and boreal felt lichen.

The proposed transmission corridor will pass through three of Newfoundland’s Regional Economic Zones: the Marine and Mountain Zone Corporation, the Long Range Regional Economic Development Board, and the Coast of Bays Corporation.

There are currently no Aboriginal groups that possess recognized Aboriginal or treaty rights on the island portion of the province of Newfoundland and Labrador. First Nations Bands located in southwestern Newfoundland include: Elmastogoeg First Nation; Flat Bay Indian Band; Indian Head First Nations Band; Port au Port Indian Band; and Miawpukek First Nation.

The Cabot Strait is approximately 110 kilometres wide between Cape Ray, Newfoundland and Cape North, Nova Scotia and has significant resident or migratory populations of groundfish, whales, seals, turtles, shorebirds and seabirds, several species of which are of conservation concern including: North Atlantic right whale, killer whale, humpback whale, fin whale, blue whale, harbour porpoise, Atlantic salmon, Atlantic cod, Atlantic sturgeon, wolffish (Atlantic, northern and spotted), American eel, white shark, cusk, and leatherback turtle.

The Strait is an important fishing area, a strategically important waterway, and an international shipping route, and is crossed by Marine Atlantic ferries that link Port aux Basques, Newfoundland and North Sydney, Nova Scotia. Many of the fisheries in the Strait are conducted using small boats operating from numerous small harbours in both Newfoundland and Cape Breton.

The Project footprint in Cape Breton, Nova Scotia includes habitat for a wide variety of wildlife and also supports substantial populations of coastal species, especially in vertical cliffs that provide seabird nesting sites. Some species that may occur in the Project area in Nova Scotia have national and/or provincial conservation status including: American marten, Canada lynx, piping plover, harlequin duck, Bicknell's thrush, Atlantic salmon, American eel, jutta arctic (Baltic grayling) (butterfly), Québec emerald (butterfly), and yellow lamp mussel.

The Mi'kmaq are the founding people of Nova Scotia and remain the predominant Aboriginal group within the province with 13 Mi'kmaq First Nation communities. Cape Breton currently contains five Mi’kmaq communities: Eskasoni; Membertou; Wagmatcook; Waycobah (We'koqma'q); and Potlotek/Chapel Island.

This document reflects the principal components of the *Maritime Link Project* as currently envisioned and although these components are not likely to change substantially, minor adjustments may be necessary based on the results of more detailed engineering and environmental studies.

1 GENERAL INFORMATION

1.1 Project Name, Nature and Locations

Project Name: *Maritime Link*

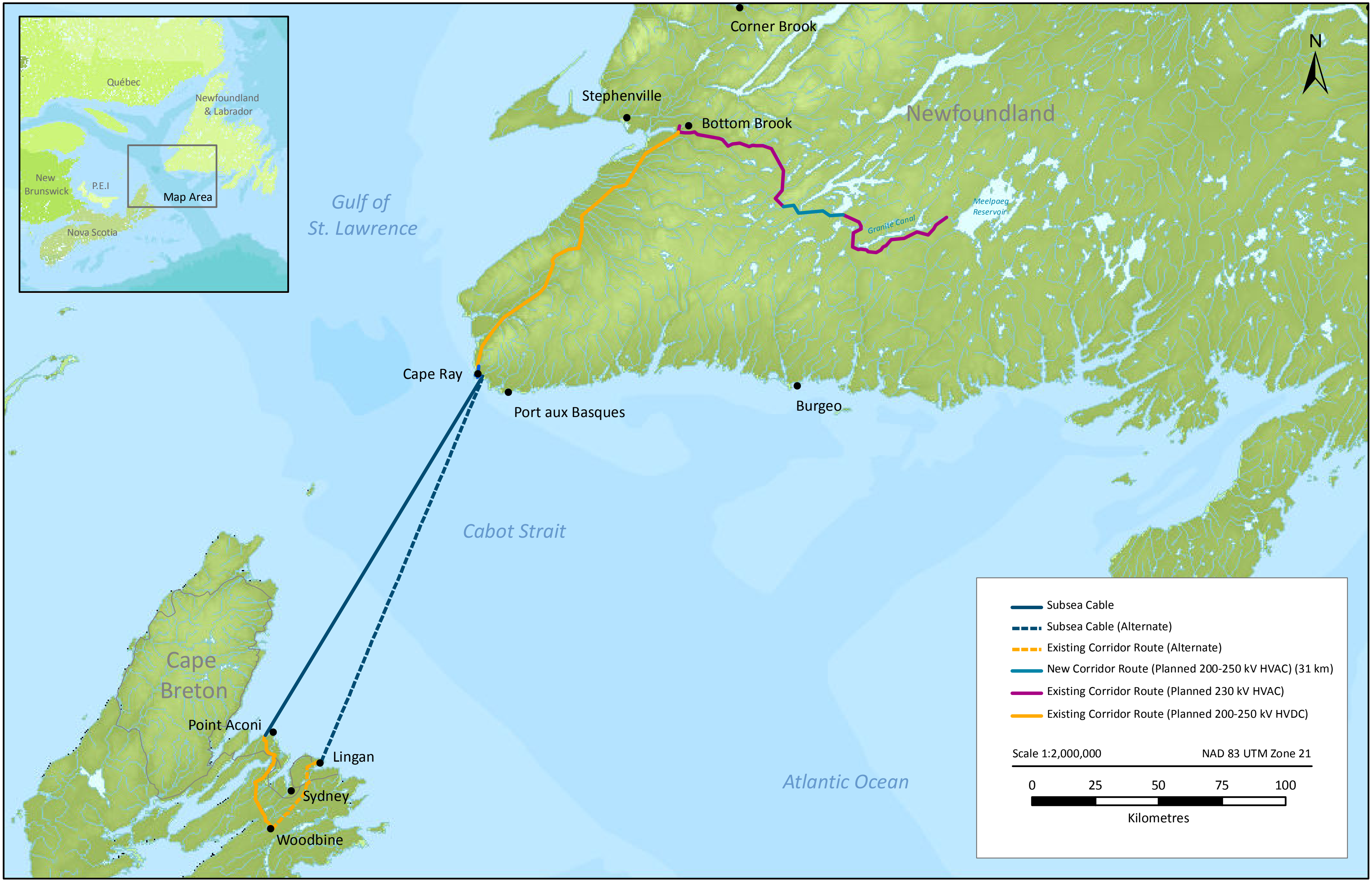
ENL Maritime Link Inc. (ENL), a wholly owned subsidiary of Emera Newfoundland and Labrador Holdings Inc., is proposing to develop an electrical power transmission system between the Island of Newfoundland and Cape Breton, Nova Scotia.

The *Maritime Link* involves the construction and operation of a new 500 megawatt (MW), +/-200 to 250 kV high voltage direct current (HVDC) and high voltage alternating current (HVAC) transmission line, the main elements of which include:

- transmission corridors (HVDC transmission, HVAC transmission, grounding system transmission lines;
- subsea cables;
- shore grounding facilities;
- two converter stations and adjoining substations;
- two transition compounds (for converting underground subsea cables to overhead transmission conductors); and
- other potential infrastructure, as required.

Geographically, the Project can be divided into three distinct areas, the Island of Newfoundland, the Cabot Strait, and Cape Breton. Figure 1.1 illustrates the complete Project footprint:

1. In Newfoundland, a new transmission line between Cape Ray and Granite Canal (approximately 292 km).
2. Across the Cabot Strait, two subsea cables spanning approximately 180 km from Cape Ray, Newfoundland (exact location to be determined), to Point Aconi (or Lingan), Nova Scotia.
3. In Nova Scotia, a new transmission line (approximately 46 km) parallel to the existing transmission corridor between Point Aconi (or Lingan) and the Woodbine substation.



Emera Newfoundland & Labrador

Date: 22NOV2011
Data Sources:
National Atlas Framerwork 1:1Million

Figure 1.1

Maritime Link Project

1.2 The Proponent

Name of Corporate Body:	ENL Maritime Link Inc.
Address:	1894 Barrington St. Barrington Tower, 16th Floor Halifax, NS Canada B3J 2A8
Telephone:	902.450.0507 / 1.800.450.0507
Fax:	902.428.6112
Website:	www.emera.com
President	Rick Janega
Principal Contact for the Purpose of the Environmental Assessment:	Ken Meade Senior Manager, Environment Phone: 902.428.6582 E-mail: ken.meade@emera.com

Emera Inc. (Emera) is an energy and services company that provides electricity generation, transmission and distribution as well as gas transmission and utility energy services. Emera operates throughout northeastern North America, in three Caribbean countries and in California. More than 80% of the company's earnings come from regulated investments. Emera Inc. shares are listed on the Toronto Stock Exchange and trade under the symbol EMA.

Emera is the parent company of Emera Newfoundland and Labrador Holdings Inc., of which ENL, the proponent of the Project, is a wholly owned subsidiary.

ENL was established following the historic announcement on November 18, 2010, when Emera and Nalcor Energy (Nalcor), with the endorsement of the governments of Nova Scotia and Newfoundland and Labrador, signed a Term Sheet agreement. Under this agreement, Emera agreed to construct the *Maritime Link* transmission facility and to provide transmission capacity on the *Maritime Link* to Nalcor, and Nalcor agreed to supply clean, renewable power to Emera. ENL is the Project proponent, responsible for the Project's regulatory approvals, construction and commissioning.

As summarized above and further described below, the *Maritime Link* will consist of a 500 MW HVDC and HVAC overland and subsea transmission line, and related components that will connect the electrical system of Nova Scotia with the electrical system of the Island of Newfoundland. ENL is the owner of the *Maritime Link* and will design, engineer, construct, commission, operate and maintain the Project. The development of the *Maritime Link* is being managed and executed by Emera Newfoundland and Labrador Holdings Inc.

The *Maritime Link* will have no direct connection to the Labrador-Island Transmission Link, which is a project being developed by Nalcor Energy, as the proponent, along with the Lower Churchill Hydroelectric Generation Project. The *Maritime Link* has a separate utility due to the fact the Project will serve as a complete and independent connection between Nova Scotia and the existing electrical system on the Island of Newfoundland, will operate independent of the Labrador-Island Transmission Link, and is the only transmission facility which will connect the two provincial grids.

1.3 Project Consultation

1.3.1 Aboriginal Engagement

Early engagement with the Mi'kmaq leadership in Nova Scotia has been a priority of ENL. Engagement with representatives of the Mi'kmaq First Nation in Nova Scotia has taken place through meetings with representatives of the following organizations and communities:

- Assembly of Nova Scotia Mi'kmaq Chiefs – Chair, Energy Committee;
- Assembly of Nova Scotia Mi'kmaq Chiefs – Co-chairs, Benefits Committee;
- Chief and Council of Eskasoni;
- Kwilmu'kw Maw-klusuaqn Negotiation Office (KMKNO);
- Unama'ki Economic Benefits Office;
- Unama'ki Institute of Natural Resources (UINR); and
- Membertou Geomatics Solutions (MGS).

Based on feedback from the Assembly of Nova Scotia Mi'kmaq Chiefs, and the requirements of the Consultation Terms of Reference under the *Made in Nova Scotia Process*, it is understood the that engagement with the Nova Scotia Mi'kmaq on the Project will be initiated through KMKNO.

The process to engage the Native Council of Nova Scotia and Aboriginal groups in Newfoundland will be determined during the Environmental Assessment (EA) process.

Table 1.1 provides contact information, for both provinces, for Aboriginal groups who may have an interest in the Project area. Early engagement activities that have been completed to date are summarized in Table 1.2.

Table 1.1 Aboriginal Groups who may have an interest in the Project Area

Aboriginal Group	Contact Information
Nova Scotia Mi'kmaq communities	Kwilmu'kw Maw-klusuaqn Negotiation Office 851 Willow Street, Truro, NS B2N 6N8 Tel (902) 843 3880 Fax (902) 843 3882 Toll Free 1 888 803 3880
Native Council of Nova Scotia	129 Truro Heights Rd, Truro, NS B6L 1X2 Tel (902) 895 1523 Fax (902) 895 0024 Toll Free 1 800 565 4372
Qalipu Mi'kmaq First Nation Band	Federation of Newfoundland Indians P.O. Box 956, Corner Brook, NL A2H 6J3 Tel (709) 634 0996 Fax: (709) 639 3997

Table 1.1 Aboriginal Groups who may have an interest in the Project Area

Aboriginal Group	Contact Information
	Toll Free 1 800 563 2549
Miawpukek First Nation	P.O. Box 10 Conne River, NL A0H 1J0 Tel (709) 882 2470 Fax (709) 882 2292 Toll Free 1 866 882 2470

Table 1.2 Early Engagement Activities Conducted to Date

Aboriginal Group	Date	Activities
KMKNO	May 3, 2011	Phone call
KMKNO	May 30, 2011	Phone call
Unama'ki Economic Benefits Office	June 7, 2011	Meeting
Eskasoni Chief and Council	June 7, 2011	Meeting
Chiefs Terry (Membertou), Gerard (Paq'tnkek), and Leroy (Eskasoni), as well as KMKNO	June 8, 2011	Meeting
KMKNO	June 28, 2011	Conference call
KMKNO	August 9, 2011	Meeting
UINR	August 16, 2011	Phone call
KMKNO	August 23, 2011	Email
MGS	August 25, 2011	Meeting
UINR	September 8, 2011	Phone call
MGS	September 8, 2011	Phone call
KMKNO	September 13, 2011	Project Brief sent
KMKNO	September 16, 2011	Phone call
UINR	October 5, 2011	Phone call
MGS	October 7, 2011	Meeting
MGS	October 14, 2011	Studies
KMKNO	October 17, 2011	Draft Project Description sent
UINR	October 17, 2011	Studies
KMKNO	November 1, 2011	Phone call
KMKNO	November 16, 2011	Meeting

The nature of the discussions to date has been only to introduce the Project. ENL has had no formal responses to the Project from Aboriginal groups, at this point. The following table outlines how ENL has responded to some preliminary concerns raised by the Mi'kmaq of Nova Scotia.

Table 1.3 Early Aboriginal Concerns and Responses

Concern Raised	ENL response
Potential confusion around communication	Agree to Nova Scotia Mi'kmaq Chiefs' request to engage through KMKNO
KMKNO expressed desire to be involved with studies	All RFPs of studies sent to KMKNO for consideration
	As a result of KMKNO response to Fisheries Study, a separate Mi'kmaq Fisheries Study was initiated
Concern about underwater archaeology	Archaeological study adapted to include a marine archaeological component
Expressed interest in potential effects to commercial fisheries	Invited to information session with commercial fisheries interests to describe Project and current geophysical studies. Also offered to contact Mi'kmaq fisheries coordinators separately, if preferred
Concern that all 13 communities should be identified in the Mi'kmaq Fisheries Study	Beginning with five communities as a start

Information on traditional or heritage use by Aboriginal groups/peoples is currently being collected through a Mi'kmaq Ecological Knowledge Study (MEKS) and Cultural Resources Study. It is known that the Mi'kmaq of Nova Scotia have commercial fishing interests in Cape Breton and also that community members fish under the Food, Social and Ceremonial fishery.

Proactive Aboriginal engagement will continue throughout the EA process to build and strengthen relationships, meet regulatory requirements and provide opportunities for the Aboriginal groups potentially affected by the *Maritime Link* to bring forward their questions and concerns. ENL is committed to working with the Mi'kmaq of Nova Scotia to identify opportunities for employment, training and capacity-building.

1.3.2 Regulatory Consultation

ENL has initiated consultation with federal and provincial regulators at both the regional and national levels. Consultation with relevant government stakeholders will include various agencies and departments at federal, provincial and municipal levels and has to date included the following:

- Canadian Environmental Assessment Agency (CEA Agency), Ottawa;
- CEA Agency, Atlantic office;
- Nova Scotia Department of Energy;
- Fisheries and Oceans Canada (DFO), Newfoundland and Labrador Region;
- DFO, Maritimes Region;
- DFO, Ottawa;
- Natural Resources Canada, Major Projects Management Office, Ottawa;
- Newfoundland and Labrador Department of Environment and Conservation, Environmental Assessment Division; and
- Nova Scotia Environment, Environmental Assessment Branch.

Examples of other agencies and departments that will be engaged, depending on the regulatory requirements, including advice from relevant specialists, are:

- Environment Canada (EC);
- Transport Canada (TC);
- Newfoundland and Labrador Department of Environment and Conservation, Wildlife Division;
- Newfoundland and Labrador Department of Environment and Conservation, Sustainable Development and Strategic Science Branch;
- Newfoundland and Labrador Department of Tourism, Culture and Recreation;
- Nova Scotia Department of Natural Resources; and
- Nova Scotia Fisheries and Aquaculture.

1.3.3 Stakeholder Consultation

Many stakeholders will have an interest in the *Maritime Link* including, but not limited to, interest groups such as fisheries associations and individual license holders, representatives of the aquaculture industry, environmental and recreational groups, residents, and municipalities. Stakeholder interests are expected to range from those wanting information on the Project and the potential effects, to those who may be affected by Project activities. ENL will be consulting with stakeholders on the design of the Project.

ENL intends to consult with interested stakeholders throughout the EA process and over the past months has met with several representatives of the following stakeholder groups to introduce the Project:

- Maritime Fishermen's Union in Nova Scotia;
- N-ENS Crab Fishermen's Association;
- Big Bras d'Or Fishermen's Association;
- Point Aconi Fishermen's Association;
- North of Smokey Fishermen's Association;
- Temporary Snow Crab Entrants;
- Glace Bay Inshore Fishermen's Association; and
- Fish, Food and Allied Workers.

1.4 Environmental Assessment Process and Requirements

The Project is subject to provisions of the *Canadian Environmental Assessment Act* (*CEAA*) as well as the *Newfoundland and Labrador Environmental Protection Act* (*NLEPA*) and the *Nova Scotia Environment Act* (*NSEA*).

The EA process for the *Maritime Link* will involve federal regulators, as well as provincial regulators from both Newfoundland and Labrador and Nova Scotia. The Project is expected to require approvals under the federal, Newfoundland and Labrador, and Nova Scotia EA processes and will require other provincial and municipal authorizations. Appendix A outlines possible approvals and permits required from other jurisdictions.

1.4.1 Federal Environmental Assessment Process

Several federal approvals required for the Project, as currently described, are also included in the *CEAA* Law List Regulations triggers:

- the potential for harmful alteration, disruption or destruction (HADD) of fish habitat requiring an authorization issued by DFO pursuant to s.35(2) of the *Fisheries Act;*
- the potential for blasting in the marine environment exists in which case an authorization issued by DFO pursuant to s.32 of the *Fisheries Act* would be required;
- project work conducted on, over, under, through, or across a navigable waterway requiring an authorization issued by TC pursuant to Part 1, s.5 of the *Navigable Waters Protection Act* ; and
- the potential for the disposal of dredged material or other matter at sea requiring an authorization issued by EC pursuant to s.127(1) of the *Canadian Environmental Protection Act*.

Projects developed with financial assistance provided by a federal department or agency may also trigger the *CEAA* process. A federal loan guarantee has been approved, in principle, by Natural Resources Canada (NRCan) for the *Maritime Link*.

Based on the current understanding of the Project route, the subsea cable component of the Project will pass through the high seas between the territorial seas off Newfoundland and Labrador and Nova Scotia, over both federal and provincial lands on the tidal shore and buried in the seafloor. It is expected that the federal government will assert jurisdiction over the seabed and that an authorization issued by Public Works and Government Services Canada (PWGSC) and NRCan will be required under the *Federal Real Property and Federal Immovables Act.* ENL will seek to acquire an easement from, or make other suitable arrangements with, each of the federal Crown, Nova Scotia Crown and Newfoundland and Labrador Crown, as applicable in order for the Project subsea cable to cross the provincial tidal shores and the subsea floor.

Based on experience and consultation with government regulators, the *Maritime Link* will not likely meet the requirements of *CEAA* Comprehensive Study List Regulations. The *Maritime Link* consists of elements of an electricity system with voltages varying from +/- 200 to 250 kV DC to 230 kV AC, neither of which meets the criteria of a voltage of 345 kV; the threshold for a comprehensive study for a transmission line under *CEAA*. Furthermore, the routing of the Project has also been carefully selected to reduce the required amount of new land Right of Way (RoW) to approximately 30 km. This distance, which is again well below the threshold of 75 km, optimizes the site selection to reduce the need for new RoW and reduces the potential effects on the surrounding environment. The Project is therefore expected to be subjected to a federal screening under *CEAA*.

1.4.2 Provincial Environmental Assessment Processes

1.4.2.1 Newfoundland and Labrador

The provincial EA requirements for Newfoundland and Labrador are set out in the *NLEPA*. The Project is expected to be registered under the *NLEPA* (Part X), and pursuant to s.3 4(2) of the associated Environmental Assessment Regulations whereby “an undertaking that will be engaged in the construction of new electric power transmission lines or the relocation or realignment of existing lines where a portion of a new line will be located more than 500 metres from an existing right RoW shall be registered."

The Environmental Assessment Division of the Newfoundland and Labrador Department of Environment and Conservation administers the EA process, which can be broken down into five steps:

1. Registration and Review: A registration document is submitted demonstrating how the best practicable technology and methods will be used to minimize harmful effects. The EA Division coordinates a 35-day public review as well as a governmental review, and prepares a recommendation to the Minister.
2. Minister's Decision: Within 45 days of receiving a registration, the Minister will advise the proponent of the decision on the undertaking. There are four options:

    a. the undertaking may be approved;
    b. the undertaking may be approved but require an Environmental Preview Report (EPR) to provide additional information;
    c. an Environmental Impact Statement (EIS) is required, where there is indication of significant negative environmental effects or significant public concern; or
    d. the undertaking may be rejected, by Cabinet, if unacceptable environmental effects are indicated, the project is not in public interest, and/or if there is inconsistency with an existing law or government policy.

3. Formation of an Assessment Committee and Preparation of EPR/EIS Guidelines: The Minister will appoint an Assessment Committee to consult with the proponent and prepare guidelines to address unanswered questions that may determine the significance of environmental effects. EPR Guidelines are issued by the Minister within 60 days of the EPR decision and then made available to the public. EIS Guidelines are issued within 120 days and are subject to a 40-day public review prior to approval by the Minister.
4. Proponent Preparation of EPR/EIS: The proponent will prepare an EPR or EIS. An EPR typically relies on existing information and no original fieldwork is required, whereas an EIS will focus on key issues relating to the effects of the project. An EIS often requires original research, implementation of a public information program, and one or more component studies. These component studies, although part of the EIS, are distinct documents with separate guidelines, and public review and approval.
5. EPR/EIS Review and Decision: Both processes require public review and comment, and a recommendation from the EA Committee before acceptance and decision from the Minister. However, an EIS approval process also requires a Ministerial recommendation to Cabinet, and Cabinet decision. If there is strong public interest or concern regarding an undertaking, the Minister may request Cabinet to appoint an EA Board for the purpose of conducting public hearings. Cabinet may reject any undertaking where unacceptable effects are identified; the undertaking is contrary to law or policy, or where it is in the public interest to do so.

1.4.2.2 Nova Scotia

In Nova Scotia, the provincial EA requirements are set out in the *NSEA*, under the Environmental Assessment Regulations. Schedule A of the Regulations designates specific undertakings for EA. The Project, which would involve "a modification, extension, abandonment, demolition or rehabilitation of an undertaking listed in Schedule A which was established either before or after March 17, 1995", would be considered a Class 1 Undertaking according to the Regulations.

The Environmental Assessment Branch of Nova Scotia Environment (NSE) is responsible for administering the EA Process.

Prior to registration, a draft registration document can be submitted to allow the EA Branch and selected government departments to provide preliminary comments on the proposed project. Projects can be registered as a Class 1 or Class 2 undertakings. Registration documents must include adequate information sufficient for the Minister to make a decision and the initial public review period for both types of undertakings is 30 days.

A Class 1 undertaking is typically 50 calendar days and there are five possible outcomes:

1. Additional information required: The proponent then has one year to submit the requested information.
2. Focus Report required: The EA Branch will provide the terms of reference for the focus report which must be submitted within one year. The EA Branch will notify the public of the release of the focus report for review and distribute the report to the review committee.
3. EA Report required: The EA Branch will provide the terms of reference for public review along with the registration document. There is an opportunity to reply to any comments submitted prior to receiving the final terms of reference. The proponent then has two years to prepare and submit the report to the EA Branch. The Minister has the option to refer the EA report to the EA Board for review. If a Board review is not needed, a 45-day public review is initiated. Comments are summarized by the Administrator together with a report and recommendation for the Minister's consideration. If a Board review is required, the Board will notify the public of the report, and conduct a public review, and if warranted, public hearings. Comments are summarized and a recommendation presented for the Minister's consideration.
4. Undertaking approved.
5. Undertaking rejected.

All Class 2 undertakings are referred to the EA Board and typically take 275 calendar days (8 - 9 months) of process time to complete, including the 110 days the EA Board has to conduct a public review or hearings. The proponent has up to two years outside of the review time to prepare the EA report.

1.4.3 Responsible Authorities

A federal authority which exercises a trigger in the context of a project, as defined under *CEAA*, becomes a Responsible Authority (RA). An RA must ensure that an EA of a proposed project is conducted and that a conclusion on the significance of adverse environmental effects is reached and considered as part of the decision-making process prior to the action occurring. Based on the law list and funding triggers discussed above the following is a preliminary list of RAs for the *Maritime Link*:

- EC;
- NRCan;
- DFO;
- TC;
- Enterprise Cape Breton Corporation (ECBC); and
- PWGSC.

2 PROJECT INFORMATION

2.1 Project Context

The socioeconomic context for the *Maritime Link* is the growing demand for more renewable energy as part of a comprehensive, long-term and sustainable electrical power management strategy. In addition to supply/demand management, a key component of this strategy is the need to gradually reduce or eliminate dependency on existing commercial-scale carbon-based generation facilities. In Atlantic Canada, as in many other jurisdictions, alternatives are being aggressively pursued and developed, particularly wind and tidal power. Although these renewable energy alternatives can collectively account for a significant increase in electrical power, unfortunately, even when fully developed, they only operate intermittently and will not provide a sufficient or reliable base load.

The Lower Churchill Hydroelectric Generation Project will significantly contribute to the increasing production of renewable energy in the province of Newfoundland and Labrador, to the point where after meeting current and foreseeable energy requirements, surplus energy will be available for export through the *Maritime Link* to the existing mainland power grid in Cape Breton, Nova Scotia. The connection will be scheduled to deliver energy when needed and will not require the same backup capacity that intermittent sources, such as wind and tidal, require.

2.2 Project Purpose

The primary purpose of the *Maritime Link* is to directly interconnect the electrical systems of the Island of Newfoundland with Nova Scotia, thereby increasing the ability to distribute renewable power among the Atlantic Provinces.

One example of the benefits to be derived from the Project is that it will greatly assist the province of Nova Scotia in meeting the proposed amendments to the Nova Scotia Renewable Electricity Regulations. The amendments, which received Royal Assent on May 19th, 2001, require the Minister of Energy to make regulations requiring the achievement of 40% renewable electricity by 2020. Since there are no untapped major hydroelectric opportunities remaining in the province, the government is currently accelerating the development of wind farms and is actively experimenting with tidal power, although significant commercial power production from the latter is a number of years in the future. Power from the Lower Churchill Hydroelectric Generation Project, will result in surplus energy in Newfoundland and Labrador which, transmitted via the *Maritime Link*, is expected to qualify as renewable energy and greatly contribute to meeting the province's Renewable Energy Standards (RES).

With the emerging greenhouse gas (GHG) regulations federally, and the existing Nova Scotia regulations, for reduction of carbon dioxide ($C0_2$) emissions, the need for replacement energy to reduce coal generation goes hand-in-hand with the construction of the *Maritime Link*. Displacing coal generation with stable and clean renewable energy from Newfoundland and Labrador means the ongoing import of coal can be reduced as well as the emission of not only $C0_2$ but also proportionate reductions of $S0_2$, NO_x, particulate and other emission will reduce the effect on the environment with and annual elimination of over 1 million tonnes of pollutants.

The energy will be delivered through the *Maritime Link* to existing transmission facilities in Cape Breton. This means no new transmission facilities are required beyond the *Maritime Link* to distribute more renewable energy throughout Nova Scotia and, indeed, the Maritime region.

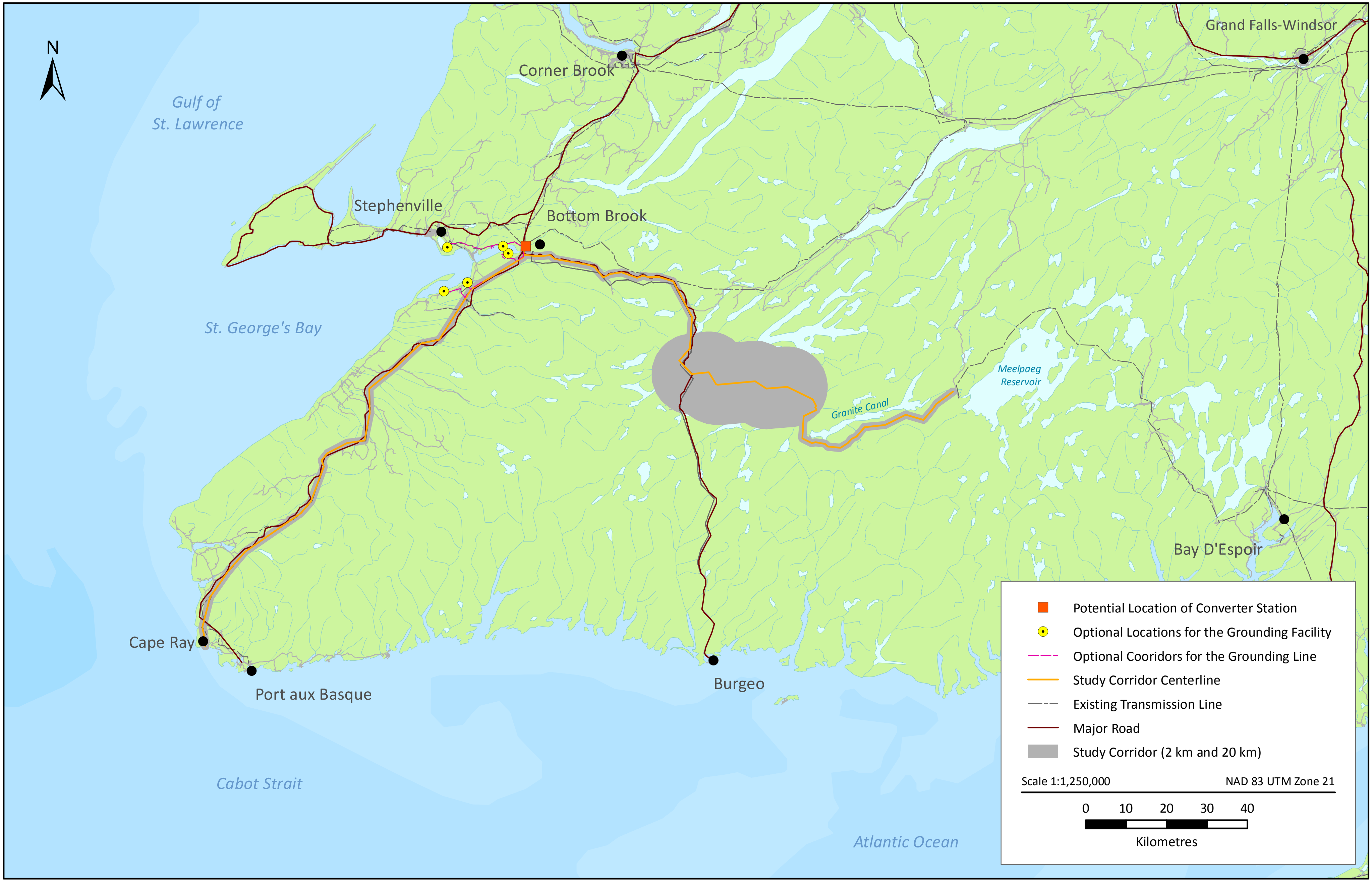
2.3 Project Objectives

The primary objective of the *Maritime Link* is to provide a direct, safe, reliable and cost-effective connection between the electrical system of Nova Scotia and the electrical system in southwestern Newfoundland. Secondary objectives include planning, designing, building and operating the Project with minimal adverse environmental, economic, social and cultural effects, and to create an economic cooperation between Nova Scotia and Newfoundland and Labrador, once the connection is completed.

2.4 Project Components

The Project involves the transmission of high voltage electricity between southwestern Newfoundland and Cape Breton, Nova Scotia. The system will be a bipolar design of +/- 200 to 250 kV DC and a potential 230 kV AC, that is able to transmit up to 500 MW of power. A general overview of the technology proposed for the *Maritime Link* is provided below followed by sections describing specific Project components, such as permanent and temporary structures, associated infrastructure, construction methods and types of equipment used, production capacity, size, and RoWs, in each jurisdiction (i.e., Newfoundland and Labrador, Cabot Strait and Nova Scotia). Proposed Project components for Newfoundland and Labrador and Nova Scotia are shown in Figures 2.1 and 2.2, respectively.

Study areas or study corridors for the Project components have been defined more broadly than the actual Project footprint to scope the EA, assess and accommodate different routing options, and to avoid any sensitive areas that are identified. However, where possible, every effort will be made to remain adjacent to existing RoWs.

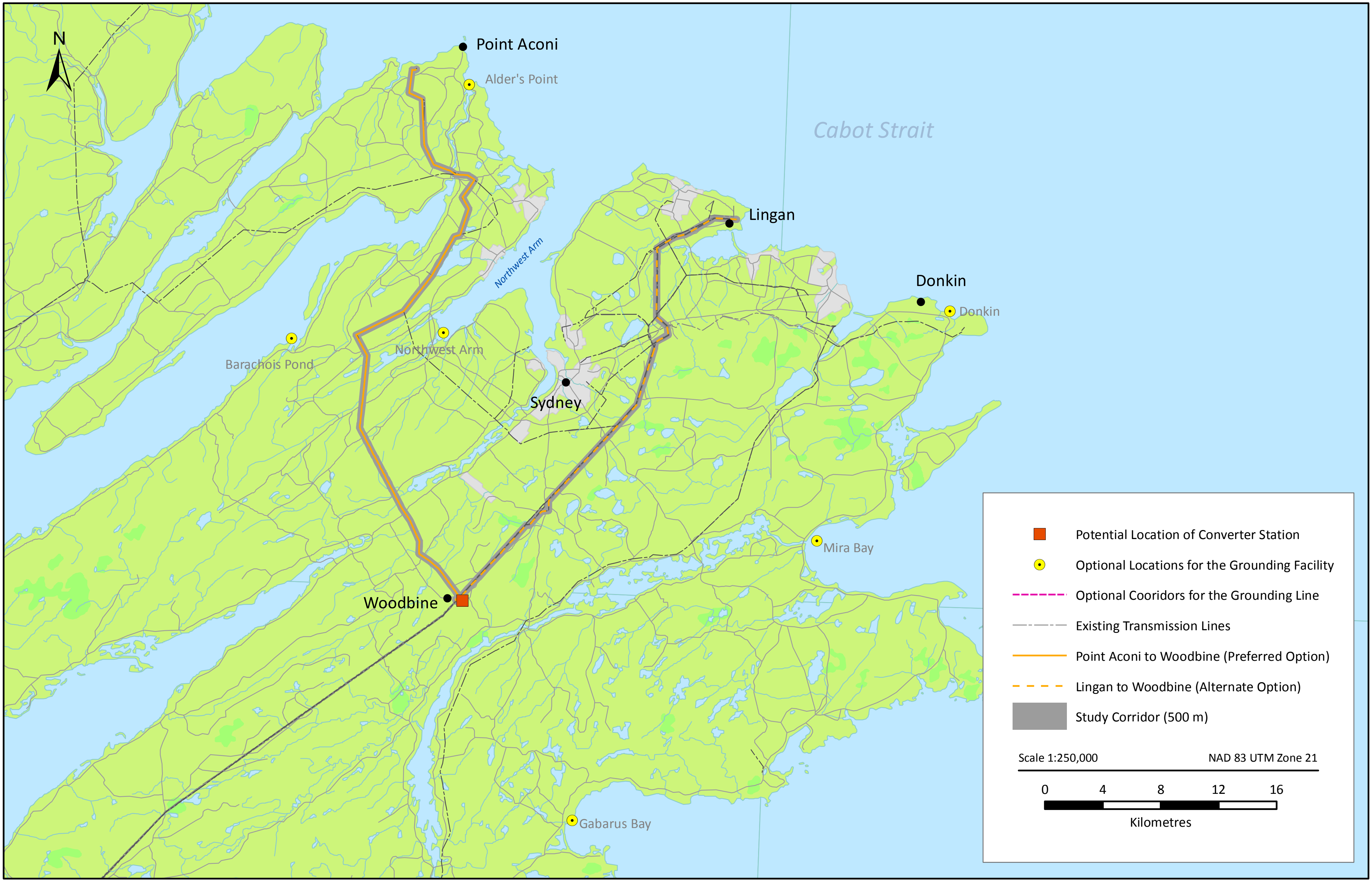


Emera Newfoundland & Labrador

Date: 22NOV2011
Data Sources:
National Atlas Framework 1:1 Million;
CanVec 1:50,000

Figure 2.1

Proposed Transmission Lines in Southwestern Newfoundland



Emera Newfoundland & Labrador

Date: 22NOV2011
Data Sources:
CanVec 1:50,000; NSDNR 1:250,000

Figure 2.2

Proposed Transmission Lines in Cape Breton, Nova Scotia

2.4.1 Overview of Technology

An HVDC transmission system consists of an AC to DC converter, DC transmission line, DC to AC converter, and associated infrastructure. The *Maritime Link* will be a bipole DC system involving two transmission paths, with a subsea component, and two converters of opposite polarity at each end of the circuit.

The length of the subsea cable required for the *Maritime Link* necessitates the use of HVDC technology. In an AC system, the natural effects of the inductive and capacitive components can be significant, especially in applications where long subsea power cables are involved. The electric currents set up by these inductive and capacitive components result in additional losses occurring within the AC transmission circuit as well as reducing the amount of energy which can be delivered to the load. These loss properties are not present with the use of DC technology.

Additionally, the subsea distances involved in this Project exceed the economic point for use of an AC system thus resulting in the decision to employ HVDC transmission technology. The decision to continue with HVDC for the overland segment, between the submarine landing point and the point of interconnection to the AC grid in southwestern Newfoundland and Cape Breton, Nova Scotia, is driven by the fact that HVDC is a more efficient means to transmit bulk power as compared with the HVAC alternative. The requirement of AC to DC conversion increases the initial Project capital expenditures relative to installation of an AC transmission; however, the *Maritime Link* exceeds the break even distance at which DC systems become more economical than AC.

2.4.1.1 Converter Stations

Converter stations consist of concrete foundations; galvanized steel structures to support the electrical equipment and switchgear; a building containing infrastructure that requires sheltering from the elements; associated office and maintenance areas; and an access road. The stations are fenced with locked gates to restrict access to authorized personnel only.

The overall footprint of a converter station is typically 135 m by 240 m. Approximately 25% is taken up by an enclosed converter building. The remaining area houses open air switchgear and other system operating devices commonly found in utility substations.

2.4.1.2 Transmission Towers

Transmission towers planned for the *Maritime Link* will be comparable to existing high voltage transmission towers in the region and will consist of two main types:

1. *Tangent towers*: Also referred to as suspension towers, these are typically wooden or steel structures that function to hold the conductor in place (suspended) and are used on straight runs or low angles.
2. *Dead end structures:* These are typically steel lattice structures with multi-faceted functionality. Unlike the tangent structure which keeps the conductor suspended only when forces in both directions are equal and opposite (symmetrical), the dead end structure is built to withstand asymmetrical loading on the tower. Asymmetrical loading can occur many ways; the two most common are planned maintenance activities or weather-related forces on a structure. They are

also used in situations of high angle turns/bends in the line and when the span is typically larger than normal, such as the case when spanning environmentally sensitive areas such as wetlands and water crossings.

For the *Maritime Link*, the towers will support three conductors and will be on average 30 to 40 m above grade and 200 to 300 m apart. Two conductors, about 58 mm in diameter, will carry power and the third will be a steel overhead ground wire to provide shielding from lightning strikes. Tower heights and spans between towers are based on clearance requirements depending upon terrain along the route as well as environmental considerations (e.g., sensitive habitats, difficult landscapes, etc.). Widening the spans (>300 m) between towers is possible and will be considered as mitigation in avoiding environmentally sensitive areas. The width of the RoW will vary such that if the new transmission line is adjacent to an existing transmission line, the width will be on the order of 76 m. If the new infrastructure is separate from existing infrastructure, the width of both RoWs will be on the order of 86 m (i.e., 38 m for existing and an additional 48 m for new HVDC RoW).

Tower foundation design will depend on selection of tower type and will be informed by geotechnical studies and environmental conditions. Generally, guy wires anchored into the ground support tangents and low-angle structures. Dead end structures typically use steel grillage and depth of foundation depends on geotechnical conditions.

The transmission lines are designed and constructed to meet the following Canadian Standards: Standard C22.3 No. 1, Overhead Systems and Standard C22.3 No. 60826, Design Criteria of Overhead Transmission Lines as set by the Canadian Standards Association (CSA) and issued under the Canadian Electrical Code, Part III.

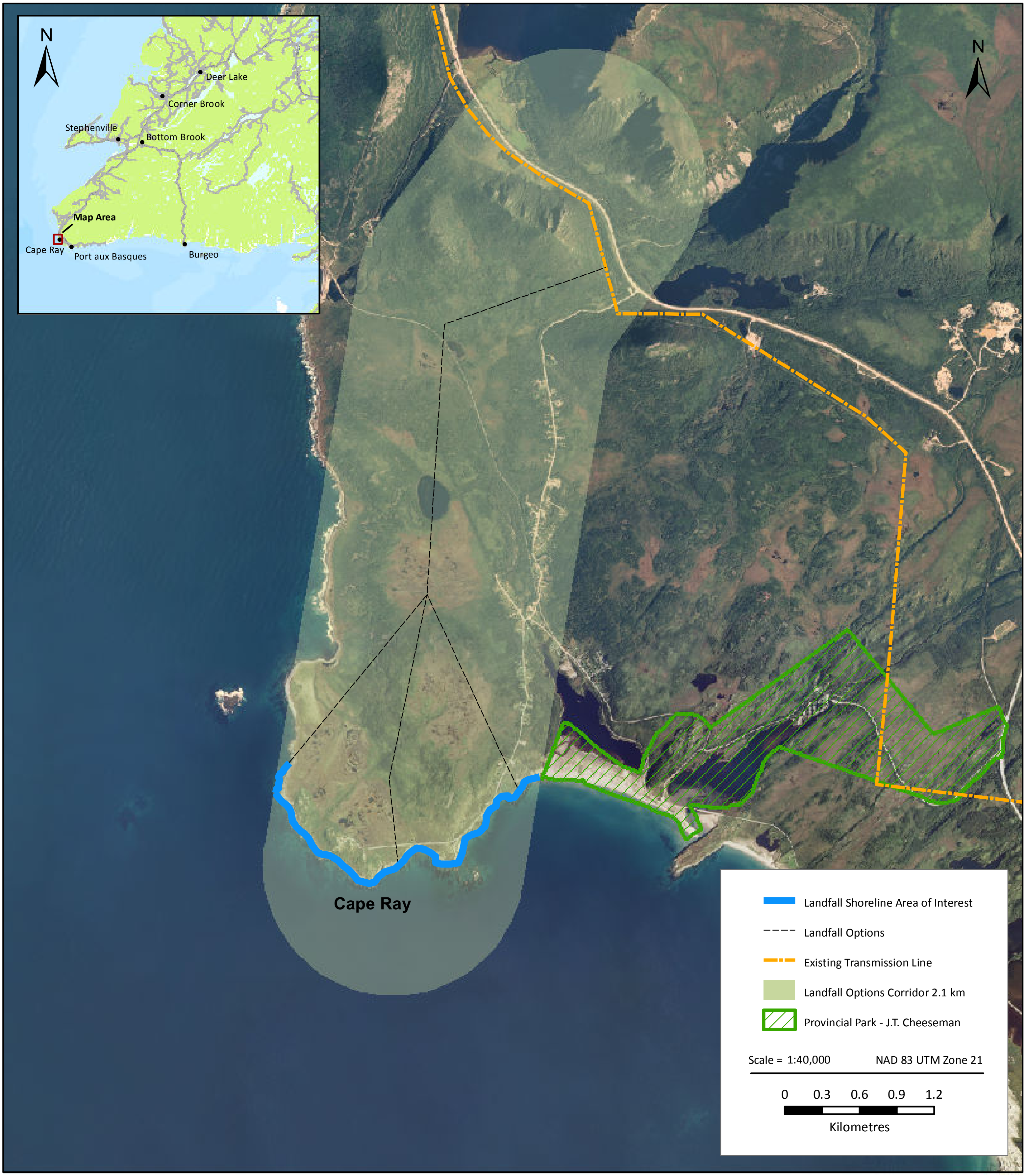
2.4.1.3 Landfall Component

The transition of land-based aerial conductors to subsea marine insulated cables (or vice versa) occur approximately 1 km inland in a compound of approximately 500 m^2 in area and 16 m in height. Potential implications from salt and ice exposure on conductor loading are the main reasons for locating the landfall compound inland from the immediate coastal environment. The arrangement of conductors will remain the same through the transition. The grounding overhead wire used as protection against lightning strikes on the land-based transmission will terminate at the transition compound. Similar to the converter stations, the transition compounds will be constructed over a grounding grid to ensure safety of utility workers against a fault condition.

The subsea cables will be brought ashore near Cape Ray, on the Island of Newfoundland (Figure 2.3) and Point Aconi (or Lingan), Nova Scotia (Figure 2.3). Each landing site will be on the order of 20 m wide; precise onshore locations will be determined based on environmental, socioeconomic, technical and financial considerations with input from key government stakeholders, aboriginal groups, and commercial fisheries interests.

Many sites are under consideration for the grounding system facility site for southwestern Newfoundland (Figure 2.3) and at Point Aconi, Cape Breton (Figure 2.4). In addition to avoiding protected species and areas, and in consideration of commercial and recreational fishing and areas of high archaeological potential, siting will involve the following screening criteria:

- type of site (industrial or greenfield);
- proximity to residential, commercial or industrial infrastructure;
- salinity at the site;
- existing access roads to the site;
- proximity to existing transmission RoW;
- potential wave action impact at the site; and
- potential ice impact at the site.



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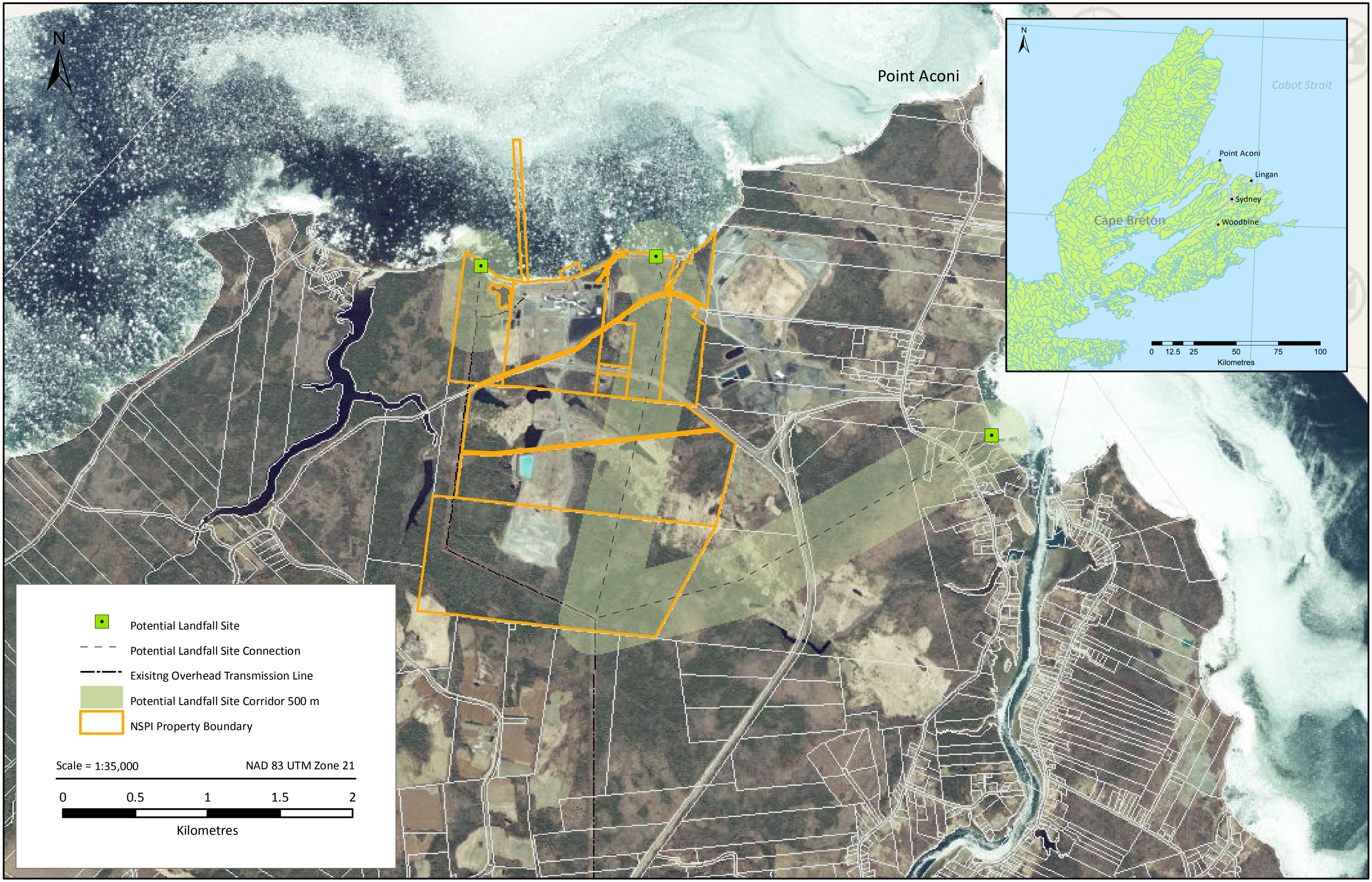
Date: 22NOV2011
Data Sources:

Figure 2.3

Potential Landfall Sites in Cape Ray, Newfoundland and Labrador



Emera Newfoundland & Labrador

Date: 22NOV2011
Data Sources: Bing Aerial; NSPI

Figure 2.4
Potential Landfall Sites in Point Aconi, Nova Scotia

2.4.1.4 Subsea Cables

Two subsea cables with an approximate combined total length of 450 km[1] will be required for the *Maritime Link*. The specifications of the cable will be based on ongoing engineering and technical investigations but will be within the range of 100 to 120 mm in diameter and 30 to 45 kg/m in weight. Two options for the cable type are under consideration: mass impregnated (MI) cable which is a conductor insulated with viscose-fluid impregnated paper and two wound helical armour layers of round wires for protection; and cross-linked polyethylene (XLPE) cable which is made from high density polyethylene and contains cross-linked bonds in the polymer structure creating a highly durable material. A fibre optics cable, for internal system communication, may be incorporated with the subsea cables either imbedded or wrapped with the cables, or laid in parallel.

Measures to bury and/or armour the cables will be taken both to protect the public from interaction with the cables and to protect the cables from potential interaction with commercial fishing gear. The cables are typically buried from the nearshore marine environment through the beach zone and approximately 1 km inland to the landfall compound. Techniques commonly used and which are being considered for cable burial in this zone are trenching; horizontal direction drilling (HDD) or micro tunnelling, with the specific method contingent upon environmental and geological conditions. Trenching involves mechanical excavation of a trench for each cable, approximately 2 m deep and 2 m wide. An excavator on land and a barge providing a platform for the excavator in the nearshore area are typically needed. Horizontal drilling involves a borehole originating from an on land drill rig, guided by directional technology providing real-time azimuth and inclination data to a bit penetration location offshore. Micro-tunnelling involves drilling a conduit for each cable.

Measures used in the deeper water environment to protect the cables may range from armouring the cables with a rock berm in areas of consolidated rock to burial of the cables in the softer sediment. The deeper water environment for the purpose of cable installation will be defined by geophysical information and vessel draft limitations. A mechanical dumping arrangement from the offshore pipe laying vessel may be utilized in locations requiring rock berms. In areas of softer sediments, the marine trenching equipment removes the substrate material, lays the cables, then backfills the trench with the material removed. Site-specific information gathered from the marine geophysical and geotechnical surveys will inform the decision of preferred alternatives for cable installation for both the nearshore and deep water areas of the corridor. It is expected that the level of negative potential effects from the cable will be temporary and minimal within the Cabot Strait. Unlike overland transmission lines, the temporal boundaries are short-term, and regular maintenance activities are not required. There is also a potential for net positive effects, once the cable is laid, as the berm structure can provide increased surface area that can function as habitat for bottom dwelling organisms.

Exclusion zones around the cables are currently not planned. Once the cables are laid, navigation charts will be updated to show cable locations and notices sent out to mariners.

[1] Note that the cables will not be laid in a straight line but will need to account for natural topographical variations on the sea floor of the Cabot Strait.

2.4.1.5 Grounding Sites

Grounding sites are fundamental to the reliability of HVDC transmission systems. These systems involve the installation of an operational high-capacity grounding system at each end of the HVDC line. The system provides a conduit for unbalanced current flow during normal operation and a means for continued operation in a reduced capacity situation, for example, during routine maintenance on system components, or as a result of unlikely component failures. The bipolar HVDC system can therefore continue to function effectively in a reduced capacity as a monopole system during such an event by using a grounding system as a return to complete the DC circuit.

Grounding systems can be sea-, land- or shore-based. In the case of a sea-based grounding system, the ocean is utilized as a return path, rather than a direct physical connection, should one of the conductors become temporarily unavailable. Obtaining effective interconnection requires installation in water with sufficient salinity. Immersed seawater systems are used in HVDC transmission systems in Europe, and comprise more than a third of the grounding systems in use for this application. There are also HVDC transmission systems throughout North America, including Québec and British Columbia. The preferred system for this Project is a shore-based system to be located in close proximity to the converter stations. The selection of the shore-based grounding system depends on a variety of parameters including, but not limited to, physical and geological properties, environmental considerations, land ownership, and weather-related effects on infrastructure. Although the shore-based grounding systems are designed to provide the necessary ground return path for long term outages, the converter stations can be equipped with switching capacity that allows for the out-of-service conductor to be temporarily reconnected to function as a metallic ground return path.

The shore-based grounding systems are often connected to the HVDC converter station by an overhead wood pole line carrying two low voltage metallic conductors, with the wood poles approximately 10 m in height at approximately 60 m intervals. The lines extend to an onshore junction house, approximately 8 m by 8 m, from which a series of bundled cables lead to immersed elements attached to the shoreline structure. The elements are installed at the end of each conductor, and are comprised of graphite rods in a carbon coating and further encased in a non-conductive conduit to provide protection. When in operation, the current is dissipated by spacing the elements to reduce potential environmental effects. Figure 2.5 is an illustration of a shoreline system.

For the *Maritime Link*, the grounding systems will be located in salt water in the vicinity of the converter stations. In Cape Breton, there are six locations under consideration: Mira Bay; Donkin; Alder's Point; Gabarus Bay; Northwest Arm; and Barachois Pond (Figure 2.2). In southwestern Newfoundland, five potential locations are situated in St. George's River estuary, near Stephenville Crossing (Figure 2.1). Specific locations will be finalized prior to submission of the final EIS.

*This image is an example only and the final grounding systems may not be exactly as illustrated above. Grounding systems may vary in terms of footprint.
(Nalcor energy, 2010)

Figure 2.5
Illustration of a Shore Line Grounding system*

2.4.2 Project Overview by Geographic Region

2.4.2.1 Southwestern Newfoundland

The main Project components in southwestern Newfoundland include an HVDC system (including transmission line, shore grounding system, converter station, and transition compound) and an HVAC transmission line.

The footprint of the transmission line will include a new HVAC transmission line from Granite Canal to Bottom Brook, containing a portion paralleling an existing transmission line and a portion within a new RoW, and a new HVDC transmission line between the converter station at Bottom Brook and Cape Ray, adjacent to the existing RoW. A shore grounding system will be installed near Bottom Brook. The total length of transmission corridor along existing RoWs is approximately 265 km. The length of new transmission corridor is approximately 30 km. The total length of line is approximately 291 km (Figure 1.1).

The Study Area defined for the Island of Newfoundland portion of the Project is shown in Figure 2.1 and is as follows:

<u>Granite Canal to Burgeo Highway</u>
A new corridor and new transmission line will be installed between the existing substation at Granite Canal and the Burgeo Highway and will require approximately 25.8 km of new RoW. The Study Area for this component will be 20 km wide.

<u>Burgeo Highway to Bottom Brook</u>
An existing transmission corridor will be expanded and a new line installed between the Burgeo Highway exit point and the Bottom Brook substation, approximately 68 km in length. The Study Area for this component will be a 2 km wide corridor centered on the existing corridor.

<u>Bottom Brook to Cape Ray</u>
An existing transmission corridor will be expanded and a new line installed between the existing Bottom Brook and Cape Ray substations, approximately 135 km in length. The Study Area for this component will be a 2 km wide corridor centered on the existing corridor. This portion of the Project will require approximately 5 km of new RoW near Cape Ray.

This part of the Project includes HVAC conversion to HVDC through a converter station at Bottom Brook. The Bottom Brook converter station will have a voltage rating of +/- 200 kV to 250 kV. The location has been selected based on the presence of the closest, suitable existing substation. The shore grounding system will be sited in the general vicinity of the converter station at Bottom Brook in a saline environment. It is anticipated that no more than 2 km of the grounding system transmission line will be located on new RoW.

Several options for the location of the shore grounding facilities are under evaluation. The final location will depend on the outcome of environmental effects assessment and on-going engineering studies for detailed siting and design. Decisions regarding specific locations of the grounding facilities and routing of the associated connector lines will be made during detailed engineering, and with consideration of environmental information and conditions.

2.4.2.2 Cabot Strait

Two subsea cables will be laid across the Cabot Strait (the Strait) from the general vicinity of Point Aconi (or Lingan), Nova Scotia to Cape Ray, Newfoundland and Labrador. Each cable will be placed within separate RoWs 1 to 4 m wide, approximately 150 m apart across the Cabot Strait, narrowing to approximately 10 m apart on shore. Within each RoW, the cables will follow independent routes and will have conductor protection. Separation of the cables is mainly required for the reliability of the system (i.e., allowing for maintenance on one cable while the other remains in service).

As mentioned previously, the onshore landing stations at each end of the cable crossing will consist of a transition compound approximately 1 km inland from the water at low tide to mitigate some of the impact of salt and ice loading on the conductors. The overhead transmission line in southwestern Newfoundland will terminate at this building, from within which cables will extend underground, within a corridor approximately 50 m wide, out into the Cabot Strait. On the Nova Scotia side, the subsea cables will return to a transition compound in the reverse order and then connect to the overhead HVDC transmission.

The Study Area for the Cabot Strait component is a 2 km wide corridor between Cape Breton and southwestern Newfoundland. Within this corridor, options for cable crossing routes and landing points are being evaluated based on ongoing engineering studies; existing and available information on the geological, bathymetric, and oceanographic conditions; subsea surveys including side-scan and multi-beam sonar; sub-bottom profile surveys; and underwater video. Locations of environmentally sensitive areas, fishing activities and historic sites are also being considered.

2.4.2.3 Cape Breton

The subsea cables will be brought ashore in Cape Breton, Nova Scotia, either at Point Aconi, or Lingan, and will transition to land-based aerial transmission and extend from the coastal area inland to Woodbine, Nova Scotia, which is the location of the DC to AC converter station. An existing transmission corridor will be expanded to accommodate installation of a new transmission line between the existing Woodbine substation, in Cape Breton County, and the Point Aconi Generating Station. The new transmission line will be approximately 50 km in length and the width of the Study Area for this component will be 500 m centered on the existing transmission corridor (Figure 2.2). The arrangement of the DC conductors will be the same as that in southwestern Newfoundland in that it will consist of two conductors rated at +/- 200 to 250 kV and a grounding overhead wire as protection against lightning strikes.

The converter station at Woodbine, Nova Scotia, is considered the end of the Project where the HVDC will be converted to 345 kV AC and integrated into the existing Nova Scotia electricity grid. No transmission lines will extend beyond the converter station other than existing 345/230 kV lines. The shore grounding system will be sited in the general vicinity of the converter station at Woodbine in a saline environment. It is anticipated that no more than 5 km of the grounding system transmission line will be located on new RoW.

Several options for the location of the shore grounding facilities are under evaluation. The final location will depend on the outcome of on-going engineering studies for detailed siting and design. Decisions regarding specific locations of the grounding facilities and routing of the associated connector lines will be made during detailed engineering, and with consideration of environmental information and conditions.

2.5 Project Activities

The following sections provide a description of the construction, operation, maintenance, and decommissioning phases of the Project including the expected timing and scheduling of each phase.

Prior to commencement of Project construction, an Environmental Management Plan (EMP) and associated Environmental Protection Plan (EPP) will be developed and implemented and will incorporate standard management practices and project-specific environmental protection measures to be applied throughout all Project activities. The EMP and EPP will address potential environmental effects, as discussed in the EIS, and will demonstrate how the Project has been designed to avoid, minimize or otherwise mitigate them, and will serve as reference documents for all project personnel, to ensure awareness, expectations, and responsibilities concerning environmental protection. The EPP will include, but not be limited to, the following information:

- contact numbers;
- requirements as outlined by provincial and federal legislation;
- erosion and sediment control measures;
- emergency procedures;
- environmental training; and
- environmental protection measures.

2.5.1 Construction

Project activities during the construction phase of the Project will be required for construction and installation of converter stations, on-land HVDC transmission lines on the Island of Newfoundland and in Nova Scotia, HVAC transmission lines on the Island of Newfoundland, and shore grounding facilities and associated infrastructure. Marine substrate may also be needed to be prepared to accommodate the subsea cables. Construction activities can be conducted in sequence or concurrently in several locations for a linear project. Each construction activity may be staggered so that crews can move along the transmission line completing separate phases sequentially. Construction activities can also be conducted in several segments of the transmission line at once. At the end of the construction phase, clean-up and restoration of all work sites will occur, in accordance with regulatory requirements and standard industry practices. A general overview of the construction phase of the Project is presented in this section.

Substation modifications at Granite Canal will encompass an expansion to the existing switchyard to accommodate an additional line terminal. This line terminal is associated with the construction of proposed Bottom Brook to Granite Canal 230 kV HVAC line.

2.5.1.1 Access and Clearing

Approximately three quarters of the routing required for the construction and maintenance of the *Maritime Link* is already accessible. Although existing access roads will be utilized to the full extent possible, construction of the transmission lines along existing RoWs or through new corridors may still involve building new access routes. Access routes will be constructed within the corridor described above for each section of the transmission line, will be conducted in accordance with standard utility practices and procedures, and will involve the removal of vegetation that exceeds one metre in height at maturity. Clearing will involve cutting vegetation 15 cm or less from the ground. Brush will remain on the RoW and may be chipped. Merchantable timber will be removed. Clearing will be conducted with chainsaws or mechanical harvesters, as appropriate. Buffer zones will be maintained along all watercourses and around sensitive areas. Travel routes will be established within the Study Area, within or as close to the RoW as possible using standard construction practices and mitigation measures. Maximum use of the RoW will be made for access during construction; however, existing road networks will also be used, where necessary. Ground access to distribute materials may be supplemented by helicopter use. At strategic points within the corridor, marshalling yards will be established to receive and temporarily store materials and equipment for use in Project construction. Construction of access routes and marshalling yards may require soil and aggregates for fill. Existing pits and quarries will be used, where possible, and additional fill will be obtained, as needed, from within the RoW. Any new pits and quarries will be identified, established and decommissioned according to regulatory requirements and standard industry practices.

<u>Protection of Fish and Freshwater Habitat</u>
Protection of freshwater habitat will be of utmost importance during construction and maintenance phases. Activities that have the potential to affect freshwater habitat include:

- installation of watercourse crossings;
- clearing and grubbing that may lead to erosion and sedimentation concerns; and
- increased access to the resource through establishment of construction access roads.

The potential for effects to occur will be minimized through mitigation to keep clean water clean and protect water resources and fish.

Watercourse crossings during construction and operations will be avoided, to the degree possible, through project planning and siting, use of helicopter transportation, conducting Project activities, where feasible, when the ground is snow-covered and watercourses frozen, and engineering controls such as temporary bridge spans.

Project planning will take into account existing road and transmission RoWs. The proposed corridor has an extensive existing road network that will be utilized to the extent possible to facilitate construction and access. It is important to note that the Project will utilize suitable existing RoWs in all instances where they exist to minimize the requirement for new RoW development. Consideration of seasonal weather conditions will be a particularly important component of Project execution planning and mitigation in the EPP. Taking advantage of snow covered ground and frozen watercourses during winter months while avoiding, to the extent possible, temporary bridge crossings during spring freshets will be important considerations in the EPP.

Upon completion of the Project, necessary steps (e.g., road barriers) will be taken to mitigate increased exploitation of fishing resources that may occur as a result of increased access associated with the construction of access roads.

Temporary bridges will be employed as a mitigation measure in crossing watercourses of a width agreed to by regulators. These bridges will be designed in accordance with acceptable industry practice and will take into account, but will not be limited to, such parameters as seasonal hydraulic conditions, duration of installation, span length, deck height, load capacities, bank stability. Erosion and sediment controls along the stream bank at the abutments , including use of vegetation buffer zone, will be installed and properly maintained throughout the construction phase of the Project. The location of the bridges will also be strategically placed to achieve proper clearance above water levels so as not to impede or divert flow. Removal of temporary bridges at crossing locations during storm events that exceed the design conditions will be included in the Contingency Plan, as part of the Project EMP. Exact details and plans for crossings will be incorporated in the Project EPP. Upon completion of the Project, all temporary bridges will be removed and watercourse banks stabilized to acceptable industry standards with the exception of routes and water crossings required to be in place to access the transmission line for maintenance activities. Any permanent crossings such as for maintenance roads, which require in-stream work, will follow applicable regulatory permitting processes.

The location and types of water crossings and access routes for the *Maritime Link* will be determined as part of ongoing Project engineering and design. Once construction is complete, access routes and water crossings will be decommissioned and rehabilitated, with the exception of routes and watercourse crossings required to be in place to access the transmission line for maintenance activities. All crossings will be designed, constructed and executed in accordance with best practices, regulatory requirements, and with procedures developed in a regulator-approved, Project specific EPP.

2.5.1.2 Distributing Materials

Materials such as steel sections for transmission towers, conductor reels and hardware will be distributed along the transmission corridor access routes by tracked vehicles or other suitable equipment. Helicopter distribution will also be used, as required. Where possible and practical, distribution will occur during the winter months when the ground is frozen and/or snow covered, for easier access and to lessen ground disturbance.

Converter stations will incorporate large components, such as transformers and electrical components and building structural components, which will be transported by road from delivery and unloading facilities at suitable marine ports nearby.

2.5.1.3 Installing Towers

Installing the transmission towers, both steel towers and wooden pole structures, includes construction of foundations, tower assembly, and erection. Foundations will require the excavation of material at each tower location and borrow materials may be required to prepare the foundations. Where foundations are on bedrock, blasting may be required. Where possible, wetlands will be avoided; however, if avoidance is not possible, material will be removed prior to foundation installation according to regulatory requirements and standard practices. The locations of the towers and site-specific information for each tower will be determined as part of ongoing Project engineering and design.

Once the materials required to build the transmission towers are distributed along the RoW and the foundations are in place, the towers will be assembled and erected. The steel sections will be bolted together to form the lattice structure and cranes will be used to attach the tower sections and lift them onto the foundations where they will be bolted. Guy wires will be attached to the towers, as required, anchored to the ground, and appropriately tensioned to stabilize the towers. Insulators will be installed on each tower prior to stringing the conductors.

Wooden poles need to be set about 2.5 m below grade and backfilled. If wetlands cannot be avoided, the wooden poles are set in circular metal enclosures, 1.8 m to 2.4 m in diameter, or in 3 m^2 wooden cribs. Clean, 15 cm diameter, rock is used as backfill.

A viewscape study is currently underway to analyze the potential visual obstructions that may occur to communities and other selected locations as a result of tower and associated infrastructure installation.

2.5.1.4 Stringing Conductors

Stringing the conductors and attaching them to the transmission towers is completed by rolling the conductor onto the line using stringing blocks or pulleys to string from tower to tower. A specialized crew is needed to attach the conductor to each tower. Once the conductors are attached, each tower is inspected to ensure that all connections are in place and the conductor is correctly tensioned.

As part of the connection to the existing HVAC system, there may be some upgrades to existing infrastructure including transmission towers, conductors, switchyards, etc., which will be required subject to design and system integration studies. These upgrades will not represent changes to the footprint of the existing HVAC system.

2.5.1.5 Installing Grounding Facilities

A grounding system involves two components: a grounding system transmission line from the converter station; and the shore based grounding site. Construction and installation of the grounding system transmission line fundamentally involves the same activities described above for the aerial transmission line construction, access and clearing, transporting of materials, installation of towers and stringing of conductors. The grounding transmission lines will utilize existing RoW or parallel existing RoW where possible in an effort to reduce new RoW construction. The lines will originate from the converter station and terminate at a junction house near the shore based grounding site. The nearshore elements will be trenched in and protected by an armour rock breakwater.

2.5.1.6 Preparing Marine Substrate

For safety and reliability purposes, various measures will be utilized to protect the subsea cables. A RoW following natural protective features such as deep valleys and ocean contours of the Strait will be favoured. However, in order to protect the cable from exposure to fishing equipment, additional physical protection may be provided. This will involve burial of the cables through trenching and/or being covered with washed rock berms consisting of 20 cm to 25 cm diameter cobble. A protective cover using concrete mattresses or formed concrete sections are alternatives to a cobble berm. For trenching, a sufficient passageway may be acquired by drilling and/or water jetting. It is expected that there may be specific physical locations where seafloor preparation (i.e. rock removal) prior to the laying of the cable may be necessary. In areas immediately adjacent to the coastline, HDD and/or trenching are being considered as options. Mechanical trenching will involve the use of excavators in shallow water to a point offshore in deeper water where excavators will continue trenching from a barge.

HDD at both landing sites is one option being considered for the Project. This option would involve drilling a conduit for each cable for a distance of approximately .5 to 1 km from the onshore cable station out to and under the Cabot Strait. If the rock quality requires stabilization, the hole may be lined with a liner constructed from steel or polyethylene type materials. Another option involves trenching from the onshore cable station out to and in the Cabot Strait. Once placed in the trench, the cables may be protected with rock gravel from a fall-pipe vessel which places the backfill material. Site-specific information gathered from the marine geophysical surveys will be a key factor in selecting a preferred option.

Trench excavation from onshore to 5 or 6 m of water depth will likely be conducted using land-based hydraulic excavators, subsea drilling and dredgers. A subsea excavator such as a crawler operated underwater device with a hydraulic cutter-head will then be used to dig a deep, narrow trench. Blasting may be required in some areas depending on the substrate and bedrock. Blasting activity within or near the marine environment will be minimized to the degree possible and practical and will comply with regulatory requirements.

Following completion of the lined drill hole or trench excavation work subsea mechanical trenching will be used to bury the cables about 1 to 2 m below the seabed by temporarily displacing seabed material to allow the cable to rest below the surface. Marine geophysical and geotechnical surveys are being conducted to assess the marine environment for such characteristics as substrate composition, bottom profile, and water depths. The results will support ongoing engineering work to evaluate the various options.

2.5.1.7 Laying Subsea Cable

The general process for laying subsea cables following preparation of the seabed involves conducting a survey of the planned cable routes prior to laying the cable. The survey will be conducted using a remotely operated vehicle (ROV) or other equivalent technology to verify that the substrate along the prepared route is clear of obstructions.

Cable-laying vessels are typically 100 to 135 m long. The cable is loaded onto an installation vessel and transported to the site where the cable is eventually laid. A tug boat may assist in maintaining positions during installation. Further survey and engineering work will help in determining on which end the installation will begin. Prior to laying the cables, pennant wires will be installed and connected to a hydraulic winch anchored onshore. Once an inspection of the equipment and seabed has occurred, a hoisting wire is lowered from the installation vessel and connected to the pennant wire from the on-shore winch. The pennant wire is connected to the cable onboard the installation vessel and the cable is lowered overboard. The onshore pull-in winch then pulls the cable towards and through the drill hole or into position on the seabed (if the shoreline is trenched rather than tunnelled). The cable is deployed overboard by the laying wheel at the stern of the installation vessel. Once the cable is in place and secured at one end, the vessel lays the cable along the route. An ROV monitors the cable touchdown along the route and ensures the cable is laid along the optimal path. Where the substrate does not permit the cables to be buried, it will be covered with a cobble berm approximately 1 to 1.5 m high and up to 3 m wide across the base.

Once the vessel reaches the other side of the Strait, at a depth of about 8 to 10 m, the vessel turns and backs towards the shore. Floats are attached to the remaining length of cable, which are deployed overboard. Workboats manoeuvre the cable, which is towed to a pre-installed wire attached to a pull-in winch installed at the landing site. The cable is then either fed through the drill holes or installed in the trench. When the cable is in the correct position, divers deflate the floats in order that the cable can be laid into position.

2.5.1.8 Accommodations Facilities and Workforce

The construction workforce will be accommodated in nearby lodgings where these are accessible to the construction site. In remote locations or where a large workforce is required, lodging will be provided through small temporary accommodation facilities established in the vicinity of the construction site along the RoW. In southwestern Newfoundland, one to two accommodation facilities are being considered. Each accommodation facility will have the capacity to lodge about 150 workers and is expected to occupy an area of about 150 m by 150 m. Within the facility, sleeping quarters, a dining hall and recreation area will be installed. The facility will rely on energy from diesel generators. Water for domestic use will be brought into the facility and wastewater and domestic wastes will be contained and disposed of according to regulatory requirements. The facility will be planned in consideration of environmental and social issues and will be removed once construction is completed.

The *Maritime Link* is expected to create approximately 2,700 direct and indirect person years of employment, in the region. Table 2.1 provides a generalized list including associated National Occupational Classification (NOC) codes.

Table 2.1 Occupations and Associated NOC Codes likely required for the Construction Phase of the Maritime Link

Occupation	NOC Code
Financial Manager	0111
Human Resource Manager	0112
Purchasing Manager	0113
Financial Auditor and Accountant	1111
Secretary	1241
Office Clerk	1411
Accounting Clerk	1431
Payroll Clerk	1432
Administrative Clerk	1441
Courier, Messenger & Door-to-Door Distributors	1463
Purchasing & Inventory Clerk	1474
Civil Engineer	2131
Mechanical Engineer	2132
Electrical & Electronics Engineer	2133
Geological Engineer	2144
Land Surveyor	2154
Civil Engineering Technologist & Technician	2231
Electrical & Electronics Engineering Technologist & Technician	2241
Drafting Technologist & Technician	2253
Land Survey Technologist & Technician	2254
Construction Inspector	2264
Electrician	7241
Industrial Electrician	7242
Power System Electrician	7243
Electrical Power Line & Cable Worker	7244
Sheet Metal Worker	7261
Ironworker	7264
Welder & Related Machine Operator	7265
Carpenter	7271
Concrete Finisher	7282
Construction Millwright & Industrial Mechanic	7311
Heavy-Duty Equipment Mechanic	7312
Crane Operator	7371
Driller & Blaster – Surface Mining, Quarrying & Construction	7372
Commercial Driver	7382
Truck Driver	7411
Heavy Equipment Operator	7421
Construction Trades Helper & Labourer	7611
Supervisor, Mining & Quarrying	8221

Source: NOC 2006.

Potential economic benefits from contracts for monitoring and vegetation control are also expected. The classification of occupations and number of employees required for the construction and operation of the Project is subject to on-going review.

2.5.1.9 Emissions and Discharges

The Project will meet or exceed regulatory requirements or standards for liquid and gaseous emissions and discharges and waste management. ENL will minimize, to the extent practical, volumes of wastes and concentrations of contaminants entering the environment. As part of the EMP, a Waste Management Plan (WMP), to minimize waste discharges and emissions and identify waste reduction and other mitigative measures, will be in place for the construction phase of the Project.

The Project will adhere to standard engineering practices and industry controls to minimize the potential environmental effects from all construction activities.

<u>Air Quality</u>
Air quality effects associated with construction activities are generally a result of emissions from engine exhaust from construction equipment and the generation of dust during construction. Control measures for dust suppression will be used in construction areas, as needed. Air emissions from engine exhaust will be localized, intermittent and temporary, lasting the duration of construction activities. Regular inspection and maintenance of construction equipment will minimize exhaust fumes.

All air emissions will be managed to ensure adherence to the *CEPA* and applicable provincial ambient air quality objectives.

<u>Noise Emissions and Electromagnetic Fields</u>
Project construction noise will be temporary, localized and intermittent with equipment being operated on an as-needed basis. Noise generated during construction will be within regulatory guidelines.

<u>Sedimentation, Siltation and Wastewater Discharges</u>
Even though the Project will avoid watercourses and wetlands, where possible, there is a potential for sedimentation resulting from land-based construction activities. As noted above, the EPP will include details for erosion and sediment control measures such as:

- installing silt fences to minimize transportation of silt from the construction site into watercourses;
- controlling runoff during the construction phase;
- maintaining buffer zones;
- minimizing construction activities in periods of heavy rainfall; and
- minimizing the disturbance area through proper scheduling of site activities.

Construction activities will also be conducted in the marine environment. Preparation of the seafloor prior to laying the subsea cables and subsequently moving materials to protect the cables may result in sediments on the seafloor being disturbed and mixed into the water column. Ongoing monitoring and analysis will assess the extent and degree of sedimentation associated with construction activities. The

EPP for this component will provide control measures for construction activities planned in the marine environment.

Wastewater will be sampled and tested prior to use and discharge. If treatment is necessary, procedures will be developed for treating the wastewater prior to discharge.

All activities that have the potential to result in a harmful alteration, disruption or destruction of fish habitat will be carried out only in accordance with authorization under the *Fisheries Act* and applicable provincial legislation.

Solid and Hazardous Waste

Potential sources of non-hazardous or solid wastes generated by construction activities include materials such as wood, scrap metals and domestic wastes. Where possible and practical, wastes will be segregated as recyclable and non-recyclable, with recyclable material collected and transported to a licensed recycling facility. Otherwise, solid wastes will be transported to and disposed of in approved landfill sites.

During construction in the marine environment, material will be disturbed on the seafloor (e.g., trenching) in preparation for laying the subsea cables. This will involve sidecasting of sediments and once the cable is laid, either backfilling the trench with the sidecast material or removing, transporting and disposing of the sediments in compliance with applicable regulatory requirements such as the Disposal at Sea Regulations under *CEPA*. Any disposal of sediment from other construction activities, such as tunnelling or drilling, will also be conducted in compliance with applicable regulatory requirements.

Waste fuels, oil and lubricants are likely to be generated during construction activities. These will be stored, handled, delivered and removed by a licensed contractor and recycled or disposed of at an approved facility. As part of the Project EMP, a Spill Management Plan and Emergency Response and Contingency Plan will also be developed and implemented to minimize risk of effects from release of potentially hazardous materials.

2.5.2 Operation and Maintenance

Following construction and commissioning, the Project is expected to operate continuously. Maintenance activities will include regular inspection, repairs, and vegetation management along the RoW.

Inspection of each Project component will occur on a regular basis. Inspection of the land-based infrastructure will be undertaken from aircraft or by using all-terrain vehicles in the summer or snowmobiles in the winter. Where possible, four-wheel drive vehicles may be used. The subsea cables will be inspected periodically by ROV or using other appropriate inspection technology.

Inspection will include monitoring vegetation as part of a long term vegetation management plan. It is expected that five to ten years after construction is complete, vegetation management will be required. Vegetation management will be focused on removing trees and shrubs which may impede the reliable operation of the transmission system. Procedures for removal and control of vegetation will range from manual cutting to selective use of approved herbicides. Herbicides will be applied by crews certified in the use of herbicide application, in accordance with standard industry practices and applicable regulations. The frequency of vegetation management will depend on the type of vegetation and the productivity of particular habitat.

2.5.2.1 Emissions and Discharges

As with the construction phase of the Project, controls of emissions and discharges during the operation phase will meet regulatory requirements or standards. ENL will continue to minimize, to the extent practical, volumes of wastes and concentrations of contaminants entering the environment and a WMP will be developed and implemented.

The Project will adhere to standard engineering practices and industry controls to minimize the potential environmental effect from operation activities.

<u>Noise Emissions and Electromagnetic Fields</u>
Electromagnetic fields (EMFs), audible noise, and radio interference are often raised as concerns by stakeholders in relation to the operation of transmission infrastructure projects. The HVDC and HVAC transmission system will be designed, constructed and operated to comply with applicable CSA Standards.

EMFs are forces that surround electrical equipment and systems such as transmission lines. HVDC systems do not emit time-varying EMFs, rather they emit a low static magnetic field that is comparable to the magnetic field of the earth. Further assessment of potential field effects from the HVDC transmission system will be undertaken and results will be incorporated into the Project design and included as part of the EIS.

There is expected to be a level of audible noise from the HVDC lines resulting from small amounts of the electrical energy of the conductor interacting with the air around the conductor. The level of interaction depends on climate conditions, in particular temperature, humidity, wind speed and direction. The difference between sound emissions from HVAC systems, more common in Newfoundland and Labrador and Nova Scotia, and HVDC systems, more common in Europe, is that the noise levels of HVAC systems are greater during wet weather while for an HVDC system, noise levels are greater in fair weather conditions.

<u>Solid and Hazardous Waste</u>
Hazardous waste expected to be generated from Project operation activities will include small quantities of fuels, oil and lubricants. These will be stored, handled, delivered and removed by a licensed contractor and recycled or disposed of at an approved facility. A Spill Management Plan and Emergency Response and Contingency Plan will also be developed and implemented to avoid potential effects from release of potentially hazardous materials.

2.5.3 Decommissioning

Decommissioning is not contemplated as the *Maritime Link* is expected to be in operation for an indeterminate time. If decommissioning is required in the future for part or all of the transmission system, it will be planned and implemented according to the relevant standards and regulatory requirements at that time.

2.6 Project Schedule

Project construction is planned to begin in 2014 and first power delivered late in 2016, or in early 2017. The Project schedule is expected to become more detailed in the next months. The current schedule is shown in Figure 2.6.

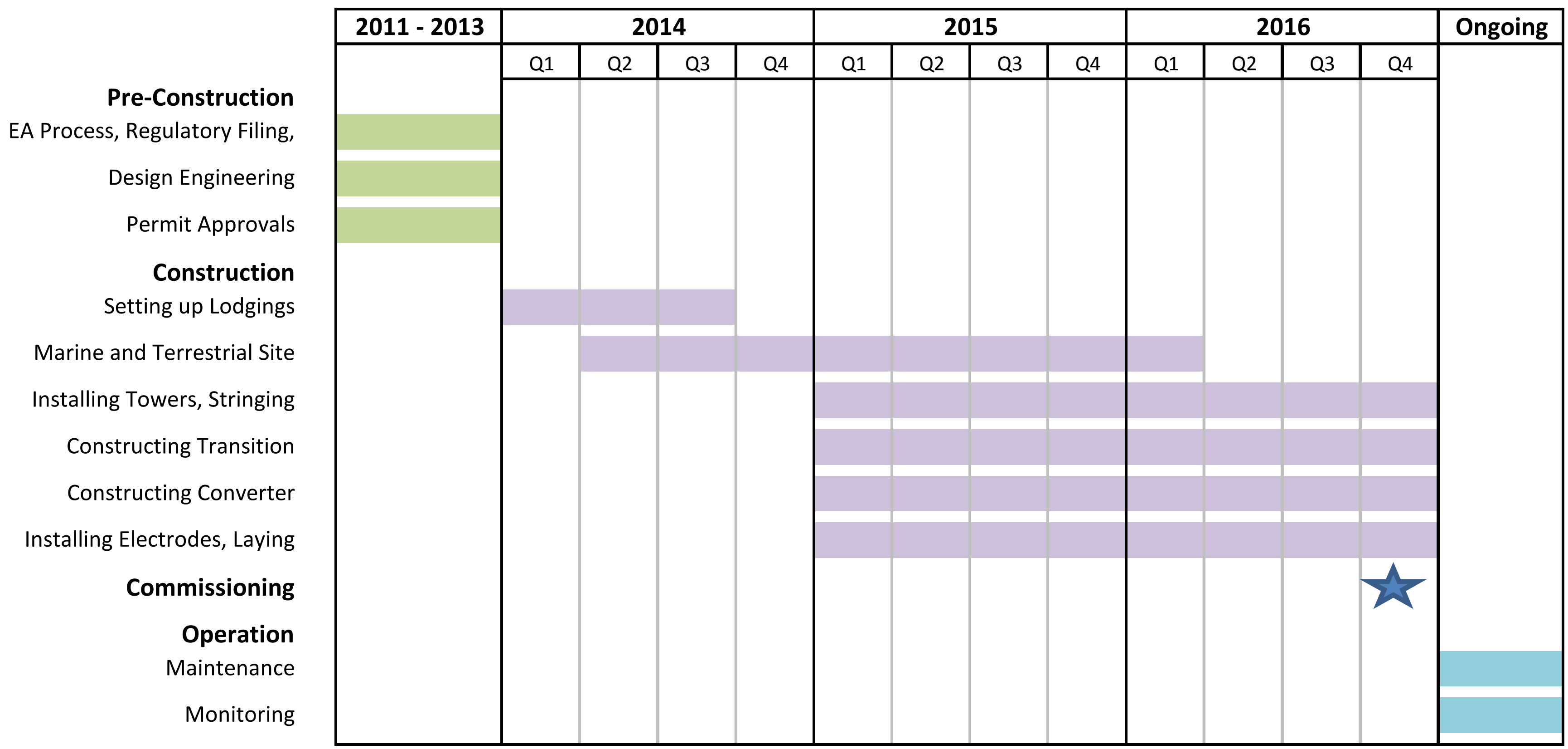


Figure 2.6
Current Project Schedule for the Maritime Link

3 PROJECT SITE INFORMATION

The following sections provide an overview of the environmental features and land use in and near the Project area, based on available information.

As previously described, the transmission line and subsea cables will extend across the southwestern portion of the Island of Newfoundland, the Cabot Strait, and Cape Breton, Nova Scotia, thereby traversing a range of natural and human environments.

3.1 Southwestern Newfoundland

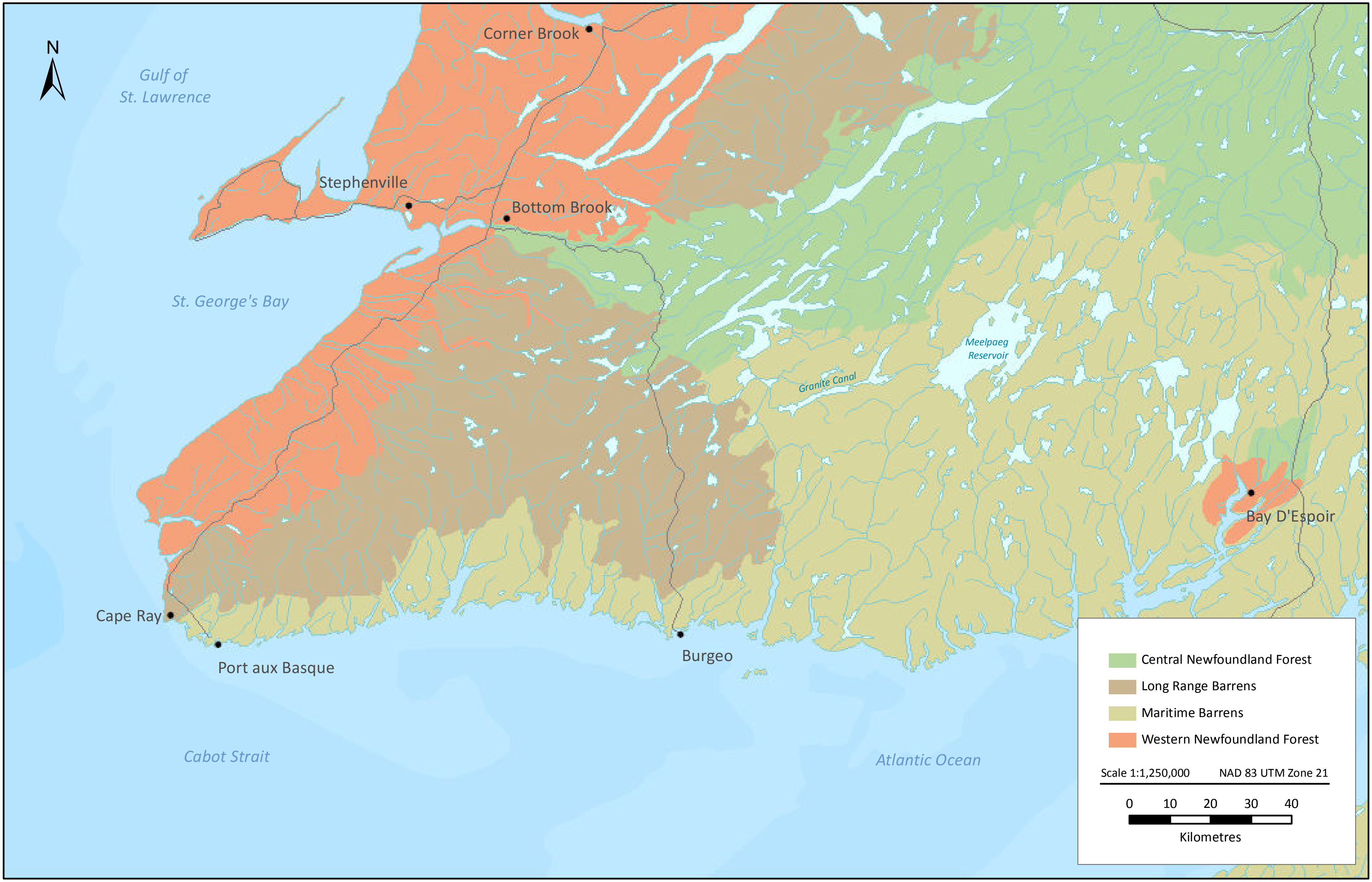
3.1.1 Environmental Features

The Island of Newfoundland component of the Project is located in the southwestern portion of the Island extending from Granite Canal to Cape Ray via Bottom Brook (Figure 2.1).

The west coast of the Island of Newfoundland borders on the Gulf of St. Lawrence separated from Cape Breton, Nova Scotia by the Cabot Strait. The Island of Newfoundland lies within the Boreal Shield Canadian Ecozone, which extends from northern Saskatchewan east to the Island of Newfoundland, passing north of Lake Winnipeg, the Great Lakes and the St. Lawrence River (Parks Canada 1986). This largest of Canada's ecozones is named after the intersection of the boreal forest and the Canadian Shield (the Shield) (Canadian Biodiversity Website n.d.). Glaciers extensively gouged the Precambrian granite bedrock of the Shield creating a series of broadly rolling uplands, interspersed with lakes and wetlands.

3.1.1.1 Ecoregions

Overall, the Island of Newfoundland has nine ecoregions, which are further divided into 21 sub-regions (Figure 3.1) (Bell 2002). The Project will pass through four ecoregions: the Western Newfoundland Forest; the Long Range Barrens; the Maritime Barrens and a small section through the Portage Pond sub-region of the Central Newfoundland ecoregion. Each of these four ecoregions is described briefly in Table 3.1.



Emera Newfoundland & Labrador

Date: 22NOV2011
Data Sources: PNAD 2007

Figure 3.1
Ecoregions of Southwestern Newfoundland

Table 3.1 Ecoregions of Southwestern Newfoundland within the Project Area

Ecoregion Description
Western Newfoundland Forest
▪ Elevations range from sea level to just over 800 m above sea level (asl). ▪ Protection from northeasterly winds is provided by the Long Range Mountains, resulting in the best growing conditions in the province. ▪ Soils are classified as humo ferric podzols; brown soils containing mostly inorganic materials. ▪ Geology consists of young sandstones, shales and conglomerates. ▪ Forests are mostly balsam fir (*Abies balsamea)* with a dominant floor covering of wood ferns (as opposed to mosses). Black spruce (*Picea mariana)*, tamarack (*Larix laricina)*, and shrubs grow in poorly drained sites. Other common tree species include yellow birch (*Betual alleghaniensis)* (common in protected valleys below 200m), white pine (*Pinus strobus),* trembling aspen *(Populus tremuloides)*, and red maple (*Acer rubrum),* which is the most common and robust tree species in this ecoregion. ▪ Two types of alder swamps; golden rod/alder and bracken fern/alder, occur only in portions of sub-regions 1d and 1e where soil is water logged or poorly drained. ▪ There are no reptiles and only one amphibian, the green frog (*Rana clamitans melanota)*.
Long Range Barrens
▪ Includes the mountainous areas above the treeline. ▪ Elevations range from sea level to approximately 815 m asl. ▪ Geology consists of three groups: Notre Dame Rocks; Exploits Rocks; and Gander Zone Rocks. ▪ Covered by sparsely forested heath and moss barrens. Trees only occur as krummholz (tuckamore) usually dominated by black spruce, balsam fir, and tamarack as well as sheep laurel (*Kalmia angustifolia)* and mosses [small patches of forest may occur in sheltered valleys with curly grass fern and black huckleberry (*Gaylussacia baccata)*]. ▪ Ground vegetation is dominated by arctic-alpine plants. Exposed sites support mixed evergreen and deciduous shrubs. ▪ String fens and slope bogs are common and cover large areas.
Maritime Barrens
▪ Elevation rises from sea level to approximately 250 m asl. ▪ Geology is consists of a mixture of sedimentary rocks and granites. ▪ Soils are classified as humo ferric podzols; brown soils containing mostly inorganic materials. ▪ Terrain is gently rolling ground moraine scattered with gigantic boulders left by retreating glaciers and hundreds of lakes and ponds. ▪ Balsam fir is the dominant tree species occurring in almost pure stands, but usually stunted, broken by extensive open heathland dominated by *Kalmia angustifolia* on protected slopes where snow accumulates and by cushions of *Empetrum nigrum* or *Empetrum easmesii* on windswept ridges and headlands. Fires have led to the replacement of fir by sparse stands of black spruce, balsam fir, tamarack, and shrubs, along with mosses and lichen.
Central Newfoundland Forest (Portage Pond Sub-region)
▪ This ecoregion is the most continental part of the Island of Newfoundland with higher elevations displaying rugged and rocky terrain, and lower areas having a more rolling terrain. ▪ Forestry is main industry in this ecoregion. ▪ Although some areas lack good forest growth due to exposure to winds and wet, cold soil conditions, balsam fir and black spruce dominate on steep, moist, upland slopes. Disturbed sites are dominated by black spruce, paper birch (*Betula papyrifera*), and trembling aspen and *Kalmia* heath and lichens are found on drier sites. ▪ Bogs, mostly domed bogs, are common and are distinguished from those in the Western Newfoundland

Table 3.1 Ecoregions of Southwestern Newfoundland within the Project Area

Ecoregion Description
Forest ecoregion by the absence of dwarf huckleberry (*Gaylussacia dumosa*) and black huckleberry. ▪ Caribou – primarily members of the Buchans herd – occur in this sub-region as does the largest remaining population of the American marten (Threatened) in areas of old-growth forest. ▪ There are no reptiles and few amphibians.

Sources: Bell 2002, Forestry Services Branch 2010, PNAD 2007, PNAD 2008

Notes:
1. String fens: Narrow ridges of hummocky vegetation alternating with numerous pools. Also known as ribbed fens.
2. Slope bogs: Generally found on slopes in poorly drained areas and can sometimes contain a scattering of pools.
3. Domed bogs: Bogs with convex surfaces that form mainly in forested valley and basins. Typically, circular pools of standing water radiate outwards from this bulge.

3.1.1.2 Vegetation

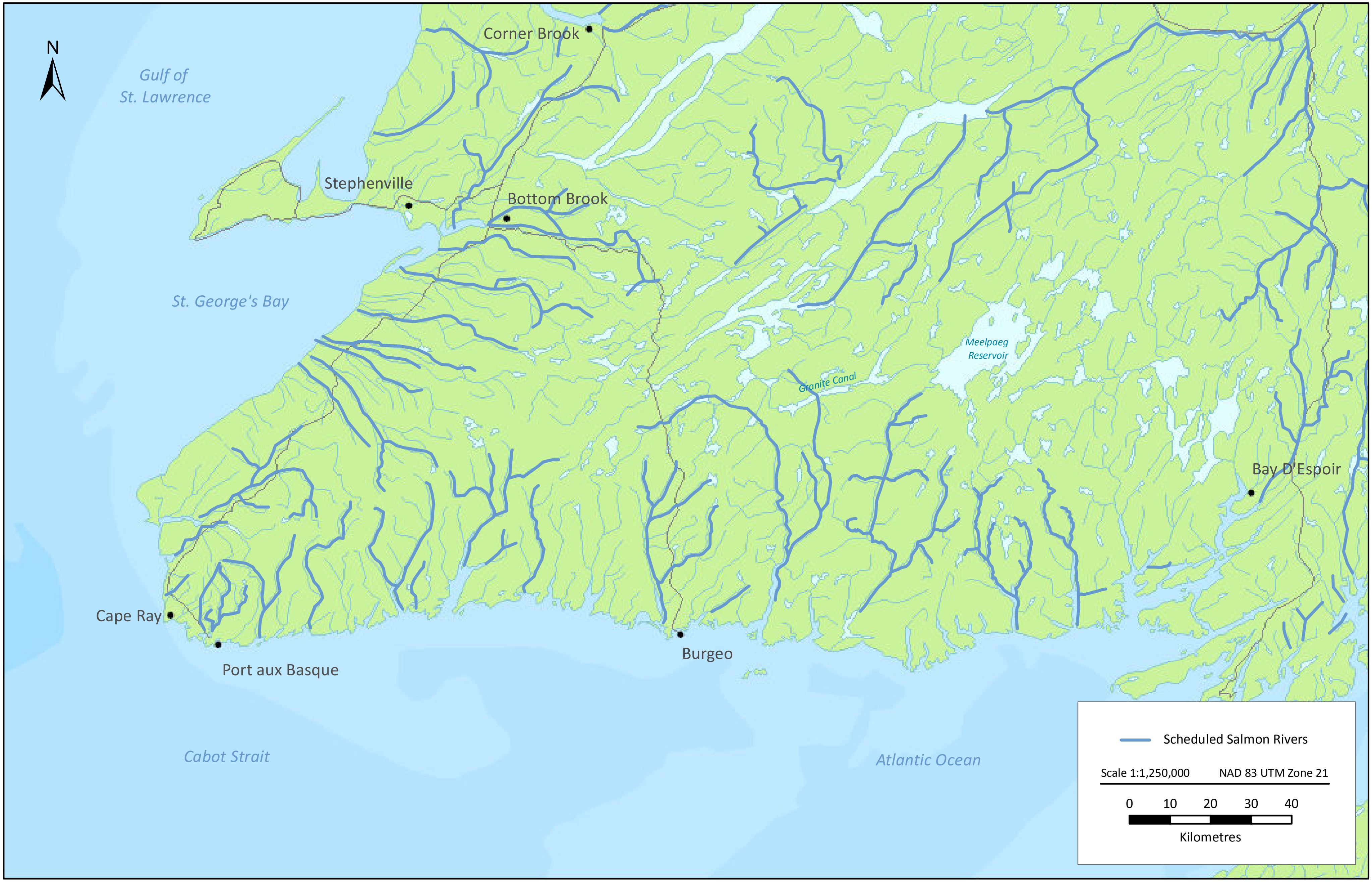
Vegetative communities vary throughout this part of southwestern Newfoundland and are determined, in large part, by the level of exposure to environmental conditions. Overall, forests are dominated by balsam fir and black spruce with an abundance of mosses. In exposed areas, trees occur only as krummholz (tuckamore), usually dominated by fir and spruce, along with tamarack and dwarf kalmia. Other tree species include white pine, trembling aspen and red maple. Stands of yellow birch occur in protected areas. Much of the higher elevations contain sparsely forested heath and moss barrens. Here ground vegetation is dominated by arctic-alpine plants or “dwarf shrub heaths” and sheep laurel, rhodora (*Rhododendron canadense)*, low bush blueberry (*Vaccinium angustifolium)*, dogberry (*Sorbus decora)*, mountain holly (*Ilex mucronata)* and stunted balsam fir are also present. Alder species form riparian edges, along watercourses and in regions of high moisture levels, will form alder swamps or thickets (Newfoundland History 2004, PNAD 2008).

3.1.1.3 Aquatic Habitat and Fish

Shallow soil and bedrock deeply scoured by glaciers have produced numerous lakes and ponds, and short, swift-flowing rivers scattered across the region. There is a marked seasonal variation of flow in most of the rivers with peak flow occurring in late spring or early summer. In the southern part of the Island of Newfoundland, peak flow can occur as early as April (Newfoundland and Labrador Heritage 2007).

In southwestern Newfoundland, the Project will cross or be located adjacent to a number of rivers and lakes, including Scheduled Salmon Rivers (Figure 3.2) (DFO 2011a).

Fish known to be present in southwestern Newfoundland include: nine-spine, three-spine and black-spotted stickleback (*Pungitius pungitius*, *Gasterosteus aculeatus*, and *Gasterosteus wheatlandi*), Atlantic salmon (*Salmo salar),* brook trout (*Salvelinus fontinalis),* rainbow smelt (*Osmerus mordax),* American eel (*Anguilla rostrata)*(ranked by *SARA*, COSEWIC, and the province of Newfoundland and Labrador), Arctic char (*Salvelinus alpinus),* mummichog (*Fundulus heteroclitus),* and banded killifish (*Fundulus diaphanous).* Of these species, American eel and banded killifish are of federal and/or provincial conservation concern. Additional information on species with conservation status is provided in Section 3.1.1.6.



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Date: 22NOV2011
Data Sources: DFO 2011a;
National Atlas Framwork 1:1 Million

Figure 3.2

Scheduled Salmon Rivers in Southwestern Newfoundland

3.1.1.4 Terrestrial Wildlife

Common terrestrial wildlife species in the Study Area include: coyote (*Canis latrans*), moose (*Alces alces),* American mink (*Mustela vison),* snowshoe hare (*Lepus americanus),* Canada lynx (*Lynx canadensis),* American black bear (*Ursus americana),* red fox (Vulpes vulpes), beaver (*Castor canadensis),* muskrat (*Ondatra zibethica),* river otter (*Lutra canadensis),* short-tailed weasel (*Mustela ermine),* little brown bat (*Myotis lucifugus),* and various other small mammals such as Eastern chipmunk (*Tamias striatus),* masked shrew (*Sorex cinereus),* and American red squirrel (*Tamiasciurus hudsonicus*).

Caribou (*Rangifer tarandus caribou*) are present in both the Long Range Barrens and Maritime Barrens ecoregions. Although at a national level this caribou species is considered threatened under the *Species at Risk Act* (*SARA*), the status does not apply to the populations on the Island of Newfoundland.

Many bird species occur throughout southwestern Newfoundland, depending upon habitat and environmental conditions. Some species remain as year-round residents, while others use specific areas for breeding or migratory purposes. Table 3.2 provides a summary of common bird species and associated habitats. Additional information on species with conservation status, including birds, is provided in Section 3.1.1.6.

Table 3.2 Bird Species in Southwestern Newfoundland

Common Name	Scientific Name
Forested areas and Valleys	
Blackpoll warbler (breeder)	*Dendroica striata*
Northern waterthrush (breeder)	*Seiurus noveboracensis*
Dark-eyed junco (resident)	*Junco Hyemalis*
Pine grosbeak (resident)	*Pinicola enucleat*
Boreal chickadee (resident)	*Parus hudsonicus*
Common goldeneye[1]	*Bucephala clangula*
Magnolia warbler	*Dendroica magnolia*
Black-throated green warbler	*Dendroica virens*
American redstart	*Setophaga ruticilla*
Veery	*Catharus fuscescens*
Osprey	*Pandion haliaetus*
Woodpeckers	*Picoides sp.*
Swainson's thrush	*Catharus ustulatus*
Ruby-crowned kinglet (breeder)	*Regulus calendula*
White-throated sparrow (breeder)	*Zonotrichia albicollis*
Hermit thrush (breeder)	*Catharus guttatus*
Fox sparrow (breeder)	*Passerella iliaca*
Yellow-rumped warbler	*Dendroica coronata*
Yellow-bellied flycatcher	*Empidonax flaviventris*
Pine siskin	*Carduelis pinus*
Wilson's tree swallow	*Tachycineta bicolor*

Table 3.2 Bird Species in Southwestern Newfoundland

Common Name	Scientific Name
Black-and-white warbler	*Mniotilta varia*
Sharp-shinned hawk	*Accipiter striatus*
Alder flycatcher	*Empidonax alnorum*
Finches	*Carpodacus sp.*
Yellow warbler	*Dendroica petechia*
Wetland/Marshes/Bogs	
Swamp sparrow	*Melospiza georgiana*
Lincoln's sparrow (breeder)	*Melospiza lincolnii*
Common snipe (breeder)	*Gallinago gallinago*
Greater yellowlegs (breeder)	*Tringa melanoleuca*
Least sandpiper (breeder)	*Calidris minutilla*
American bittern	*Botaurus lentiginosus*
Song sparrow	*Melospiza melodia*
Mourning warbler	*Oporornis philadelphia*
Bobolink	*Dolichonyx oryzivorus*
Common yellow-throat	*Geothlypis trichas*
Tuckamore	
Common redpoll	*Carduelis flammea*
Barrens	
Savannah sparrow (breeder)	*Passerculus sandwichensis*
Rock ptarmigan[2] (resident)	*Lagopus muta*
Willow ptarmigan/Partridge (resident)	*Lagopus lagopus*
Aquatic habitats	
American wigeon	*Anas americana*
American black duck (breeder)	*Anas rubripes*
Green-winged teal (breeder)	*Anas crecca*
Canada goose (breeder)	*Branta canadensis*
Red-breasted merganser (breeder)	*Mergus serrator*
Marine habitats (near shore areas and tidal flats)	
Scoters	*Melanitta sp.*
Long-tailed duck	*Clangula hyemalis*
Common eider	*Somateria mollissima*
Greater yellowlegs (nesting)	*Tringa melanoleuca*
Common snipe (nesting)	*Gallinago gallinago*
Spotted sandpiper (nesting)	*Actitis macularia*
Piping plover (nesting)	*Charadrius melodus melodus*
Willet (nesting)	*Catoptrophorus semipalmatus*
Migrants	
Northern harrier	*Circus cyaneus*
Sharp-shinned hawk	*Accipiter striatus*
Rough-legged hawk	*Buteo lagopus*
American kestrel	*Falco sparverius*

Table 3.2 Bird Species in Southwestern Newfoundland

Common Name	Scientific Name
Great blue heron	*Ardea herodias*
Common goldeneye	*Bucephala clangula*
Common merganser	*Mergus merganser*
Northern pintail	*Anas acuta*
Greater scaup	*Aythya marila*
Golden eagle	*Aquila chrysaetos*
Red-tailed hawk	*Buteo jamaicensis*
Canada goose	*Branta canadensis*
Peregrine falcon	*Falco peregrinus*
Blue-winged teal	*Anas crecca*
American wigeon	*Anas americana*
Ring-necked duck	*Aythya collaris*
Northern shoveler	*Anas clypeata*

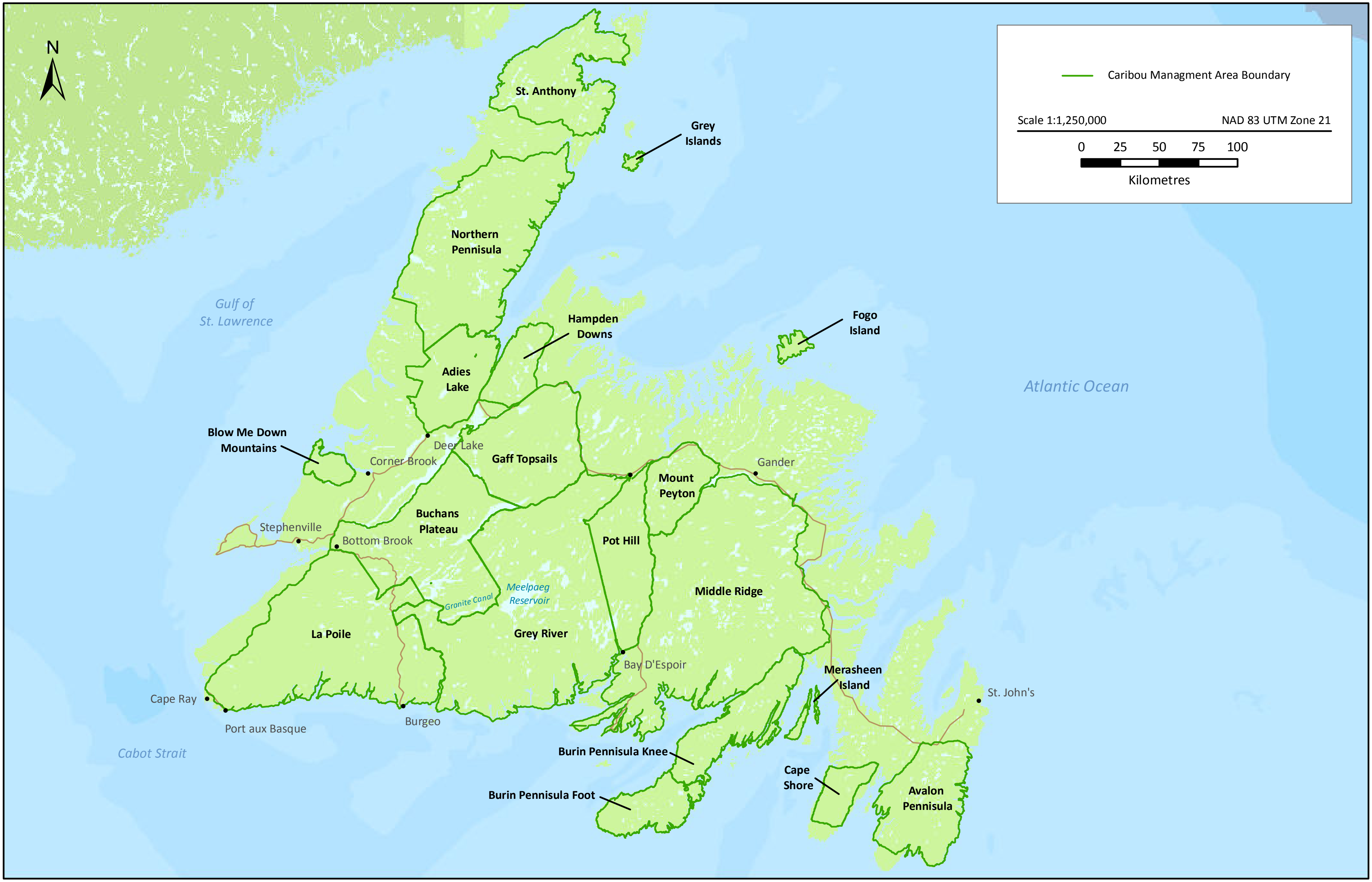
Source: IBA Canada 2010a, PNAD 2008
1. Inhabits forested areas but in the vicinity of aquatic environments.
2. Arctic breeder restricted in its range on the Island of Newfoundland.

Caribou

The province of Newfoundland and Labrador manages the woodland caribou on the Island of Newfoundland by management areas as shown in Figure 3.3. The *Maritime Link* overlaps with the following three areas: La Poile, Buchans Plateau, and Grey River.

Newfoundland and Labrador's Department of Environment and Conservation Wildlife Division has ongoing caribou research programs and extensive population data. Studies are underway to collect and assess existing data within the study corridor as well as to conduct aerial surveys. Existing data and new information currently being collected will clarify potential effects of the Project on the caribou population. Meetings with the Department of Environment and Conservation are ongoing and are currently focused on available and relevant caribou data, habitat classification, critical caribou habitat and departmental concerns with respect to caribou populations.

In collaboration with expertise within Newfoundland and Labrabor's Department of Environment and Conservation Wildlife Division, potential effects identified throughout the EA process will be addressed through the Project planning, design, mitigation, monitoring and other effective means.



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Date: 22NOV2011
Data Sources:
National Atlas Framework 1:1 Million;
CanVec 1:50,000; NL Dept. Environment
& Conservation 2011

Figure 3.3

Caribou Management Areas on the Island of Newfoundland

3.1.1.5 Protected Areas

Protected natural areas in southwestern Newfoundland include parks, and wilderness and ecological reserves. Important Bird Areas (IBAs) are discrete sites that support specific groups of birds (i.e., threatened species, large groups of birds, or birds restricted by range or by habitat), that may encompass private or public land, and may overlap partially or entirely with legally protected sites[2]. Table 3.3 provides a list of identified protected areas, including IBAs, which are in close proximity to the Project area. The same protected areas are also shown in Figure 3.4.

Table 3.3 Protected Areas in Southwestern Newfoundland

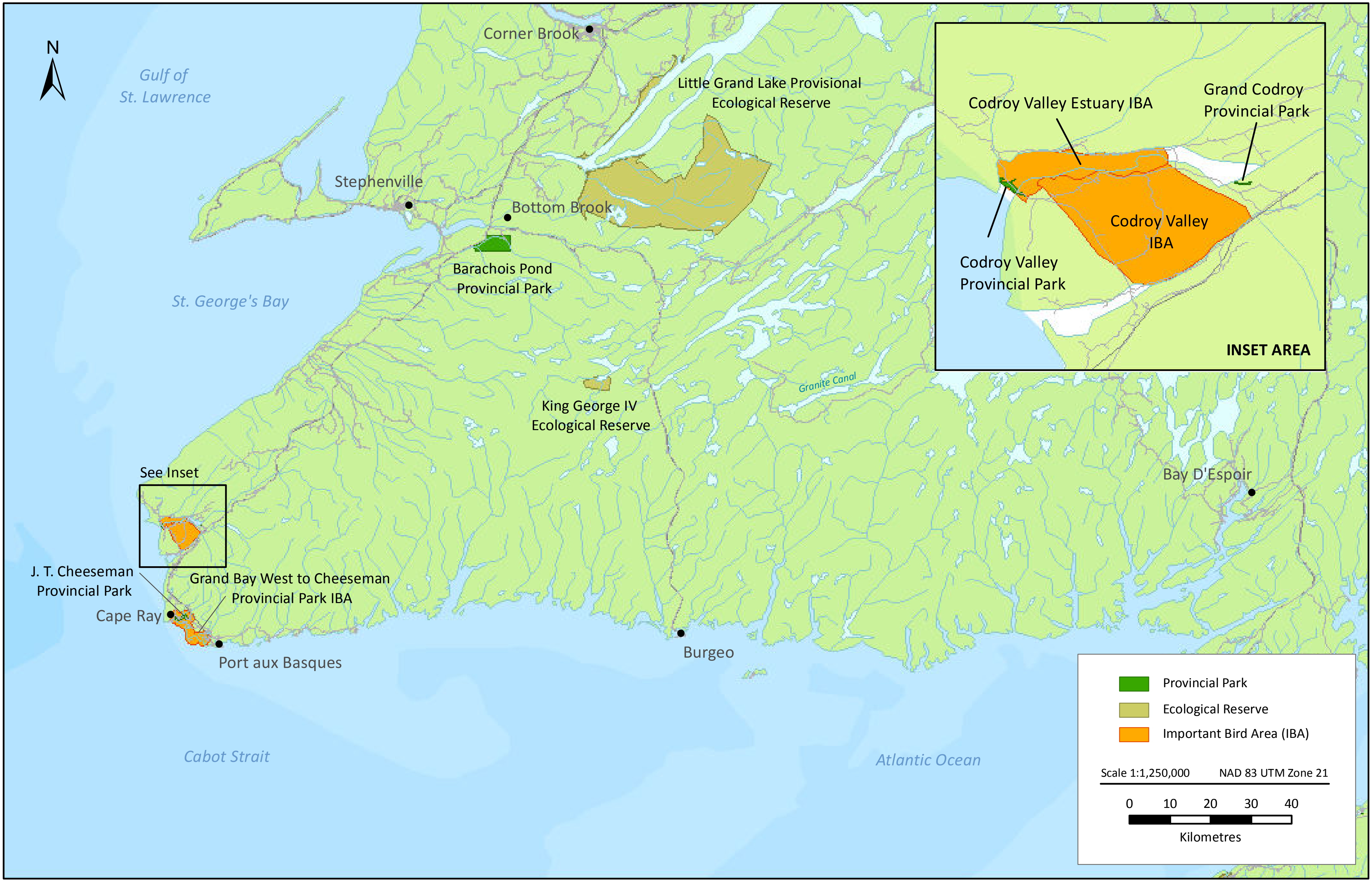
Region	Protected Area	**Area**(km^2)
Western Newfoundland Forest Ecoregion		
Codroy Sub-Region	Codroy Valley Provincial Park (private)	0.3
	Grand Codroy Provincial Park Reserve	
	Codroy Valley IBA	35.46
	Codroy Valley Estuary IBA	13.56
	Grand Bay West to Cheeseman Provincial Park IBA	40.33
Maritime Barrens		
South Coast Barrens Sub-Region	J.T. Cheeseman Provincial Park	1.8
Long Range Barrens Ecoregion		
Southern Long Range Sub-Region	Barachois Pond Provincial Park	35
Central Newfoundland Forest		
Portage Pond Sub-Region	King George IV Ecological Reserve	18.4

Sources: IBA Canada 2010b, PNAD 2010, Ramsar 2000

As the Project is currently designed, none of the proposed Project components overlap with protected areas or IBAs on the Island of Newfoundland.

There is the potential for additional protected areas to be proposed or designated during the EA process. Newfoundland and Labrador uses both the *Wilderness and Ecological Reserves Act* and the *Provincial Parks Act* to create and designate wilderness and ecological reserves, and provincial parks, respectively. The Acts and associated Regulations define and provide legal protection, and also outline the types of activities that can and cannot take place within the borders of the protected area. Ongoing discussions with the Newfoundland and Labrador Department of Environment and Conservation throughout the Project timeline will ensure that newly proposed or designated protected areas, within or near the Project footprint, are integrated into the EA process.

[2] IBAs are not legally protected in their own right. In Canada, IBAs complement (and often overlap partially or entirely with) other national, provincial, and local conservation designations such as National and Provincial Parks, Migratory Bird Sanctuaries, and National Wildlife Areas.



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Date: 22NOV2011
Data Sources: PNAD 2010;
IBA Canada 2010a and 2010b;
National Atlas Framework 1:1 Million

Figure 3.4
Protected Areas in Southwestern Newfoundland

3.1.1.6 Species at Risk

There are a number of species of conservation concern listed provincially under the *Newfoundland and Labrador Endangered Species Act* and federally under *SARA*. Some species also have national status under the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Table 3.4 provides a listing of species that could potentially occur within the Island of Newfoundland component of the Project area, and that have provincial or national status.

Table 3.4 Species of Concern in Southwestern Newfoundland

Common Name	Scientific Name	Provincial Status	*SARA* Status	COSEWIC Status
Mammals				
American marten (Newfoundland population)	*Martes americana atrata*	Threatened	Threatened	Threatened
Birds				
Piping plover[1]	*Charadrius melodus melodus*	Endangered	Endangered	Endangered
Rusty blackbird	*Euphagus carolinus*	Vulnerable	Special Concern	Special Concern
Red crossbill	*Loxia curvirostra percna*	Endangered	Endangered	Endangered
Short eared owl	*Asio flammeus*	Vulnerable	Special Concern	Special Concern
Harlequin duck	*Histrionicus histrionicus*	Vulnerable	Special Concern	Special Concern
Eskimo curlew[2]	*Numenius borealis*	Endangered	Endangered	Endangered
Gray-cheeked thrush	*Catharus minimus*	Vulnerable	*Not assessed*	*Not assessed*
Red knot	*Calidris canutus rufa*	Endangered	*Not assessed*	Endangered
Fish				
Banded killifish (Newfound population)	*Fundulus diaphanous*	Vulnerable	Special Concern	Special Concern
American eel	*Anguilla rostrata*	Vulnerable	No status	Special Concern
Flora				
Boreal felt lichen (Boreal population)	*Erioderma pedicellatum*	Vulnerable	Special Concern	Special Concern

Sources: SARA 2011, Wildlife Division 2010.
1. This species is also considered to be globally "near threatened" by the International Union for Conservation of Nature (IUCN) (IUCN 2011)
2. This species is thought to be extinct (SARA 2011).

3.1.2 Land Use

The Island of Newfoundland is characterized by several distinct and varied socio-cultural and economic landscapes. This profile of the existing socioeconomic setting will focus on the south and southwestern areas through which the proposed transmission corridor will extend.

3.1.2.1 History

The history of European exploration and settlement extends over a period of about 1,000 years. It is generally accepted that Norsemen from Greenland visited Newfoundland and Labrador as early as 1001 A.D. and established a settlement at L'Anse aux Meadows. Likely conflicts with the indigenous population (both Inuit and Beothuk) led to their early departure (Newfoundland History 2004, Canadian Encyclopedia 2011).

The Maritime Archaic Tradition began with immigrants from Labrador, who settled about 5,000 years ago along the coastline of the Island of Newfoundland. Early Palaeo-Eskimos spread southward from Northern Labrador but were eventually replaced by another Palaeo-Eskimo people known as the Dorset people (Inuit). The Dorset people spread throughout the province until their numbers began to diminish about 1,400 years ago. During a more recent period, about 2,000 to 500 years ago, a succession of cultures led to the historic Beothuk. Beothuk sites occur in coastal and inland areas, presumably based on caribou hunting and other terrestrial resources. The Beothuks did not enter into trading relationships with colonists, as other North American First Nations peoples did, and gradually retreated into the interior, where it was difficult to eke out an existence. By the early 1800s, they were gone. The last known Beothuk, *Shanawdithit*, died in 1829 (Pastore 1997, Tuck 2006).

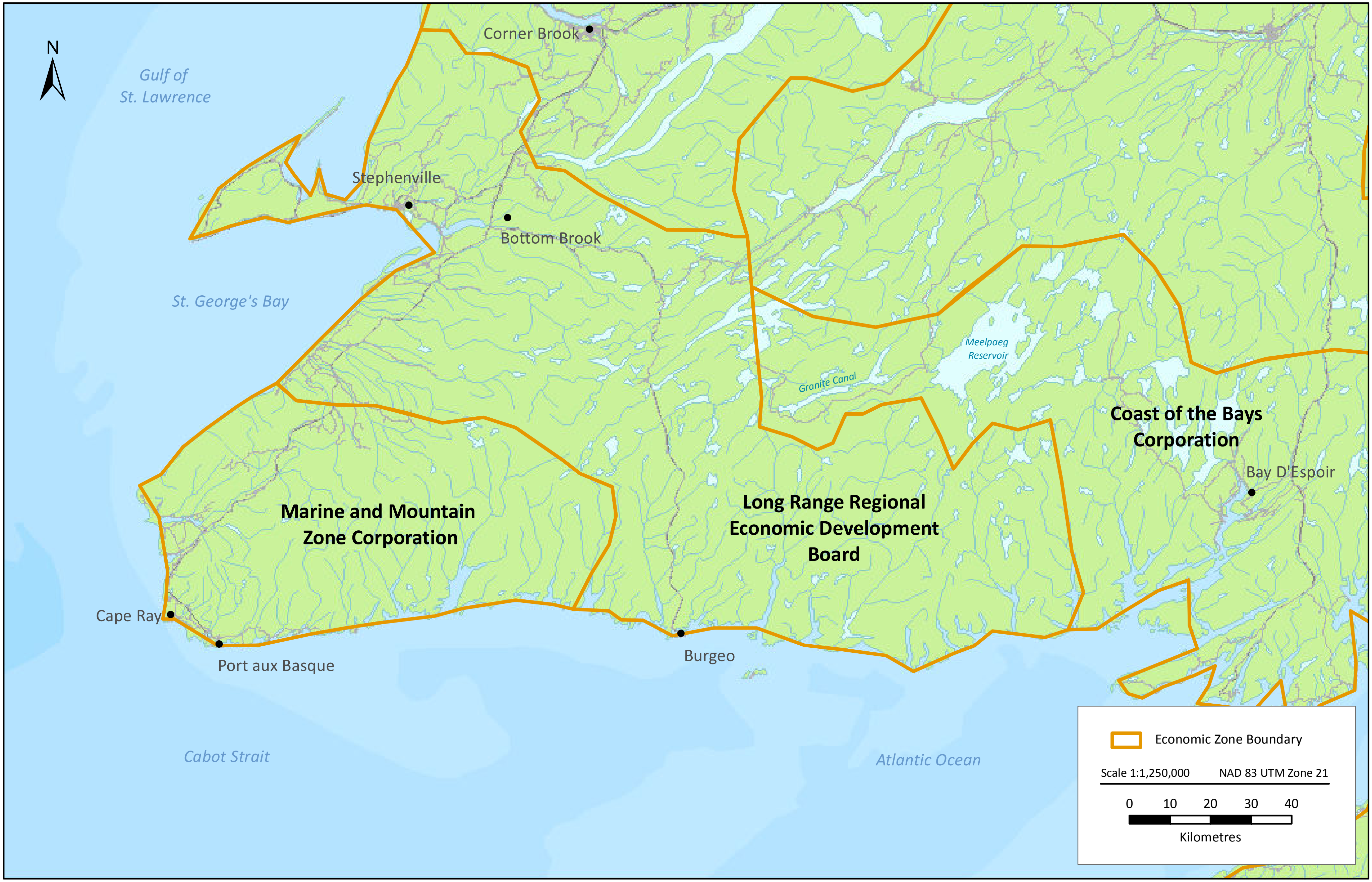
John Cabot arrived in 1497, claiming the land for England, after which fishermen arrived, drawn by tales of abundant whales and inexhaustible fish stocks. First the Basque and Portuguese, and then the English and French, descended on the Grand Banks, which were, at the time, the most prolific fishing grounds known. Despite various colonization attempts in the 17th century, it was not until later in the 18th century that Europeans established permanent settlements (Newfoundland History 2004, Canadian Encyclopedia 2011).

By the opening decade of the 16th century, stories of the abundance of fish in the Grand Banks were widespread through the fishing ports of northern Europe. The cod fishery was subsequently the economic foundation for European settlement along the eastern coast of Newfoundland and Labrador (Emery 1992). Prior to the June 1992 moratorium, the northern cod fishery was the single most important fishery on Canada's East Coast; representing 46% of total available cod quotas and 21% of all groundfish quotas. In 1991, a year when the Total Allowable Catch was the lowest in a decade, the fishery had an estimated value to the Canadian economy of over $700 million and supported directly and indirectly some 31,000 jobs in the region, 90% of which were based in Newfoundland and Labrador (DFO 1992). By the early 1990s, after decades of sustained intensive fishing from Canadian and international fleets, the northern cod stocks collapsed. In July of 1992, Canada imposed a moratorium on the catching of northern cod, resulting in a loss of jobs for about 30,000 people in the province, and ending an international industry that had lasted almost 500 years as well as a way of life that had endured for generations in many outport communities (Emery 1992, Higgins 2009a).

3.1.2.2 Contemporary Socioeconomic Setting

The Island of Newfoundland occupies about 111,500 km^2, less than 30% of Newfoundland and Labrador's total land area but with about 95% of the population. There are 229 municipalities and other small communities ranging in size from fewer than five inhabitants to more than 100,000 (DMA 2008, Statistics Canada 2006). Most of the population is concentrated in and around the capital of St. John's and in a few other centers such as Gander, Grand Falls, Deer Lake, Corner Brook, Stephenville, and Port aux Basques. The rest of the population live in scattered locations mainly along the 17,000 km coastline. The short growing season and sparse, infertile soil preclude widespread farming.

The proposed transmission corridor will pass through three of the Island of Newfoundland's Regional Economic Zones, namely: the Marine and Mountain Zone Corporation; the Long Range Regional Economic Development Board; and the Coast of Bays Corporation (Figure 3.5). A description of each zone is provided in Table 3.5.



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Data Sources:
Dept. of Finance N.d.;
National Atlas Framework 1:1 Million

Figure 3.5
Regional Economic Zones in Southwestern Newfoundland

Table 3.5 Regional Economic Zones on the Island of Newfoundland which Overlap with the Project Area

Regional Economic Zone	Description
Long Range Regional Economic Development Board	• Zone 9 • Headquartered in Stephenville • Services 54 communities, over roughly 14,000 km^2 with 21,380 residents • Industries include agriculture, tourism, fisheries and aquaculture, mining, oil and gas, forestry, business development and coastal management
Marine and Mountain Zone Corporation	• Zone 10 • Situated on the southwest coast of the Island of Newfoundland • Encompasses a total of 19 communities with approximately 9,000 residents • Port aux Basques is the central community • Codroy Valley has the potential to be a significant contributor to the agricultural sector of the province with one of the largest dairy farms in Atlantic Canada
Coast of Bays Corporation	• Zone 13 • Covers an area of 11,292 km^2 with a total coastline of 1,365 km • Includes 22 communities with populations ranging from 100 to 1,877 and a total population of 7,917 • Includes three sub-regions: Fortune Bay North Shore, Connaigre Peninsula, and Bay D'Espoir • Industries include forest resources, mining, tourism, recreation, aquaculture, fisheries, cultural industries, craft development, agrifoods, wilderness adventures, and service operations

Source: Department of Finance n.d., Marine and Mountain Zone Corporation n.d., Long Range Regional Economic Development Board n.d., Coast of Bays 2011.

Hunting within southwestern Newfoundland includes big game such as caribou, moose, and black bear and small game such as forest fowl and snowshoe hare. The Project area falls within the La Poile, Buchans Plateau and Grey River Caribou Management Areas. The hunting season for caribou in the La Poile and Buchans Plateau Management Areas is from September 10th through December 10th. Hunting is closed within the Grey River Caribou Management Area. Moose and black bear hunting in southwestern Newfoundland near the Project area is permitted from September through to early November. Small game hunting of ptarmigan and grouse is permitted mid-September through mid to late December. Hunting is closed for Arctic hare, but is permitted for snowshoe hare from October through to late February (Government of Newfoundland and Labrador 2011).

Berry picking has always been an important part of life in Newfoundland and Labrador and there are several types of berries harvested in this portion of the province. Historically, berries were harvested and stored and were an important food source during the long cold months of winter. Blueberries, partridge berries (lingonberries) (*Mitchella repens*) and bakeapples (cloudberries) (*Rubus chamaemorus*) are all common species throughout the province (Newfoundland Department of Natural Resources 2010). Although there are some commercial operations for both blueberry and partridge berry in the province, most harvesting activities are for personal use. Partridge berries and bakeapples, however, are harvested commercially and used in jams, sauces, liqueurs, and wine making, with the former being harvested usually after mid-September and the latter from late July to mid-August.

3.1.3 Aboriginal Groups

3.1.3.1 Historical

At the time of contact with European explorers and settlers in the early 16th century, the Mi'kmaq were a migratory people who relied on various resources throughout the Gulf of St. Lawrence region (Higgins 2008). In the early historic period, the fundamental unit of Mi'kmaq society was the extended family, which could consist of a leader of a group of related people including the immediate family, married children and their families, and other relatives, all living together. At times and places of plentiful food, a number of these local groups could form bands which, in the summer, could range up to two or three hundred people (Pastore 1998).

Religion, warfare and competition for scarce resources influenced the departure of the Mi'kmaq from Cape Breton to southern parts of the Island of Newfoundland where there was a French presence and enough game and fish to accommodate subsistence activities. Thus, it was during the late 1700s that Mi'kmaq families began to have more regular presence on the Island of Newfoundland.

Throughout the 19th century, the 150 or so Mi'kmaq people in Newfoundland made their living as guides, trappers, mail carriers, and as sellers of basketry (Pastore 1997). Logging operations and the completion of the trans-island railway in 1898 attracted new settlers and provided caribou hunters with access to the interior. By 1930 the caribou had been hunted almost to extinction. This loss, along with the world-wide decline in fur prices and the Depression of the 1930s, greatly altered the traditional way of life for many Mi'kmaq and accelerated the erosion of Mi'kmaq culture and language (Pastore 1997, Higgins 2008).

The establishment of churches and schools during early 1900s, both of which had considerable influence over Mi'kmaq lifestyles and traditions, further diminished traditional Mi'kmaq culture (Higgins 2008). Many Mi'kmaq adapted to their changing circumstances by working as guides for explorers and visiting hunters, or as woodsmen in the forestry industry; however, the exclusion of the Mi'kmaq people from the terms of Confederation in 1949 made it difficult to protect their culture (Pastore 1997, Higgins 2008). By 1945, there were no full-time trappers left in Conne River (Miawpukek), the largest Mi'kmaq community, and seasonal logging for low wages represented one of the few sources of cash for the community (Pastore 1997). Hunting, fishing, and gathering berries remained a necessary part of most families' lives (Pastore 1997, Tuck 2006, Higgins 2008).

To safeguard the land and resources on which they relied, and to protect their language and culture from outside influences, the Mi'kmaq people were helped by the Native Association of Newfoundland and Labrador. This organization later changed its name to the Federation of Newfoundland Indians (FNI) (Higgins 2008).

3.1.3.2 Contemporary Setting

There are currently no Aboriginal groups that possess recognized Aboriginal or treaty rights on the island portion of the province of Newfoundland and Labrador.

First Nations Bands located in southwestern Newfoundland include the following:

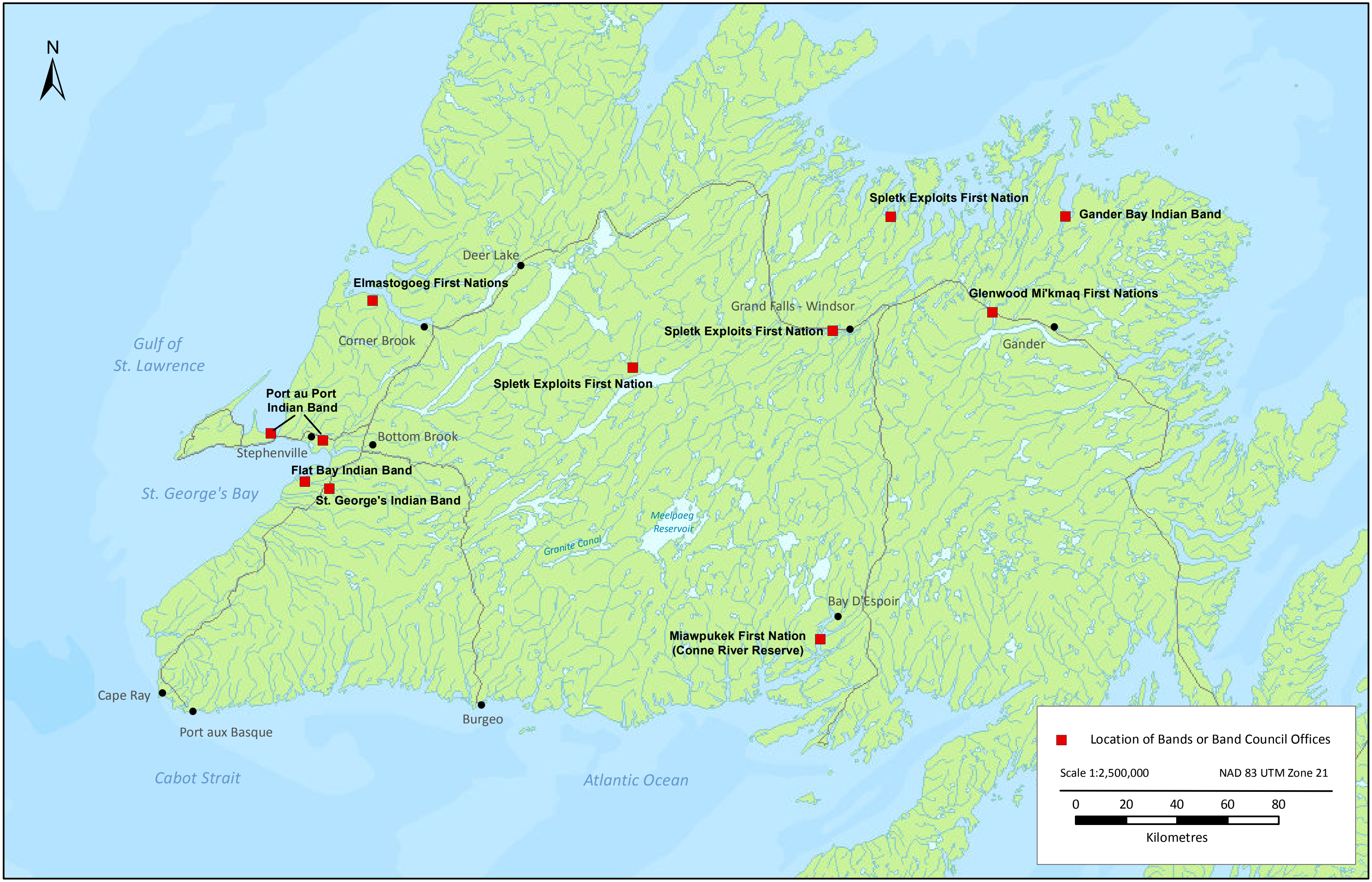
- Elmastogoeg First Nation;
- Flat Bay Indian Band;
- Indian Head First Nations Band;
- Port au Port Indian Band; and
- Miawpukek First Nation.

While the members of the Miawpukek First Nation (MFN) at Conne River (St. Alban's) currently have status under the *Indian Act,* and the members of the Federation of Newfoundland Indians (FNI) were granted status on September 27, 2011, pursuant to an agreement in principle between the FNI and the federal government, these communities do not possess Aboriginal or treaty rights merely because their members are status Indians.

MFN became a Status Indian Reserve in 1987, with an on-reserve population of about 800 and an off-reserve population of about 1,700. The FNI initiated an Agreement in Principle with the Government of Canada on November 30, 2007 and on September 27, 2011 the Qalipu Mi'kmaq First Nation Band, which refers collectively to all nine FNI bands, was officially recognized by the federal government. This Agreement provides for the creation of a new landless band named Qalipu Mi'kmaq First Nation Band. Once established, the Qalipu Band will become one of the largest bands in Canada. It will realize many long-sought benefits for Newfoundland Mi'kmaq outside of Miawpukek, including:

- registration to verify its Mi'kmaq population;
- eligibility for recognition under the *Indian Act*; and
- access to federal programs and funding.

Figure 3.6 shows the Mi'kmaq communities in southwestern Newfoundland.



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Date: 22NOV2011
Data Sources: Department of Labrador and Aboriginal Affairs 2011
National Atlas Framework 1:1 Million

Figure 3.6

Mi'kmaq First Nations Bands on the Island of Newfoundland

3.2 Cabot Strait

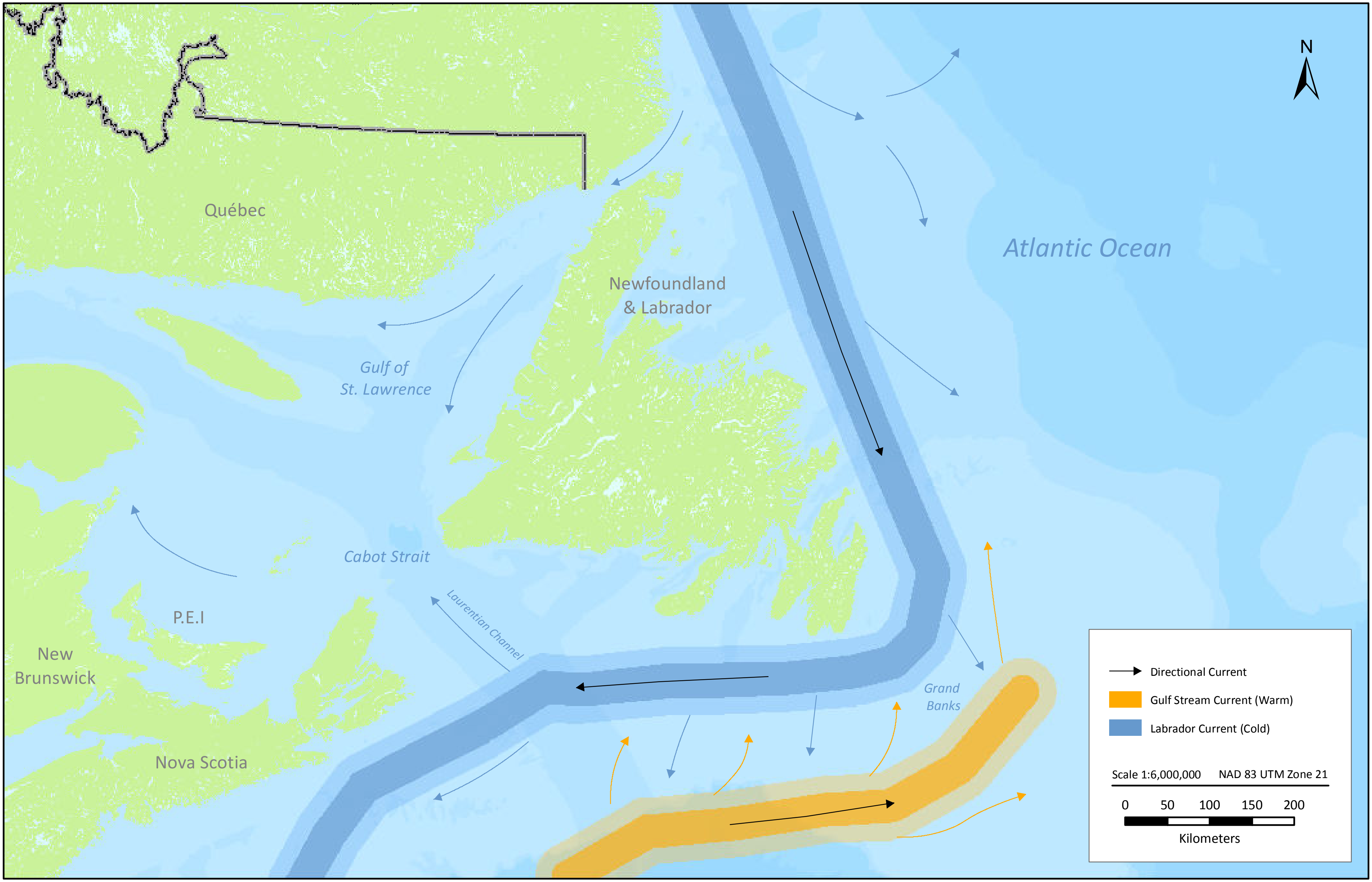
3.2.1 Environmental Features

The Cabot Strait is approximately 110 km wide between Cape Ray, Newfoundland and Labrador and Cape North, Nova Scotia and is the largest of the three outlets for the Gulf of St. Lawrence (the Gulf) into the Atlantic Ocean, the other two being the Strait of Belle Isle and the Strait of Canso. It is a strategically important waterway and international shipping route, linking the Atlantic with inland ports on the Great Lakes and the St. Lawrence Seaway (DFO 2005).

The bathymetry of the Strait is highly variable, with the Laurentian Channel creating a deep trench through the centre, and comparatively shallow waters in the coastal bays and estuaries. On average, water temperatures are 7 to 10°C lower than at corresponding latitudes on the west coasts of North America and Europe, primarily due to southward flow of the Labrador Current. At the Grand Banks, the Labrador Current turns southwest, and a branch flows westward along the south coast of the Island of Newfoundland and into the Gulf of St. Lawrence through the Cabot Strait (Figure 3.7) (MacPherson 1997). Freshwater exits the Gulf on the surface of the Strait on the Nova Scotia side, sweeping salt water along as well. Water moving out is replaced by salt water drawn into and along the bottom of the Strait on the Island of Newfoundland side (DFO 2005, Newfoundland and Labrador Heritage 2007).

Coastal environments include fjords, low rocky shores, deltas, coastal bluffs, coastal dunes, barrier beaches and tidal flats. The coast of southwestern Newfoundland contains fjords surrounded by cliffs reaching up to plateaus at elevations of 200 to 450 m. The depth of the Laurentian Channel acts as a break separating several stocks of shallow water fish species (MacPherson 1997).

The main biological orders found in the waters of the Strait include: phytoplankton; zooplankton; invertebrates; forage fish; large ichthyophagous (fish feeding) fish species; birds; and marine mammals. The dominant visible primary producers are large macrophytes such as kelps, Irish moss (*Chondrus crispus*) and rockweed, coralline algae, benthic diatoms, dinoflagellates, and grasses including eel grass and marsh grass (DFO 2005).



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Date: 22NOV2011
Data Sources: Newfoundland and Labrador Heritage, 2007; Nationa Atlas Framework 1: 1Million

Figure 3.7

Ocean Currents Influencing the Cabot Strait

3.2.1.1 Marine Fish

The fish community in the Gulf of St. Lawrence, including the Strait, includes a large number of species that are either at the northern or southern edge of their range. This reflects a variety of environmental conditions that include cold water combined with ice coverage in winter, and warmer water in summer, especially in the Gulf (DFO 2005).

The Cabot Strait has significant groundfish populations. Common fish species include:

- Atlantic halibut (*Hippoglossus hippoglossus*)
- Atlantic herring *(Clupea harengus)*
- Atlantic salmon (*Salmo salar)*
- smooth skate (*Malacoraja senta*)
- black dogfish (*Centroscyllium fabricii)*
- blue shark (*Prionace glauca*)
- porbeagle shark (*Lamna nasus*)
- Greenland halibut (*Reinhardtius hippoglossoides*)
- haddock (*Melanogrammus aeglefinus)*
- hagfish (*Myxine glutinosa*)
- hake (*Urophycis sp.)*
- Atlantic whitefish (*Coregonus huntsmani*)
- redfish (*Centroberyx affinis*)
- Atlantic mackerel (*Scomber scombrus)*
- capelin (*Mallotus villosus)*
- monkfish (*Lophius americanus*)
- witch flounder (*Glyptocephalus cynoglossus*)
- swordfish (*Xiphias gladius)*
- Atlantic cod (*Gadus morhua)*
- cusk (*Brosme brosme)*
- northern wolffish (*Anarhichas denticulatus*)
- Atlantic wolffish (*Anarhichas lupus)*
- spotted wolffish (*Anarhichas minor)*

The Cabot Strait also contains specialized habitats and marine fish species of conservation concern (refer to Section 3.2.1.7). The southern slope of the Strait is the only known overwintering area for the Laurentian south designatable unit of Atlantic cod. The area is inclusive of three DFO recognized management units: Southern Gulf of St. Lawrence; Cabot Strait; and Eastern Scotian Shelf (Endangered under COSEWIC) (Sanger 1998, Campana *et al*. 1999, Ruzzante *et al*. 2000 as noted in COSEWIC 2010). The coastal component of the white hake (*Urophycis tenuis*) stock and other groundfish species also use the Strait for migratory purposes and the area is a significant summer feeding ground for witch flounder and for deep water components of the white hake stock (DFO 2007).

3.2.1.2 Management Zones

<u>NAFO Convention Area</u>
The Strait is included within the Northwest Atlantic Fisheries Organization (NAFO) Convention Area and encompasses part of two Sub-Areas (Sub-Area 3 and Sub-Area 4) (Figure 3.8). Within these Sub-Areas, the Study Area for the proposed cable route will include two Sub-Divisions: 4Vn; and 3Pn (NAFO n.d.). NAFO uses these delineations to support management and conservation of the fishery resources found in the Convention Area.

<u>Large Ocean Management Areas</u>
Large Ocean Management Areas (LOMAs) are marine regions established for planning purposes. Collaborative management, using an integrated ocean management approach, addresses the socio-economic needs while preserving the health of the marine ecosystem through the sustainable management of resources within the LOMA boundaries (DFO 2011b).

There are three LOMAs associated with the Project Study Areas (Figure 3.8):

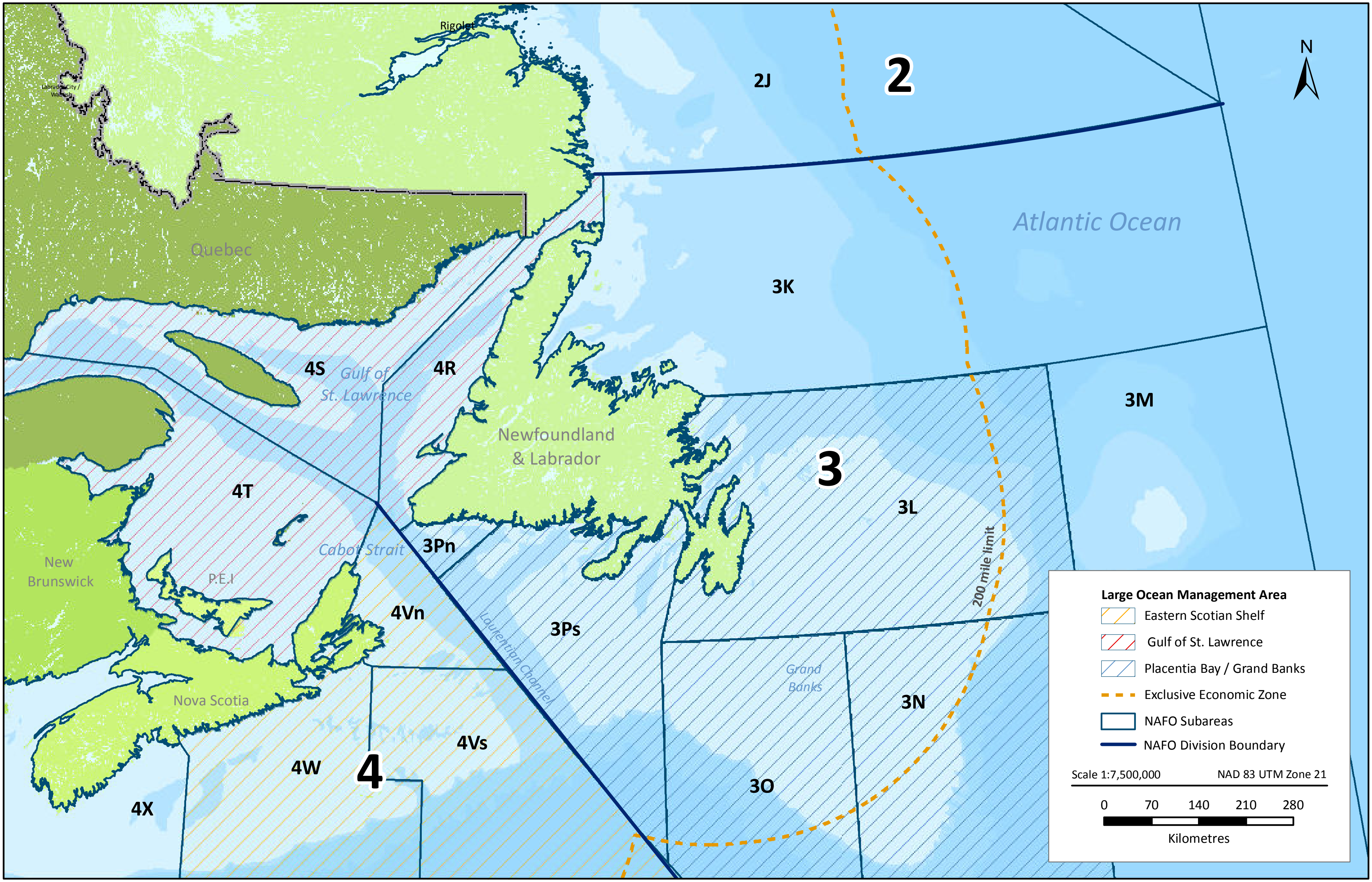
1. Eastern Scotian Shelf;
2. Gulf of St. Lawrence; and
3. Placentia Bay/Grand Banks.

3.2.1.3 Marine Mammals

The Cabot Strait is an important migratory corridor for marine mammals moving in and out of the Gulf of St. Lawrence. The Strait is also a major summer feeding area for marine mammals, particularly migratory cetaceans (DFO 2005, Hammill *et al*. 2001). At least 15 whale species may occur or pass through the Cabot Strait. Six are abundant and regularly observed: fin (*Balaenoptera physalus)*; minke (*Balaenoptera acutorostrata)*; humpback (*Megaptera novaeangliae)*; and long-finned pilot whales (*Globicephala melaena)*; Atlantic white-sided dolphins (*Lagenorhynchus acutus)*; and harbour porpoise (*Phocoena phocoena)*. Low numbers of North Atlantic right whales (*Eubalaena glacialis)* also regularly transit the area (Hammill *et. al* 2001). Five species of dolphins are present: white-beaked (*Lagenorhynchus albirostris)*; short-beaked (*Delphinus delphis)*; common (*Lagenorhynchus obliquidens)*; bottlenose (*Tursiops truncatus)*; and striped (*Stenella coeruleoalba)*. Whales include sei (*Balaenoptera borealis)*, Northern bottlenose (*Hyperoodon ampullatus)*, blue (*Balaenoptera musculus)*, and killer whales (*Orcinus orca)*. The area appears to be particularly important for pilot whales and this species forms the basis of whale-watching activities for tourists visiting western Cape Breton.

Four pinniped species common to the area are harp (*Phoca groenlandica*) and hooded (*Cystophora cristata)* seals, which are migratory species, and grey (*Halichoerus grypus*) and harbour (*Phoca vitulina*) seals which are year-round residents (DFO 2005, Newfoundland and Labrador Heritage 2007). Ringed (*Pusa hispida*) and bearded (*Erignathus barbatus*) seals have been recorded occasionally in the northern parts of the Gulf (DFO 2005), and may be observed as far south as the Cabot Strait.

Although some of the cetaceans are considered at risk or of conservation concern (Table 3.6), none of the pinniped species have been designated by *SARA* or COSEWIC.



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Date: 22NOV2011
Data Sources: DFO 2007; National Atlas Framework 1:1 Million

Figure 3.8

Marine Management Zones in the Northwest Atlantic

3.2.1.4 Marine Avifauna

Four groups of marine birds depend on the resources of the Gulf, including the Strait (DFO 2005):

1. Inshore seabirds that feed in inshore habitats (cormorants, gulls and terns).
2. Offshore or pelagic seabirds which spend long periods of time at sea, and are independent of land for both feeding and resting, but return to rocky cliffs and islands for breeding (petrels and auks).
3. Waterfowl, including eiders and scoters.
4. Shorebirds which are present only for a short time, usually feeding on mud flats from July to September during migration from the Arctic to southern wintering grounds. Some species also breed in the area.

Common marine birds in the Strait are mostly pelagic species or those that have nesting areas on coasts close to the Strait. Seabirds include greater shearwater (*Puffinus gravis*), sooty shearwater(*Puffinus griseus*), Atlantic Cory's shearwater (*Calonectris diomedea borealis*), manx shearwater (*Puffinus puffinus*), Wilson's storm-petrel (*Oceanites oceanicus*), Leach's storm-petrel (*Oceanodroma leucorhoa*), Northern gannet (*Morus bassanus)*, Northern fulmar (*Fulmarus glacialis*), jaegers, gulls, terns and sea ducks (DFO 2005). Breeding seabirds mostly consist of herring gull (*Larus argentatus*), although the common black-headed gull (*Chroicocephalus ridibundus*) is a European species that has recently begun nesting in the region (Newfoundland and Labrador Heritage 2007). Ring billed gull (*Larus delawarensis*), great black-backed gull (*Larus marinus*), Arctic tern (*Sterna paradisaea*) and common tern (*Sterna hirundo*) all inhabit Flat Island close to the Newfoundland coast and within the Western Newfoundland Forest ecoregion (PNAD 2008).

3.2.1.5 Benthic Community

The benthic community includes many commercially valuable species such as lobster, along with invertebrates and micro-organisms of many forms with little or no commercial value but of significant ecological importance. The benthic community is more diverse and more abundant than other marine communities, due to the diversity of habitat types. DFO (2005) considers the following main classifications:

- macrobenthos including crustaceans (lobster), molluscs (oysters, mussels, snails) and echinoderms (starfish, sand dollar);
- other benthic macro-invertebrates such as annelids (marine worms), sponges and cnidarians (corals, anemones), ascidians (tunicates), and small orders of animals (flat worms); and
- microfauna and meiofauna, including microcrustaceans (barnacles) which play an important role in nutrient recycling through feeding on decaying wastes of other species. Algae, protozoa and bacteria are also an important part of the benthic community.

Common invertebrates include soft corals, sea anemones, Icelandic scallop (*Chlamys islandica*), shortfin squid (*Illex illecebrosus*), lesser bobtail squid (*Semirossia tenera*), common Atlantic octopus (*Octopodia vulgaris*), Northern shrimp (*Pandalus borealis*), American lobster (*Homarus americanus*), heart urchins (*Brisaster fragilis*), mud stars (*Ctenodiscus crispatus*), deep sea brittle stars (*Amphiodia urtica*), sea pens

(*Ptilosarcus gurneyi*), stone crab (*Menippe mercenaria*), and deep sea king crab (*Lithodes maja*). The walls of the Laurentian Channel are suitable habitat for deep sea corals as the water is highly saline and rich in nutrients (MacPherson 1997).

3.2.1.6 Reptiles

The leatherback turtle (*Dermochelys coriacea*), the only marine reptile with a range that includes the Cabot Strait and the Gulf of St. Lawrence, migrates into Atlantic Canadian waters in summer likely due to the abundance of jellyfish, its main food source. The species is highly migratory and, in Canada, is also observed regularly along the continental shelf (DFO 2005).

The leatherback turtle is ranked as endangered by COSEWIC and is a listed species under *SARA*.

3.2.1.7 Protected Areas

Marine protected areas (MPAs) in Canada are managed both federally and provincially, and are established, by DFO, under the *Oceans Act* to protect and conserve important fish and marine mammal habitats, endangered marine species, unique features, and areas of high biological productivity or biodiversity. Support is provided through the Federal Marine Protected Areas Strategy, which provides a framework to establish a network of MPAs in a collaborative and transparent way, and the Canada's Oceans Action Plan, under which DFO, Parks Canada (PC), and EC co-operate with provincial, territorial and Aboriginal governments to identify and manage new MPAs.

There is the potential for additional MPAs to be proposed or designated during the EA process. Ongoing discussions with DFO, PC and EC throughout the Project timeline will ensure that newly protected and proposed areas, within or near the Project footprint, are integrated into the EA process.

Three types of protected marine areas are located within and proximate to the Cabot Strait: Ecologically and Biologically Significant Areas (EBSAs), Areas of Interest (AOI), and a Conservation Area.

Ecologically and Biologically Significant Areas

Under Canada's *Oceans Act* (1997), DFO is authorized to provide enhanced protection to areas of the oceans and coasts that are ecologically or biologically significant. EBSAs that are adjacent to the area under consideration for the cable crossing are shown in Figure 3.9, and described below:

1. Western Cape Breton (EBSA 1): This EBSA is distinguishable mostly for its major abundance of meroplankton, organisms that are planktonic for only a part of their life cycle, and for important biodiversity and the high biomasses of groundfish including witch flounder, Atlantic cod, winter flounder (*Pseudopleuronectes americanus*), American plaice (*Hippoglossoides platessoides*), and yellowtail flounder (*Limanda ferruginea*).
2. Laurentian Channel and Slope (EBSA 4): This area is characterized by the variety of depths and resulting diversity of habitats (DFO 2007).
3. West Coast of Newfoundland (EBSA 10): This portion of the west coast of the Island of Newfoundland covers 18,238 km^2, mostly offshore. The area extends from Cabot Strait at the

southern limit to the Esquiman Channel in the north. This special marine area is significant for a large abundance of fish, including several groundfish and pelagic species that rely on the area for feeding, especially in summer. Herring and halibut over-winter in the area, and cod, capelin and herring use the area for spawning (DFO 2007).

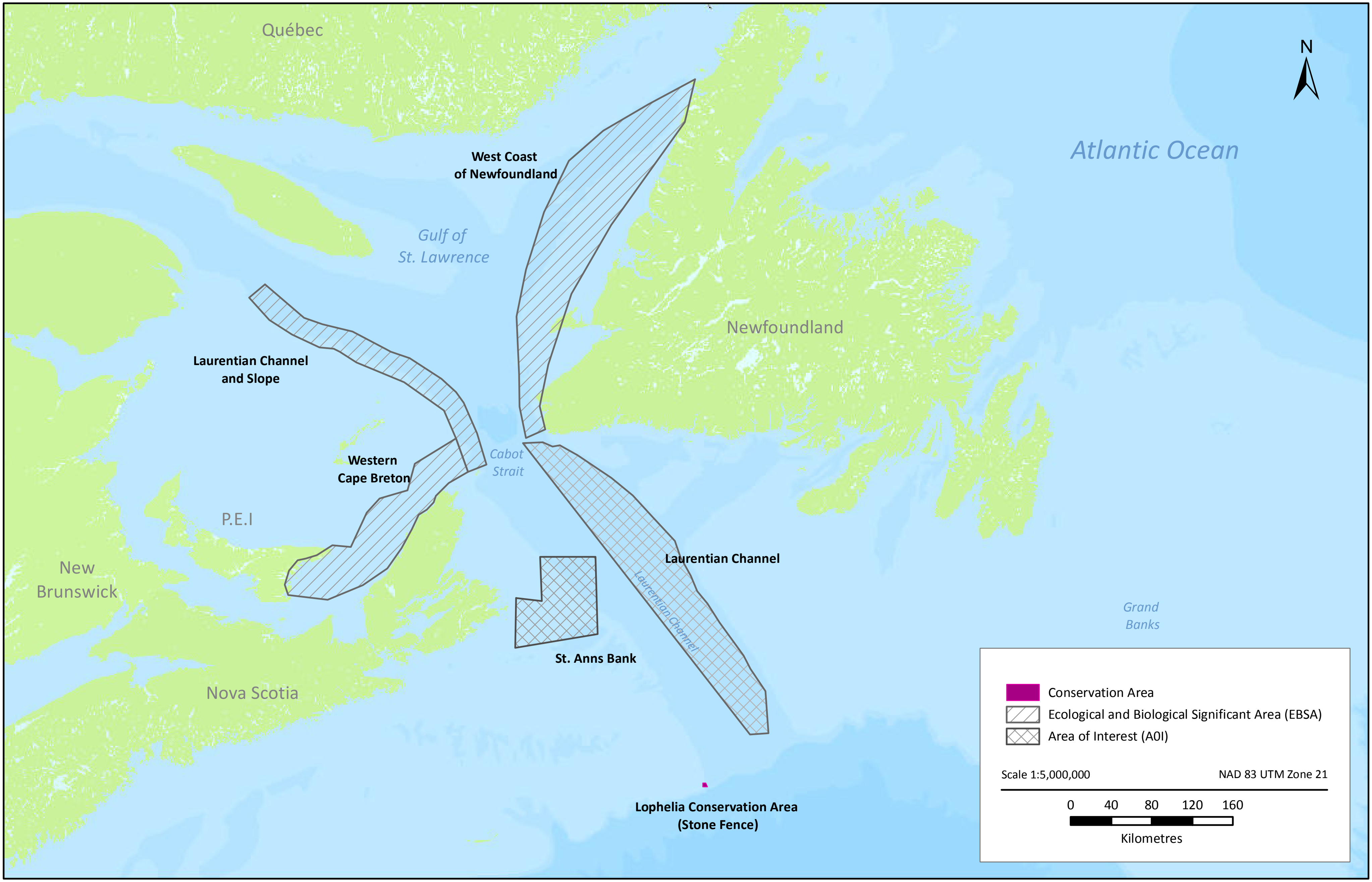
Areas of Interest

St. Anns Bank, located within the Cabot Strait (Figure 3.9), was formally declared as an AOI, in June 2011, for establishment as an MPA under the *Oceans Act* (DFO 2011c). Although the AOI is located within the wider reaches of the Strait and is therefore outside of the proposed Study Area for this Project, it has been mentioned due to various important ecological and biological features.

The Laurentian Channel AOI was formally declared as an AOI on June 8th, 2010. The AOI is a deep submarine valley over 1,200 km long, extending from the intersection of the St. Lawrence and Saguenay Rivers to the edge of the continental shelf off the Island of Newfoundland (Figure 3.9) and was identified as an ecologically and biologically significant area mainly due to the presence of the highest concentration of black dogfish in Canadian waters and as the only place where pupping of this species occurs. The area is also an important spawning, nursery, and feeding area for a variety of species including porbeagle shark, smooth skate, monkfish, pollock (*Pollachius* sp.), and white hake, and an overwintering habitat for cod and redfish stocks. For marine mammals, the area is used as a critical migration route in and out of the Gulf (DFO 2010a).

Conservation Area

Steps have also been taken in Canada to protect areas of high sensitivity from bottom disturbances. The Lophelia Conservation Area (LCA) (the *Stone Fence*) is 15 km^2 in size and protects the only known occurrence of the reef building coral, *Lophelia pe*rtusa, in Canadian waters (DFO 2004). The LCA is located off Canada's East Coast (Figure 3.9) and although is not within the Cabot Strait or the proposed Study Area for this Project, its importance in protecting a significant aspect of the marine ecosystem is recognized.



Emera Newfoundland & Labrador

Date: 22NOV2011
Data Sources: DFO

Figure 3.9

Distribution of Protected Areas Within/Adjacent to the Cabot Strait

3.2.1.8 Species at Risk

There are a several species considered to be at risk or of conservation concern in the Cabot Strait. Table 3.6 provides a summary of these species including all applicable status rankings.

Table 3.6 Species of Concern in the Cabot Strait

Species Common Name	Species Scientific Name	Provincial Status (NS/NL)	*SARA* Status	COSEWIC Status
Mammals				
North Atlantic Right whale	*Eubalaena glacialis*		Endangered	Endangered
Killer whale (Northwest Atlantic / Eastern Arctic population)	*Orcinus orca*		No Status	Special Concern
Humpback whale (Western North Atlantic population)	*Megaptera novaeangliae*		Special Concern (Schedule 3)	Not at Risk
Fin whale (Atlantic population)	*Balaenoptera physalus*		Special Concern	Special Concern
Blue whale (Atlantic population)	*Balaenoptera musculus*		Endangered	Endangered
Harbour porpoise (Northwest Atlantic population)	*Phocoena phocoena*		Threatened (Schedule 2)	Special Concern
Fish				
Atlantic salmon (Southern Newfoundland population)	*Salmo salar*	Red[1]	No Status	Threatened
Atlantic cod (Laurentian South Designatable Unit)	*Gadus morhua*		No Status	Endangered
Atlantic sturgeon	*Acipenser oxyrinchus*	Red	No Status	Threatened
Atlantic wolfish	*Anarhichas lupus*		Special Concern	Special Concern
Northern wolfish	*Anarhichas denticulatus*		Threatened	Threatened
Spotted wolfish	*Anarhichas minor*		Threatened	Threatened
American eel	*Anguilla rostrata*	Green/ Vulnerable	No Schedule, No Status	Special Concern
White shark (Atlantic population)	*Carcharodon carcharias*		Endangered	Endangered
Cusk (Atlantic population)	*Brosme brosme*		No Status	Threatened

Table 3.6 Species of Concern in the Cabot Strait

Species Common Name	Species Scientific Name	Provincial Status (NS/NL)	*SARA* Status	COSEWIC Status
Reptiles				
Leatherback turtle (Atlantic Ocean population)	*Dermochelys coriacea*		Endangered	Endangered

Sources: DFO 2011d, NSDNR 2011a, *SARA* 2011.
1. Status rank for Atlantic salmon is inclusive of all anadromous species
Note: Two species that have not been included in the table but are noted by DFO (2011d) as at risk for the region are the grey whale (*Eschrichtius robustus*) (Atlantic population) and Atlantic Walrus (*Odobenus rosmarus rosmarus*) (Northwest Atlantic population) due to the fact that both species are considered extirpated for this region.

3.2.2 Resource Use

3.2.2.1 History

The Cabot Strait is 110 km wide between Cape Ray, Newfoundland, and Cape North, Nova Scotia and is named for John Cabot, a navigator and explorer whose voyages provided the basis for England's claim to North America, and led to the opening of the rich Northwest Atlantic fishery (Canadian Encyclopaedia 2011, Economic Expert 2011). As the principal ocean-going route to the Gulf of St. Lawrence and therefore to much of Eastern Canada and the inland ports of the Great Lakes and St. Lawrence Seaway, the Cabot Strait has been strategically important in Canadian military and commercial history. Two major events occurred in the Strait during WWII: the sinking of the Newfoundland ferry SS Caribou by a German U-boat torpedo in 1942, with the loss of 137 people; and the sinking of HMCS Shawinigan by U-boat U-1228, by torpedo in November, 1944, with the loss of 91 crew members all hands on board. Other shipwrecks, unexploded ordnances, and DND legacy sites are likely in the Project corridor but will be avoided through the Project design phase, or managed as part of the EA process.

A submarine telegraph cable laid across Cabot Strait in 1856 eventually joined North America and Europe via the transatlantic cable (1866) (Canadian Encyclopaedia 2011, Economic Expert 2011). One infamous location in the Strait is St. Paul's Island, known as the "Graveyard of the Gulf". As many as 350 ships have sunk near St. Paul’s Island due to changeable weather conditions and fog that makes navigation treacherous. St. Paul’s Island is located about 24 km northeast of Cape North, Cape Breton and 71 km southwest of Cape Ray, Newfoundland.

3.2.2.2 Contemporary Socioeconomic Setting

In addition to fishing, the Cabot Strait has been used for a variety of commercial purposes including placer mining of sand and gravel deposits, coastal recreation, marine transportation, and communications in the form of submarine cables. Marine Atlantic ferries cross the Strait daily between Port aux Basques, Newfoundland and North Sydney, Nova Scotia. The ferries carry 300,000 passengers per year, as well as automobiles, commercial vehicles, and freight. Five vessels operate on the service: the MV Blue Puttees; the MV Highlanders; the MV Leif Ericson; the MV Atlantic Vision; and the MV Atlantic Freighter (Government of Newfoundland and Labrador 2001, Economic Expert 2011, Marine Atlantic 2011).

The Cabot Strait also provides many commercial opportunities including several fisheries of major economic importance. Harvested species include seaweeds (*Furcellaria* and Irish moss), molluscs (clams, oysters, mussels, scallops, periwinkles, and squid), crustaceans (crabs, lobsters, and shrimp), demersal fish (cod, halibut, pollock, and flounders), and pelagic fish (mackerel, herring, and tuna). Coastal waters offer potential for the culture of various species that can thrive on phytoplankton. The Nova Scotia inshore fishery for lobster occurs exclusively in the Inner Shelf area. Anadromous fish using rivers and estuaries (e.g., gaspereau and Atlantic salmon) are also important. Due to the variety of targeted species, area fisheries encompass a wide range of gear, techniques, and vessels, often with local variations. The coastal areas are divided into management districts, each of which has particular regulations regarding season, catch limit, and permissible gear. Aquaculture, particularly for mussels and salmonids, is growing in importance and blue mussel (*Mytilus edulis*) aquaculture is increasing in the warmer bays.

Many fisheries employ small boats working out of numerous small harbours in Nova Scotia and the Island of Newfoundland, including Mi'kmaq fishers. Generally, there are two broad categories of Aboriginal fishing that occur in the Cabot Strait (Pers. Comm. G. Herbert 2011):

1. Communal commercial fisheries operate in the same timeframe and in conjunction with non-native commercial fisheries. Snow crab, shrimp and lobster are the main species, but Mi'kmaq fishers hold a wide assortment of licences.
2. Food, Social and Ceremonial fisheries cover a full array of species that require an annual licence from June 1 of any given year until May 31 of the following year. These fisheries are managed by the respective First Nation community and the NCNS, and are primarily coastal fisheries.

3.3 Cape Breton, Nova Scotia

3.3.1 Environmental Features

The Nova Scotia portion of the Project is located in Cape Breton County, on Cape Breton Island (Cape Breton) and will extend from Point Aconi (or Lingan) to the existing Woodbine substation (Figure 2.2).

Cape Breton Island covers 10,311 km^2 and comprises 18.7% of Nova Scotia's total area. Although physically separated from the Nova Scotia peninsula by the Strait of Canso, it is artificially connected to the mainland by the 1,385 m long Canso Causeway. This part of the province is located east-northeast of the mainland with its northern and western coasts fronting on the Gulf of St. Lawrence and part of the western coast also forming the eastern limits of the Northumberland Strait. The eastern and southern coasts front on the Atlantic Ocean and part of the eastern coast also forms the boundary of the Cabot Strait. The landmass slopes upward from south to north, culminating in the Highlands.

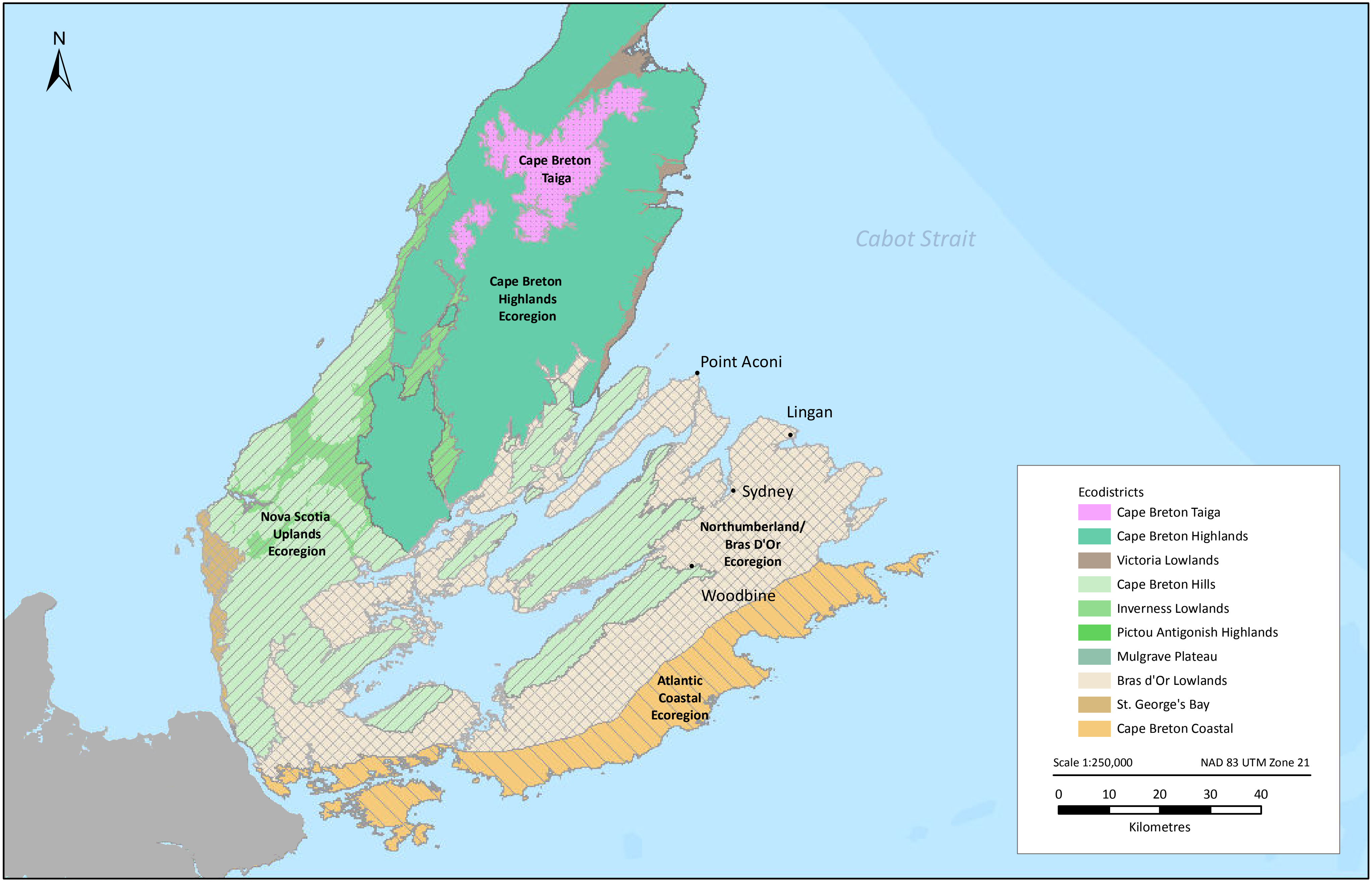
3.3.1.1 Ecoregions and Ecodistricts

The area of Cape Breton extending from Point Aconi, and Lingan, to Woodbine is part of Cape Breton County, and is located within the Bras d'Or Lowlands Ecodistrict of the Nova Scotia Highlands Ecoregion (Webb and Marshall 1999; NSDNR 2003) (Figure 3.10). This ecoregion includes a band of plateaus separated by lower-elevation uplands and lowlands extending across northern Nova Scotia. The climate is moderated, by its proximity to a large body of inland salt water, the Bras d'Or Lake, and by the shelter afforded by surrounding uplands. The weather is marked by warm, rainy summers and mild to cold, snowy winters (Webb and Marshall 1999).

The lowlands are underlain by Carboniferous sediments covered by shallow, stony, moderately coarse-textured glacial till (Webb and Marshall 1999, NSDNR 2003). The area is affected by strong coastal winds and has mean annual temperatures of -4.5^{o}C in winter and 16.4^{o}C in summer, and receives about 1,502 mm of precipitation annually (Webb and Marshall 1999, NSDNR 2003).

3.3.1.2 Vegetation

The Bras d'Or Lowlands Ecodistrict covers 2585 km^2 and extends from the Strait of Canso to Glace Bay (Figure 3.10). This Ecodistrict consists of rolling to undulating lowland plain characterized by balsam fir that has re-established on most forested lands previously disturbed by harvesting or by natural causes (NSDNR 2003). Other predominant tree species include white spruce (*Picea glauca*), black spruce, and, on steeper slopes, white pine (Webb and Marshall 1999; NSDNR 2003). Poor-quality shade-tolerant hardwood [American beech (*Fagus grandifolia*), maple and yellow birch] are found on higher ground. Old fields and pastures have regenerated mostly to pure stands of white spruce (Webb and Marshall 1999, NSDNR 2003). Red spruce (*Picea rubens*) and (Eastern) hemlock (*Tsuga canadensis*) are found in the valley canyons, steep ravines, and along some watercourses coming off the uplands (NSDNR 2003).



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Date: 22NOV2011
Data Sources: NSDNR 2003

Figure 3.10

Ecoregions and Ecodistricts of Cape Breton, Nova Scotia

3.3.1.3 Aquatic Habitat and Fish

Many short streams and brooks form a modified trellis drainage pattern connecting numerous small lakes and ponds (NSMNH n.d.). Streams in the area generally have pH levels between 6.4 and 7.1, while lakes tend to average between 6.0 and 6.6 (NSMNH n.d.). Ponds near Point Aconi, and Lingan, tend to be shallow with soft anaerobic bottoms and extensive peat bogs occur in depressions. Aquifers are confined by the low permeability of the overlying hills (NSMNH n.d.). There are a few salt marsh areas with eel grass beds in Lingan Basin, Glace Bay, and Port Morien. Scouring by sea ice in winter limits the growth of marine algae (NSMNH n.d.).

3.3.1.4 Terrestrial Wildlife

The highly urban region provides habitat for mammals that are typically found in proximity to developed areas such as white-tailed deer (*Odocoileus virginianus)*, moose, American black bear, snowshoe hare, fisher (*Martes pennant)*, coyote, American red squirrel, red-backed vole (*Clethrionomys gapperi*), and porcupine (*Erithizon dorsatum)* (NSMNH n.d.). The area is known to support a significant faunal component along the coast, especially in vertical cliffs that provide seabird nesting sites (NSMNH n.d.). Common bird species in this part of Cape Breton comprise both sea birds and inland species (passerines, and hawks, owls and eagles). Species include: herring and great black-backed gulls; black guillemots (*Cepphus grylle*); cormorants; common eider; red-breasted merganser; red-eyed vireo (*Vireo olivaceus*); American robin (*Turdus migratorius*); Swainson's thrush (*Catharus ustulatus*); blue jay (*Cyanocitta cristata*); black-capped chickadee (*Poecile atricapillus*); purple finch (*Carpodacus purpureus*); rose-breasted grosbeak (*Pheucticus ludovicianus*); white-throated sparrow (*Zonotrichia albicollis*); and numerous species of warblers. Some bald eagle (*Haliaeetus leucocephalus*) nesting habitat also occurs.

3.3.1.5 Protected Areas

There are no protected areas [Parks (provincial or national), Heritage Rivers, Nature Reserves, or Wilderness Areas] and no Nova Scotia Department of Natural Resources (NSDNR) designated wetlands in the Study Area for this component of the Project.

There are two IBAs located near the Project area in Cape Breton. Bird Islands (NS001) is an offshore IBA located about four kilometres off Cape Dauphin. This IBA includes Hertford Island, a Nova Scotia Bird Society Sanctuary, and Ciboux Island, which is not currently protected (IBA Canada 2010c). The Central Cape Breton Highlands IBA (NS061) is located south of Cape Breton Highlands National Park and just west of Point Aconi. Both IBAs are considered to be globally significant; the Bird Islands IBA for congregatory species and the Central Cape Breton Highlands IBA for both threatened and congregatory species. The proposed Project does not overlap with either IBA.

There is the potential for additional protected areas to be proposed or designated during the EA process. NSDNR adheres to various statutes including the *Provincial Parks Act* and *Parks Development Act*, to create and designate protected areas within the province. The Acts and associated Regulations define and provide legal protection, and also outline the types of activities that can and cannot take place within the borders of the protected area. Ongoing discussions with the Parks and Recreation Division of NSDNR throughout the Project timeline will ensure that newly proposed or designated protected areas, within or near the Project footprint, are integrated into the EA process.

3.3.1.6 Species at Risk

Several species of conservation concern, listed provincially under the *Nova Scotia Endangered Species Act* or federally under *SARA,* have the potential to occur in the Cape Breton County area. Some of these species also have national status under COSEWIC. Species that might occur within the Nova Scotia component of the Project area, and that have provincial and/or national status, are included in Table 3.7.

Table 3.7 Species of Concern in Cape Breton County

Species Common Name	Species Scientific Name	NSDNR General Status	*SARA* Status	COSEWIC Status
Mammals				
American marten	*Martes americana*	Red	Extirpated	Data Deficient
Canada lynx	*Lynx canadensis*	Red		Not at risk
Birds				
Piping plover	*Charadrius melodus melodus*	Red	Endangered	Endangered
Harlequin duck (Eastern population)	*Histrionicus histrionicus*	Yellow	Special concern	Special concern
Bicknell's thrush	*Catharus bicknelli*	Yellow	Special concern	Threatened
Fish				
Atlantic salmon	*Salmo salar*	Red	No schedule, No Status	Special concern
American eel	*Anguilla rostrata*	Green	No schedule, No Status	Special concern
Butterflies				
Jutta arctic (Baltic grayling)	*Oeneis jutta*	Red		
Québec emerald	*Somatochlora brevicincta*	Undetermined		
Molluscs				
Yellow lampmussel	*Lampsilis cariosa*	Red	Special concern	Special concern

Source: NSDNR 2011a, PC 2009a, *SARA* 2011
Note: Marine aquatic species of conservation concern are discussed in Section 3.2.1.8.

3.3.2 Land Use

3.3.2.1 History

Cape Breton Island's first residents were likely Maritime Archaic people; however, at the time of European discovery the Mi'kmaq inhabited Cape Breton. John Cabot reportedly visited Cape Breton Island, also known as Île Royale, in 1497; however, historians are unclear as to whether Cabot first visited the Island of Newfoundland or Cape Breton Island. The Portuguese established a fishing colony on Cape Breton Island around 1521, and as many as 200 settlers lived in a nameless village thought to be located at present-day Ingonish on the northern peninsula. The fate of the colony is unknown, but it is mentioned as late as 1570.

The French established settlements on Cape Breton at present day Englishtown (1629) and St. Peter's (1630). These settlements lasted almost continuously until 1659, whereupon Cape Breton remained virtually vacant of Europeans for more than 50 years, until Louisbourg, and other communities, were established in 1713.

Although New Englanders captured Louisbourg in 1745, and the British did so again in 1758, Île Royale remained formally part of colonial France until it was ceded to Britain under the Treaty of Paris in 1763. Britain then merged Île Royale with its adjacent colony of Nova Scotia (present day mainland Nova Scotia and New Brunswick). From 1763 to 1784, Cape Breton was administratively part of the colony of Nova Scotia, and governed from Halifax.

The first permanently settled Scottish community on Cape Breton Island was Judique, settled in 1775. In 1784, Britain split the colony of Nova Scotia into three separate colonies: New Brunswick; Cape Breton Island; and present-day mainland Nova Scotia, in addition to the adjacent colonies of St. John's Island (renamed Prince Edward Island in 1798) and the Island of Newfoundland. The colony of Cape Breton Island had its capital at Sydney.

Shipbuilding on a large scale began in the 1790s. Schooners were built for local trade, with construction moving on to larger brigs and brigantines in the 1820s, and peaking in the 1850s, with construction of the full rigged ship *Lord Clarendon*, the largest wooden vessel ever built in Cape Breton (1851). In 1820, the colony of Cape Breton Island was merged for the second time with Nova Scotia, and this was one of the factors that led to large-scale industrial development in the Sydney Coal Field of Eastern Cape Breton County. By the late 19th century, as a result of faster shipping, an expanding fishery, and industrialization, exchanges of people between the Islands of Newfoundland and Cape Breton increased, beginning a cultural exchange that continues to this day.

As a result of the Highland clearances in the first half of the 19th century, Cape Breton Island experienced an influx of about 50,000 Highland Scots. Many of the Scots who immigrated to Cape Breton were either Roman Catholics or Presbyterians, which can be seen in a number of landmarks and place names. Today, the descendants of the Highland Scots dominate Cape Breton Island's culture, particularly in rural communities, but a campaign by the provincial school system led to the near extermination of Gaelic culture. The growing influence of English-dominated media from outside the Scottish communities saw Gaelic use erode quickly during the 20th century. Today, Gaelic remains the first language of a dwindling number of elderly residents.

The turn of the 20th century saw Cape Breton Island at the forefront of scientific achievement through the activities of inventors Alexander Graham Bell and Guglielmo Marconi. Beginning in the 1940s, tourism promotion recognized the importance of the Scottish culture to the province, and more recently, the provincial government started encouraging the use of Gaelic once again. In the 1960s, PC partially reconstructed the Fortress of Louisbourg. This National Historic Site now employs many residents and attracts thousands of tourists every year. The Fortress has also led to the revival of pride among Acadians, who were among the first European settlers.

Sydney boomed at the turn of the 20th century with the building of the Dominion Steel and Coal Company steel plant at Whitney Pier. Coal mines expanded, and numerous sand and gravel deposits were, and still are, commercially exploited in the area. At Coxheath near Sydney, copper occurrences were reported in 1825, with mining production taking place intermittently until 1896. Coal-generated steam turbine power plants at Glace Bay, Lingan, and Point Aconi supply electrical power to the province (NSMNH n.d.).

Acadians in Cape Breton

The Acadians are the descendants of 17th-century French colonists who settled in Acadia, a colony of New France, located in Nova Scotia, New Brunswick, and Prince Edward Island (as well as part of Québec, and Maine) (Government of Nova Scotia 2008). Between 1714 and 1734, approximately 500 Acadians moved to Île Royale and settled in the Baie des Espagnols (modern Sydney), Mordienne (Port Morien - Cow Bay), L'Indienne (Lingan), and Port Toulouse (St. Peter's) areas, and developed friendly relations with the Mi'kmaq, learning hunting and fishing techniques (Jonah 1995, Government of Nova Scotia 2008). In 1755, the Lieutenant Governor of Nova Scotia ended negotiations with the Acadians, and the governing council of Nova Scotia issued the order that the entire population be expelled from the colony and dispersed throughout British North American territory (Jonah 1995). The deportations of Acadians from mainland Nova Scotia began in the fall of 1755, and those living in Île Royale were deported to British colonies in the present day USA and later to France, or to prisons in England after that colony was defeated in 1758 (Jonah 1995). After the conclusion of the Seven Years' War (1764), the Acadians were allowed to return to Nova Scotia and some re-joined the few who had managed to elude deportation, including a group of families who had led a nomadic existence in the vicinity of Isle Madame, Cape Breton (Jonah 1995). Isle Madame was one of only two places in Nova Scotia, the other being Cape Sable, where Acadians were allowed to return to lands they had previously occupied, and this was the first area of Cape Breton that the Acadians settled after 1764 (Jonah 1995, Ross and Deveau 1995). Acadian resettlement of Cape Breton spread from the Isle Madame area to the western side of Cape Breton and inland toward the end of the 18^{th} century (Jonah 1995, Government of Nova Scotia 2008).

3.3.2.2 Contemporary Socioeconomic Setting

Cape Breton residents can be grouped into five main cultures: Mi'kmaq; Scottish; Acadian; Irish; and English, with respective languages Mi'kmaq, Gaelic (Scottish and Irish), French, and English. English is now the primary spoken language, though Mi'kmaq, Gaelic and French are also spoken. Later migrations of Black Loyalists, Italians, and Eastern Europeans mostly settled in the eastern part of Cape Breton Island around the Industrial Cape Breton region. According to Statistics Canada, the population of Cape Breton Island in 2001 was 102,250, a 3.5% decline from 105,968 in 2001, a trend that has continued for almost two decades, with an increasing population exodus in recent years due to economic conditions (Statistics Canada 2006).

Cape Breton encompasses four of Nova Scotia's eighteen counties: Cape Breton; Inverness; Richmond; and Victoria. In 2001, the population of Cape Breton was approximately 16% of the provincial total. The Study Area for the Project lies within Cape Breton County, which occupies the same geographical area as the Cape Breton Regional Municipality (CBRM). The area is often referred to as Industrial Cape Breton, given the history of coal mining and steel manufacturing in this area. Approximately 72% of Cape Breton's population is located in the CBRM (CBRM 2009).

Cape Breton Island has two major coal deposits: the Sydney Coal Field in the southeast; and the Inverness Coal Field in the west along the Gulf of St. Lawrence. Sydney has traditionally been the main port, with various docking facilities in a large, sheltered, natural harbour. The city is also Cape Breton's largest commercial center, home to the daily newspaper, two television stations, and several radio stations. North Sydney is the southern terminus for Marine Atlantic ferries travelling to Port aux Basques and, seasonally, to Argentia on the Island of Newfoundland.

To the east of the Project Study Area, Glace Bay is the second largest urban community in population and was Cape Breton's main coal mining center until its last mine ceased operation in the 1980s. Glace Bay also served as the hub of the Sydney and Louisburg Railway, and as a significant fishing port. Industrial Cape Breton faced several challenges with the closure of the Cape Breton Development Corporation's coal mines and the Sydney Steel Corporation's steel mill. In recent years, residents attempted to diversify the area's economy by investing in tourism, call centers, and small businesses, as well as manufacturing ventures in such fields as auto parts, pharmaceuticals, and specialty window glazings (CBRM 2009).

While CBRM transitions from an industrial to a service-based economy, the rest of Cape Breton Island, outside the industrial area, has been more stable, with a mixture of fishing, forestry, small-scale agriculture, and tourism. Tourism in particular has grown throughout the post-Second World War era, especially vehicle-based touring, which was furthered by the creation of the Cabot Trail scenic drive. Whale-watching is a popular attraction for tourists, and numerous vendors from Baddeck to Cheticamp operate whale-watching tours. Building on the popularity of the Cape Breton Highlands National Park and the Fortress of Louisbourg National Historic Site, the tourism industry has grown in recent decades. The Condé Nast travel guide has rated Cape Breton Island as one of the best island destinations in the world.

There are numerous recreational opportunities in this part of the province including swimming (freshwater and marine), hiking, golf, sea kayaking, birding, cycling, and geocaching. Freshwater and marine fishing are popular when in season, on the many lakes and streams, with the most sought after species being the native brook trout, and in some rivers, Atlantic salmon.

A wide assortment of berries are harvested both as economic resources and for personal consumption in Cape Breton. These include raspberry (*Rubus* sp.), low bush blueberry, elderberry (*Sambucus nigra*), crowberry (*Empetrum* sp.), cranberry (*Vacciniu*m sp.) and bunchberry (*Cornus canadensis*). Teaberries, from wintergreen (*Gaultheria procumbens*), are also picked along with the leaves of the wintergreen plant which provide mint for flavouring in cooking. Although not economically important, Northern blueberry (*Vaccinium boreale*) is also found in small numbers in exposed regions of Cape Breton. Other plants that are harvested include dulse, or purple seaweed (*Palmaria palmata*), Irish moss and seaweed (*Ascophyllum nodosum*).

Wildlife commonly hunted in Cape Breton includes moose, white-tailed deer, black bear, Canada geese, ducks, and small or upland game such as snowshoe hare, pheasant (*Phasianus colchicus*) and ruffed grouse (*Bonasa umbellus*) (NSDNR 2011b). Open seasons for big game generally run from late October to the end of November and small or upland game seasons extend October through December. Hunting methods vary but include trapping, snaring, bow hunting, and shooting.

Caribou, moose, and wolf (*Canis lupus*) were extirpated from Cape Breton by the beginning of the 1900s due partly to over-hunting and trapping. Moose were successfully re-introduced to Cape Breton in the late 1940s and NSDNR now annually processes almost 12,000 applications for 335 licences for Inverness and Victoria Counties only[3] (PC 2009b, NSDNR 2011b and c). The 2011 moose hunt in Cape Breton is now managed on a five-zone basis and divided into four seasons that cover a hunting period, in specific zones, extending from late-September to mid-October, and for a few days in mid-December (NSDNR 2011c). This last season, in December, was introduced in 2004 to provide additional opportunity and to reduce the number of nuisance moose that cause area residents considerable frustration and pose a hazard to traffic (NSDNR 2011c). Zone 3 is located near the Project Study Area, in Victoria County, Cape Breton. The rest of the zones lie to the west of Zone 3.

3.3.3 Aboriginal Groups

3.3.3.1 Historical

The Mi'kmaq are the founding people of Nova Scotia. Historically, Mi'kmaq territory stretched from the southern portions of the Gaspé Peninsula eastward through most of modern-day New Brunswick, and all of Nova Scotia and Prince Edward Island. This area was divided into seven smaller territories across what was known as Mi'kma'ki (Office of Aboriginal Affairs 2011).

Mi'kmaq harvested resources in the Gulf of St. Lawrence on a seasonal schedule that typically brought them to coastal encampments in the spring and summer, when the ice was melting and fish were plentiful in inshore waters, coastal rivers, and streams (Pastore 1998, Higgins 2009b). Winter flounder was one of the earliest fish to become available, followed by a string of other species until the early fall – smelt, herring, salmon, sturgeon, trout, cod, bass, plaice, and eels (Higgins 2009b).

Fishers employed a variety of methods including fishing with bone hooks, spears, and a three-pronged leister able to catch salmon, sturgeon, and other large species. The Mi'kmaq also harvested shellfish, sea mammals, seabirds, and seabird eggs during the spring, summer, and early fall. From May to the middle of September, the Mi'kmaq fished and gathered shellfish until the fall and winter hunting season, which typically ran from October until mid-March. Mi'kmaq returned to the coast to harvest marine resources such as seals that whelped in coastal areas in January and February, and young cod caught under the ice in December (Pastore 1998, Higgins 2009b).

Mi'kmaq oral tradition suggests that their people visited the Island of Newfoundland seasonally to hunt in the fall and winter months before returning to Cape Breton Island (Higgins 2008).

3.3.3.2 Contemporary Setting

In 1992, the Aboriginal Fisheries Strategy was announced in Atlantic Canada. The Strategy was designed to provide economic opportunities to Aboriginal groups primarily in coastal areas of Canada, but also to contribute to the enhancement of Atlantic salmon stocks, and to recognize Aboriginal right of access to

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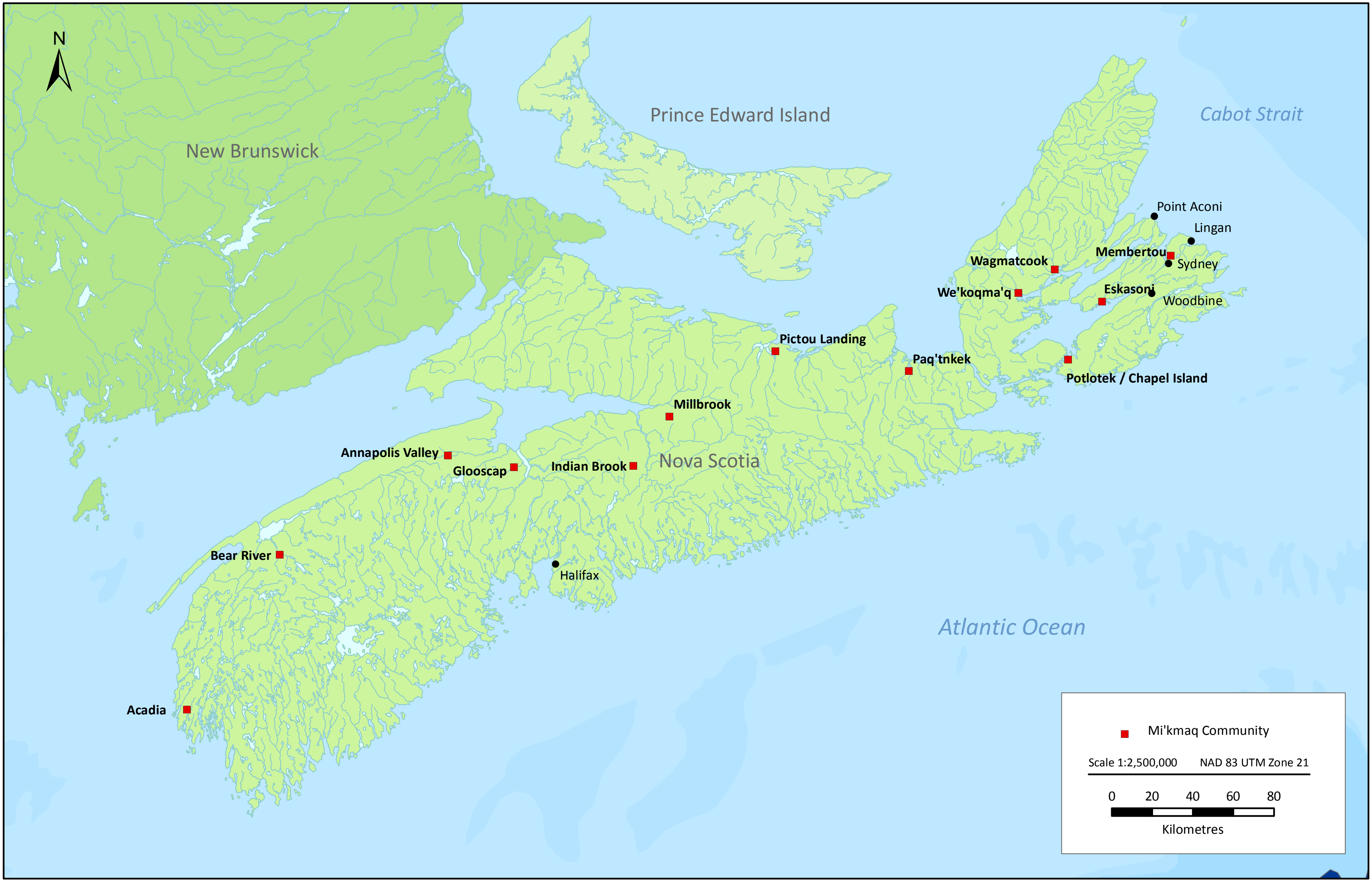
[3] Mainland moose (*Alces alces americana*) are an endangered population. As a result, moose hunting only takes place in two counties in Cape Breton.

the fishery for food, social and ceremonial purposes, second only to conservation concerns and the orderly management of Canada's fisheries resources (DFO 2010b).

The Mi'kmaq remain the predominant Aboriginal group within the province with 13 Mi'kmaq First Nations and a total of 13,518 registered Indians; 4,752 of whom live off-reserve. The Registered Indian population is represented through a series of 13 band councils and two tribal councils—the Confederacy of Mainland Mi'kmaq and the Union of Nova Scotia Indians. The Union of Nova Scotia Indians tribal council represents the five First Nation communities within Cape Breton along with two First Nations located in mainland Nova Scotia (Indian Brook and Acadia First Nations). The remaining six communities are represented by the Confederacy of Mainland Mi'kmaq (Office of Aboriginal Affairs 2011). The Assembly of Nova Scotia Mi'kmaq Chiefs (the Assembly) represents all 13 bands and provides consultation and negotiations decisions and directions as laid out in the Consultation Terms of Reference under the Made in Nova Scotia Process. The Assembly is comprised of all 13 Nova Scotia Mi'kmaq Chiefs and two ex-officio members. KMKNO undertakes the necessary research, develops consensus positions on identified issues, and creates public and community awareness in a manner that supports the ability of the Assembly to fully guide negotiations and implement and exercise the constitutionally protected Mi'kmaq rights.

Cape Breton currently contains five Mi'kmaq communities: Eskasoni; Membertou; Wagmatcook; Waycobah (We'koqma'q); and Potlotek/Chapel Island (Figure 3.11). Eskasoni, is the largest in both population and land area, although recent census studies have shown that the number of First Nation Canadians living in CBRM has increased, between 2001 and 2006, from 670 to 1,055 (Cape Breton Post 2008, Office of Aboriginal Affairs 2011).

The UINR is an interest group that represents these five Mi'kmaq communities of Unama'ki and was formed to address concerns regarding natural resources and their sustainability and to represent Cape Breton Mi'kmaq on natural resources and environmental concerns (UINR 2011). The group works closely with government and other First Nations organizations to meet objectives. In 2010, the UINR was involved in the development of a new of guidelines developed to assist in quantifying the native moose hunt which had, until that time, no mandatory reporting system (MacIntyre 2006). The Tiamuwel Netuklimkewe–Unama'ki Moose Harvesting According to Netukulimk Guidelines were released in August 2010 and were created through input from Mi'kmaq across Nova Scotia, and endorsed by the Assembly of Nova Scotia Mi'kmaq Chiefs (UINR 2011). The document acts as a voluntary reporting system and is seen as an important step in native self-governance over traditional resources (UINR 2011).



Emera Newfoundland & Labrador

Date: 22NOV2011
Data Sources: Office of Aboriginal Affairs, 2011; National Atlas Framwork 1:1 Million

Figure 3.11

Mi'kmaq Communities of Nova Scotia

4 CLOSURE

This Project Description contains essential information on the proposed *Maritime Link*, a development that will provide a direct link between the power systems of Newfoundland and Labrador and Nova Scotia. As proponent of the *Maritime Link*, ENL is responsible for the design, construction and operation of the Project, in accordance with relevant government regulations, environmental protection requirements and stakeholder considerations. When completed, the Project will enhance the ability of each province to meet their respective power requirements by achieving an optimal balance among available renewable energy sources.

This Project Description describes the basic design and operating procedures, as well as general information on the environmental and socioeconomic characteristics of the areas that could be affected. Construction and operation of the land and marine components of the *Maritime Link* involve the application of proven technologies operating within a tightly regulated, standards-based industrial sector. As the proponent, ENL has the necessary experience, technical capacity and commitment to environmental protection to ensure that the Project is built and operated with minimal environmental effects.

ENL has held preliminary meetings with federal and provincial regulators to explore options for conducting a coordinated or harmonized environmental assessment process among the three jurisdictions. In addition, ENL has conducted information sessions with various stakeholder groups, including First Nations, as a prelude to further and more in-depth engagement of interested parties.

As proponent, ENL is well aware of its environmental responsibilities and has embarked on a series of baseline environmental and socioeconomic studies that will provide the basis for a further refinement of the main topics requiring more detailed investigations.

This Project Description provides a starting point for an EA process that will meet the requirements of the Government of Canada, the province of Newfoundland and Labrador, and the province of Nova Scotia.

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APPENDIX A

Potential Permitting Requirements for the Maritime Link

Appendix A—Potential Permitting Requirements for the Maritime Link

Activity	Approval/Certificate/License /Permit/Inspection	Legislation	Regulating Agency
Federal Permitting Requirements			
Project Construction/Commencement	EA approval	*Canadian Environmental Assessment Act*	Canadian Environmental Assessment Agency, Relevant Federal Departments
Instream and Marine Activities	*Fisheries Act* Authorization approval	*Fisheries Act*	DFO http://www.dfo-mpo.gc.ca/regions/central/pub/factsheets-feuilletsinfos-on/l1-eng.htm
Instream Activities (that interfere with navigation, shoreline protection measures, grounding and aerial transmission lines, and any temporary construction bridges)	Navigable Waters Protection Program approval	*Navigable Waters Protection Act*	Transport Canada http://www.tc.gc.ca/eng/marinesafety/oep-nwpp-guide-2053.htm
Disposal at Sea	Permit for Dredged Material	*Canadian Environmental Protection Act*	Environment Canada http://www.ec.gc.ca/lcpe-cepa/eng/regulations/detailReg.cfm?intReg=58
Purchase, Possession, Transport and Storage of Explosives	Explosive Purchase and Possession Permit, Explosive Transportation Permit, Magazine License (Temporary)	*Explosives Act*	Natural Resources Canada http://www.nrcan.gc.ca/mms-smm/expl-expl/license-eng.htm
Registration of Foreign Vessels	Registration	*Canada Shipping Act*	Transport Canada http://www.tc.gc.ca/eng/marinesafety/oep-vesselreg-registration-procedures-103.htm
Handling and Transportation of Dangerous Goods	Equivalency Permit (if activity is not in compliance with the Act)	*Transportation of Dangerous Goods Act*	Transport Canada http://www.tc.gc.ca/tdg/permits/menu.htm
Provincial Permitting Requirements – Newfoundland and Labrador			
Project Construction/ Commencement	Release	Newfoundland and Labrador *Environmental Protection Act*	Departmentof Environment and Conservation (EA Division) http://www.env.gov.nl.ca/env/env_assessment/index.html
Land Requirements	Crown Land Lease/License/Permit Notice of Intent of Reservation of Shoreline	Newfoundland and Labrador *Lands Act*	Department of Environment and Conservation http://www.env.gov.nl.ca/env/forms/lands/app_crown_lands.pdf
Watercourse Alteration, Instream Activity, Construction Site Drainage	Certificate of Approval	Newfoundland and Labrador *Water Resources Act*	Department of Environment and Conservation http://www.gs.gov.nl.ca/licenses/env_protection/appl_storage_tank_system_used.pdfhttp://www.env.gov.nl.ca/env/waterres/regulations/appforms/index.html
Garbage Disposal/Waste Management	Waste Management System – Certificate of Approval	Newfoundland and Labrador *Environmental Protection Act – Waste Disposal and Litter*	Department of Environment and Conservation

Activity	Approval/Certificate/License /Permit/Inspection	Legislation	Regulating Agency
Access to highway	Permit for Access off Any Highway	Newfoundland and Labrador *Urban and Rural Planning Act – Highway Sign Regulations*	Department of Municipal Affairs http://www.gs.gov.nl.ca/licenses/land_dev/highway/index.html
Fuel Storage	Fuel Storage and Handling – Temporary Storage Remote Locations	Newfoundland and Labrador *Environmental Protection Act – Storage and Handling of Gasoline and Associated Products Regulations (Section 13)*	Department of Environment and Conservation http://www.assembly.nl.ca/Legislation/sr/Regulations/rc030058.htm#3_ http://www.env.gov.nl.ca/env/forms/env_protection/appl_storage_tank_system.pdf
	Fuel Storage and Handling – Permit for Flammable and Combustible Liquid Storage and Dispensing (above or below ground) and for Bulk Storage (above ground only)	Newfoundland and Labrador *Environmental Protection Act – Storage and Handling of Gasoline and Associated Products Regulations* and *Fire Prevention Act*	Departmentof Environment and Conservation and Departmentof Municipal Affairs (Office of the Fire Commissioner) http://www.gs.gov.nl.ca/licenses/env_protection/fuel/index.html
General Construction Activities	Operating Permit/Fire Season – Crown or private land for a company or individual to operate during forest fire season	Newfoundland and Labrador *Forestry Act – Forest Fire Regulations*	Department of Natural Resources – Forest Resources Division http://www.nr.gov.nl.ca/nr/forestry/permits/licence.html#burn
	Permit to Cut Crown Timer (required for commercial or domestic cutting of timber on Crown Land)	Newfoundland and Labrador *Forestry Act – Cutting of Timber Regulations*	
	Permit to Burn	Newfoundland and Labrador *Forestry Act – Forest Fire Regulations*	
	Quarry Permit	Newfoundland and Labrador *Quarry Materials Act*	
Highway Signage (for signs erected or placed within the designated control lines of a highway)	Permit to erect signage	*Urban and Rural Planning Act* (O.C. 99-444)	Department of Municipal Affairs http://www.gs.gov.nl.ca/licenses/highway/off_site/new/
Investigation for the purpose of seeking heritage resources (e.g., as part of EA)	HRIA Permit Research Permit	*Historic Resources Act* (1985).	Department of Tourism, Culture and Recreation http://www.tcr.gov.nl.ca/tcr/faq/resources_for_Archaeologists.html#Permit%20deadlines
Wetland Alteration	Written permission from the Minister	Newfoundland and Labrador *Water Resources Act*	Department of Environment and Conservation http://www.env.gov.nl.ca/env/waterres/regulations/policies/wetlands.html
Provincial Permitting Requirements – Nova Scotia			
Project Construction/ Commencement	EA Approval	Nova Scotia *Environment Act, 1994-95, c. 1, s. 1.*	Nova Scotia Environment http://www.gov.ns.ca/snsmr/paal/nse/paal164.asp

Activity	Approval/Certificate/License /Permit/Inspection	Legislation	Regulating Agency
Land Requirements (for most any usage of Crown Lands)	Crown Lands – Easement/Lease/License/Permit	*Crown Lands Act*. R.S., c. 114, s. 1. *Beaches Act.* R.S., c. 32, s. 1.	Nova Scotia Department of Natural Resources
Cross a railway under provincial jurisdiction (Cape Breton and Central Nova Scotia Railway)	Authorization	*Enterprise Cape Breton Corporation Act*	Enterprise Cape Breton Corporation http://www.ecbc-secb.gc.ca/English/Pages/Home.aspx
Burn a fire within 1,000 feet of the woods	Burn permit	*Forests Act*. R.S., c. 179, s. 1.	Nova Scotia Department of Natural Resourceshttp://www.gov.ns.ca/snsmr/paal/dnr/paal082.asp
Investigation for the purpose of seeking heritage resources (e.g., as part of EA)	Heritage Research Permit	*Special Places Protection Act*. R.S., c. 438, s. 1.	Nova Scotia Museum Department of Communities, Culture and Heritage http://www.gov.ns.ca/snsmr/paal/tourism/paal157.asp
Travel on forest land while a travel ban (woods closure) is in force.	Travel In Woods During Woods Closure Permit	*Forests Act*, Revised Statutes of Nova Scotia, 1989, Chapter 10, Section 25	Nova Scotia Department of Natural Resources http://www.gov.ns.ca/snsmr/paal/dnr/paal406.asp
Store dangerous goods or burn used oil	Dangerous Goods / Waste Dangerous Goods: Approval	Nova Scotia *Environment Act, 1994-95, c. 1, s. 1.*	Nova Scotia Environment http://www.gov.ns.ca/snsmr/paal/nse/paal162.asp
Watercourse Alteration	Watercourse Alteration Approval	Nova Scotia *Environment Act, 1994-95, c. 1, s. 1.*	Nova Scotia Environment http://www.gov.ns.ca/snsmr/paal/nse/paal181.asp
Wetland Alteration	Wetland Alteration Approval	Nova Scotia *Environment Act, 1994-95, c. 1, s. 1.*	Nova Scotia Environment http://www.gov.ns.ca/snsmr/paal/nse/paal586.asp
Pesticide Application	Pesticide Use and Storage Approval	Nova Scotia *Environment Act, 1994-95, c. 1, s. 1.*	Nova Scotia Environment http://www.gov.ns.ca/nse/forms/docs/Application-PesticideApproval.pdf
Access 100 series highway for purpose of removing logs or pulpwood	Entrance Onto Controlled Access Highway: Temporary Permit	*Public Highways Act*, Revised Statutes of Nova Scotia, 1989, Chapter 371, Section 22	Nova Scotia Transportation and Infrastructure Renewal http://www.gov.ns.ca/snsmr/paal/trans/paal292.asp
Municipal Government Requirements			
Building Construction	Development or building permit		Relevant municipality
Waste Disposal	Approval to dispose waste in municipal landfill		Relevant municipality