

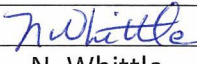
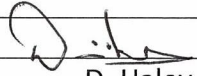
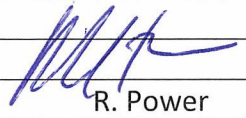
## Nalcor Energy – Lower Churchill Project



### LITL VEGETATION PROTECTION AND ENVIRONMENTAL EFFECTS MONITORING PLAN

Nalcor Doc. No. ILK-PT-MD-0000-EV-PL-0006-01

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**Inter-Departmental / Discipline Approval (where required)**

Department	Department Manager Approval	Date
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## 1 PURPOSE

The purpose of this Labrador-Island Transmission Link (L-ITL) (the Project) Vegetation Protection and Environmental Effects Monitoring Plan (VPEEMP) is to demonstrate how any adverse environmental effects will be mitigated, and to set out a program for monitoring the effectiveness of mitigation measures. To comply with regulatory requirements and commitments made in the L-ITL Environmental Impact Statement (EIS), the L-ITL's VPEEMP approach includes consideration of:

- Mitigation objectives – performance objectives in respect of each adverse environmental effect;
- Mitigation – measures planned to achieve the mitigation objectives;
- Metrics and targets – specific, quantifiable, relevant and time constrained;
- Follow-up or Monitoring Programs – how the Project will include follow-up or monitoring surveys to confirm that mitigation strategies are meeting the mitigation objectives; and
- Contingency – plan to be implemented should monitoring reveal that mitigation measures have not been successful.

The L-ITL's VPEEMP relates to wetlands, riparian shorelines, listed plants, regionally uncommon plant species and timber resources. The VPEEMP builds on existing information and commitments made in the EIS (Nalcor 2012), and conditions of permits and licenses for the Project.

## 2 SCOPE

This plan addresses the required aspects of vegetation protection and effects monitoring for the design, construction, and operation phases for the Labrador-Island Transmission Link (described in Section 6.0).

## 3 DEFINITIONS

**Environmental Assessment:** An evaluation of a project's potential environmental risks and effects before it is carried out and identification of ways to improve project design and

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implementation to prevent, minimize, mitigate, or compensate for adverse environmental effects and to enhance positive effects.

**Environmental Management:** The management of human interactions with the environment (air, water and land and all species that occupy these habitats including humans).

**Environmental Protection Plan:** Document outlining the specific mitigation measures, contingency plans and emergency response procedures to be implemented during the construction or operations of a facility.

**Environmental Effects Monitoring:** Monitoring of overall Project effects to confirm the predictions of EA and to fulfill EA commitments.

**Environmental Compliance Monitoring:** Monitoring of Project activities to confirm compliance with regulatory requirements and commitments made through the EA process.

## 4 ABBREVIATIONS & ACRONYMS

<b>CEAA</b>	Canadian Environmental Assessment Act
<b>COSEWIC</b>	Committee on the Status of Endangered Wildlife in Canada
<b>CWS</b>	Canadian Wildlife Service
<b>EA</b>	Environmental Assessment
<b>EEMP</b>	Environmental Effects Monitoring Plan
<b>EIS</b>	Environmental Impact Statement
<b>EMP</b>	Environmental Management Plan
<b>EPP</b>	Environmental Protection Plan
<b>ERC</b>	Environment and Regulatory Compliance
<b>HSE</b>	Health Safety and Environment
<b>IBA</b>	Impacts and Benefits Agreement
<b>IPD</b>	Integrated Project Delivery
<b>LCP</b>	Lower Churchill Project
<b>L-ITL</b>	Labrador-Island Transmission Link
<b>NE</b>	Nalcor Energy
<b>NL</b>	Newfoundland and Labrador
<b>NLDEC</b>	Newfoundland and Labrador Department of Environment and Conservation
<b>NLDEC-WD</b>	Newfoundland and Labrador Department of Environment and Conservation – Wildlife Division
<b>PEEMP</b>	Protection and Environmental Effects Monitoring Plan
<b>RCP</b>	Regulatory Compliance Plan
<b>SARA</b>	Species at Risk Act

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## 5 REFERENCE DOCUMENTS

LCP-PT-MD-0000-PM-PL-0001-01	LCP Project Execution Plan
LCP-PT-MD-0000-PM-CH-0001-01	LCP Project Charter
LCP-PT-MD-0000-EA-PL-0001-01	LCP Generation Environmental Assessment Commitment Management Plan
LCP-PT-ED-0000-EA-SY-0002-01	Environmental Impact Statement and Supporting Documentation for the Labrador-Island Transmission Link
LCP-PT-MD-0000-SM-ST-0001-01	Post Environmental Assessment Release
LCP-PT-MD-0000-EV-PL-0009-01	LCP HVdc Overland Transmission and HVdc Specialties Environmental Protection Plan
LCP-PT-MD-0000-RT-PL-0001-01	Regulatory Compliance Plan
LCP-PT-MD-0000-HS-PL-0001-01	Health and Safety Plan
LCP-PT-MD-0000-HS-PL-0004-01.	LCP Emergency Response Plan
LCP-PT-MD-0000-EV-PY-0001-01	LCP No Harvesting Policy

## 6 LABRADOR-ISLAND TRANSMISSION LINK PROJECT DESCRIPTION

As described in the L-ITL EIS, the Project consists of the Construction and Operations of a  $\pm 350$  kilovolt (kV) High Voltage direct current (HVdc) electricity transmission system from Central Labrador to the Avalon Peninsula on the Island of Newfoundland (the Island). A 2 kilometre (km) wide study corridor was studied for environmental assessment purposes. A 60 meter wide right-of-way (ROW) has been selected within the 2 km-wide corridor (Figure 6.1).

The transmission system will include the following key components:

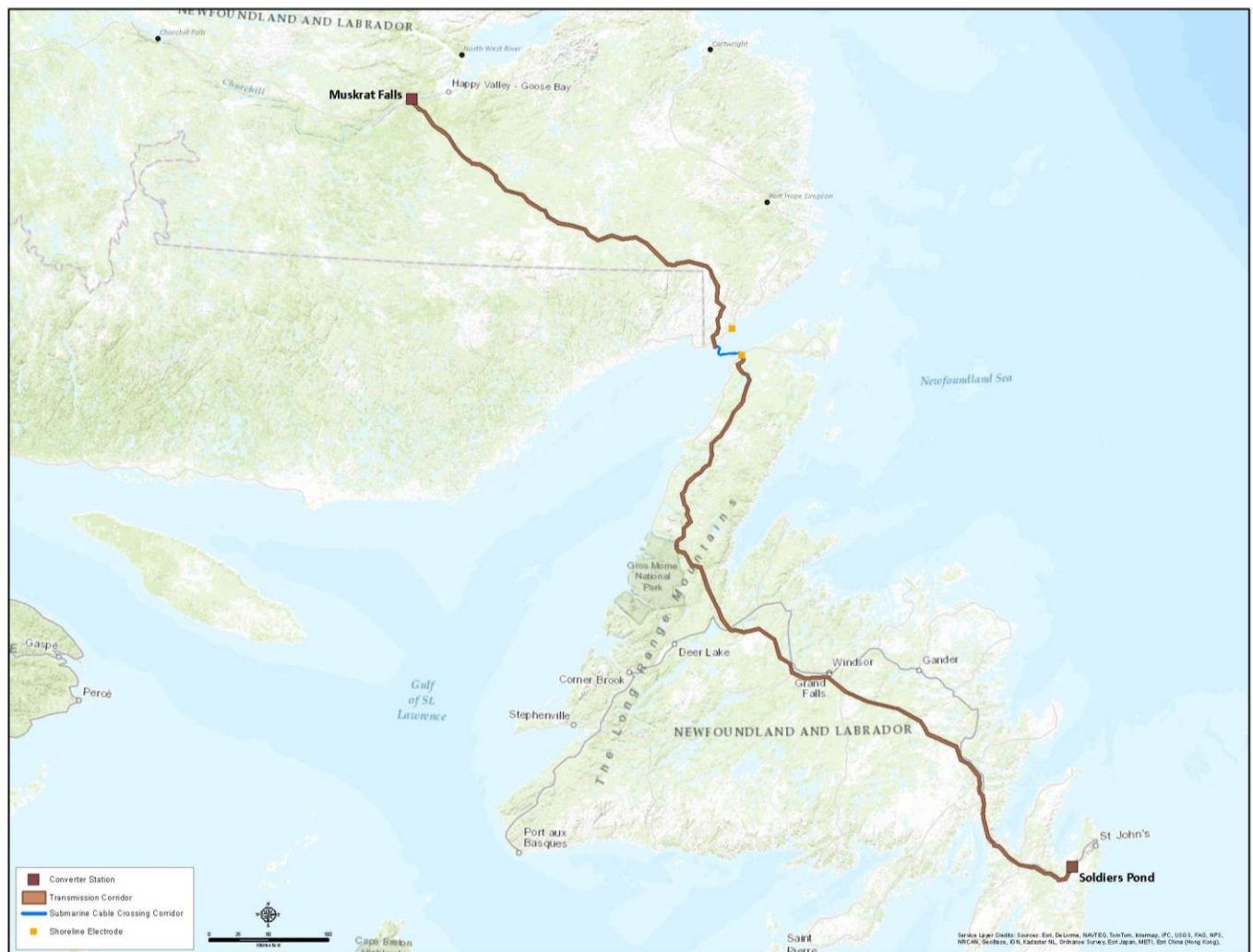
- an alternating current (ac) to direct current (dc) converter station at Muskrat Falls;
- approximately 400 km overhead HVdc transmission line from Muskrat Falls to Forteau Point;
- three, approximately 35 km long, submarine cables across the Strait of Belle Isle (SOBI) (i.e., between Forteau Point and Shoal Cove), with associated onshore infrastructure (transition compounds and land cables at both cable landings);



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- approximately 700 km of overhead HVdc transmission line from Shoal Cove to the Avalon Peninsula;
- a dc to ac converter station at Soldiers Pond; and
- shoreline electrodes at L'Anse au Diable and Dowden's Point, and overhead, wood pole electrode lines between the shoreline electrode sites and their respective converter stations.



**Figure 6-1** Labrador-Island Transmission Link (Nalcor, 2012)



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## 7 EXISTING INFORMATION

The existing information section is a summary of Nalcor (2012), unless otherwise noted.

### 7.1 VEGETATION ABUNDANCE AND DIVERSITY

The transmission corridor crosses two of fifteen ecozones in Canada – the Boreal Shield Ecozone and the Taiga Shield Ecozone. These two Ecozones are further divided into a number of Ecoregions. There are 19 Ecoregions within the province, nine in Newfoundland (Damman 1983) and 10 in Labrador (Meades 1990). The transmission corridor passes through 10 of these Ecoregions, four of which occur in Labrador and six in Newfoundland.

Vegetation in the Study Area represents a transition between Arctic ecosystems of the Taiga Shield Ecozone, typically associated with upland areas and higher elevations in the north, to the boreal forest ecosystems of the Boreal Shield Ecozone in the south. With the majority of the Study Area occurring within the Boreal Shield Ecozone of Southern Labrador and the Island of Newfoundland, undisturbed, upland coniferous forest vegetation is typically interspersed with wetlands. In Labrador, Aboriginal peoples are known to use select vegetation for food, medicine, fuel, shelter and other cultural purposes. Abundance and health of vegetation in the Study Area is presently influenced by factors such as forest fire, insect infestations, disease and commercial forest harvesting activities.

Fifteen ELC Habitat Types (as defined by plant species presence and abundance) were identified within Ecoregions crossed by the transmission corridor. Nine Habitat Types were identified for Labrador and 10 Habitat Types were identified for Newfoundland. Burn, Conifer Forest, Conifer Scrub, Mixedwood Forest, Open Conifer Forest and Wetland ELC Habitat Types are common to both Labrador and Newfoundland.

#### 7.1.1 Central and Southeastern Labrador

The transmission corridor within Central and Southeastern Labrador comprises an area of 770 square kilometres (km<sup>2</sup>), of which 45% occurs within the Low Subarctic Forest (Mecatina River) Ecoregion. The most common Habitat Types occurring in this region are Open Conifer Forest, Conifer Forest, Conifer Scrub and Wetland, each occupying a range of 19% to 26% of the total area in this region. Uncommon Habitat Types (i.e., those occupying 5% or less of a region) are Black Spruce Lichen Forest, Burn, Hardwood Forest and Mixedwood Forest.

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### 7.1.2 Northern Peninsula

Approximately 59% of the transmission corridor in the Northern Peninsula occurs within the Northern Peninsula Forest Ecoregion and 32% within the Long Range Barrens Ecoregion. The total area is 484 km<sup>2</sup>. The dominant habitat types include Conifer Forest and Scrub/Heathland / Wetland Complex which occupy a range of 28 to 22% of the total areas in this region, respectively. Alpine Vegetated, Conifer Scrub, Kalmia Lichen / Heathland and Rocky Barrens are considered as uncommon Habitat Types for the Northern Peninsula.

### 7.1.3 Central and Eastern Newfoundland

The Central and Eastern Newfoundland portion of the transmission corridor occupies a total of 654 km<sup>2</sup>, of which 98% is located within the Central Newfoundland Forest Ecoregion. The most common Habitat Type is Mixedwood Forest at over 33%, while uncommon Habitat Types were identified as Conifer Scrub, Kalmia Lichen / Heathland and Rocky Barrens.

### 7.1.4 Avalon Peninsula

The area of the transmission corridor within the Avalon Peninsula is 248 km<sup>2</sup> and just over 90% of this occurs within the Maritime Barrens Ecoregion. Scrub/Heathland/Wetland Complex is the most common Habitat Type, representing 40% of the transmission corridor. Uncommon Habitat Types include Burn, Conifer Scrub and Wetland.

## 7.2 WETLANDS

Wetlands refer to land that has the water table at, near or above the land surface, such as bogs, fens, marshes, swamps and other shallow open water areas (GNL 2002b). The *Comprehensive Study List Regulations*, SOR/94-638, define wetlands as "swamp, marsh, bog, fen or other land that is covered by water during at least three consecutive months of the year".

A total of 1,731 wetlands were identified in the transmission corridor, comprising over 211 km<sup>2</sup> of wetland area and representing approximately 10% of the transmission corridor area. The proportion of wetland area in the transmission corridor, wetland density (wetland number/km<sup>2</sup>) and the average size of wetlands differs among the regions. Wetlands made up the largest proportion of the corridor in the Central and Eastern Newfoundland region (12%), and wetland density was greater than in other regions of the transmission corridor with 1.1 wetlands per km<sup>2</sup>.

Wetlands in the Avalon Peninsula region of the corridor were smaller than in the other regions (average 0.10 km<sup>2</sup>), at the lowest density (0.8 wetlands per km<sup>2</sup>) and represented the smallest

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proportion of the transmission corridor (8%). Wetlands in the Central and Southeastern Labrador and Northern Peninsula regions of the corridor occurred at similar density (0.6 and 0.7 wetlands per km<sup>2</sup>, respectively), represented the same proportion of landmass of the corridor (9%) and similar average size (0.13 and 0.15 km<sup>2</sup>, respectively).

Of the three wetland classes found within the proposed transmission corridor, bogs have the lowest biological productivity and marshes have the highest. While bogs are an important habitat for many wildlife species, the increased biological productivity in fens and, in particular, marshes results in higher overall habitat values. Due to their location within the landscape, fens and marshes play more of a role in attenuating surface water flows than bogs. Given the geographic extent of the proposed transmission corridor, most wetlands within it are not in populated or developed areas (Stantec, 2010).

### 7.3 RIPARIAN HABITAT

Riparian habitat is defined as non-wetland habitat adjacent to watercourses and inland waterbodies that is unique in hydrology and vegetation from other upland habitat (Ilhardt et al. 2000). It is the unique hydrology and vegetation from other upland habitat that allows the functional width of a riparian area to be delineated in the field. Riparian shoreline length has been used as a measure of riparian area occurrence in the transmission corridor; width is defined by the buffer distance from a watercourse or waterbody that is locally prescribed or regulated.

Approximately 6% (229 km) of total Riparian Shoreline within the Study Area is intersected by the centre line ROW. Protected Public Water Supply Areas (PPWSA) are present in all regions of the Study Area. Riparian shoreline within the PPWSAs is protected by the Newfoundland and Labrador Department of Environment and Conservation (NLDEC) under the *Water Resources Act (2002)*. The largest proportion of PPWSA Riparian Shoreline (16 km of 6%) is intersected in Central and Southeastern Labrador.

A total of 101 km of scheduled salmon river shoreline is intersected in each region of the Study Area, 5% of which is intersected by the centre line ROW. The Central and Eastern Newfoundland region has the most scheduled salmon river shoreline (4 km or 5%) in the Study Area. The Northern Peninsula region has approximately 7% scheduled salmon river shoreline affected however, this represents 1 km.

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#### 7.4 LISTED PLANTS

There are two listed NLESA plant species known to exist within the Study Area for the Project: Long's Braya (*Braya longii*) and Fernald's Braya (*Braya fernaldii*). These species are discussed in the L-ITL Endangered Species Act Listed Plants Impacts Mitigation and Monitoring Plan (Document number ILK-PT-MD-0000-EV-PL-0002-01)

#### 7.5 REGIONALLY UNCOMMON PLANT SPECIES

"Regionally Uncommon Plants" refers to those species which occur in a limited number of locations in Newfoundland and Labrador and/or are represented by relatively few individuals in the province. Regionally uncommon plant species are those which are ranked SH, S1 or S2 by the Atlantic Canada Conservation Data Centre, as follows:

- SH - Historical. Previously occurred in the province but may have been overlooked during the past 20-70 years. Presence is suspected and will likely be rediscovered; depending on species/community;
- S1 - Extremely rare throughout its range in the province (typically five or fewer occurrences or very few remaining individuals). May be especially vulnerable to extirpation; and
- S2 – Rare throughout its range in the province (6 to 20 occurrences or few remaining individuals). May be vulnerable to extirpation due to rarity or other factors.

Regionally uncommon plant species with the potential to occur within the study area were reviewed and compared with spatial data, to establish a potential list. Twenty plant species were identified along the Labrador portion of the transmission corridor, and 122 species along the Newfoundland portion.

#### 7.6 TIMBER RESOURCES

In the *Labrador – Island Transmission Link Timber Resources Component Study* (Stantec 2011a), timber resources are defined as those natural resources collected from forests and woodlands of the province, including natural ecosystems, managed plantations (cutblocks), or wood lots, which are used as a source for wood (e.g., industrial round wood (pulpwood), sawn timber, wood chips / pellets, or home-heating fuel).

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In Labrador, the gross merchantable value of productive forest is calculated for softwoods only, with the available timber volumes in the transmission corridor (as identified within Forestry Management District 19A) estimated at 706,207 m<sup>3</sup>. In Newfoundland, the GMV of productive forest (softwood / hardwood) within the transmission corridor is estimated at 3,872,124 m<sup>3</sup>. The total volume of the timber resource is estimated at 4,578,331 m<sup>3</sup> for the transmission corridor.

Within Newfoundland and Labrador, Project effects on Timber Resources were assessed as the proportion of productive forest landbase (i.e., productive forest areas within the overall land base in which timber harvesting activities have the potential to occur) containing merchantable volume of available timber to be cleared during clearing activities of the Project.

The potential Project effects on Timber Resources in each region crossed by the 2 km wide study corridor were informed by superimposing the hypothetical 60 m wide centre line ROW on the geo-referenced (spatially delineated) inventory of forest polygons in the 2 km wide study corridor. This spatial query produced a subset of data including an estimate of stand-level volumes, which, in turn were aggregated to provide estimates of the GMV of all merchantable forest potentially intersected by the ROW, by region. A 20% contingency was then added to the merchantable timber calculations as a precautionary approach to account for uncertainty in final Project ROW alignment selection and other Project components. The total GMV for softwoods in Labrador is 25,991 m<sup>3</sup>, and the GMV for both softwoods and hardwoods in Newfoundland is 145,441 m<sup>3</sup>.

## 8 REGULATORY COMPLIANCE

Listed plant species are protected by the *Newfoundland and Labrador Endangered Species Act (NLESA)* (SNL 2001 Chapter E-10.1). As mentioned in Section 7.4, only Long's Braya (*Braya longii*) and Fernald's Braya (*Braya fernaldii*) are present within the Project area. Timber resources are provincially protected by the *Forestry Act (RSNL 1990 Chapter F-23)*. All cutting that occurs within the Project requires a Commercial Cutting Permit.

The intent of the L-ITL VPEEMP is to allow the LCP to evaluate and to respond appropriately to the findings of the Project effects during construction and operations on disturbance to vegetation.

The NLR 87/13, also referred to as the Labrador-Island Transmission Link Undertaking Release Order under the Environmental Protection Act releases the Project from environmental

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assessment and sets conditions for this release that Nalcor Energy must meet. The release of the Labrador-Island Transmission Link from environmental assessment under Section 3 is subject to the following terms and conditions:

- (a) Nalcor Energy shall adhere to all mitigation, monitoring and commitments stated in the Environmental Impact Statement submitted April 12, 2012 and the additional Environmental Impact Statement information submitted December 10, 2012;
- (f) the proponent shall prepare environmental effects monitoring plans, EEMs, in consultation with the applicable government divisions, and submit them to the Minister of Environment and Conservation for approval before the start of any site specific construction;
- (g) the environmental effects monitoring plans referred to in paragraph (f) shall address the following project valued ecosystem components, VECs, and will be developed to monitor effects as a result of the project and to ensure that any changes to existing baseline as a result of project effects are documented and mitigated:
  - (i) vegetation

Submission of this EEMP satisfies the condition/requirement in NL Reg 87/13 (f) and (g) under Section 3.

## 9 CONSTRUCTION EFFECTS

### 9.1 DETERMINATION OF SIGNIFICANCE

Significant environmental effects are those that are considered to be of sufficient magnitude, duration and geographic extent to cause a change in the VEC that will alter its status or integrity beyond an acceptable level.

Alteration or loss of habitat, or more specifically the extent to which vegetation and vegetation communities are affected by the physical disturbance of the Project, was the measurable effect of greatest importance in determining the effect of the Project on vegetation. The Project is expected to result in the loss of less than 5% of habitat in the 2 km wide study corridor. The magnitude of effects on vegetation within the 2 km wide study corridor resulting from the Project are low, as the area of a given Habitat Type potentially affected by physical disturbance associated with the ROW and other Project components is low (i.e., relative to the area available within the 2 km wide study corridor). Vegetation within the cleared ROW (including electrode lines), particularly those habitat types occurring in the late successional stages (i.e.,

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Black Spruce Lichen Forest, Conifer Forest, Hardwood Forest, Mixedwood Forest, Open Conifer Forest), will be maintained in an early successional stage throughout the life of the Project.

Changes to vegetation within Newfoundland and Labrador are likely to be limited to the Project components within the 2 km wide study corridor, with limited alteration or loss to existing Habitat Types and plant species (including Listed and Regionally Uncommon Plant species). All current vegetation species and Habitat Types within the 2 km wide study corridor will continue to be represented, with limited effects expected on biodiversity predicted as a result of the Project.

## 9.2 LIKELY RESIDUAL PREDICTED PROJECT EFFECTS

The likely residual effects on vegetation are Construction activities that result in clearing or disturbance of vegetation, or those that result in the disturbance of Wetlands, Riparian Shoreline and those habitats supporting populations of Listed or Regionally Uncommon Plant species have the greatest likelihood to contribute to adverse effects. Construction activities will likely lead to local, low magnitude direct and indirect disturbances to vegetation, resulting from clearing, soil disturbance, drainage alteration and inadvertent spills resulting in site-specific contamination. The predicted limited nature of these effects is based on the application of proven, accepted mitigation methods and approaches (Nalcor 2012).

Operations and Maintenance activities will also likely lead to local, low magnitude, direct and indirect disturbances to Vegetation, resulting from intermittent vegetation management, increased access for OHVs and the resultant disturbance to potentially sensitive habitats or mismanagement of the resource (i.e., illegal harvesting); spread of non-native or invasive plant species; and inadvertent spills resulting in site-specific contamination. The limited nature of these effects considers the application of proven, accepted mitigation methods and approaches.

## 10 ENVIRONMENTAL EFFECTS MANAGEMENT

The effects management plans (i.e., mitigation measures outlined in the EIS [Nalcor 2012] and the LCP HVdc Overland Transmission and HVdc Specialties Environmental Protection Plan (EPP) (LCP, 2013) and the commitments made by the LCP in the EIS ensure regulatory compliance of the above discussed regulations which include the mitigation measures outlined in the following subsections.



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## 10.1 VEGETATION ABUNDANCE AND DIVERSITY MITIGATIONS

- Project components and the final ROW alignment were sited and routed to avoid, to the extent practical, vegetation communities that were identified as sensitive to disturbance (e.g., wetlands, riparian shorelines, listed plant habitats), difficult to reclaim, or of stakeholder or management concern (i.e., uncommon Habitat Types, limestone barrens);
- Existing access roads will be used and development of new access will be minimized, to the extent practical;
- Clearing activities will only occur within the ROW and other site specific areas (e.g., converter station, marshalling yards, camps);
- Vegetation clearing for the transmission ROW and other Project components will be conducted using the following measures:
  - all vegetation shall be cut within 150 mm of the surface of the ground;
  - all vegetation that exceeds 2 m height at maturity will be cut;
  - trees will be felled onto the ROW away from standing forest and away from any waterbody; any leaning or danger trees partially knocked down during clearing will be removed;
  - all vegetation will be selectively cleared (mechanical-felling, hand-felling and piling) from the ROW to secure the transmission line; and
  - merchantable timber will be cleared through various means (e.g., feller-buncher (mechanical), hand-felling), de-limbed, and neatly piled at a right angle to, but within the ROW, to a height not exceeding 3 m.
- Tree tops, limbs, brush and debris will be piled along the edge of the ROW or used for brush mats;
- A 6.5 m break will remain between slash piles at least every 200 m to facilitate drainage and wildlife passage.;
- No cutting will occur within 100 m of the centre line of a public highway without approval from the Newfoundland and Labrador Department of Natural Resources;
- Trails will be cleared to the width of the vehicles that will use them (usually 4 m), as safety allows;
- Cleared timber will be used in the construction of corduroy bridges (i.e., logs or timber laid parallel to each other as a temporary and low impact crossing structure), where appropriate, to cross areas of saturated soils and wetland areas. The reuse of timbers cut for the ROW clearing for corduroy is a more environmentally friendly and

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economical option than trucking swamp mats constructed from timber cuts in other regions. Corduroy which is located within the high water mark of streams will be removed when such removal will not destabilized the banks and in other areas where feasible from economical and environmental perspectives;

- Grubbing will not be permitted within 2 m of standing timber;
- During grubbing activities, site-appropriate erosion prevention and sediment control measures will be implemented, and could include (but not be limited to) surface water diversion ditches, silt fences, stone or brush cover, erosion control fabrics, settling ponds and other sediment filtration and flow management products;
- Grubbing will not be conducted in saturated conditions, during or immediately following a precipitation event. Where appropriate, grubbed materials will be re-spread or stockpiled and as many stumps and roots as possible will be left on the ground surface to maintain soil cohesion, to dissipate energy from run-off and promote natural revegetation;
- The length of time that grubbed areas are left exposed to natural elements will be limited to prevent unnecessary surface run-off and erosion;
- Erosion control measures including brush cover, stone riprap, wire mesh, settling ponds and drainage channels will be implemented in areas prone to soil loss;
- Topsoil stripping within or near areas with existing non-native or invasive species populations will be managed, where practical, to reduce the potential spread of these species;
- Nalcor will inspect equipment required for Construction before use to reduce the potential for the introduction of non-native and invasive plant species;
- Blasting activities will be designed and undertaken in compliance with provincial and federal regulations;
- Blasting mats will be used in environmentally sensitive areas as defined in the EPP;
- During windy conditions, specific Project activities that generate air-borne dust will be assessed on a case by case basis and corrective actions implemented as warranted and appropriate to reduce dust;
- Mobile storage tanks will comply with the Transportation of Dangerous Goods regulation SOR/2008-34, as well as the Storage and Handling of Gasoline and Associated Products Regulations, 2003, under the *Environmental Protection Act*;
- Spill kits will be available at all work sites, and a spill response team will be formed and trained prior to Construction, and all spills will be reported to the designated Environmental Monitor, construction supervisor, or designated Project personnel;

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- Any spill will be contained immediately and the application of absorbent pads (e.g., granular, pillow, sock) will be used to absorb and contain the spill; spills of reportable quantities of hazardous or regulated materials will be reported to the appropriate federal or provincial authority to coordinate the provincial response; and
- Construction staging areas will be located and operated in a manner that limits disturbance to native vegetation to the extent practical. Unless otherwise agreed upon with the NLDEC, all construction materials and debris will be removed from marshalling yards and construction staging areas when Construction is complete, and the areas returned to original land use capability, regraded and allowed to revegetate naturally.

## 10.2 WETLANDS MITIGATIONS

- Project components and the final ROW alignment were sited and routed to avoid, to the extent practical, vegetation communities that were identified as sensitive to disturbance (e.g., wetlands), and the minimum practical footprint will be used for construction activities;
- All Nalcor mitigation referencing setbacks and buffers for waterbodies will also be applied to wetlands, as appropriate;
- If construction is required in wetland areas, Nalcor will conduct the work in winter, fall, late summer, summer, spring (in order of preference), to the extent practical;
- Only construction equipment necessary to install the tower assembly within wetlands will be operated in or transported through wetlands; all other equipment will use an alternate route;
- Construction site drainage features, such as ditches, will be designed such that wetland hydrology is maintained, to the extent possible. Discharge of storm water, wastewater, or diversion of surface water during construction will be directed away from wetlands, where practical, unless it is intended to maintain pre-construction hydrology;
- There will be no discharge of silt-laden, contaminated or nutrient-enriched water (e.g., sewage) to wetlands;
- The upper organic layer of organic material will be salvaged and stored for restoration purposes where construction is required within a wetland (e.g., if an access has to cross a wetland);
- Silt fences will be installed on all approaches to wetlands, as appropriate, to prevent erosion and sedimentation;
- To limit the potential for adverse effects from hazardous or regulated materials, use of the least toxic products will be a priority when working in and around wetlands;

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- Spill kits will be available at all work sites, and a spill response team will be formed and trained prior to Construction, and all spills will be reported to designated Environmental Monitor, Construction Supervisor, or alternate point of contact for the Project.
- Any spill of reportable quantities of hazardous or regulated materials will be contained immediately and the application of absorbent pads (e.g., granular, pillow, sock) will be used to absorb and contain the spill; these spills will be reported to the appropriate federal or provincial authority to coordinate the provincial response;
- Appropriate storage and handling of fuels and hazardous or controlled products including storing fuels and oils at least 100 m away from any surface water;
- Refuelling and maintaining of equipment and machinery will not be permitted within 50 m of a waterbody, wetland or flood-prone area;
- Nalcor will inspect equipment required for Construction before use to reduce the potential for the introduction of non-native and invasive plant species;
- Natural recovery will be used for wetlands in areas that are healthy and have few non-native or invasive plant species;
- Blasting activities will be designed and undertaken in compliance with provincial and federal regulations;
- Blasting mats will be used in environmentally sensitive areas as defined in the EPP; and
- During windy conditions, specific Project activities that generate air-borne dust will be assessed on a case by case basis and corrective actions implemented as warranted and appropriate to reduce dust.

### 10.3 RIPARIAN HABITAT MITIGATIONS

- Project components and the final ROW alignment were sited and routed to avoid, to the extent practical, vegetation communities that were identified as sensitive to disturbance (e.g., wetlands, riparian shorelines, listed plant habitats), difficult to reclaim, or of stakeholder or management concern (i.e., uncommon Habitat Types, limestone barrens);
- Existing trails, roads or cut-lines will be used to the extent practical to avoid disturbance to riparian vegetation and, where practical, access roads and trails will be located to avoid riparian shoreline;
- Trails will be cleared to the width of the vehicles that will use them (usually 4 m), as safety allows;

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- Trees, logs, slash, brush or debris will not be deposited in (or on, if frozen) any waterbody or disposed of within 30 m of the high water mark of any waterbody;
- Buffer zones (non-disturbance areas) of various widths around watercourses and waterbodies will be implemented as follows:
  - Approval will be obtained from the Government of Newfoundland and Labrador for development activities to take place within riparian areas in a designated PPWSA (Section 39 *Water Resources Act* 2002 (GNL 2002, internet site)); Approval will be required under Section 39 for all activities within PPWSAs, not just within riparian areas of PPWSAs. This would include any activities that would contribute to ground disturbance within the PPWSA. Development and approval will be obtained for activities to take place within a prescribed distance from the edge of a watercourse or waterbody, as follows:

Waterbody	Minimum Buffer Width
Intake lake or pond	150 m
River intake	150 m (applied 1 km upstream and 100 m downstream)
Major river channel	75 m
Major tributaries, lakes or ponds	50 m
Other waterbodies	30 m

- In non-PPWSA, the minimum buffer zone width will be determined using the formula:  $12\text{ m} + 1.5\text{ m} \times \text{slope of the land (percent)}$  or 20 m, whichever is larger;
  - Section 39 permits do not allow any or greatly limit the activities with the minimum buffers listed in the table above. All activities outside these buffer zones will require a Section 39 permit if inside a PPWSA; and
  - To protect scheduled salmon rivers, a minimum 30 m buffer will remain from the high water mark (DFO 2009, internet site).
- Camp plans will be reviewed prior to the commencement of Construction so that buffer zones are flagged prior to any disturbance activities;
- Approaches to fording sites will be stabilized (e.g., by use of swamp mats, corduroy), as appropriate, to avoid rutting;
- Bridges will be placed entirely above the high water mark and will not be located on meander bends, braided streams, alluvial fans, active flood plains, or any other inherently unstable area, and will be installed perpendicular to the watercourse;

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- Where practical, removal of riparian vegetation will occur by hand. If machinery is required, it will be operated in a manner that minimizes disturbance to the banks of the waterbody and banks will be restored to their original or stable condition;
- Erosions control measures including brush cover, stone riprap, geotextile, settling ponds and drainage channels will be implemented in areas prone to soil loss. The length of time grubbed or otherwise disturbed areas are left exposed to natural elements will be limited to prevent unnecessary erosion;
- Blasting operations near a watercourse will be conducted in accordance with the *Guidelines for Protection of Freshwater Fish Habitat in Newfoundland and Labrador* (Gosse et al. 1998);
- Blasting activities will be designed and undertaken in compliance with provincial and federal regulations;
- Blasting mats will be used in environmentally sensitive areas as defined in the EPP;
- During windy conditions, specific Project activities that generate air-borne dust will be assessed on a case by case basis and corrective actions implemented as warranted and appropriate to reduce dust;
- Appropriate storage and handling of fuels and hazardous or controlled products including storing fuels and oils at least 100 m away from any surface water;
- Refuelling and maintaining of equipment and machinery will not be permitted within 50 m of a waterbody, wetland or flood-prone area;
- Nalcor will inspect equipment required for Construction before use to reduce the potential for the introduction of non-native and invasive plant species;
- Species and site specific mitigation measures will be established in consultation with the Wildlife Division; and
- Mineral soils exposed as a result of surface disturbance within riparian areas will be allowed to re-vegetate naturally, and covered with mulch to prevent soil erosion and encourage seed germination. If there is insufficient growing season remaining, the site will be stabilized and vegetated the following spring.

#### 10.4 REGIONALLY UNCOMMON PLANT MITIGATIONS

- Project components and the final ROW alignment will be sited and routed to avoid, to the extent practical, vegetation communities that are identified as sensitive to disturbance (e.g., wetlands, riparian shorelines, listed plant habitats), difficult to reclaim,

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or of stakeholder or management concern (i.e., uncommon Habitat Types, limestone barrens);

- Qualified personnel will undertake pre-Construction plant surveys of High or Very High rated habitat (for regionally uncommon species) crossed by Project components, to identify any occurrences. Species and site-specific mitigation measures will be developed as required. The following is a list of mitigation options that may be used:
  - Align the ROW around or narrow the ROW in known locations of regionally uncommon plants or their habitats to partially or completely avoid the habitat, to the extent practical.
  - Flag known locations of regionally uncommon plant species within the Project components prior to construction and avoided to the extent practical.
- Nalcor will inspect equipment required for Construction before use to reduce the potential for the introduction of non-native and invasive plant species;
- Mobile storage tanks will comply with the Transportation of Dangerous Goods regulation SOR/2008-34, as well as the Storage and Handling of Gasoline and Associated Products Regulations, 2003, under the *Environmental Protection Act*;
- Spill kits will be available at all work sites, and a spill response team will be formed and trained prior to Construction, and all spills will be reported to the designated Environmental Monitor, construction supervisor, or designated Project personnel;
- Any spill of reportable quantities of hazardous or regulated materials will be contained immediately and the application of absorbent pads (e.g., granular, pillow, sock) will be used to absorb and contain the spill; these spills will be reported to the appropriate federal or provincial authority to coordinate the provincial response;
- Blasting activities will be designed and undertaken in compliance with provincial and federal regulations;
- Blasting mats will be used in environmentally sensitive areas as defined in the EPP; and
- During windy conditions, specific Project activities that generate air-borne dust will be assessed on a case by case basis and corrective actions implemented as warranted and appropriate to reduce dust.

## 10.5 TIMBER RESOURCES MITIGATIONS

- Nalcor will comply with existing provincial legislation and regulation (Newfoundland and Labrador *Forestry Act* 1990);



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- Merchantable timber within areas supporting Project components will be cleared in accordance with provincial guidelines. Over-mature and old growth forests have been avoided, to the extent practical, during final ROW selection;
- Trails will be cleared to the width of the vehicles that will use them (usually 4 m), as safety allows;
- Where practical and feasible, timber cleared, but not intended for commercial use, will be made available for domestic use;
- Mobile storage tanks will comply with the Transportation of Dangerous Goods regulation SOR/2008-34, as well as the Storage and Handling of Gasoline and Associated Products Regulations, 2003, under the *Environmental Protection Act*;
- Spill kits will be available at all work sites, and a spill response team will be formed and trained prior to Construction, and all spills will be reported to the designated Environmental Monitor, construction supervisor, or designated Project personnel;
- Any spill of reportable quantities of hazardous or regulated materials will be contained immediately and the application of absorbent pads (e.g., granular, pillow, sock) will be used to absorb and contain the spill; these spills will be reported to the appropriate federal or provincial authority to coordinate the provincial response; and
- In addition, environmental protection measures designed to limit environmental disturbances associated with Project design and construction will be detailed in a separate (EPP), prepared in support of the EIS.

## 11 ENVIRONMENTAL EFFECTS MONITORING

Nalcor will implement all mitigation measures as discussed in Section 10 related to regionally uncommon and listed plant species. Adverse effects of the Project on regionally uncommon plant species are predicted to be minimal, as proven, standard, accepted mitigation practices, including avoidance to the extent practical or minimal disturbance of known locations of these plants have been proposed (Nalcor 2012).

### 11.1 BASELINE DATA COLLECTION

Baseline surveys were conducted for regionally uncommon plants, in 11 locations in Labrador along the ROW where disturbance may occur (e.g., foundation construction, access trails). A total of 19 uncommon plant species, subspecies and varieties were found during the field

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surveys in Labrador. Surveys for regionally uncommon plant species on the island portion of the province will be conducted in 2014.

#### **11.1.1 Data Collection during Construction and Operations**

The LCP will compile results of daily environmental reports that reference any new occurrences of regionally uncommon plants. These reports are completed by the On-Site Environmental Monitors (OSEMs) who have been trained to identify and located regionally uncommon plants in Newfoundland and Labrador, along with the use of an iPad application (i.e., App) of regionally uncommon plants. The App will also identify the types of habitat where regionally uncommon plants would be expected, to assist with identification.

### **11.2 REPORTING**

Data collected during construction and operations will be compiled to produce an annual report for submission to the NLDEC – WD. This report will include a summary of all observations (including potentially new occurrences) of regionally uncommon plant species. It will also include any instances where rare or listed plants were damaged or destroyed in the course of construction, maintenance, or other activities. The report will also indicate any cases where specific mitigations were used to avoid or reduce the impact of activities on rare or listed species. Results will be used to inform Project construction activities where possible. The results of the regionally uncommon plant survey for Newfoundland and Labrador will also be provided to the NLDEC-WD.

### **11.3 CONTINGENCY PLAN**

At this time, contingency plans are not anticipated for vegetation and any changes to the LCP's procedures or mitigation plans would be addressed through the adaptive management approach, if and as appropriate.

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