Environmental Impact Assessment (EIA) Registration for the Modernization of Electrical Transmission Infrastructure near Kedgwick, New Brunswick

Construction of New Kedgwick Substation, New Transmission Line to Tap into Existing Transmission Line 1110, and Decommissioning of Existing Kedgwick Substation and Transmission Line 0028

Submitted pursuant to Section 5(2) of the New Brunswick Environmental Impact Assessment Regulation 87-83 of the Clean Environment Act

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1.0 INTRODUCTION

This is an Environmental Impact Assessment Registration (EIA Registration) document for the proposed modernization of electrical transmission infrastructure near the rural community of Kedgwick, New Brunswick (hereinafter referred to as "the Project"), being considered by the New Brunswick Power Corporation (NB Power). The Project is being carried out in two phases and consists of the Construction and Operation of a new substation and new transmission line (Phase 1), and the Decommissioning of an existing substation and transmission line near Kedgwick, New Brunswick (Phase 2). This Project will be financed by NB Power. No applications for grants or loans of capital funds from any other government agency will be submitted for this Project.

This document is being submitted to the New Brunswick Department of Environment and Local Government (NBDELG) as part of the environmental impact assessment (EIA) process under the New Brunswick *Environmental Impact Assessment Regulation 87-83* of the *Clean Environment Act*.

1.1 OVERVIEW OF THE PROJECT

NB Power is proposing a two-phased project to modernize electrical transmission infrastructure near Kedgwick, New Brunswick. The two phases will consist of the following:

- Phase 1 of the Project will see the construction of a new electrical substation in the rural community of Kedgwick to replace an existing substation, and a new 5.3 km-long 138 kV transmission line that will connect the new substation to an existing 138 kV transmission line (Line 1110) located east of Kedgwick; and
- Following completion of Phase 1 including energization of the new line and substation, Phase 2 will involve the Decommissioning of the then-obsolete Kedgwick substation, and the decommissioning of the then-obsolete 25 km-long section of a 69 kV transmission line (Line 0028), located south of Kedgwick, which currently connects the existing Kedgwick substation to the New Brunswick electrical grid.

Further details are provided below.

1.1.1 Phase 1

In Phase 1, a new 5.3 km-long 138 kV transmission line and a new electrical substation will be constructed in the rural community of Kedgwick, Restigouche County, New Brunswick. The new transmission line will interconnect the new substation with a nearby 138 kV transmission line (referred to as Line 1110) that runs in an approximate north-south direction approximately 5.3 km east of Kedgwick. The new substation will be built in order to provide 138 kV service to the area. Increasing the substation voltage from the existing 69 kV to 138 kV will allow for improved electrical service and reliability in Kedgwick and surrounding communities in the southern part of Restigouche County and provide for potential future growth in the area.

Phase 1of the Project, as currently conceived, would include the following major components and infrastructure:

- A 5.3 km-long, 30 m-wide right-of-way (RoW) for linear infrastructure
- A 5.3 km-long 138 kV transmission line including H-frame poles
- Conductors (i.e., wires) and insulators
- A new electrical substation to enable an upgrade to138 kV service for the Kedgwick area

1.1.2 Phase 2

Once the new 138 kV transmission line and new substation are energized, and the new substation is being supplied with electricity from the new transmission line, approximately 25 km of an existing 73 km-long 69 kV transmission line (Line 0028) that currently supplies electricity to the Kedgwick substation from Saint-Léonard, Madawaska County, New Brunswick, will become redundant and will thus be decommissioned. The new endpoint of Line 0028 would require connection to tap off structure 255 A, located near its current intersection with Line 1110, approximately 7 km southwest of Saint-Quentin, NB (Figure 2.1). The Decommissioning of the obsolete portion of Line 0028 will require the removal of poles, conductors, and insulators, and will allow for the natural revegetation (over time) of 25 km of RoW.

Phase 2 will also include the decommissioning of the existing 69 kV Kedgwick electrical substation.

1.2 PROPONENT INFORMATION

The proponent for the proposed undertaking is as follows:

Name of Proponent:	New Brunswick Power Corporation (NB Power)
President & Chief Executive Officer:	Mr. Gaëtan Thomas
Mailing Address of Proponent:	P.O. Box 2000, 515 King Street Fredericton, NB E3B 4X1
Contact Person for this EIA Registration:	Ms. Chantal St. Pierre Director – Regulatory and Environmental Affairs New Brunswick Power Corporation PO Box 2000, 515 King Street Fredericton, NB E3B 4X1 Tel.: (506) 458-6655 Fax: (506) 458-4000 Email: CStPierre@nbpower.com
Proponent Website:	www.nbpower.com

1.3 PURPOSE/RATIONALE/NEED FOR THE UNDERTAKING

The existing Kedgwick substation, which supplies electricity to approximately 1,293 downstream customers in the rural community of Kedgwick and surrounding communities, currently receives its electrical supply from Line 0028. Unfortunately, Line 0028 reportedly has the poorest reliability of any

NB Power transmission line in the province, which has resulted in customers experiencing an increasing number of power outages in recent years.

The decreasing reliability of the Kedgwick substation to supply customers with electricity prompted regional stakeholders to meet with NB Power in 2012 to discuss opportunities to remedy the situation. Of the two options considered (i.e., rebuild the 25 km of Line 0028, or interconnect directly with Line 1110), NB Power determined that supplying the Kedgwick area from a new interconnection with Line 1110 made greater sense financially, while improving reliability to customers and eliminating low voltage issues associated with the existing 69 kV supply. To accommodate 138 kV service, and to address ongoing concerns with the existing substation expressed by some residents of Kedgwick (particularly noise), a new electrical substation will be constructed to tie into the new transmission line, and the existing electrical substation will be decommissioned along with the former 25 km section of Line 0028.

Thus, this modernization Project is intended to improve electrical service and reliability to customers in the rural community of Kedgwick and surrounding communities in the southern part of Restigouche County, as well as to provide opportunities for meeting the needs of potential future electrical users in the area.

1.4 REGULATORY FRAMEWORK

This section provides an overview of the anticipated major regulatory processes that could be applicable to the Project, including provincial and federal environmental assessment requirements.

1.4.1 Provincial

1.4.1.1 New Brunswick *Environmental Impact Assessment Regulation*

The New Brunswick *Environmental Impact Assessment Regulation 87-83* under the *Clean Environment Act* (EIA Regulation) governs the environmental impact assessment (EIA) process in the province. The EIA Regulation requires that all "undertakings" listed in Schedule "A" of the Regulation (including the proposed construction, operation, modification, extension, abandonment, demolition or rehabilitation of one of 24 categories of undertakings listed in Schedule "A") require registration and, at minimum, a Determination Review led by NBDELG to review the Project's information and potential environmental interactions. At the conclusion of the Determination Review, NBDELG's Technical Review Committee (TRC) recommends to the New Brunswick Minister of Environment as to whether an undertaking can proceed, with or without conditions, or whether it requires the preparation of an Environmental Impact Assessment Report (referred to as a "Comprehensive Review").

As the Project includes the construction of a new 138 kV transmission line, and the Decommissioning of 25 km of 69 kV transmission line, it is considered an undertaking under the EIA Regulation, according to item (d) of Schedule "A", as follows:

> *"(d) all electrical transmission lines exceeding sixty-nine thousand volts in capacity or five kilometers in length."*

Based on the Project as currently conceived, registration of the Project under Section 5(1) of the EIA Regulation is required, and it will undergo, at minimum, a Determination Review coordinated by the NBDELG.

1.4.1.2 New Brunswick *Species at Risk Act*

Schedule A of the New Brunswick *Species at Risk Act* (NB *SARA*) lists species in New Brunswick that are classified as being extirpated, endangered, threatened, or of special concern. The NB *SARA*, by way of Section 28(2), prohibits the killing, harming, harassing, or taking of any species listed in Schedule A.

The Project will require a desktop review and field assessment to determine the presence of any NB *SARA* listed species, including their residences or critical habitat. In the event such species are found, the Project will need to implement measures to comply with the NB *SARA*.

1.4.1.3 Other Potential Provincial Permit Requirements

The following table contains a representative list of potential additional permits, approvals, and authorizations that may be applicable to the Project.

Table 1.1 Other Potential Provincial Permit Requirements

Project Component	Permit, Approval, or Authorization	Issuing Provincial Agency
Right-of-Way (RoW)	Archaeological Field Research Permit (*Heritage Conservation Act)*	New Brunswick Archaeological Services, Heritage Branch, Department of Tourism, Heritage, and Culture
	Site Alteration Permit (*Heritage Conservation Act)*	New Brunswick Archaeological Services, Heritage Branch, Department of Tourism, Heritage, and Culture
	Watercourse and Wetland Alteration Permit (*Watercourse and Wetland Alteration Regulation - Clean Water Act*)	Surface Water Protection Section, Sustainable Development, Planning and Impact Evaluation Branch, New Brunswick Department of Environment and Local Government
	Highway Usage Permit (*Highway Act*)	Highway Usage Permit Section, Property Services Branch, New Brunswick Department of Transportation and Infrastructure
	Work Permit (*Forest Fires Act*)	Forest Fire Management Section, New Brunswick Department of Energy and Resource Development
	Easement (*Crown Lands and Forests Act)*	Crown Lands Branch, New Brunswick Department of Energy and Resource Development
	Crown Lands – License of Occupation (*Crown Lands and Forests Act)*	Crown Lands Branch, New Brunswick Department of Energy and Resource Development

1.4.2 Federal

1.4.2.1 Canadian Environmental Assessment Act, 2012

The *Canadian Environmental Assessment Act, 2012* (*CEAA 2012*) defines the requirements for federal Environmental Assessments (EA) in Canada. *CEAA 2012* applies mainly to "Designated Projects", which are the physical activities listed under the *Regulations Designating Physical Activities* under *CEAA 2012*, as well as physical activities carried out on federal land.

The *Regulations Designating Physical Activities* identify 48 "Physical Activities" that are considered to be Designated Projects, thereby requiring an EA under *CEAA 2012*. Item 39 of the Schedule to the Regulations includes:

> *"39. The construction, operation, decommissioning and abandonment of a new electrical transmission line with a voltage of 345 kV or more that requires a total of 75 km or more of new right of way."*

Since the Project does not exceed the voltage and length thresholds prescribed in the Regulations, it is not a Designated Project under *CEAA 2012*. Furthermore, as no aspect of the Project will be built on federally-owned or regulated land, an EA under *CEAA 2012* is not required for the Project. That said, the federal Minister can require, at her discretion, an EA to be completed for any project.

1.4.2.2 Fisheries Act

The *Fisheries Act*, by way of Section 35(1), defines the provisions by which commercial, recreational or Aboriginal (CRA) fisheries are protected. The mitigation measures applied to the Project's activities will comply with the *Fisheries Act* to prevent the "serious harm to fish" that are part of a CRA fishery (including fish habitats) and to fish that support a CRA fishery. Authorization must be provided under Section 35(2) of the Act for activities that cause serious harm to fish that support a CRA fishery, including appropriate fish habitat offsetting.

1.4.2.3 Species at Risk Act

The *Species at Risk Act* (*SARA*), by way of its Schedule 1, lists species in Canada that are classified as being extirpated, endangered, threatened, or of special concern. The more than 300 wild plant and animal species listed in Schedule 1 are afforded special measures to protect them and assist in their recovery. These special measures include, amongst other things, prohibitions against:

- The killing, harming, or harassment of these species;
- The damage or destruction of their residences; and,
- The destruction of any part of their critical habitat.

The Project will require a desktop review and field assessment to determine the presence of any *SARA* Schedule 1 listed species, including their residences or critical habitat. In the event such species are found, the Project will implement measures that are consistent with the applicable requirements of *SARA*.

1.4.2.4 Migratory Birds Convention Act

The *Migratory Birds Convention Act* (*MBCA*), by way of *Migratory Birds Regulations* and *Migratory Birds Sanctuary Regulations*, defines the provisions by which an estimated 450 native species of migratory birds (including their nests and eggs) are protected in Canada. Under the Act, it is prohibited to kill, capture, injure, take, or disturb migratory birds, or to damage, destroy, remove, or disturb their nests.

The Project will implement measures to comply with the *MBCA*.

1.5 PROPERTY OWNERSHIP

Two possible alignments were considered for the new 138 kV transmission line (see Section 2.3). The right-of-way (RoW) for the preferred transmission line route, which was identified following preliminary assessment, field studies, and discussions between NB Power and the mayor and councillors of Kedgwick, will cross eight properties. Five of the properties are private landowners, two are Crown land (including an abandoned rail line), and one is a parcel owned by the New Brunswick Department of Transportation and Infrastructure (NBDTI). The alternative transmission line route, crosses nine properties, of which six are private landowners, two are Crown land, and one is NBDTI. Both routes have been selected as largely paralleling existing property lines wherever possible, to prevent undue bisecting of private properties where it is possible to do so.

Three proposals were considered for the relocation of the Kedgwick substation. The preferred option, which is to construct a new substation with a new 0.18 ha footprint on a previously disturbed site, crosses one property owned by the rural community of Kedgwick, and avoids the Kedgwick Protected Wellfield. Two alternative options were considered (one to expand the footprint of the existing Kedgwick substation, and a second on the rural community of Kedgwick property at a different location); however, both alternatives would have had footprints extending into the Kedgwick Protected Wellfield and are thus not preferred.

The existing 69 kV transmission line 0028 to be decommissioned crosses 106 properties, including 3 owned by the Crown, 7 owned by NBDTI, 94 owned by private landowners, and 2 identified as restricted freehold.

NB Power has initiated discussions with the private landowners with respect to possible easements for the Project.

1.6 PROJECT-RELATED DOCUMENTS

This EIA registration includes other relevant documents as appendices A to F of this document, as follows;

- Additional information requirements for an EIA Registration, as outlined in the NBDELG document entitled “A Guide to Environmental Impact Assessment in New Brunswick” (NBDELG 2012a), attached as Appendix A;
- A letter from the Restigouche Regional Service Commission confirming that the Project conforms to the Rural Community of Kedgwick Zoning By-Laws, provided in Appendix B;

- The Constraints Analysis report conducted on the two potential route Options, and 500 m on either side of them, attached as Appendix C;
- Survey data acquired for the Terrestrial Environment, attached as Appendix D;
- An information package related to the Project which will be provided to landowners, and will be included as part of the public consultation report, attached as Appendix E; and,
- A sample of the letters provided to Aboriginal leaders to inform them of the Project, attached as Appendix F.

Other than this EIA registration document and the appended information, there are no additional Project-related documents that are publicly accessible.

1.7 ORGANIZATION OF THIS DOCUMENT

This document is intended to fulfill the information requirements for registering the Project under Section 5(1) of the EIA Regulation, as outlined in the NBDELG document entitled "A Guide to Environmental Impact Assessment in New Brunswick" (NBDELG 2012a) and the sector guidelines entitled "Additional Information Requirements for Linear Facilities" (NBDELG 2008). It is organized as follows.

- Chapter 1 provides introductory information regarding the Project, including Project scope, information on the proponent, the purpose of the Project, and the regulatory framework that is anticipated to apply to the Project.
- Chapter 2 provides a detailed description of the Project as it is currently conceived. This description includes information on the Project location, siting considerations, specific Project components and infrastructure, the means by which Construction, Operation, and Decommissioning and Abandonment of the Project will be achieved, mitigation by design of the Project, and the anticipated Project workforce and schedule.
- Chapter 3 provides an overview of the environmental setting of the Project.
- Chapter 4 contains details of the potential interactions between the Project and valued components (VCs), including a description of existing conditions, previous environmental assessment work that has been completed in the area, and potential Project-environment interactions.
- Chapter 5 provides a summary of mitigation for the Project, both by design and in response to potential environmental interactions.
- Chapter 6 outlines public involvement activities planned for the Project.
- Chapter 7 describes the Aboriginal engagement activities conducted to date and planned for the Project.
- Chapter 8 includes closing remarks and a statement of limitations about the document.
- Chapter 9 lists the references cited in this work.

Additional information is provided in Appendices A through F of this document.

2.0 PROJECT DESCRIPTION

This chapter describes the Project as it is currently conceived and includes information on the Project location, siting considerations, and specific Project components and infrastructure. The means by which Construction, Operation, and Decommissioning and Abandonment of the Project will be achieved, proposed measures for emissions and waste management, mitigation by design of the Project, and a discussion of the anticipated Project workforce and schedule, are also provided.

2.1 ENVIRONMENTAL PLANNING AND MANAGEMENT

NB Power is a New Brunswick Crown corporation responsible for providing electricity to thousands of customers in New Brunswick. It also exports electricity to other Maritime Provinces as well as Québec and New England. NB Power was established in 1920, and since that time has grown to currently maintain and operate more than 6,849 km of transmission lines, as well as 49 terminals and switchyards (NB Power 2016a).

While generating and distributing electricity is paramount, NB Power is committed to making the environment a priority in the business decisions that it makes. NB Power will carefully plan and manage all aspects of this Project from initial design through to site reclamation. Potentially adverse environmental interactions will be avoided, mitigated, or otherwise managed using the following methods, among others:

- Reviewing and understanding major regulatory processes that may apply to the Project (Section 1.4);
- Using a diverse set of physical, biological, and socioeconomic constraints to select a preferred route (Section 2.3);
- Identifying potential sources of emissions and wastes that could result from the Project, and ways to mitigate them (Section 2.7);
- Considering potential accidents, malfunctions, and unplanned events (Section 2.8); and,
- Summarizing proposed mitigation, including adhering to NB Power's Environmental Protection Plan (NB Power 2012).

2.2 PROJECT LOCATION

The Project will be located in northern New Brunswick, in Restigouche County, near the rural community of Kedgwick. The Project Development Area (PDA) of new transmission line will be approximately 5.3 km in length, with a 30 m wide RoW (Figure 2.1). The 30 m RoW, shown in Figure 2.1, will commence at a tap off point on the existing 138 kV transmission line 1110 (at structure 246) and run west for approximately 5.3 km to supply a new Kedgwick substation. This new section of transmission line will require new RoW.

The existing 69 kV Kedgwick substation is situated on a 0.18 ha parcel of land located along the northeastern edge of Kedgwick. The land is currently owned by NB Power and shares a boundary to the north and the east with the Kedgwick Protected Wellfield. A new substation will be built on a 0.18 ha parcel of land located 0.1 km south of the existing substation, and upgraded to provide 138 kV service. The new substation will be outside of Zone C of the Kedgwick Protected Wellfield. Once the new

substation is energized, the existing substation will be decommissioned. Through Project design and mitigation, the new substation is not anticipated to have any interaction with the Kedgwick Protected Wellfield (see Section 4.3.2).

The section of transmission line 0028 that is to be decommissioned originates at Structure 255A where it intersects with Line 1110 and travels approximately 25 km to supply the Kedgwick substation (Figure 2.1).

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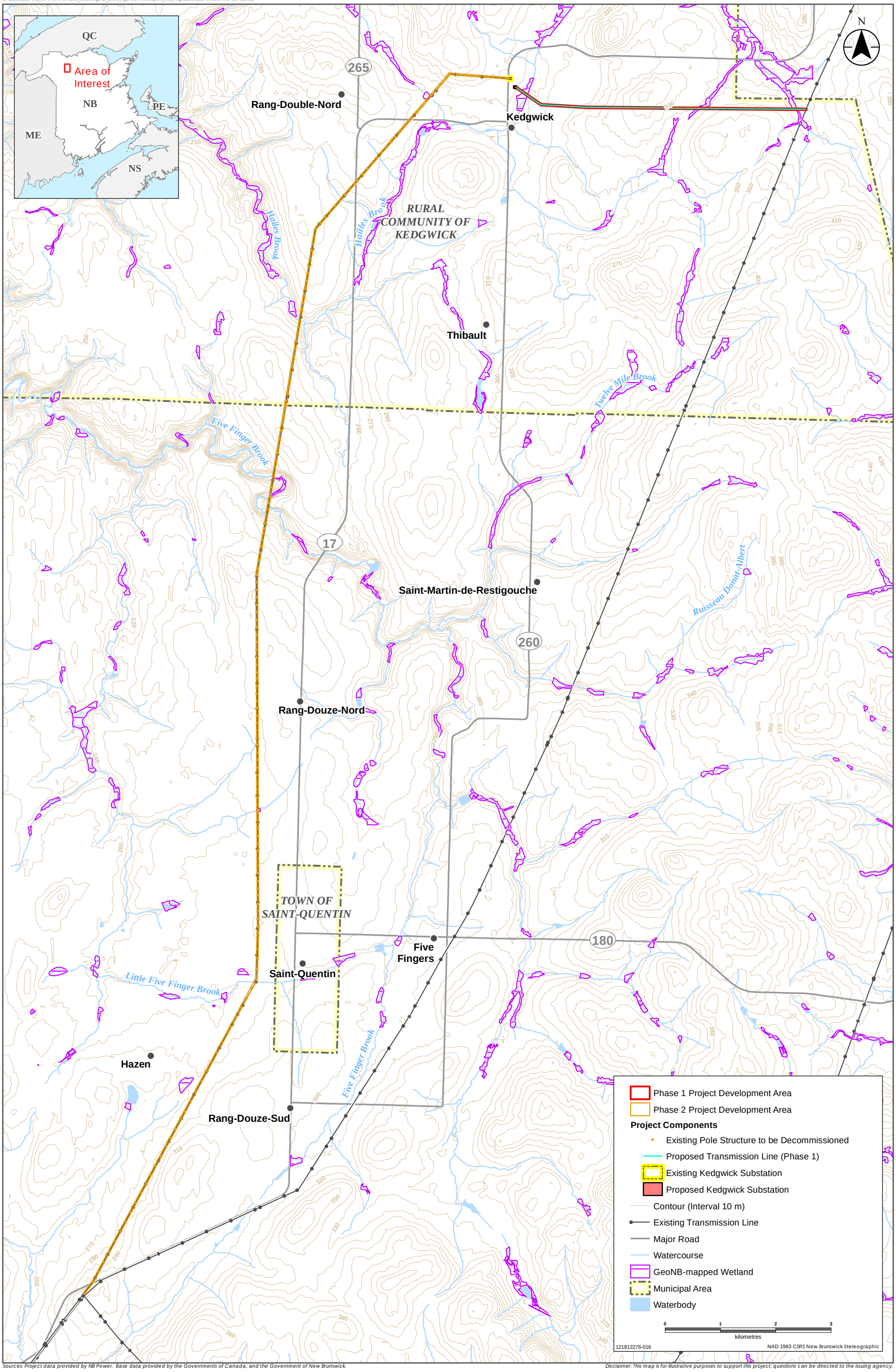

Sources: Project data provided by NB Power. Base data provided by the Governments of Canada, and the Government of New Brunswick.

Disclaimer: This map is for illustrative purposes to support this project; questions can be directed to the issuing agency.

Project Development Area for the Proposed Kedgwick Electrical Transmission Infrastructure Project

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121812276 - KEDGWICK TRANSMISSION LINE - NEW BRUNSWICK POWER CORPORATION

Figure 2.1

2.3 SITING CONSIDERATIONS: NEW TRANSMISSION LINE TO TAP INTO TRANSMISSION LINE 1110

NB Power adhered to several best management practices when selecting a route for the Project. The first best practice was to minimize the overall length of the line by identifying the closest connection point for a supply line to the existing substation, and by maintaining the straightest alignment possible. Route alignment ultimately influences the extent and magnitude of any effects on the environment, engineering design, and cost.

The second best practice was to minimize interactions with known environmental constraints. Aerial photographs, GIS based mapping and biological databases were referenced so as to reduce the potential for the crossing of wellfields, wetlands, watercourses, known archaeological sites, and environmentally significant areas, among other constraints (see Section 2.3.2).

The third best practice incorporated industry recognized engineering and design principles. Particular attention was paid to the type and number of structures in order to reduce the overall environmental footprint. Terrain constraints such as accessibility, slope, and crossing windows were also considered when selecting the route.

Finally, route selection was conducted with respect to existing land use. Where possible, the route was located to minimize the proximity to buildings and residences, to follow roadways and property lines where possible, and to avoid bisecting properties to the extent possible. The route selection process resulted in two route options being proposed by NB Power.

Using these best management practices and principles, and after defining key environmental, socioeconomic and engineering constraints to guide the analysis, a constraints analysis was carried out to identify the preferred and alternative route for the Project. The preliminary results of the constraints analysis, and information obtained from consultation with elected officials and landowners (Section 6.3), resulted in slight modifications to both of the original route options. The constraints analysis is provided in Appendix C. A brief summary follows.

2.3.1 Methodology: Relative Weighting and Ranking of Constraints

The two route options were evaluated through a weighted ranking process that incorporated three general categories of constraints: environmental, socioeconomic, and engineering. Each category was subdivided into smaller components. For each route option, individual components within a category of constraints were evaluated and ranked using pre-determined criteria, according to the following methodology.

1. Components were ranked on a scale of 0 – 10. A ranking of 10 was given to an ideal potential route component, whereas a ranking of 0 was given to potential route components of low favourability based on their respective criteria. Potential route components of equal favourability were ranked equally. No scores of less than 0 were assigned. The methodology of ranking components is provided in greater detail in Appendix C.
2. The ranking of each component within a category was then multiplied by its associated weighting factor to give a weighted component ranking (score).

3. All weighted component rankings (scores) were then summed to give an overall category ranking (score) for each of the environmental, socioeconomic, and physical criteria categories.
4. The overall category ranking was then multiplied by its weighting factor to give a weighted category ranking.
5. Weighted category rankings from each of the three categories were summed to give an overall ranking for each route Option. The overall rankings are displayed as a score out of 100, such that a score of 100 will be an ideal route, while a lesser score signifies a less desirable route. The route with the highest overall weighted score is the preferred route.

The complete Constraints Analysis report for the two route Options is provided in Appendix C for additional detail.

2.3.2 Description of Options

The goal of siting considerations was to select options that would meet the routing principles and minimize potential interactions with constraints during Construction and Operation and Maintenance of the transmission line. NB Power identified two route options that were modified slightly following the preliminary results of the Constraints Analysis to avoid the Kedgwick Wellfield Protected Area. An initial weighted ranking process was conducted on the two NB Power route options, which, resulted in a preferred route (Option 1) and alternative route (Option 2).

The two route options were presented to Kedgwick elected officials and to the public and stakeholders at an open house. Recommendations provided to NB Power from the public consultation process resulted in an opportunity to forgo the expansion of the existing Kedgwick substation, and instead build a new electrical substation on land owned by the rural community of Kedgwick that was outside of the Kedgwick Wellfield Protected Area (Chapter 6.0). The proposed new substation location also presented an opportunity to slightly modify Option 1 so that this route better aligned with an existing property boundary. The Constraints Analysis was updated to reflect the modifications to Option 1, and to allow for its re-evaluation through the weighted ranking process so it could be compared with compared to Option 2 (Appendix C). The routes for Option 1 and Option 2 are depicted in Figure 2.2.

There were several potential environmental, socioeconomic, and physical attributes that were not found to be crossed by any of the Project components (Appendix C). Specifically, in the areas of review for the two route options, and 500 m on either side of them, there were none of the following:

- First Nations reserve lands;
- Military bases;
- Mining claims, or mining agreements;
- ESAs;
- Known deer wintering areas;
- Fish hatcheries;
- Steep slopes or rock outcroppings;
- Registered archaeological sites or palaeo shorelines;
- Pipelines; and,
- Active railways.

The final preferred route (Section 2.3.2.1) was determined following consideration of the Constraints Analyses, field studies, and discussions with Kedgwick elected officials and landowners.

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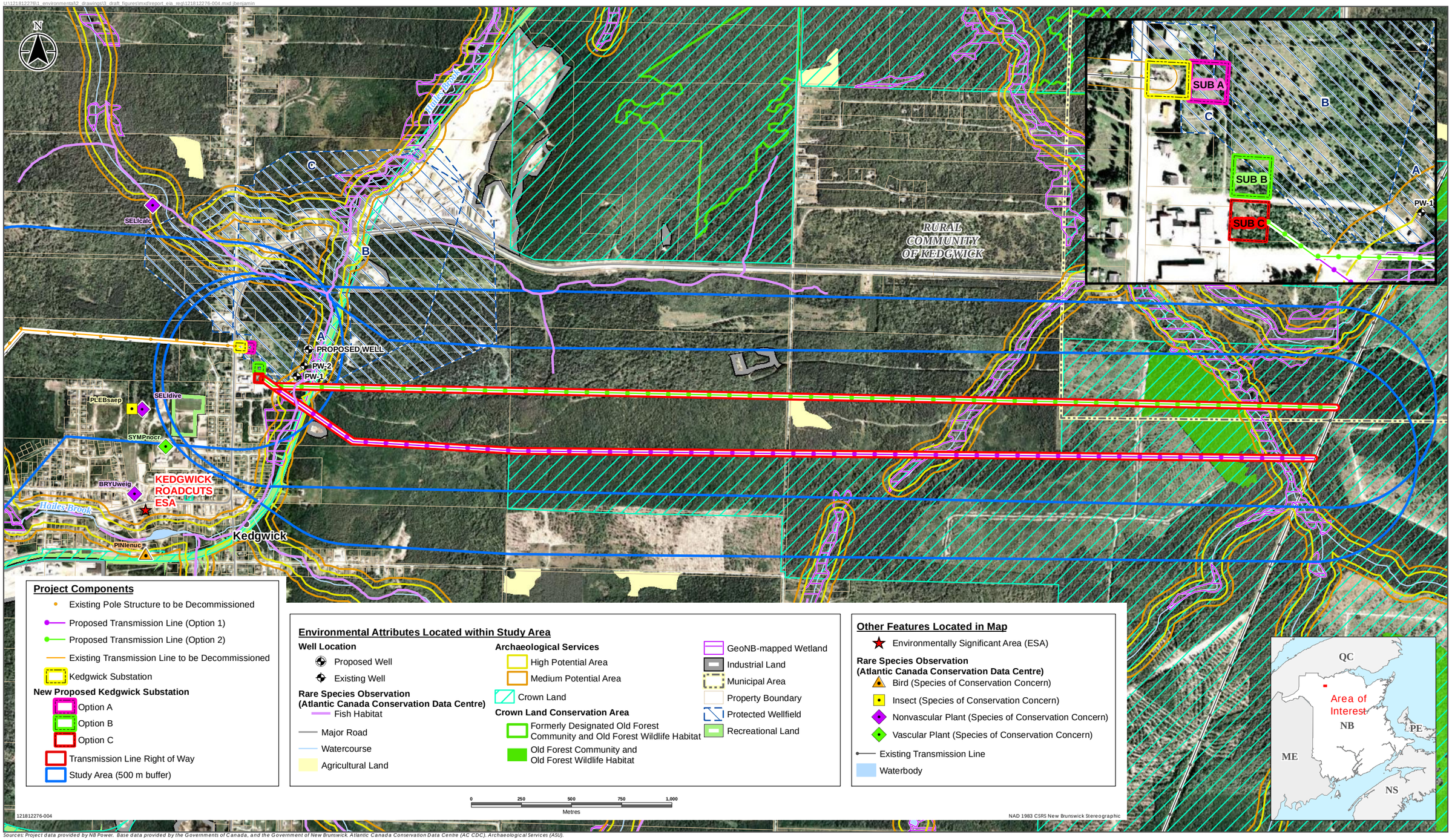

Sources: Project data provided by NB Power. Base data provided by the Governments of Canada, and the Government of New Brunswick; Atlantic Canada Conservation Data Centre (AC CDC); Archaeological Services (ASU).

Routes for the New 138 kV Transmission Line, Proposed Substation Locations, and Associated Environmental, Socioeconomic, and Physical Constraints

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121812276 - KEDGWICK TRANSMISSION LINE - NEW BRUNSWICK POWER CORPORATION

Figure 2.2

2.3.2.1 Route Option 1

Route Option 1 was the shorter of the two route options, and crosses the least amount of private land, lands of medium archaeological potential, and conservation forest (Table 2.1). Option 1 does not cross land used for agricultural purposes. This Option does, however, cross the greatest amount of wetland, watercourse, and waterbody areas. The route crosses Hailes Brook and two unnamed tributaries, and it also crosses the NB Trail.

Overall, it was determined that Option 1 possesses not only the highest overall weighted score of 68.45 (Table 2.2, Appendix C), but also the highest weighted score in the socioeconomic criteria category. Option 1 is therefore identified as the preferred route. The assessment of the existing environment (Section 3.0), the summary of potential interactions between the Project and the environment (Section 4.0), and the mitigation proposed to alleviate environmental interactions (Section 5.0) will be focused on Option 1 only.

2.3.2.2 Route Option 2

Route Option 2 crosses the least amount of wetland, watercourse, and waterbody areas (Table 2.1). Option 2 does, however, cross the greatest amount of protected and conservation areas, private lands, lands of medium archaeological potential, and lands used for agricultural purposes. Option 2 also crosses Hailes Brook, two unnamed tributaries, and the NB Trail, and was the longer of the two options. Option 2 recorded a marginally better weighted score for environmental criteria, and a similar weighted score as Option 1 for physical criteria; however, Option 2 recorded a lower weighted score for the socioeconomic criteria and a lower overall weighted score (Table 2.2). As such, Option 2 ranks second overall and is now considered the alternative route.

Table 2.1 Summary of Environmental Constraints for the Two Route Options

Constraints / Attributes	Option 1 (Preferred Route)	Option 2 (Alternative Route)
Environmental Criteria		
Watercourse and Waterbody Crossings (ha)	0.98	0.75
GeoNB-Mapped and NBDNR Wetland Crossings (ha)	1.68	1.49
Protected Areas and Conservation Areas (ha)	0.56	1.51
Parallel to Existing Corridor (km)	0.0	0.0
Species at Risk, Species of Conservation Concern, and Sensitive Areas (no.)	0.0	0.0
Forested Areas (ha)	14.91	14.73
Socioeconomic Criteria		
Designated Lands and Private Land (ha)	6	12.5
Total Properties Crossed (no.)	8	9
Public / Recreational Land Use (ha)	0.02	0.02
Industrial Land Use (ha)	0.0	0.0

Table 2.1 Summary of Environmental Constraints for the Two Route Options

Constraints / Attributes	Option 1 (Preferred Route)	Option 2 (Alternative Route)
Agricultural Land Use (ha)	0.0	0.29
Registered Archaeological Sites and Elevated Archaeological Potential Areas (ha)	1.8	2.8
Physical Criteria		
Length (km)	5.3	5.4
Length Through Steep Slopes and Bedrock Outcrops (km)	0.0	0.0
Infrastructure Crossings (no.)	0.0	0.0
Weighted Constraints Analysis Score* (Table 2.2)	68.45	65.1
Weighted Constraints Analysis Rank*	1	2

Table 2.2 Constraints Analysis Results –Routes for the Proposed New 5.3 km-Long 138 kV Transmission Line

Criteria	Weight (%)	Option 1 (Preferred Route)		Option 2 (Alternative Route)	
		Ranking	Score	Ranking	Score
Environmental Criteria					
Watercourse and Waterbody Crossings	25%	6	1.5	7	1.75
GeoNB-Mapped and NBDNR Wetland Crossings	20%	2	0.4	3	0.6
Protected Areas and Conservation Areas	20%	7	1.4	6	1.2
Parallel to Existing Corridor	15%	0	0	0	0
Species at Risk, Species of Conservation Concern, and Sensitive Areas	10%	10	1	10	1
Forested Areas	10%	1	0.1	1	0.1
Score for Environmental Criteria			**4.4**		**4.65**
Weighted Score for Environmental Criteria	**40%**		**17.6**		**18.6**
Socioeconomic Criteria					
Designated Lands and Private Land	30%	4	1.2	2	0.6
Total Number of Properties Crossed	15%	10	1.5	8	1.2
Public Land Use	10%	10	1	10	1
Industrial Land Use	10%	10	1	10	0.9
Agricultural Land Use	20%	10	2	8	1.6
Registered Archaeological Sites and Elevated Archaeological Potential Areas	15%	5	0.75	4	0.6

Table 2.2 Constraints Analysis Results –Routes for the Proposed New 5.3 km-Long 138 kV Transmission Line

Criteria	Weight (%)	Option 1 (Preferred Route)		Option 2 (Alternative Route)	
		Ranking	Score	Ranking	Score
Score for Socioeconomic Criteria			**7.45**		**6**
Weighted Score for Socioeconomic Criteria	**30%**		**22.35**		**18**
Physical Criteria					
Length	50%	9	4.5	9	4.5
Steep Slopes and Bedrock Outcrops	25	10	2.5	10	2.5
Infrastructure Crossings	25	10	2.5	10	2.5
Score for Physical Criteria			**9.5**		**9.5**
Weighted Score for Physical Criteria	**30%**		**28.5**		**28.5**
Overall Weighted Score			**68.45**		**65.1**

Complete details of the Constraints Analysis for both route options, and a 500 m buffer on either side of them, are provided in Appendix C

2.4 DESCRIPTION OF PROJECT COMPONENTS AND INFRASTRUCTURE

The high-voltage transmission line consists of a series of structures (poles or towers) which support conductors (wires) that carry electricity to the substation. Various structure types and configurations exist to support the conductors such as wood H-frame poles. During the initial planning stages of a transmission line and substation, an economic evaluation is carried out to determine the structure type. In most instances, factors considered include material cost, cost of structure assembly and erection, structure heights and strength, hardware cost, and available RoW. Environmental and social factors, such as weather and soil conditions are also considered.

2.4.1 Phase 1 – New 138 kV Transmission Line and New Kedgwick Substation to be Constructed

The components and infrastructure needed for Phase 1 meet the financial and reliability criteria and the socioeconomic, environmental, and physical considerations identified for the Project (Section 2.3). The substation and transmission line will be designed and built to the same standards as existing high voltage transmission infrastructure in New Brunswick. Transmission lines in New Brunswick are built as per NB Power specifications, which are constructed in accordance with CSA Standard C22.3, “Design Criteria for Overhead Systems”.

2.4.1.1 New 138 kV Transmission Line

2.4.1.1.1 Structure Type

Structures are used to support the high voltage conductors and to ensure minimum clearance to ground, to objects under the transmission line, and at road crossings. Also, structures are designed to withstand known weather conditions and other related constraints.

The Project will use wood pole H-frame structures, installed to a height of approximately 23 m, and spaced approximately 200 m apart. The spacing of the H-frame poles will be determined based on physical and environmental surveys, and will avoid watercourses, wetlands, and any other environmentally sensitive areas wherever possible. Angle structures (e.g., dead-end structures) may also be used where the line turns and terminates. Poles will be reinforced with a cross arm and cross braces. Angle structures will be anchored with guy wires. Based on preliminary analysis, it is expected that up to 30 H-frame structures will be required for the construction of the new transmission line.

The wooden poles are safer to maintain than alternative pole materials (e.g., pre-cast concrete, corrosive-resistant steel and plastic lumber) and minimize the environmental footprint required along the RoW. The poles are pressure treated with Pentachlorophenol to protect the wood against fungi and insects, and provide extra protection against moisture content changes (EC 1999). Pentachlorophenol is currently authorized for use in Canada, and its use in treated poles is not considered to result in dietary or drinking water risks (Health Canada Pest Management Regulatory Agency 2011). Untreated poles, such as hemlock, tamarack, and cedar were not considered for this Project as they are more susceptible to decay from wood rot or damage from wood boring insects which would lead to structural weakening and possibly pole failure. Creosote-treated poles are no longer used by NB Power for constructing transmission lines. Pentachlorophenol-treated poles have greater wood stability and resistance to splitting, which substantially extends the service life of the wood (from less than 10 years to 50 years) and increases its durability. In addition, this type of treatment provides resistance to electrical currents and facilitates the climbing of poles by line maintenance staff (EC 1999). Pentachlorophenol-treated poles are widely available, have the lowest cost, and are more practical to climb. They are a proven product, derived from a renewable resource, are readily available and locally produced. Alternate pole materials (e.g., pre-cast concrete, corrosive-resistant steel and plastic lumber) have proven to be cost prohibitive and were not considered for this Project.

2.4.1.1.2 Guy Wires and Anchors

Although specific information regarding anchor requirements for guy wires at angle structures has yet to be determined, Helix anchors, rock anchors and/or log anchors may be used depending on structure location. It is anticipated that Helix (screw type) anchors will be used predominantly for the Project. Helix anchors are best suited for soil conditions having limited load bearing characteristics and/or in wet areas. This type of anchor is comprised of a steel shaft and helices that are screwed into the ground to a calculated depth. The helices transfer the stress of the load evenly across the soil. These anchors are easier to install, require little to no site preparation, do not result in excavated material, and can be withdrawn and reused.

Rock anchors will be required in areas where bedrock is present and screw type anchors are not feasible. Wedge style anchors and grouted rock anchors are typical rock anchor configurations. Grouted rock anchors are best suited for areas of fractured bedrock and will most likely be used. Bedrock is drilled to a specific depth and the grouted rock anchor is installed and backfilled with grout to the surface, preventing the anchor from pulling back through the bedrock while under tension.

Log anchors may be used as required. Log anchors will be installed in soft areas (e.g., wetlands) or at structure locations under high tension. Log anchors consist of a 1.2 to 1.8 m section of pole that is typically buried lengthwise 2.4 m under the ground surface. Tension cables are attached to anchor rods through logs and structures; the excavation is then backfilled and the soil compacted.

2.4.1.1.3 Conductors and Insulators

A 556 Aluminum Conductor Steel-Reinforced conductor will be used for the 138 kV transmission line. This wire provides higher corrosion resistance, is lighter in weight, has a recognized longer service life, and offers reduced power losses. The conductors are typically suspended from the cross arms by insulator strings, and will be spaced 3.8 m apart.

2.4.1.1.4 Overhead Ground Wires and Counterpoise

Lightning strikes on transmission lines pose a significant risk to the stability of the electrical network. In order to mitigate impact to the proposed transmission line, cables called “ground wires” may be strung above the conductor to protect them from the high current and voltage surges present in lightning. In the event the line suffers a direct or indirect strike, these wires provide a path for the high current and voltage to safely discharge down through the structures and into the ground.

Counterpoise may also be installed on the structures where the ground resistance is found to be too high in order to improve grounding capacities. The counterpoise consists of a steel galvanized wire that is attached to the bottom of the poles and covered with overburden to a depth of approximately 0.5 m and runs radially for a distance of approximately 1 m.

2.4.1.1.5 Width of Right-of-Way (RoW)

The cleared width of the RoW is governed by a number of factors such as tree height, structure type, height of conductors, sag of conductors, flashover distances, and safety factors for tree growth and conductor swing. For safe electrical clearances and to prevent trees from falling onto the line or coming into contact with the conductors, the RoW is cleared of tall vegetation. The typical minimum width required for a 138 kV transmission line using standard suspension H-Frame structures is 30 m.

2.4.1.1.6 Easement

An easement is defined as a non-possessory, registered interest acquired by one person on the land of another, permitting partial use of the other’s land for a specific purpose, such as a right-of-way across it. The easement allows for the construction and operation of a transmission line on part of a property while ownership of the entire parcel of land remains with the original owner. A 30 m-wide easement will be acquired to construct the proposed transmission line.

2.4.1.2 Construction of New Kedgwick Substation

The new substation will require the grading and preparation of approximately 0.18 ha of land, that will be purchased by NB Power. The substation, which will be situated on a previously disturbed site, will require the construction of a ground grid, with instrument transformers, switches, and circuit breakers needed to support the new 138 kV transmission line. On-site spill containment will be incorporated into the design, fencing will be established to enclose these structures, and signage will be added to inform the public of electrical hazards.

2.4.2 Phase 2 – Decommissioning of 69 kV Transmission Line 0028 and Existing Kedgwick Substation

The decommissioning of approximately 25 km of Line 0028 does not require the addition or replacement of poles, conductors, guy wires, anchors, or counterpoise. Also, this phase of the Project will not require the creation of new RoW or the acquisition of additional land easements. The only new component needed will be the tap off structure 255 A which will be connected to existing pole infrastructure near where Line 0028 currently intersects with Line 1110. The remainder of Line 0028 between structure 255A and the Town of Saint-Léonard will be unaffected.

Similarly, the decommissioning of the existing substation will not require the addition or replacement of a ground grid, transformers, switchers, or conductors, nor will any additional fencing or signage be required. No new RoW will be required for the decommissioning of the existing substation.

2.5 PROJECT PHASES AND ACTIVITIES

The two phases of the Project differ in their respective phases and activities. As such, they are described separately.

2.5.1 Phase 1 – New Kedgwick Substation and New 138 kV Transmission Line

The lifecycle of a newly designed substation and transmission line involves initial Construction, ongoing Operation and Maintenance, and eventually Decommissioning and Abandonment. Since the two new Project components will be developed concurrently, share numerous similarities in their activities, and are interconnected, they will be described collectively as Phase 1. However, unique attributes of each component will be noted separately.

2.5.1.1 Project Construction

The construction of a transmission line and substation typically involves the following stages:

- Site preparation;
- Excavation, structure assembly, and installation;
- Stringing conductors;
- Connection of transmission line and substation;
- Inspection and energization; and,
- Clean-up/revegetation.

Both tracked and wheeled equipment and vehicles are used to perform these activities. The type of equipment and vehicles may include, but is not limited to, the following: Muskeg, crane, excavator, auger, dump trucks, dozer, tractor trailer and all-terrain vehicles. A brief description of the Construction details is provided below.

2.5.1.1.1 Site Preparation

Site preparation for the substation and transmission line can include access and staging, vegetation clearing and grubbing, and the construction of temporary watercourse crossings. The following describes the anticipated Project works that are needed to prepare the land for the construction of a new substation and the installation of the overhead transmission infrastructure.

2.5.1.1.1.1 Access and Staging

Access to the new substation and the RoW will be required in some locations to allow transportation of construction equipment, materials, and personnel. Access may be required along the RoW and deviate where watercourses and wetlands cannot be crossed with equipment. Maximum use will be made of existing access roads.

Existing access roads may require improvements to provide construction vehicle and equipment access to the substation and transmission line RoW. These improvements may include one or more of the following:

- Clearing brush overgrowth to widened sections of roads with the use of a mulching head;
- Grading existing roadbeds and, where necessary, placing a few cm of gravel on the newly graded areas (e.g. crowning);
- Installing cross-drainage in certain areas to divert storm water runoff to the side of the roads; and,
- Installing culverts, where required.

Preliminary reconnaissance work and a review of aerial photographs suggests that access to the new substation and the entire length of the RoW can be accessed using a combination of existing roads and trails. These roads and trails may require some minor improvements which will be identified following field studies. No new access roads will be required for the Project. Permission from landowners will be obtained to access existing roads and trails.

2.5.1.1.1.2 Vegetation Clearing and Grubbing

Vegetation clearing will be conducted for the substation and the RoW corridor and, where necessary, for existing access roads. The new substation will be largely located on a previously disturbed site; however, some vegetation removal may be required. The majority of clearing activities will be conducted with harvesting equipment; however, within 30 m of a watercourse or wetland, clearing will be conducted by hand. Hand clearing may also be required in areas of medium to high archaeological potential. To prevent disturbance of migratory birds and their nests, the timing of clearing will be planned for outside of the breeding bird season for most species (i.e., outside of April 1 to August 31) to the extent possible. Cleared merchantable timber will be removed and sold by the contractor, and any remaining cleared vegetation will be stockpiled and/or chipped on site.

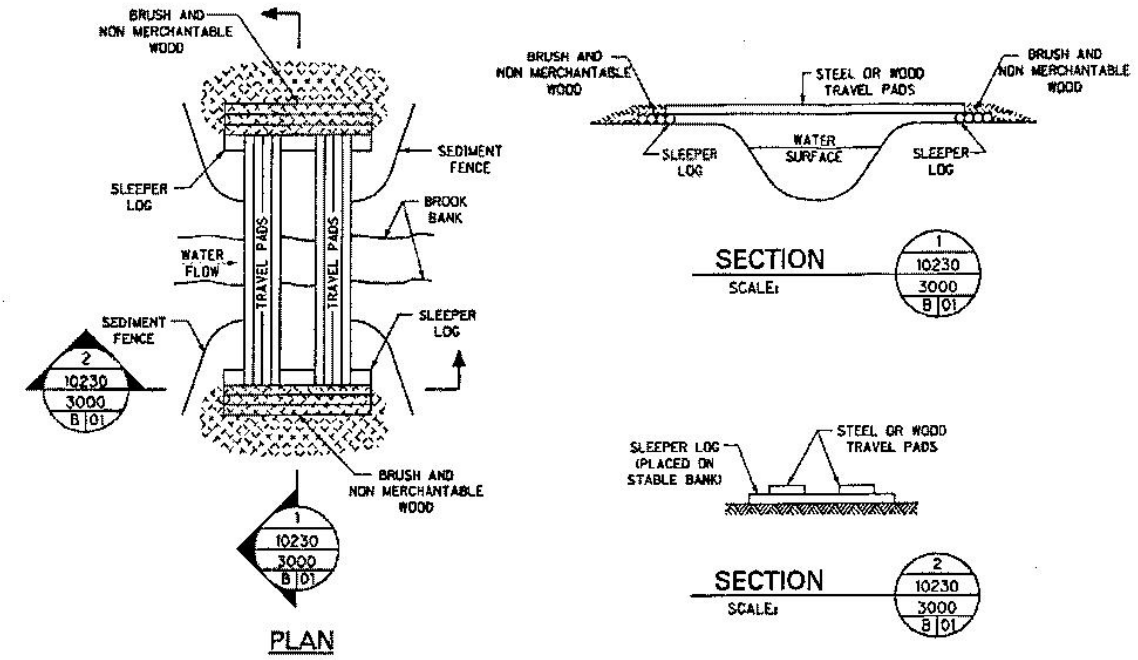
Grubbing will include the removal and disposal of stumps and roots that remain after clearing, where necessary. Grubbing will be conducted using a root rake or similar equipment that is able to remove the roots and stumps of cleared vegetation and leaves the topsoil for salvage. The grubbing will be limited to the footprints of the transmission line structures. If grubbing is required, archaeological surveys will be required in areas of medium and high archaeological potential.

Staging areas will be used for temporary placement of construction materials (e.g., ground grid, switches, fencing, poles, conductors, and hardware) in the vicinity of the construction area. Staging areas will be situated to avoid environmentally sensitive areas, such as rare plants, wetlands, watercourses, and their buffers. They will be easily accessible, located to reduce potential traffic hazards, and will be located away from developed areas in order to reduce noise and dust concerns. Sites requiring little or no modification, such as forestry landings or harvested fields, will be used for temporary staging areas, where possible. If staging areas are to be located on private property, agreements will be signed with the individual landowners. Security fencing may be placed around the site. Following construction, staging area sites will be reclaimed to as close to their pre-construction condition as possible.

2.5.1.1.1.3 Temporary Watercourse Crossings

Although there are no anticipated interactions with watercourses or wetlands for accessing or developing the new substation, access along the transmission line corridor may be interrupted by watercourses and wetlands. Crossing of watercourses or wetlands is required if no other existing means of access is available. To cross watercourses or wetlands, temporary structures will be constructed to eliminate fording. The methods for the construction of temporary watercourse or wetland crossings will depend on the crossing width and length of the span required, hydrology, environmental sensitivities, and engineering considerations. The following includes possible options for crossing watercourses and wetlands.

- Where feasible, NB Power will use existing structures.
- Where existing/permanent crossings are not available, NB Power will use temporary structures (e.g., temporary bridges, brush mats, swamp mats). Temporary structures, if needed, will be designed and installed in accordance with applicable provincial and federal guidelines. Structures will be removed when construction is complete and any disturbance caused as a result of the structures will be rehabilitated to as close to original conditions as possible. Figure 2.3 provides a generic drawing of a typical temporary bridge crossing.
- As part of the design stage of the Project, NB Power will avoid locating structures next to watercourses and/or wetland habitat, and their 30 m buffers, where possible. Where these areas cannot be avoided, mitigation measures will be developed in consultation with the appropriate authorities. If access is not available on either side of a watercourse or wetland, temporary bridging or corduroy (for wetlands only) will be used to cross these areas, allowing access for both wheeled and tracked vehicles.
- Where practical, only tracked vehicles (i.e., Muskegs, excavators, dump vehicles, small dozers, and terriva-bucket vehicles) will be used in or near watercourses and/or wetlands to reduce the potential for rutting.



Source: Transmission Line 3016 CAD Drawing No. : 3016-10230-3000-001-DD-B

Figure 2.3 Typical Temporary Bridge Crossing

Erosion and sedimentation control practices will be implemented with all physical works to reduce erosion of exposed areas and sedimentation of surface water. Dust control measures will be taken, where necessary, during site preparation to minimize the potential for fugitive dust.

2.5.1.1.2 Excavation and Structure Assembly and Installation

2.5.1.1.2.1 New Substation

There will be little ground disturbance required for the installation of the new Kedgwick electrical substation. Instead, clean fill will be used to build up the site for the installation of the containment pad, and the ground grid. The installation of security fencing will also require the excavation of holes approximately 15 cm in diameter and approximately 1 m in depth. Precise structure locations and numbers have yet to be determined; they will be based on a number of physical and environmental surveys. Structure locations will avoid watercourses, wetlands, and any other environmentally sensitive areas where possible.

2.5.1.1.2.2 New Transmission Line

The assembly of overhead transmission structures includes transportation of materials to the site, excavation of the pole location, pole placement, backfilling of excavated material, and the installation of anchors and guy wires (Section 2.4.1.1.2).

Installation of transmission line structures will require an excavation of two holes approximately 1 m in diameter and approximately 2.5 to 3 m deep. Based on these dimensions, there will be 4.0 to 4.8 cubic metres (m^3) of excavated material for each structure. An excavator will be used to excavate the majority of the pole locations. The assembly of structures will take place on-site at structure locations. The disturbance area around the structure site for construction equipment operation, structure assembly, and structure installation activities will be limited to the corridor. Compacted native soil disturbed during the auguring process will be used to fill the sides of the excavations. Should additional backfill material be required for the new structures, it will be obtained from a provincially approved local source.

Precise structure locations have yet to be determined; they will be based on a number of physical and environmental surveys. Structure locations will avoid watercourses, wetlands, and any other environmentally sensitive areas where possible.

2.5.1.1.3 Conductor Stringing

Large reels of wire (conductor) will be delivered to selected areas along the RoW. The wire will be subsequently strung using a tension-pulling machine and attached to the insulators by hand while pulling lines will be used to pull the wire between structures. In areas where the transmission line crosses a watercourse or wetland, the pulling line (p-line) is walked across and then strung using a tension-pulling machine.

Once the conductors are in place, they will be correctly sagged and tensioned, then permanently clipped into the clamps at each structure. Miscellaneous hardware such as marking, vibration damping devices, or air flow spoilers may also be installed, as required.

In areas where the transmission line crosses a road, rider poles will be installed on either side of the roadway to support conductors to prevent the conductor from sagging which could potentially affect traffic flow and pose safety concerns.

2.5.1.1.4 Connection of Transmission Line

Upon completion of the new substation, the transmission line will be connected to the substation breakers. This connection will occur within the footprint of the new substation and complete the connection to the grid for the transmission of electric power.

2.5.1.1.5 Inspection and Energization of the Project

Following Construction, a line inspection of the line's readiness for service will be conducted by NB Power staff from the ground and potentially from the air. Any deficiencies discovered during these inspections will be corrected prior to energizing (commissioning) of the transmission line.

2.5.1.1.6 Clean-up and Revegetation

In areas where soil disturbance due to Construction may cause erosion, measures will be taken to stabilize the affected area. Such measures may include trimming and back blading, mulching, seeding,

fabric placement, and silt fencing. Erosion control used during Construction will be maintained until such time as the disturbed ground has been stabilized with vegetation.

2.5.1.2 Operation and Maintenance

During Operation of the transmission line and substation, routine activities will be performed to protect the reliability of the network. Activities expected during Operation include energy transmission, vegetation management, infrastructure inspection, maintenance and repair, access road maintenance, and transportation of people or materials. NB Power will conduct the required maintenance of the transmission line so that it operates in a safe and reliable manner according to the Canadian Electrical Code.

2.5.1.2.1 Operation and Maintenance of Hardware

Regular ground and aerial line inspections will be performed by maintenance staff. Maintenance inspections will be completed to check for the deterioration of the ground grid, switches, conductors, poles, hardware and insulators, and identify maintenance requirements. These inspections will assist in identifying potential for weakened support structures and foundations, as well as changes in terrain that may affect structure stability. Aerial inspections and/or ground patrols will be performed periodically. Ground patrols will be performed using existing adjacent road access and will therefore avoid fording of watercourses or disturbance to wetlands. Additional inspections may be carried out in the event of an emergency (e.g., ice or wind storm). Inspection results will be provided to NB Power operational personnel who are responsible for planning and scheduling maintenance work.

2.5.1.2.2 Vegetation Management

Maintaining the RoW for vegetation control permits suitable access to the transmission lines during emergencies and for regularly scheduled inspections and maintenance. Routine inspections will be conducted to facilitate the safe and reliable operation of the transmission line, and to minimize the risk of potential hazards such as fires or electrocution caused when trees grow too close to energized transmission lines. The tolerance for clearances between vegetation and the transmission lines were developed from the Canadian Electrical Code for safe and reliable operation of high-voltage lines. NB Power will restrict the growth of trees and brush along the line through their vegetation management program to avoid interruptions to electric service caused by overgrown or fallen vegetation. The frequency of vegetation management depends upon the growth rate, but is normally carried out every five to seven years.

2.5.1.3 Decommissioning and Abandonment

The new 138 kV transmission line and new substation will have a design life of 50 years. While Decommissioning or Abandonment of these components is not currently envisioned, the substation and transmission line will at some point be decommissioned or rebuilt at the end of its useful service life, in accordance with the applicable standards and regulations current at that time. In the event the substation and/or transmission line is no longer required, NB Power will provide the necessary information to the appropriate regulatory agencies so that the regulatory requirements are met prior to

commencement of Decommissioning activities. As such, Decommissioning and Abandonment of the new Kedgwick substation and 138 kV transmission line are not discussed further in this document. In this document, references to and discussion of Decommissioning activities relate to the Decommissioning of the existing Kedgwick substation and existing 69 kV transmission line 0028 (Phase 2, described below).

2.5.2 Phase 2 – Decommissioning of 69 kV Transmission Line 0028 and Existing Kedgwick Substation

This phase of the Project will be conducted following the successful construction, connection, and energization of the new 138 kV transmission line to the new Kedgwick substation (Phase 1).

2.5.2.1 Decommissioning and Abandonment

The existing Kedgwick substation and the 69 kV transmission line (Line 0028) between structures 255A and 420 will be dismantled since they will no longer be required. Infrastructure and hardware will be decommissioned and removed. Removable assets will be sold or disposed of prior to or concurrent with their dismantling.

There are two stages to the Decommissioning of a substation and transmission line:

- Decommissioning of facilities; and,
- Clean-up and revegetation.

2.5.2.1.1 Decommissioning of Facilities

2.5.2.1.1.1 Wires and Hardware Removal

After the new substation is in service and the existing substation is de-energized, components such as instrument transformers, switches, circuit breakers, and conductors will be disconnected. Hardware, such as bushings, light fixtures, junction boxes, and electrical panels will removed. After the transmission line is de-energized, components such as conductors, overhead ground wires, and anchor wires will be disconnected.

2.5.2.1.1.2 Structure Disassembly

The sections that make up a structure will be disassembled in the reverse order they were assembled. For the existing substation, the metal ground grid will be cut off at ground level. If concrete pads exists, they will be broken and pieces removed until they are below grade. The recycling or reuse of materials, such as scrap metal, would depend on the market and the existing technology.

For transmission lines, the cross arms will be removed and set on the ground. Helix anchors will be removed from the ground. In the case of log anchors, the guy wire is cut and removed and the log anchor is left in the ground to avoid ground disturbance. The anchor wires will be removed from support poles and the support poles will be taken down by cutting them at ground level.

Hardware such as insulators, anchors and cross arms will be removed from structures and transported off-site for reuse or recycling. If reuse or recycling opportunities are not available, the hardware will be disposed of at approved facilities. Existing woods roads and trails that intersect the right-of-way will be used to allow transportation of equipment, hardware and personnel. A trail will be cleared along the right-of-way using mechanical and manual methods to access the structures.

2.5.2.1.2 Clean-up and Revegetation

In areas where soil disturbance due to decommissioning may cause erosion, measures will be taken to stabilize the affected area. Such measures may include trimming and back blading, mulching, seeding, fabric placement, and silt fencing. Erosion control used during decommissioning will be maintained until such time as the disturbed ground has been stabilized with vegetation.

The decommissioning of the existing Kedgwick substation will include a Phase 2 environmental site assessment (ESA) to determine if there are any contaminated soils on the 0.18 ha site. If contaminated soils are found, a Phase 3 ESA would be conducted to delineate the area of contamination, and develop a remediation plan that complies with regulatory requirements. All contaminated soils will be disposed of in accordance with the Atlantic Risk Based Corrective Action (RBCA) methodology (Atlantic RBCA 2012), following NBDELG approval.

2.6 WORKFORCE AND PROJECT SCHEDULE

Construction will require NB Power staff as well as a clearing contractor, a general contractor that specializes in substation and transmission line construction, and subcontractors, as may be needed. The Construction of the new substation and new transmission line, including RoW clearing, will occur over an approximately seven month period (April to November 2017); however, RoW clearing and new transmission line Construction activities will occur before April 1 and/or after August 31 to avoid the disruption of habitat during the sensitive bird breeding season. The decommissioning of the existing substation and Line 0028 will take approximately three months, and will commence upon the completion of Phase 1.

The workforce will be expected to work a standard eight-hour work day (typically between the hours of 8:00 a.m. and 6:00 p.m.), Monday through Friday. Work is not typically conducted overnight or on weekends; however, delays in the Project schedule may require extended work hours.

A summary of key Project activities and timelines is provided in Table 2.3 below.

Table 2.3 High Level Schedule of Key Project Activities

Project Activities	Timeline
Communication with stakeholders and First Nations	Spring through Fall 2016 (and throughout Project activities)
Environmental field studies (Section 4.3)	April to August 2016
Permits/approvals acquisition (Section 1.4.1.3)	Winter 2017 to Spring 2017
RoW clearing	Spring 2017 and/or Fall 2017
Construction of new substation (Phase 1)	Spring to Fall 2017
Construction of new line (Phase 1)	Spring and/or Fall 2017
Decommissioning of existing Kedgwick substation (Phase 2)	Spring 2018
Decommissioning of Line 0028 (Phase 2)	Spring 2018
In-service date for new substation and new 138 kV line	Fall 2017

2.7 EMISSIONS AND WASTE

2.7.1 Airborne Emissions

Emissions associated with fuel combustion in heavy equipment and vehicles, and dust associated with travel on unpaved surfaces, are anticipated to occur during the Construction and Decommissioning Phases 1 and 2 of the Project. Water sprayers would be used to suppress and control dust levels, as required, during Construction.

Project Construction is not anticipated to result in substantial emissions of air contaminants or greenhouse gases (GHG) to the environment (Section 4.3.1). Airborne emissions are expected to be generally confined to the PDA and are not expected to result in measurable increases in the air quality conditions in Kedgwick or Saint-Quentin, or to exceed provincial air quality standards.

2.7.2 Hazardous Materials

Potentially hazardous materials used during Construction would include propane, diesel, gasoline, hydraulic fluids, motor oil, and grease and lubricants for heavy equipment, ATV and vehicle use. Cleaning and maintenance of vehicles and equipment, site inspections, and the monitoring and inventorying of materials, as well as proper disposal of hazardous materials, would be essential for environmental protection. Construction of the Project is not anticipated to result in any substantial releases of hazardous materials into the environment, and is addressed further in Section 2.8.1.

2.7.3 Sound Emissions

Sound emissions would occur during the Construction and Decommissioning and Abandonment of Phases 1 and 2, and would be limited to the use of heavy equipment, vehicles, and chain saws. Mitigation will be used wherever feasible to reduce the potential environmental interactions resulting

from sound emissions. Construction is not anticipated to result in substantive emissions of sound into the environment (see Section 4.3.1).

2.7.4 Solid Waste

Solid wastes generated during the Construction phase of the Project would include packaging materials, plastics, cardboard, wood, metals, felled vegetation, and sediment runoff. Wherever possible, solid wastes will be re-used or recycled, and felled vegetation will be windrowed along the edge of the RoW to naturally decompose. Other materials will be properly disposed of through the Restigouche Regional Service Commission Solid Waste Management Division transfer station, located in Campbellton.

2.7.5 Runoff

Erosion and runoff associated with Construction activities is not anticipated to result in a substantial deposition of sediments into watercourses (Section 4.3.3). Sedimentation and erosion control measures will be used to provide slope stability and prevent siltation of construction-related sediments into watercourses.

2.8 ACCIDENTS, MALFUNCTIONS, AND UNPLANNED EVENTS

Accidents, malfunctions, and unplanned events are upset conditions or other events that are not part of any planned activity or normal operation of the Project, and have the potential to result in adverse environmental interactions. While accidents, malfunctions, and unplanned events could occur during any phase of the Project, many of them can be prevented and addressed by good planning and design, communication, worksite health, safety, and environmental training of personal, emergency response planning, vehicle and equipment maintenance, and mitigation.

Given the adherence of Project-related activities to the mitigation measures and response plans in the existing NB Power Environmental Protection Plan (EPP) (NB Power 2012), adverse environmental interactions related to accidents, malfunctions and unplanned events are not likely to occur during the Construction, Operation and Maintenance, and Decommissioning and Abandonment of the Project.

This section describes the potential accidents, malfunctions, and unplanned events that have a reasonable probability of occurrence. Mitigative planning and response procedures are also described below.

2.8.1 Hazardous Material Spills

The potential for the release of hazardous materials is limited to the operation of vehicles, with the most likely source of a release being the rupture of a hydraulic line or the loss of fuel. The mitigation and management of hazardous materials for the Project will include:

- The training of personnel in spill prevention and response, and Workplace Hazardous Materials Information System (WHMIS);

- Following procedures within the existing NB Power Environmental Protection Plan (EPP) (i.e. fuel storage containment and locations, refuelling procedures);
- Routine cleaning, preventative maintenance, and visual inspections of hydraulic equipment and vehicles;
- On-Site spill response equipment; and,
- In the event of a spill, reporting to the appropriate Project personnel and New Brunswick Power System Operator (PSO) (1-800-756-8411). During normal business hours (i.e., Monday to Friday from 8:15 a.m. to 4:30 p.m.), the PSO will notify the appropriate authorities (i.e., NBDELG). Outside of normal business hours, on weekends and on holidays, the PSO will notify the Canadian Coast Guard/Spills Action Centre (1-800-565-1633).

In the unlikely event that a hazardous material spill reaches a nearby sensitive area or a body of water, measures will be taken to stop the spill and isolate the affected area as soon as possible. An assessment of the affected area will be conducted and remediation will be completed as required.

2.8.2 Project-Caused Fire

The potential for fire to occur as a result of Project activities is limited to the use of vehicles, or to infrastructure (e.g., substation). The mitigation and management of fire will include:

- Equipping all Project-related vehicles with fire extinguishers that are appropriately sized and rated;
- Training personnel in the location and proper use of fire extinguishers;
- Safely storing flammable wastes (i.e., oily rags);
- Avoid parking vehicles in areas of long grass; and,
- Immediately reporting a fire to local emergency response services.

As the Project location is not remote, local emergency response services are available.

2.8.3 Vehicle Collisions

Vehicular activity will be most prevalent during the Construction and Decommissioning phases of the Project, and will be minimal during Operation and Maintenance. However, during all phases, there is the potential for vehicles associated with Project activities to collide with:

- Other vehicles;
- Project infrastructure or other infrastructure; and,
- Wildlife.

The mitigation and management measures planned to reduce the potential for vehicle collisions include:

- Implementing traffic control measures, as required, to reduce the potential for vehicle to vehicle collisions;
- Project staff will be appropriately licensed to operate vehicles on the Project site, will obey traffic rules and regulations, and will exercise caution while on-site;
- Trucks will only use designated truck routes and obey weight restrictions; and,

- Emergency services will be immediately contacted by Project personal in the event of a collision.

In the event of a vehicle collision, there is the potential for the loss of life (human or wildlife) and damage to infrastructure.

2.8.4 Wildlife Encounters

The potential for an unplanned encounter with wildlife is largely limited to disturbances to birds nesting on transmission poles during the operation and maintenance of Phase 1 and Decommissioning of Phase 2.

The mitigation and management of wildlife encounters will include:

- Documentation, mapping and species identification of all nests on Project infrastructure;
- Scheduling of maintenance and Decommissioning activities outside of nesting periods; and,
- Consultation with New Brunswick Department of Energy and Resource Development (NBDERD) biologists prior to unplanned/emergency maintenance during nesting periods.

3.0 OVERVIEW OF ENVIRONMENTAL SETTING

The Project is located near the rural community of Kedgwick, in the Grimmer Parish of Restigouche County, New Brunswick. The setting is consistent with this Appalachian region of New Brunswick, with an abundance of forest stands, and streams and rivers that flow through hilly and often steep terrain. Residential clusters are sparse in this area, with Kedgwick being situated on the juncture of Route 17 and Route 260, approximately 12 km north of the town of Saint-Quentin, and 64 km southwest of the city of Campbellton.

Historically, Aboriginal land and resources use in and near the PDA would have included travel through the area for hunting, gathering, and for accessing the Saint John, Nepisiguit, and Restigouche Rivers (NBDNR 2007). The PDA is situated near the border of traditional territories of the Wolastoqiyik (Maliseet) and Mi'kmaq First Nations.

Modern settlement of the area began in the early 1900's, and was supported largely though a boom in the forestry industry and the establishment of rail (GNB 2016a). The region continued to develop through the twentieth century, with the addition of road and telecommunications infrastructure, the expansion of commercial forestry operations, and the establishment of an outfitter industry based on sport fishing and hunting.

Today, the area continues to be influenced largely by forestry, along with service industries including public sector, tourism, fishing, and hunting (NBPETL 2013).

3.1 PHYSICAL SETTING

3.1.1 Physiography and Geography

New Brunswick is divided into six physiographic (geomorphologic) districts defined largely by the underlying bedrock geology. The Project lies within the Chaleur Uplands District, in the Saint-Quentin Plateau (Rampton et al.1984).

Phase 1 is underlain by the Whites Brook Formation of the Grog Brook Group from the Late Ordovician Period. The Whites Brook Formation is characterized by medium dark grey weakly calcareous sandstone interbedded with medium dark grey non-calcareous siltstone and shale (Carroll 2003).

Phase 2 is predominantly underlain by the Pabos Formation and the White Head Formation of the Matapedia Group from the Late Ordovician and Early Silurian Period, as well as partially underlain by the Whites Brook Formation. The Pabos Formation is characterized by calcareous sandstone interbedded with calcareous siltstone and shale. There is a fault line that crosses Phase 2 with the displaced White Head Formation located on either side. The White Head Formation is characterized by its medium dark grey to dark bluish grey calculitite, which is a fine grained calcareous rock, interbedded with a greyish black mudstone (Carroll 2003).

3.1.2 Topography and Drainage

Phase 1 is situated in Restigouche County with elevations ranging from 280 to 360 metres above mean sea level (m amsl). Phase 1 crosses the McGee soil type and is well drained; the water table is not typically present in the soil. The soil is in its original state and is untouched by agriculture (NRCan 2016a). However, according to the Canada Land Inventory, the area consists of both Class 2 and 3 agricultural soil classes. Class 2 soils have moderate limitations that restrict the range of crops. These specific Class 2 soils are sub-classified as being 'Low Fertility'; as such, proper management is required (NRCan 2016a). Class 3 soils have moderately severe limitations that restrict the range of crops or require special conservation practices. The limitations to Class 3 soils, according to their sub-classification could be due to lack of moisture or topography in the area (NRCan 2016a).

Phase 2 is also primarily located within Restigouche County with the southern last 4 km located in Victoria County. Elevations in Phase 2 range from 200 to 310 m amsl. Phase 2 crosses three different soil types: Thibault, Nickel Mill and McGee (NRCan 2016a). The majority of the area is well drained, with the water table not typically present in the soil. Conversely, one third of the area is classified as being imperfectly drained and having the water table always present in the soil (NRCan 2016a). According to the Canada Land Inventory, the area spans a few different agricultural soil classes. The majority of Phase 2 is defined as being Class 2 and 3, similarly to Phase 1. However, small sections (less than one kilometer each) of Phase 2 are within Class 5 and Class 7; these classes have severe limitations due to excess water, or no capacity for arable culture or permanent pasture due to the topography, respectively (NRCan 2016a).

3.1.3 Surficial Geology

The surficial geology in the general vicinity of the Project is composed mainly of blanket and stony till (Rees 2005). The blanket lodgement till is generally 0.5 to 3 m thick. The stony till is classified as having 35% clasts that are pebble sized or larger (Rampton et al.1984). Based on their parent material, soils are divided into two groups; they are either considered mineral soils or organic soils. The soils in this area are considered to be mineral based, which consist primarily of inorganic compounds as found in sand, clays and rock fragments (Rees 2005).

3.2 BIOPHYSICAL SETTING

3.2.1 Atmospheric Environment

The Government of New Brunswick has not established any ambient air quality monitoring stations in the vicinity of the Project. The two nearest air quality monitoring stations in Saint-Léonard (approximately 70 km southwest from the PDA) and Bathurst (approximately 130 km east of the PDA) recorded no exceedances for ozone, or for fine particulate matter ($PM_{2.5}$) or nitrogen oxides, from 2010 through 2013.

The closest Environment Canada weather station with available historical data is located in Nictau, approximately 48 km south-southeast from the PDA. Climate normals (1981-2010) data from the Nictau weather station indicate that January is typically the coldest month of the year, with a daily average temperature of -13.2 °C. July is typically the warmest month of the year, with a daily average

temperature of 17.4 °C. The average annual precipitation (including snow as a water equivalent) in Nictau is 1,166 mm, with July being the rainiest month (118 mm on average) and January being the snowiest month (79 cm on average) (Government of Canada 2016a).

The Project is located in a rural, mostly forested area with clusters of residential dwellings along the western edge of the PDA near the rural community of Kedgwick. Therefore, the existing sound pressure levels (noise) in the area are expected to be typical of rural ambient levels.

More details on the Atmospheric Environment are provided in Section 4.3.1and Section 4.3.8.

3.2.2 Freshwater Fish and Fish Habitat

The Project is located in the Restigouche River watershed. The Project makes 11 watercourse crossings, including one crossing of Whites Brook, five crossings of Hailes Brook, three crossings of Five Fingers Brook and two crossings of Little Five Fingers Brook. The Hailes Brook subwatershed is 182km^2, the Whites Brook subwatershed is 186 km^2, and the Little Main Restigouche subwatershed is 1,582 km^2, collectively making up approximately19.5% of the Restigouche River watershed. Land use in the Restigouche River watershed is primarily forested land. Water quality in the river ranges from good to excellent (GNB 2007).

The Restigouche River has a number of species that support commercial, recreational or Aboriginal (CRA) fisheries. The Restigouche River is well known for its Atlantic salmon (*Salmo salar*) and brook trout (*Salvelinus fontinalis*) recreational fisheries, but has a number of other fishes such as burbot (*Lota lota*), American eel (*Anguilla rostrata*), gaspereau (*Alosa aestivalis* or *A. pseudoharengus*), rainbow smelt (*Osmerus mordax*), American shad (*Alosa sapidissima*), striped bass (*Morone saxatilis*), round whitefish (*Prosopium cylindraceum*), white perch (*Morone americana*), and yellow perch (*Perca flavescens*) (GNB 2016b). Other notable species found in the Restigouche River watershed include, but are not limited to blacknose dace (*Rhinichthys atratulus*), slimy sculpin (*Cottus cognatus*), lake chub (*Couesius plumbeus*), sea lamprey (*Petromyzon marinus*), common shiner (*Notropis cornutus*), fallfish (*Semotilus corporalis*), white sucker (*Catastomus commersoni*), stickleback (*Gasterosteus sp.*), finescale dace (*Chrosomus neogaeus*), and Northern redbelly dace (*Chrosomus eos*) (Pickard *et al.* 1983; Pickard 1997; Chaput and Jones 2004).

More details on fish and fish habitat are provided in Section 4.3.3.

3.2.3 Water Resources

Groundwater is the source of drinking water for the residents and businesses in the area near the Project. Drinking water for residents within the rural community of Kedgwick is obtained from municipal supply wells, supplied from the Kedgwick Protected Wellfield. Residents outside of the serviced portion of Kedgwick obtain their groundwater from individual water wells drilled on their properties. Wellfield Protected Areas have been designated for the two existing municipal groundwater supply wells in Kedgwick (GeoNB 2016). A third municipal supply well is proposed to expand the water supply for Kedgwick (GHD 2015).

As described in Section 3.2.2, the Project is located in the Restigouche River watershed, and intersects the subwatersheds for Hailes Brook, Whites Brook, and the Little Main Restigouche River. There are no known users of surface water located downstream of the Project in these sub-watersheds.

More details on water resources are provided in Section 4.3.2.

3.2.4 Terrestrial Environment

The Project is located in the Sisson Ecodistrict of the Madawaska Uplands area of the Central Uplands Ecoregion of New Brunswick (NBDNR 2007). The Madawaska Ecodistrict is noted as being one of the more 'hilly' areas of New Brunswick, with an abundance of rivers that flow through numerous gorges and canyons. The steep topography of the Madawaska Uplands strongly influences the distribution of trees in the area (NBDNR 2007). The low-lying valleys are dominated by softwood communities of balsam fir and red, white and black spruce; steep slopes support mixed forests of spruce, fir and tolerant hardwoods: upper slopes and ridge tops are characterised by stands of hardwoods (NBDNR 2007).

There are relatively fewer wetlands in this part of New Brunswick, due in part to the steep terrain of the Madawaska Uplands. Those that do occur are typically alder swamps adjacent to watercourses, or open water marshes along the edges of lakes (NBDNR 2007). There are some peat bogs in the southern areas of this Ecodistrict.

New Brunswick is host to 521 terrestrial vertebrate animal species, including 446 birds, 52 terrestrial mammals, 16 amphibians, and 7 terrestrial reptiles (NBDERD 2016).

The land in the general vicinity of the Project is a mix of Crown, private and municipal properties, with a variety of historic land uses. The diversity of habitats, ranging from standing forest, to open edge, to varying successional stages, is expected to provide abundant resources for wildlife.

3.3 SOCIOECONOMIC SETTING

3.3.1 Economic Activity and Economic Drivers

The private sector, including trade, forestry, and resource extraction employs the largest component (40%) of the labour force in the region (NBPETL 2013). Forestry is a substantial contributor to the local economy in Kedgwick, with local employees of J.D. Irving, Limited earning average wage rates in 2013 that were 45 % higher than the provincial average (Jupia Consultants Inc. 2013). The public sector is the second largest employer in the region (32.2%) (NBPETL 2013).

3.3.2 Land Use

Approximately 90% of the land in the Sisson Ecodistrict is forested. Of the remaining, 10% is un-forested land, 36% is used for agricultural purposes, 19% for roads, and 10% for developments (NBDNR 2007).

3.3.3 Infrastructure and Services

The rural community of Kedgwick offers residents and businesses a number of amenities, including restaurants, a Service New Brunswick outlet, multi-functional centre for community events, a Forestry Museum, and two hotels. In addition to municipal roads and sidewalks, the rural community also has wastewater treatment.

3.3.4 Transportation and Transportation Infrastructure

The rural community of Kedgwick is situated at the juncture of Route 17 and Route 260. Roads and other transportation infrastructure support local traffic including vehicles associated with the forestry industry.

4.0 SUMMARY OF ENVIRONMENTAL INTERACTIONS

4.1 METHODS

Baseline and field studies were conducted in May, June, July, and August 2016 with the intent of defining the existing environmental conditions with which the Project could interact. The field studies provided ground-truthing for selected environmental features and identified additional environmental features that could not be obtained from desktop information. These studies were conducted largely within 100 m of the centreline of the RoW. Field studies, which are described below, included Freshwater Fish and Fish Habitat, Terrestrial Environment, and Heritage Resources.

4.1.1 Valued Components

Based on its professional experience and work with similar projects, the Stantec team selected the following valued components (VCs) as those that should be considered as part of this EIA Registration:

- Atmospheric Environment;
- Water Resources (surface water and groundwater);
- Freshwater Fish and Fish Habitat;
- Terrestrial Environment (including wetlands, vegetation, and wildlife);
- Socioeconomic Environment;
- Heritage Resources;
- Current Use of Land and Resources for Traditional Purposes by Aboriginal Persons; and,
- Effects of the Environment on the Project.

The following sections describe each of these VCs, their existing (baseline) conditions, potential interactions with the Project, and planned mitigation to reduce Project-environment interactions.

4.1.2 VC Rating

A two-tiered qualitative rating system was used to evaluate the potential for interactions between the Project and the environment. One of the following two ratings was prescribed for each individual VC:

- An interaction between the Project and the environment could occur; and,
- No interaction occurs between the Project and the environment.

Project-VC interactions are discussed in greater detail in Section 4.2.

4.1.3 VC Assessment Area

There were two assessments areas used in the assessing potential Project-environment interactions, as follows:

- The Project Development Area (PDA) is the area of physical disturbance associated with Construction, Operation and Maintenance, and Decommissioning and Abandonment of the Project. The PDA encompasses the Project footprint, and includes:
  - the 30 m-wide RoW beneath the proposed 5.3 km of new transmission line,
  - the 0.18 ha footprint of the new substation,
  - the existing 25 km of 20 m-wide RoW beneath Line 0028 to be decommissioned,
  - the 0.18 ha footprint of the existing substation to be decommissioned, and
  - the temporary installation of bridging for watercourse crossings.
- The Local Assessment Area (LAA) is defined as the maximum area where Project-specific environmental effects can be predicted and measured with a reasonable degree of accuracy and confidence. The LAA is commonly referred to as a "zone of influence" and can vary amongst the VCs; it is thus is described in its respective section for each VC.

4.2 POTENTIAL INTERACTIONS BETWEEN THE PROJECT AND THE ENVIRONMENT

Based on the Project Description (Chapter 2), the Environmental Setting (Chapter 3), and the methods described briefly above, the potential interactions between the Project and the environment are summarized in Table 4.1.

Table 4.1 Potential Interactions between the Project and the Environment

Activities/Physical Works Associated with the Project	Atmospheric Environment	Water Resources (Surface Water and Groundwater)	Freshwater Fish and Fish Habitat	Terrestrial Environment (Wetlands, Vegetation, and Wildlife)	Socioeconomic Environment	Heritage Resources	Current Use of Land and Resources for Traditional Purposes by Aboriginal Persons	Effects of the Environment on the Project
Construction of New Substation and New Transmission Line								
Site Preparation	✓	✓	✓	✓	✓	✓	✓	
Excavation, Structure Assembly, and Installation	✓	✓	✓	✓		✓	✓	✓
Conductor Stringing	✓					✓	✓	✓
Connection of Transmission Line						✓		
Inspection and Energization				✓		✓		✓
Clean-up/Revegetation	✓	✓	✓	✓	✓			✓

Table 4.1 Potential Interactions between the Project and the Environment

Activities/Physical Works Associated with the Project	Atmospheric Environment	Water Resources (Surface Water and Groundwater)	Freshwater Fish and Fish Habitat	Terrestrial Environment (Wetlands, Vegetation, and Wildlife)	Socioeconomic Environment	Heritage Resources	Current Use of Land and Resources for Traditional Purposes by Aboriginal Persons	Effects of the Environment on the Project
Operation and Maintenance								
Operation and Maintenance of Hardware	✓	✓		✓	✓			✓
Vegetation Management	✓	✓	✓	✓	✓		✓	✓
Decommissioning of Existing Substation and Line 0028								
Decommissioning of Facilities	✓	✓		✓	✓		✓	✓
Clean-up/Revegetation	✓	✓	✓	✓	✓			✓

In the table above, the interaction with a particular VC is identified when the interaction first occurs.

4.3 ASSESSMENT OF POTENTIAL ENVIRONMENTAL INTERACTIONS

4.3.1 Atmospheric Environment

This section describes potential environmental interactions between the Construction, Operation and Maintenance, and Decommissioning and Abandonment of the Project and the Atmospheric Environment.

4.3.1.1 Scope of Assessment

The Atmospheric Environment consists of three components: air quality, climate/greenhouse gases, (GHGs), and sound quality, which are described as follows:

- Air quality is characterized by the composition of the ambient air, including the presence and quantity of air contaminants in the atmosphere in comparison to applicable air quality objectives.
- Climate is characterized by the historical seasonal weather conditions of a region (Government of Canada 2016b), which can include temperature, humidity, precipitation, sunshine, cloudiness, and winds. Statistical climate data are typically averaged over a period of several decades (Government of Canada 2016b). Project-based releases of GHGs (such as carbon dioxide [CO_2], methane [CH_4] and nitrous oxide [N_2O]) are typically used as an indicator of the potential for environmental interactions with climate change, as it is understood that GHG releases on a global scale from both natural processes/sources and human activities are increasing global concentrations of GHGs in the atmosphere and they are thought to be a contributor to climate change.

- Sound quality is characterized by the type, frequency, intensity, and duration of noise (unwanted sound) in the outdoor environment. Vibration, or oscillation in matter that may lead to noise or stress in materials of adjacent structures, is also considered to be an element of sound quality.

The Atmospheric Environment has been selected as a Valued Component (VC) for this EIA Registration because it interacts with several other systems on earth, including land, oceans, and ecosystems. Project-related releases of air contaminants to the atmosphere may adversely affect the quality of the ambient air or adversely affect human and/or ecological health. There is a high level of confidence of the link between anthropogenic releases of GHGs to the atmosphere, global climate change, and the resulting adverse environmental interactions. In addition, unwanted sound and vibration from Project activities may result in community annoyance and/or ecological disturbance.

This assessment of the Atmospheric Environment considers the air contaminants that are typically associated with this type of Project, which are regulated provincially and in some cases federally. These air contaminants are generated from fuel combustion and the movement of heavy equipment required for construction. For the Project components and activities assessed herein, combustion gases (including but not limited to sulphur dioxide (SO_2), carbon monoxide (CO), and nitrous oxides (NO_x)) and particulate matter are considered to be the potential contaminants of concern relating to air quality. Releases of GHGs from the combustion of fuel in heavy equipment are considered pertaining to the potential for interactions with climate change. Sound pressure levels and vibration are considered relating to sound quality. This section also considers electromagnetic fields (EMF) which may originate from transmission lines.

The *Air Quality Regulation 97-133* under the *New Brunswick Clean Air Act* defines air quality objectives in New Brunswick. Sound is defined as a contaminant in the New Brunswick *Clean Air Act*; however, there are currently no specific applicable requirements or objectives relating to GHG or EMF.

4.3.1.1.1 Boundaries

4.3.1.1.1.1 Spatial Boundaries

The assessment of potential environmental interactions with the Atmospheric Environment encompasses two spatial boundaries: Project Development Area (PDA) and Local Assessment Area (LAA).

Project Development Area (PDA)

The PDA is the immediate area encompassing the Project footprint, and is limited to the anticipated area of physical disturbance associated with the Construction, Operation and Maintenance, and Decommissioning and Abandonment of the Project. The PDA includes the footprint of the 5.3 km-long, 30 m-wide RoW for the new 138 kV transmission line to be constructed and the 0.18 ha footprint of the new Kedgwick substation. The PDA also includes the footprint of the existing substation, and the RoW for existing Line 0028, both of which will be decommissioned as part of the Project. The PDA is illustrated in Figure 2.1.

Local Assessment Area (LAA)

The LAA for the Atmospheric Environment is the immediate area within 1 km on either side of the PDA (i.e., the LAA has a total width of 2 km), and is illustrated in Figure 4.1. This area is expected to be where most of the notable potential environmental interactions with the Atmospheric Environment could occur. Air contaminant emissions and noise from Construction and EMF during Operation attenuate over distance from the PDA. For GHGs and climate change, no LAA is applicable, as it is a global phenomenon.

4.3.1.1.1.2 Temporal Boundaries

The temporal boundaries for the assessment of the potential environmental interactions of the Project on the Atmospheric Environment include the following periods:

- Construction – anticipated to be seven months in spring to fall 2017;
- Operation and Maintenance – approximately 50 years or the end of useful life; and,
- Decommissioning and Abandonment – anticipated to be three months.

4.3.1.2 Existing Conditions for Atmospheric Environment

4.3.1.2.1.1 Air Quality

Air quality in the vicinity of the PDA is predominantly influenced by combustion emissions from vehicle traffic and nearby communities, and various sources of air contaminants located generally within the region. There are four manufacturing facilities, several pits, five sewage treatment facilities, and three mills in the Kedgwick to Saint-Quentin area (Figure 4.1). Only one of these facilities (a sawmill) reports annual emissions of air contaminants to the National Pollutant Release Inventory (NPRI), therefore the other facilities are expected to be below reporting thresholds.

There is no ambient air quality monitoring station near Kedgwick. The nearest provincial air quality monitoring station to the PDA is located in Saint-Léonard (approximately 70 km southwest from the PDA). There were no exceedances of the provincial air quality objectives (measurements of ozone) at the Saint-Léonard monitoring station in 2010, 2011, 2012, or 2013 (NBDELG 2012b; 2013; 2015). The next nearest station, the Bathurst air quality monitoring station, is located approximately 130 km east of the PDA. There were also no exceedances of the provincial air quality objectives (measurements of ozone, $PM_{2.5}$ and nitrogen oxides) at the Bathurst monitoring station in 2010, 2011, 2012, or 2013 (NBDELG 2012b; 2013; 2015).

Given the rural nature of the area, it is expected that the provincial air quality objectives are met within the LAA.

The Canadian Ambient Air Quality Standards (CAAQS) record long-term trends for fine particulate matter and ground level ozone across Canada. The 2015 CAAQS targets were met at the Saint-Léonard and Bathurst monitoring stations from data collected in 2011, 2012 and 2013 (NBDELG 2015).

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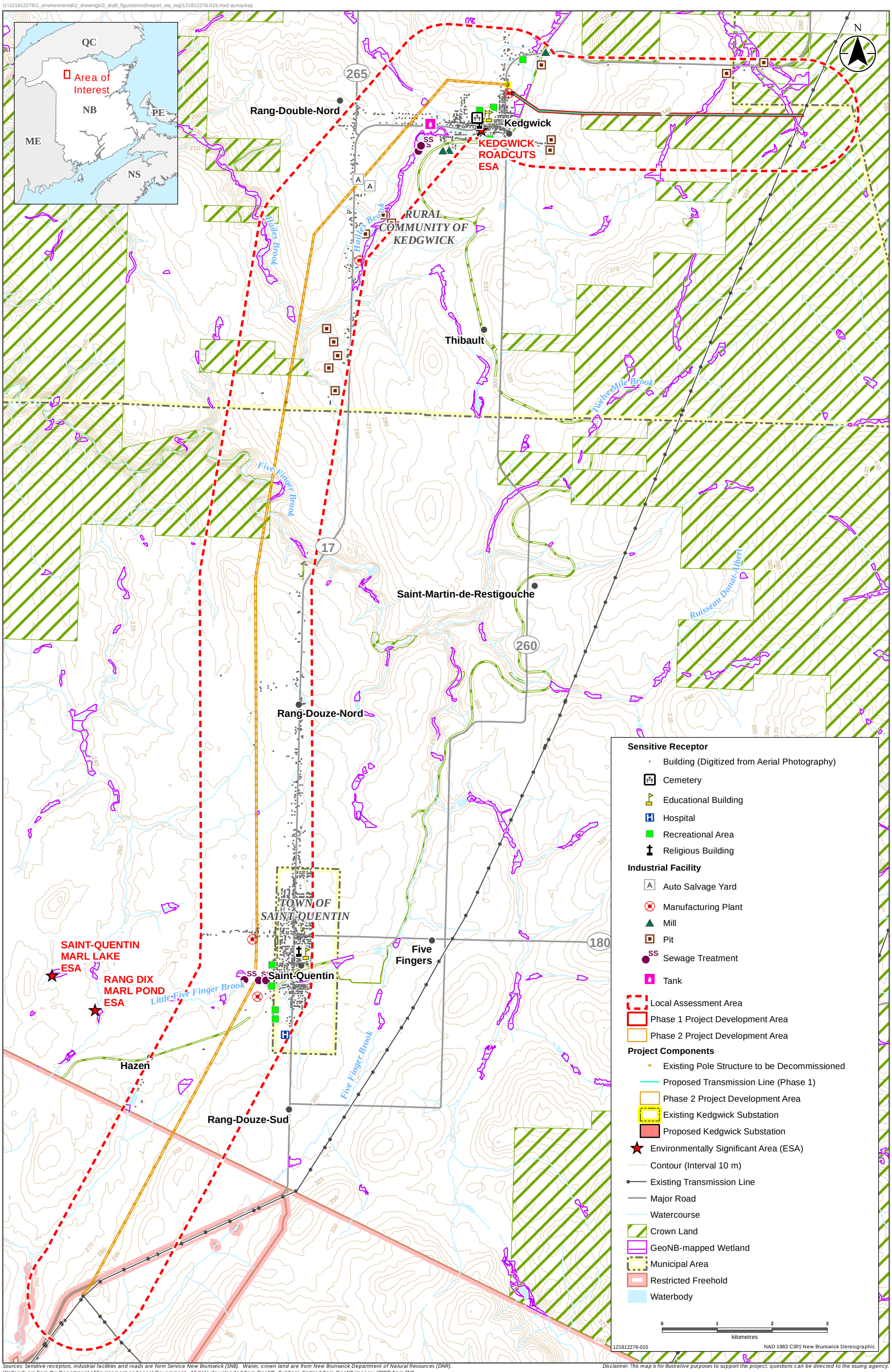

Sources: Sensitive receptors, industrial facilities and roads are form Service New Brunswick (SNB). Water, crown land are from New Brunswick Department of Natural Resources (DNR). Wetlands are from the Department of Environment and Local Government. All data downloaded from GeoNB. Buildings digitized from GeoNB imagery (2007) from SNB.

Disclaimer: This map is for illustrative purposes to support this project; questions can be directed to the issuing agency.

Local Assessment Area for Atmospheric Environment

Stantec

Figure 4.1

4.3.1.2.1.2 Climate

There is an Environment Canada weather station with available historical data located in Nictau, approximately 48 km south-southeast from the PDA. Climate normals at the Nictau station are discussed in Section 3.2.1.

4.3.1.2.1.3 Greenhouse Gas Emissions

According to Canada's National Inventory Report for 2014 (the most recently published data), total Canadian GHG emissions were 732 million tonnes of carbon dioxide equivalent (CO_2e), 15 million tCO_2e of which were released in New Brunswick (ECCC 2016). Therefore, the province of NB represents a small portion of Canada's total annual GHG emissions (approximately 2%).

Global GHG emissions in 2012 (latest available data) were estimated to be 44.8 billion tCO_2e (excluding land use change and forestry) (World Resources Institute 2016). Therefore, Canada's contribution to global GHG emissions is approximately 1.6%.

4.3.1.2.1.4 Sound Quality

The Project is located in a rural, mostly treed area. Sound quality in the PDA is likely predominantly influenced by vehicle traffic, nearby communities, and various industrial and commercial developments within the rural community.

Overall, the existing sound pressure levels in the area are expected to be representative of rural ambient sound levels and are expected to be reasonably estimated based on Alberta Regulator methodology (AER 2007). The average ambient sound level in Alberta for areas with similar population densities and rural settings as Kedgwick and Saint-Quentin was 48 dB_A at night and 58 dB_A during the day (AER 2007). Ambient sound levels in less populated areas of the route are expected to be lower.

Since interactions between the Project and sound quality are expected to be limited, no background sound pressure level monitoring was conducted.

4.3.1.3 Potential Environmental Interactions with Atmospheric Environment

This section describes how the Project activities could interact with the Atmospheric Environment as well as the techniques and practices that will be applied to mitigate these potential interactions.

4.3.1.3.1 Construction – New 138 kV Transmission Line and New Substation

Construction of the new substation and new 138 kV transmission line are expected to release small amounts of combustion gases and GHGs from the operation of equipment, machinery, and large trucks travelling to and from the Project site. However, Construction is transient and relatively short in duration, and repair/maintenance will be conducted for Project equipment as required. Unnecessary idling of vehicles, equipment, and machinery will be avoided to the extent possible to reduce combustion gas and GHG emissions.

Dust will be generated as a result of excavation activities during Construction of Phase 1, and the movement of equipment along unpaved surfaces. Dust can also be generated when topsoil and overburden is transferred to stockpiles. However, standard dust control mitigation practices will be used to suppress dust levels. These practices include the revegetation of areas where soil has been disturbed, as well as the use of dust suppressants and water on access roads to limit dust emissions, especially during dry and windy periods if they occur. In consideration of the available standard mitigation practices, Project-related releases of air contaminants and GHGs are unlikely to cause exceedances of air quality standards or measurably contribute to provincial or national GHG totals.

Noise and vibration will occur from the use of heavy equipment and trucks during the Construction phase of the Project; however, they will mainly be confined to the PDA and adjacent areas. Noise and vibration will be transient and short in duration during the three months of Construction. Construction is expected to be limited to daytime hours (typically between the hours of 8:00 a.m. to 6:00 p.m.) in order to reduce disturbances to nearby residences. Work is typically not conducted overnight or on weekends, however, delays in the schedule may require extended work hours. Project equipment will be repaired/maintained in good working order which could potentially reduce overall noise levels (e.g., if a malfunctioning muffler is repaired).

4.3.1.3.2 Operation and Maintenance – New 138 kV Transmission Line and New Substation

During Operation and Maintenance of the new transmission line and substation, no substantial air contaminant, GHG or noise emissions are expected to occur as maintenance activities are infrequent and small in scope. Health Canada reviewed existing information on EMFs and reported that there is insufficient evidence to establish a relationship between EMFs and human health risks for the frequencies of EMF associated with electrical transmission lines (Health Canada 2009). Health Canada also noted that the risk associated with EMFs is sufficiently low that there is no requirement to warn people who spend time or live near electrical transmission lines (Health Canada 2009). As such, Project-related EMF's are not anticipated to result in any substantial environmental interactions.

4.3.1.3.3 Decommissioning and Abandonment – 69 kV Transmission Line 0028 and Existing Substation

During Decommissioning and Abandonment of the Kedgwick substation and Line 0028 (Phase 2), air contaminant, GHG and noise emissions are expected to be comparable or less than those that would occur during Construction of Phase 1. As such, mitigation for Decommissioning and Abandonment activities will be as described above for Construction activities.

4.3.1.4 Summary for Atmospheric Environment

With mitigation and environmental protection measures, there will not be any substantial interaction between the Project and the Atmospheric Environment during all phases of the Project. The Project is not expected to result in any exceedances of the *Air Quality Regulation 97-133* under the New Brunswick *Clean Air Act.* Additionally, Project-related releases of GHGs are unlikely to measurably contribute to provincial or national GHG totals. While there is potential for sound pressure or vibration levels to increase near the Project during Construction, they will be mainly confined to the PDA and

adjacent areas, will be transient and short in duration, and will only occur during the daytime. There is also potential for EMF to increase during Construction and Operation of the Project, yet the risk is sufficiently low that there is no requirement to warn people who spend time or live near electrical transmission lines (Health Canada 2009).

4.3.2 Water Resources

This section includes a discussion of potential environmental interactions between Construction, Operation and Maintenance, and Decommissioning and Abandonment of the Project and Water Resources.

4.3.2.1 Scope of Assessment

Water Resources are defined for the purposes of this Project as any water supply from the ground or the surface that is available for human use, including consumption and other residential, agricultural, commercial, and industrial uses. Surface water also plays an important role in supporting freshwater fish and fish habitat, as described further in Section 4.3.3.

4.3.2.1.1 Boundaries

4.3.2.1.1.1 Spatial Boundaries

The assessment of potential environmental interactions on Water Resources encompasses two spatial boundaries: Project Development Area (PDA) and Local Assessment Area (LAA).

Project Development Area (PDA)

The PDA is the immediate area encompassing the Project footprint, and is limited to the anticipated area of physical disturbance associated with the Construction, Operation and Maintenance, and Decommissioning and Abandonment of the Project. The PDA includes the footprint of the 5.3 km-long, 30 m-wide RoW for the new 138 kV transmission line to be constructed and the 0.18 ha footprint of the new Kedgwick substation. The PDA also includes the footprint of the existing substation, and the RoW for Line 0028, both of which will be decommissioned as part of the Project. The PDA is illustrated in Figure 2.1.

Local Assessment Area (LAA)

The LAA for Water Resources is defined as an area extending 500 m from the centreline of the new 138 kV transmission line and the new Kedgwick substation, and the area contained within the PDA for the existing transmission Line 0028 and substation to be decommissioned. Beyond the LAA, the effects on Water Resources (surface and groundwater) are expected to be minimal based on the planned Project activities. The LAA for Water Resources is illustrated in Figure 4.2 .

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N

RANG 7 & 8 Chemin

MICHAUD Chemin

Hailes Brook

Zone C

Zone B

Zone A

Kedgwick Substation

PROPOSED WELL

PW-1

PW-2

17

Whites Brook

Hailes Brook Composite

Hailes Brook

Kedgwick

JEANNE D'ARC Rue

Kedgwick Rural Community

QC

Area of Interest

NB

PE

USA

NS

Drinking Water Well
Existing Well
Proposed Well
Kedgwick Protected Wellfield
Subwatershed Boundary
Local Assessment Area

Phase 1 Project Development Area
Phase 2 Project Development Area

Project Components

Existing Pole Structure to be Decommissioned
Proposed Transmission Line (Phase 1)
Existing Kedgwick Substation
Proposed Kedgwick Substation

Existing Transmission Line
Watercourse
Crown Land
Municipal Area
Waterbody

0 200 400 600 800 1,000
Metres

121812276-018

NAD 1983 CSRS New Brunswick Stereographic

Sources: Water well data from the Online Well Log Systems (OWLs), roads and waterbodies from SNB, watercourses, crown Land and transportation data are from NBDNR. All data downloaded from GeoNB. Imagery: Service New Brunswick/Service Nouveau Brunswick

Disclaimer: This map is for illustrative purposes to support this project; questions can be directed to the issuing agency.

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121812276 - Kedgwick Transmission Line - New Brunswick Power Corporation

Local Assessment Area for Water Resources - Phase 1

Figure 4.2

4.3.2.1.1.2 Temporal Boundaries

The temporal boundaries for the assessment of the potential environmental interactions between the Project and Water Resources include the following periods:

- Construction – anticipated to be seven months in spring to fall 2017;
- Operation and Maintenance – approximately 50 years or the end of useful life; and,
- Decommissioning and Abandonment – anticipated to be three months.

4.3.2.2 Existing Conditions for Water Resources

The PDA is located within the Restigouche River watershed, and crosses the subwatersheds for Hailes Brook, Whites Brook, and the Little Main Restigouche River. There are no Designated Watershed Protected Areas, nor any known surface water intakes within the LAA.

The rural community of Kedgwick draws its municipal water from two wells (PW-1 and PW-2, Figure 4.2) located in a confined sand and gravel aquifer underlying Hailes Brook (Acer Environmental 2004). The wells are 12 m and 11 m deep, respectively, with 1.5 m long well screens completed in sand and gravel (Acer Environmental 2004). An EIA registration to expand the water supply with an additional well has been submitted to NBDELG (GHD 2015).

A Wellfield Protected Area has been delineated for the municipal supply wells in Kedgwick, and will be updated for the proposed replacement well. Three protection zones are typically defined that restrict land-use activities that are potentially hazardous to groundwater quality. These zones are established based on groundwater travel time to a well, and they are designed to protect against three types of groundwater contaminants: bacterial, petroleum products, and chlorinated solvents. The three zones are described below.

- Zone A lies closest to the wellhead and therefore protects against the highest risk of pollution. The Designation Order states that septic tanks, sewer lines, petroleum products, chlorinated solvents, pesticides and similar chemicals or activities must be controlled, or in some cases restricted, within this zone. Its outer boundary surrounds the area where the potential exists for living organisms such as bacteria or viruses to reach a supply well prior to their expected natural die-off. Potential bacterial contaminant sources such as manure or new septic tanks are more restricted in this zone.
- Zone B lies more distant from the wellhead and surrounds Zone A. The risk of bacterial contamination from land use is greatly reduced in Zone B, but significant pollution risks still persist from petroleum products, chlorinated solvents or other persistent chemicals or activities.
- Zone C surrounds Zones A and B and is located furthest from the wellhead. Controls on some chemicals or activities are much less stringent in Zone C, but are still required for the more persistent contaminants such as chlorinated solvents, some petroleum products, and groundwater extraction.

The PDA for the proposed new 138 kV transmission line passes adjacent to but outside of Zone C of the current Kedgwick Wellfield Protected Area (Figure 4.2). The Construction and Operation of a power transmission line is not listed as a restricted activity within the wellfield. The new substation will be constructed outside and to the south of the existing Wellfield Protected Area.

Residents outside of the rural community of Kedgwick receive their drinking water from residential wells. No residential water wells were identified within the LAA (NBDELG 2016). Known water well locations outside of the LAA are presented on Figure 4.2.

4.3.2.3 Potential Environmental Interactions with Water Resources

This section describes how the Project activities could interact with Water Resources as well as the techniques and practices that will be applied to mitigate these potential interactions.

4.3.2.3.1 Construction – New 138 kV Transmission Line and New Substation

The construction of the new substation outside of the existing Wellfield Protected Area will include the import of fill to build up the site prior to construction. As such, no excavation is anticipated for the construction of the new substation. These activities are not anticipated to interact with Water Resources. In fact, relocating the substation to this location outside the existing Wellfield Protected Area represents a positive environmental interaction with Water Resources.

The installation of transmission line poles during the Construction phase of the new 138 kV transmission line will occur at depths of up to 3 m from ground surface in small localized footprints within the PDA. As such, the construction of these structures is expected to reach groundwater only within areas that have a shallow water table (i.e., the water table is less than 3 m below ground surface). Temporary dewatering may be necessary in rare occasions during construction. The need for dewatering of excavations will be determined based on local water table conditions at the time of construction. However, as no groundwater users are located within the LAA outside of the municipally-serviced portion of Kedgwick, any temporary drawdown of groundwater during dewatering activities is not anticipated to interact with individual well users. Construction dewatering to depths of 3 m below ground surface in Zone C of the wellfield, if necessary, is not anticipated to result in drawdowns that would extend to the municipal supply wells for Kedgwick.

The removal of vegetation within the PDA may affect surface water resources by increasing runoff coefficients and decreasing evapotranspiration rates. This will likely increase runoff volumes that are discharged to nearby streams. However, given the linear nature of the Project and the scale of its footprint when compared to the watershed composites where the RoW is located, any increase in runoff is considered to be minimal and can be attenuated by the receiving watersheds.

Clearing of vegetation and excavation may also result in an increased risk of local erosion, which may have the potential to result in sediment entering surface water features. NB Power will reduce the potential for interactions between the Project and Water Resources by adhering to best management practices and the EPP (NB Power 2012). This includes preventing machinery from entering watercourses, preventing the movement of sediments and woody debris into watercourses.

4.3.2.3.2 Operation and Maintenance – New 138 kV Transmission Line and New Substation

The Operation and Maintenance phase of the Project will require vegetation management which will be conducted in accordance with government regulations, including restrictions specified in the Wellfield Designation Order.

Although not currently planned, in the unlikely event that the construction of the new substation extends into the updated Wellfield Protected Area, a Wellfield Exemption will need to be obtained. As indicted in Section 4.3.2.3.1, secondary spill containment will be installed beneath the transformers in the new substation to prevent mineral oil from the transformers from being released into the surrounding environment in the event of an accidental spill. The capacity of the secondary containment system will exceed the capacity of the transformers.

As such, with the mitigation described above, the Operation and Maintenance phase of the Project is not expected to have substantive interaction with Water Resources.

4.3.2.3.3 Decommissioning and Abandonment – 69 kV Transmission Line 0028 and Existing Substation

The removal of transmission line poles during the Decommissioning and Abandonment of the existing 69 kV transmission line 0028 will occur, in most cases, by removing the conductors and cutting the transmission line poles at ground surface. Where the removal of poles requires excavation to remove the buried portion of the poles, this will occur at depths of up to 3 m from ground surface in small localized footprints within the PDA. As such, the decommissioning of these structures is expected to reach groundwater only within areas that have a shallow water table (i.e., the water table is less than 3 m below ground surface). These interactions will be similar to those described for the Construction Phase, and are not considered substantive.

The decommissioning of the existing substation may require the excavation and removal of contaminated soil beneath the substation. The decommissioning of the existing Kedgwick substation will include a Phase 2 environmental site assessment (ESA) to determine if there are any contaminated soils on the site. If contaminated soils are found, a Phase 3 ESA would be conducted to delineate the area of contamination, and develop a remediation plan that complies with regulatory requirements. including the Guidelines for the Management of Contaminated Sites (NBDELG 2003). As the existing substation is located outside of the Wellfield Protected Area for Kedgwick, this work is not anticipated to interact with the wellfield. All contaminated soils will be disposed of in accordance with the Atlantic Risk Based Corrective Action (RBCA) methodology (Atlantic RBCA 2012), following NBDELG approval.

4.3.2.4 Summary for Water Resources

With mitigation there will not be any substantial interaction between the Project and Water Resources during all phases of the Project.

4.3.3 Freshwater Fish and Fish Habitat

This section describes the potential environmental interactions between Construction, Operation and Maintenance, and Decommissioning and Abandonment of the Project and Freshwater Fish and Fish Habitat.

4.3.3.1 Scope of Assessment

This section evaluates potential Project interactions with freshwater fish species and freshwater habitats.

Freshwater fish are defined as fishes that live in freshwater for at least part of their lifecycle. The federal *Fisheries Act* defines fish habitat as spawning, nursery, rearing and feeding grounds, food supplies, and areas used for migration by fish or other organisms that fishes depend on. The Freshwater Fish and Fish Habitat VC also includes;

- Freshwater species at risk (SAR), which are species listed as extirpated, endangered, threatened, or special concern by the federal *SARA*, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), or the NB SARA; and,
- Freshwater species of conservation concern (SOCC), which are species that have been identified by federal and/or provincial species at risk agencies as being rare in New Brunswick, or their populations may not be considered sustainable. SOCC are here defined to include species that are not SAR, but are ranked S1 (critically imperiled), S2 (imperiled), or S3 (vulnerable) in New Brunswick by the Atlantic Canada Conservation Data Centre (AC CDC).

Freshwater fish habitat includes the physical (e.g., substrate, and water temperature, flow velocity, volume, and depth), chemical (e.g., dissolved oxygen, nutrients), and biological (e.g., fish, benthic macroinvertebrates, emergent macrophytes) characteristics that are required by freshwater fish to carry out their life cycle processes.

Freshwater Fish and Fish Habitat was selected as a VC because the Project lies within the Restigouche River watershed which contains commercial, recreational, and Aboriginal (CRA) fisheries that are protected under federal and provincial legislation as discussed in Section 1.4. Moreover, the Restigouche River watershed is important to local communities for water supply, food, and recreational and cultural activities.

4.3.3.1.1 Boundaries

4.3.3.1.1.1 Spatial Boundaries

The assessment of potential interactions on the Freshwater Fish and Fish Habitat encompasses two spatial boundaries: Project Development Area (PDA) and Local Assessment Area (LAA).

Project Development Area (PDA)

The PDA is the immediate area encompassing the Project footprint, and is limited to the anticipated area of physical disturbance associated with the Construction, Operation and Maintenance, and Decommissioning and Abandonment of the Project. The PDA includes the footprint of the 5.3 km-long, 30 m-wide RoW for the new 138 kV transmission line to be constructed and the 0.18 ha footprint of the new Kedgwick substation. The PDA also includes the footprint of the existing substation, and the RoW for Line 0028, both of which will be decommissioned as part of the Project. The PDA is illustrated in Figure 2.1.

Local Assessment Area (LAA)

The LAA for Freshwater Fish and Fish Habitat is defined as the potential zone of Project interactions with Fish and Fish Habitat. For the purpose of the Freshwater Fish and Fish Habitat VC, the LAA extends 100 m immediately upstream and 100 m downstream from any location where the new transmission line and

new electrical substation crosses a watercourse, plus a 30 m buffer on either side of the watercourse (Figure 4.3). The LAA for the decommissioning of the existing transmission Line 0028 and existing electrical substation (Phase 2) is the PDA.

4.3.3.1.1.2 Temporal Boundaries

The temporal boundaries for the assessment of the potential interactions of the Project on the Freshwater Fish and Fish Habitat include the following periods:

- Construction – anticipated to be seven months in spring to fall 2017;
- Operation and Maintenance – approximately 50 years or the end of useful life; and,
- Decommissioning and Abandonment – anticipated to be three months.

4.3.3.2 Existing Conditions for Freshwater Fish and Fish Habitat

The Project is located within three sub-watersheds of the Restigouche River; Whites Brook, Little Main Restigouche, and Hailes Brook (Figure 4.3). Phase 1 of the Project crosses three mapped watercourses, including one unnamed tributary to Whites Brook and two unnamed tributaries to Hailes Brook (Figure 4.3). Phase 2 crosses six watercourses, including two unnamed tributaries to Hailes Brook, Hailes Brook, Five Fingers Brook, and two unnamed tributaries to Little Five Fingers Brook. The Project RoW encompasses 0.06% of the Whites Brook watershed, 0.03% of the Hailes Brook watershed, and 0.03% of the Little Main Restigouche River watershed.

4.3.3.2.1 Fish Habitat

4.3.3.2.1.1 Phase 1 – New 138 kV Transmission Line and New Substation to be Constructed

Field surveys conducted on June 15 and 16, 2016 confirmed the three mapped watercourses within the RoW for the new 138 kV transmission line (Figure 4.3), and field-identified two other potential watercourses. The two field-identified watercourses were found to have no visible channel, water flow, fish or fish habitat. As such, they are not discussed further. No watercourses are located near the proposed new substation.

In-stream habitat surveys were conducted on the three mapped watercourses crossed by the proposed new 138 kV transmission line. Surveys were conducted at the RoW centreline at each watercourse crossing, and at locations 50 m and 100 m upstream and downstream of the centreline. Habitat information was collected as per Fisheries and Oceans Canada (DFO)/New Brunswick Department of Energy and Resource Development (NBDERD) guidelines. The *in situ* water quality parameters measured included water temperature, dissolved oxygen, and conductivity (all measured using YSI ProPlus meter); pH (measured using a Hanna Instruments 98127 pH meter); and turbidity (measured using a Hach 2100Q turbidimeter). *In situ* water quality for all streams was acceptable for cold water fish species such as brook trout and Atlantic salmon. Dissolved oxygen concentrations for all three watercourses exceeded the CCME (1999) recommended lower limit of 9.5 mg/L for early stages of fish (Table 4.2). The pH was within the accepted range (6.5 to 9.0) for the protection of freshwater aquatic life at two of the watercourses surveyed (Table 4.2), and below the accepted range for one site (NB-003-00).

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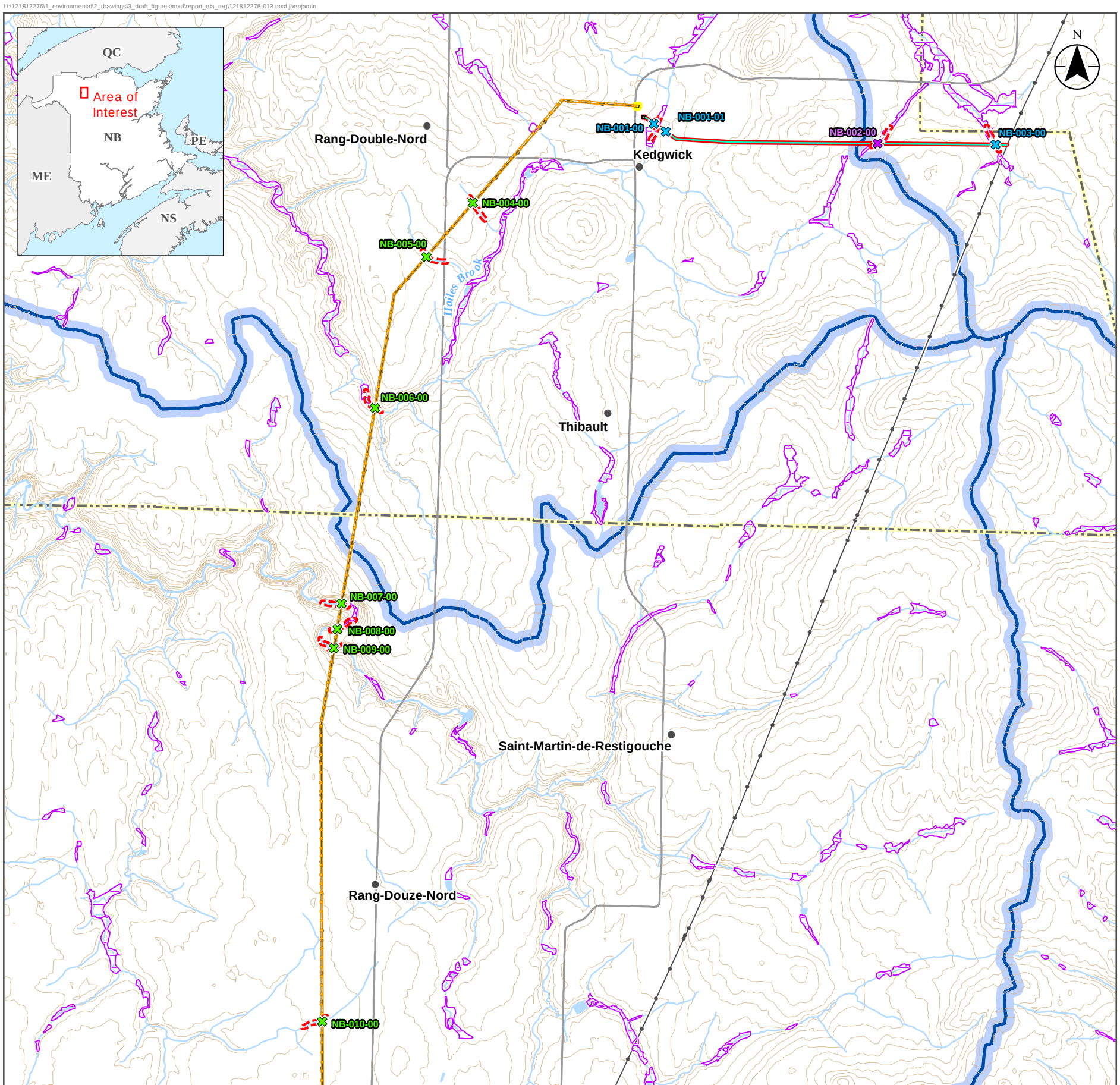

Sources: Project data provided by NB Power. Base data provided by the Governments of Canada, and the Government of New Brunswick.

Disclaimer: This map is for illustrative purposes to support this project; questions can be directed to the issuing agency.

Local Assessment Area for Freshwater Fish and Fish Habitat

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121812276 - KEDGWICK TRANSMISSION LINE - NEW BRUNSWICK POWER CORPORATION

Figure 4.3

Table 4.2 In Situ Water Quality Parameters for Surveyed Watercourses

Watercourse	Water Temperature (°C)	Dissolved Oxygen (mg/L)	pH	Conductivity (µS/cm)	Turbidity (NTU)
NB-001-00	10.3	10.5	6.5	112	9.05
NB-001-01	9.7	10.9	7.1	24	1.08
NB-003-00	8.2	10.9	6.1	70	1.06

Watercourse NB-001-00 is a second order stream with an average bankfull width of 6.6 m which split twice within the 200 m section surveyed (Table 4.3). The substrate is dominated by large gravel and cobble. The banks are stable and well vegetated with shrubs and grasses. At the time of sampling, instream cover was provided mainly by water clarity (i.e., turbidity).

Watercourse NB-001-01 is a first order stream with an average bankfull width of 5.7 m. The habitat types are primarily riffle and run, with one beaver dam impoundment. The channel is unconsolidated through a wetland between a culvert and 15 m upstream of the culvert. The channel is consolidated through the remainder of the survey area. The substrate is dominated by fines (Table 4.3). Banks are stable and well vegetated with shrubs and grasses. Instream cover for fish is provided primarily by submerged aquatic vegetation.

Watercourse NB-003-00 is a third order stream with an average bankfull width of 30.6 m. The considerable bankfull width of this watercourse section is largely reflective of a habitat that is primarily beaver impoundments with small segments of run in between dams. The substrate is dominated by organics/fines (Table 4.3). Banks are stable and well vegetated with conifers and grasses. Instream cover for fish is provided primarily by woody debris. A young-of-the-year brook trout was observed by the field crew.

Table 4.3 Summary of Key Fish Habitat Characteristics

Watercourse	% Riffle-Run/Pool	Bankfull Width (m)	Bankfull Depth (m)	Dominant Substrate(s)	Bank Stability	Instream Cover (%)
NB-001-00	100/0	6.6	0.37	Large Gravel/Cobble	Stable	87
NB-001-01	85/15	5.7	0.37	Fines	Stable	12
NB-003-00	28/72	30.6	0.55	Organics/Fines	Stable	1

The three watercourses crossed by Phase 1 of the project contain habitat suitable for freshwater fish.

4.3.3.2.1.2 Phase 2 – Decommissioning of Existing 69 kV Transmission Line 0028 and Kedgwick Substation

The RoW for the existing 69 kV transmission line 0028 to be decommissioned crosses six watercourses at eight locations (Figure 4.3). However, as no fish habitat surveys were conducted in these watercourses, a desktop analysis including aerial imagery was used to estimate major fish habitat characteristics. Fish

habitat in the three Five Finger Brook crossings (NB-007-00, NB-008-00, and NB-009-00) appears to be comprised of riffle, run and pool habitats. The watercourse sections are estimated to be between 11 m and 15 m in width and riparian areas appear well vegetated. Electrofishing surveys from Pickard *et al.* (1983) found that fish habitat in Little Five Finger Brook, a tributary to Five Finger Brook, was comprised of riffles and runs with substrates of rubble and boulder. Average width was 6.4 m and depths ranged from 0.21 to 0.51 m. Fish habitat in Five Finger Brook is likely similar to the habitat surveyed on Little Fiver Finger Brook (Pickard *et al.* 1983) as they are located within the same sub-watershed (Little Main Restigouche).

Fish habitat in the two unnamed tributaries to Hailes Brook (NB-004-00 and NB-005-00) is likely similar to fish habitat found in the first order watercourses surveyed in Phase 1 of Hailes Brook (NB-001-01). The fish habitat in the third order section of Hailes Brook (NB-006-00) is likely similar to watercourse NB-003-00, as upstream and downstream of the crossing location appears to be influenced by beaver activity based on aerial imagery. Estimates of stream width vary from 4 to 8 m in the consolidated channel.

Watercourses crossed by Phase 2 of the Project likely contain habitat suitable for freshwater fishes.

4.3.3.2.2 Fish Species

Since all watercourses were assumed to be fish-bearing (except those unmapped watercourses that were determined to be dry, which are assumed to not be considered suitable to support CRA fisheries), no sampling of fishes was conducted. Information on the fish species present was derived from a literature review; however, visual observations during the field studies confirmed that one of the watercourses (NB-003-00) contains brook trout.

Of the 22 fish species known to be present in the Restigouche River, the watercourses crossed by the Project likely support a smaller number of species because of their smaller size. Electrofishing surveys conducted by Pickard *et al.* (1983) and Pickard (1997) in smaller tributaries of the Restigouche River found American eel, Atlantic salmon, brook trout, blacknose dace, slimy sculpin, and lake chub. These freshwater fish species are likely representative of the fish communities found within the small watercourses crossed by the Project. Based on the literature review and in field observations, the watercourses crossed by the Project contain Freshwater Fish and Fish Habitat that support CRA fisheries. Watercourses in the LAA likely support CRA fisheries by providing spawning and rearing habitat for brook trout and Atlantic salmon, which support recreational and Aboriginal fisheries in the region. As well, the watercourses likely support rearing and migratory habitat for juvenile American eels that as adults could contribute to the commercial eel fishery in the lower portions of the Restigouche River and are of Aboriginal importance (Schuegraf and Dowd no date). Many of the smaller species present may support CRA fisheries by providing prey to those species.

In addition to CRA fisheries, the LAA has the potential to contain freshwater fish SAR. Atlantic salmon found in the Restigouche River are of the Gaspe-Southern Gulf of St. Lawrence population, which is listed as Special Concern. American eel is listed as Threatened, by both COSEWIC and NB *SARA*. Although both of these species are listed, their current status does not provide them legal protection.

4.3.3.3 Potential Environmental Interactions between Freshwater Fish and Fish Habitat

This section describes how the Project activities could interact with Freshwater Fish and Fish Habitat as well as the techniques and practices that will be applied to mitigate the potential effects of these interactions.

4.3.3.3.1 Construction – New 138 kV Transmission Line and New Substation

There are no Construction activities associated with the new substation that would interact with Freshwater Fish or Fish Habitat; however, during Construction of the new 138 kV transmission line, accessing, clearing vegetation and grubbing within the RoW will involve the use of heavy equipment (e.g., excavators, clearing equipment). A potential interaction between Freshwater Fish and Fish Habitat could occur as a result of heavy equipment entering a watercourse. Equipment entering a watercourse could result in mortality or injury to fish through physical contact, and could result in a change in fish habitat through alterations to in-stream habitats, such as erosion of the stream bed and increases in the presence of fines in downstream substrates.

A potential interaction could also occur between Freshwater Fish and Fish Habitat as a result of heavy equipment being used around watercourses or in riparian areas during grading or excavation of holes for structure assembly or riparian clearing. A change in fish habitat could result through alterations to riparian habitats (e.g., change in structure or cover) or as a result from the erosion and transportation of soils within the RoW (e.g., change in sediment concentrations). The removal of riparian vegetation adjacent to the watercourse has the potential to increase water temperatures by exposing the watercourse to direct sunlight, and to reduce protective canopy cover for fish. However, substantial warming is unlikely because of the size of the streams crossed and the small water surface area available for warming within the RoW.

NB Power will reduce the potential for interactions between the Project and Freshwater Fish and Fish Habitat by adhering to best management practices and the EPP (NB Power 2012). Overall, NB Power will mitigate risks to Freshwater Fish and Fish Habitat by preventing machinery from entering watercourses, preventing the movement of sediments and woody debris into watercourses, minimizing the clearing of riparian areas adjacent to watercourses. Specifically, best management practices will include:

- Watercourses and riparian buffers will be clearly marked prior to accessing or operating heavy equipment in the RoW;
- Existing bridges or temporary structures will be used when crossing watercourses;
- Silt fencing or hay bales will be used in areas where soil disruption could result in the transport of sediment into watercourses;
- Silt fencing will be removed after revegetation has occurred;
- A buffer zone will be left on the banks of watercourses;
- Brush and woody debris will be relocated to areas where it cannot enter watercourses; and,
- The Project design will adhere to a maximum RoW width of 30 m.

The practices used to mitigate risks to Freshwater Fish and Fish Habitat will be applied to all phases and activities of the Project.

4.3.3.3.2 Operation and Maintenance – New 138 kV Transmission Line and New Substation

During Operation and Maintenance activities for the new 138 kV transmission line and new substation, accessing the RoW to trim vegetation or repair equipment could result in heavy equipment entering the watercourse which could result in changes to fish health (including possible direct mortality of fish) or changes in fish habitat through instream or riparian disturbances (e.g., bank erosion). Mitigation for Operation and Maintenance activities will be as described above for Construction activities.

4.3.3.3.3 Decommissioning and Abandonment – 69 kV Transmission Line 0028 and Existing Substation

The Decommissioning and Abandonment of the existing 69 kV transmission line 0028 has the potential to interact with Freshwater Fish and Fish Habitat in that heavy equipment may require the use of temporary bridges to cross watercourses to remove poles, conductors, and hardware. As there will be no vegetation clearing or excavation required, mitigation for Decommissioning and Abandonment activities of Line 0028 will be as described in Section 4.3.3.3.1 for Construction activities.

There are no activities associated with the decommissioning of the existing Kedgwick substation that would interact with Freshwater Fish or Fish Habitat.

4.3.3.4 Summary for Freshwater Fish and Fish Habitat

With mitigation, it is not anticipated that there will be any substantial interaction between the Project and Freshwater Fish and Fish Habitat during all phases of the Project. The Project as planned is not anticipated to result in fish mortality, a substantive change in fish habitat, or a loss in fisheries productivity. The Project is not anticipated to result in serious harm to any CRA species as defined in the *Fisheries Act*, or result in the killing, harming, or harassment, and damage or destruction of the habitat of any freshwater fish SAR as defined in the NB *SARA* or the federal *SARA*.

4.3.4 Terrestrial Environment

This section describes the potential environmental interactions between the Project and the Terrestrial Environment.

4.3.4.1 Scope of Assessment

The Terrestrial Environment includes wildlife, vegetation, and wetlands. This VC is valued by the people of New Brunswick for its environmental and socioeconomic importance. The Terrestrial Environment has been selected as a VC due to the potential for interactions between the Project and vegetation and wildlife species including Species at Risk (SAR), Species of Conservation Concern (SOCC), and vegetation communities and wildlife habitats, including wetlands and Ecological Communities of Management Concern (ECMC).

In addition to wetlands, this VC focuses on vegetation and wildlife SAR and SOCC. SAR include species listed as extirpated, endangered, threatened, or special concern by the federal *SARA*, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), or the NB *SARA*. Some of the species

defined as SAR in this document currently have regulatory protection under Schedule 1 of the federal *SARA* or the *Prohibitions Regulation* of NB *SARA*. The definition used in this document also includes species on the NB *SARA List of Species at Risk Regulation* and those listed by COSEWIC that may become protected within the timeframe of this Project.

SOCC are species not listed or protected by any legislation, but are considered rare in New Brunswick, or their populations may not be considered sustainable. SOCC are here defined to include species that are not SAR, but are ranked S1 (critically imperiled), S2 (imperiled), or S3 (vulnerable) in New Brunswick by the Atlantic Canada Conservation Data Centre (AC CDC).

ECMC are typically vegetation communities which fulfill special management objectives on Crown land in New Brunswick. They may also have been identified on Crown or private land through field work or by local conservation organizations as supporting unique ecological features (e.g., Environmentally Significant Areas (ESA)).

Wetlands are defined as lands that are permanently or temporarily submerged by water near the soil surface for long enough to maintain wet or poorly drained soils, support plants adapted to saturated soil conditions, and have other biotic conditions characteristic of wet environments (Government of Canada 1991; NBDNRE and NBDELG 2002). Wetland conservation is addressed in both The Federal Policy on Wetland Conservation (Government of Canada 1991) and the New Brunswick Wetlands Conservation Policy (NBDNRE and NBDELG 2002).

The federal policy aims to protect wetlands on federal lands and waters or within federal programs where wetland loss has reached critical levels, and also within federally designated wetlands, such as Ramsar sites (Government of Canada 1991). None of these conditions apply to the Project.

In New Brunswick, regulation and conservation of wetlands are under the jurisdiction of the New Brunswick Department of Environment and Local Government (NBDELG). The provincial wetland policy focuses on protecting wetlands in New Brunswick through securement, increasing education and awareness, and maintaining wetland function. These policy goals are enforced through the New Brunswick *Clean Water Act* and associated *Watercourse and Wetland Alteration* (*WAWA) Regulation*, and the New Brunswick *Clean Environment Act* and associated *Environmental Impact Assessment Regulation* (*EIA Regulation*). The *WAWA Regulation* applies to all wetlands of 1 hectare (ha) or greater in size, or any wetland contiguous to a watercourse. The *EIA Regulation* considers any activities or projects affecting 2 or more ha of wetland to be an undertaking requiring registration. Any wetlands considered to be "Provincially Significant Wetlands" (primarily tidal wetlands and wetlands adjacent to the lower Saint John River) are subject to a greater level of protection under the provincial policy (NBDNRE and NBDELG 2002).

NBDELG maintains a publicly-available official map of "Regulated Wetlands" in the province on the GeoNB website (SNB 2011). Current guidance from NBDELG (the "Short Term Strategy") released in November 2011 indicates that the wetlands on the GeoNB website, or "GeoNB-mapped wetlands," represent the extent of regulated wetlands within New Brunswick (NBDELG 2011). The Short Term Strategy states that permits are required for any alterations occurring in GeoNB-mapped wetlands or

within 30 m of the boundary of a GeoNB-mapped wetland, and that wetland habitat lost from GeoNB-mapped wetlands will require compensation at a ratio of 2:1 (NBDELG 2011).

Currently, wetland area is frequently used in New Brunswick and other Canadian jurisdictions as a surrogate when discussing potential loss of wetland function. This assessment discusses noteworthy wetland functions that were observed, but potential environmental interactions are reported in terms of amount of wetland area affected. Despite the current guidance to the contrary, it is assumed that wetland compensation may be required for any permanent loss of wetland area, to achieve the goal of no net loss of wetland function described in the provincial wetland conservation policy.

4.3.4.1.1 Boundaries

4.3.4.1.1.1 Spatial Boundaries

The assessment of potential interactions between the Project and the Terrestrial Environment encompasses two spatial boundaries: Project Development Area (PDA) and Local Assessment Area (LAA).

Project Development Area (PDA)

The PDA is the immediate area encompassing the Project footprint, and is limited to the anticipated area of physical disturbance associated with the Construction, Operation and Maintenance, and Decommissioning and Abandonment of the Project. The PDA includes the footprint of the 5.3 km-long, 30 m-wide RoW for the new 138 kV transmission line to be constructed and the 0.18 ha footprint of the new Kedgwick substation. The PDA also includes the footprint of the existing substation, and the RoW for Line 0028, both of which will be decommissioned as part of the Project. The PDA is illustrated in Figure 2.1.

Local Assessment Area (LAA)

The LAA for the Terrestrial Environment includes the PDA, and a 500 m buffer on either side of the PDA. This represents the maximum area within which Project-related environmental effects can be predicted or measured with a reasonable degree of accuracy and confidence, and also represents the likely zone of Project influence. The LAA is primarily defined by the distance where noise may penetrate wildlife habitats, which is further than vegetation-related edge effects. For some avian species in forested habitats, edge effects are believed to extend up to 300 m; however, edge effects are typically more pronounced at lower distances to the edge (Batáry and Báldi 2004). Thus, an LAA of 500 m on either side of the PDA is conservative.

For vegetation and wetlands, the area of potential direct or indirect effects is expected to be much smaller than that for wildlife and wildlife habitat, however the same LAA is used and is therefore conservative. The LAA for the Terrestrial Environment is illustrated in Figure 4.4 for Phase 1 and Figure 4.5 for Phase 2.

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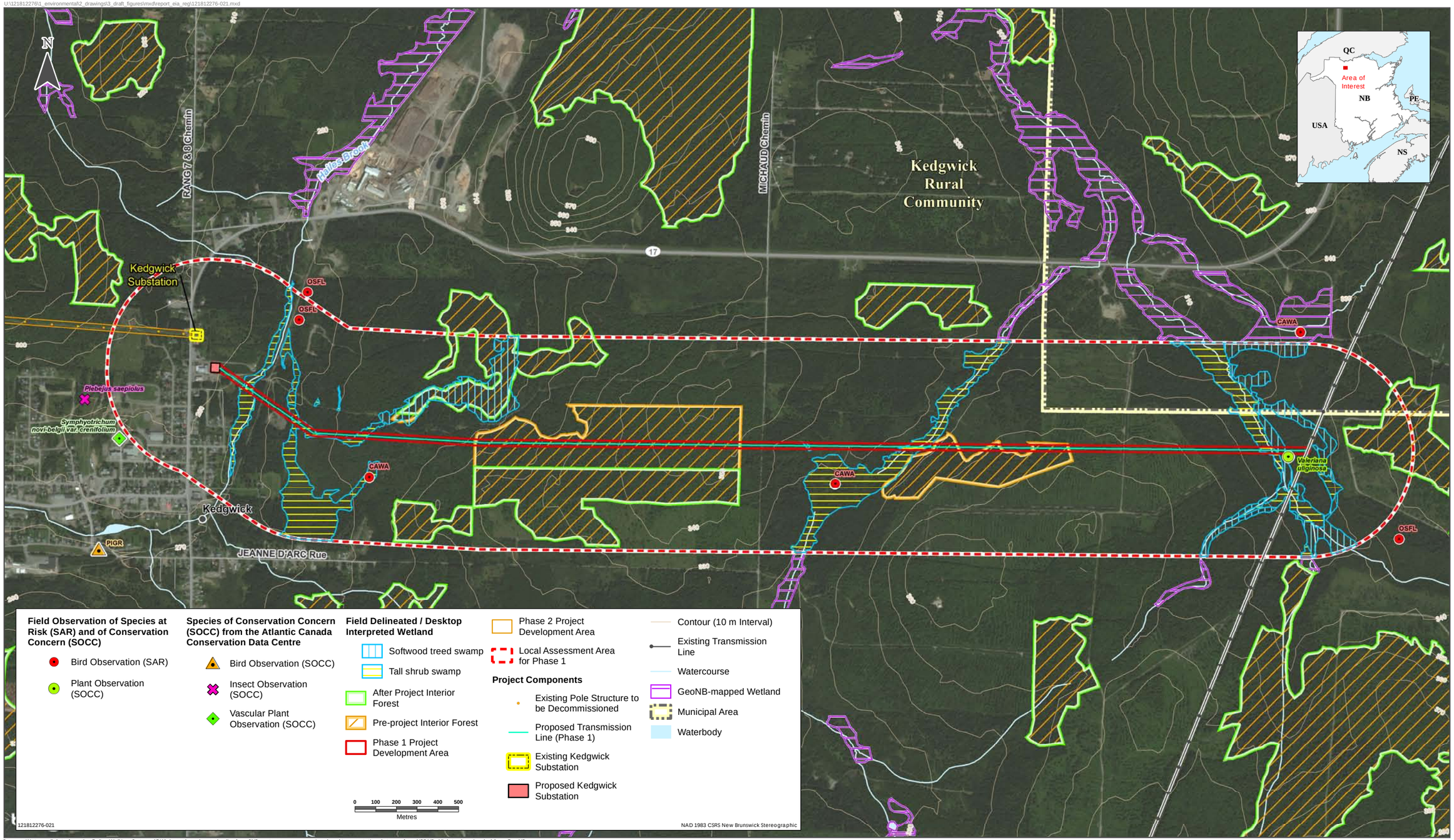

Sources: Water well data from the Online Well Log Systems (OWLS), roads and waterbodies from SNB, watercourses, crown Land and transportation data are from NBDNR. All data downloaded from GeoNB.
Imagery: Microsoft product screen shot(s) reprinted with permission from Microsoft Corporation © 2010 DigitalGlobe Image courtesy of USGS © 2010 GeoEye Earthstar Geographics SIO © 2016 Microsoft Corporation

Disclaimer: This map is for illustrative purposes to support this project; questions can be directed to the issuing agency.

Stantec

121812276 - Kedgwick Transmission Line - New Brunswick Power Corporation

Local Assessment Area for Terrestrial Environment - Phase 1

Figure 4.4

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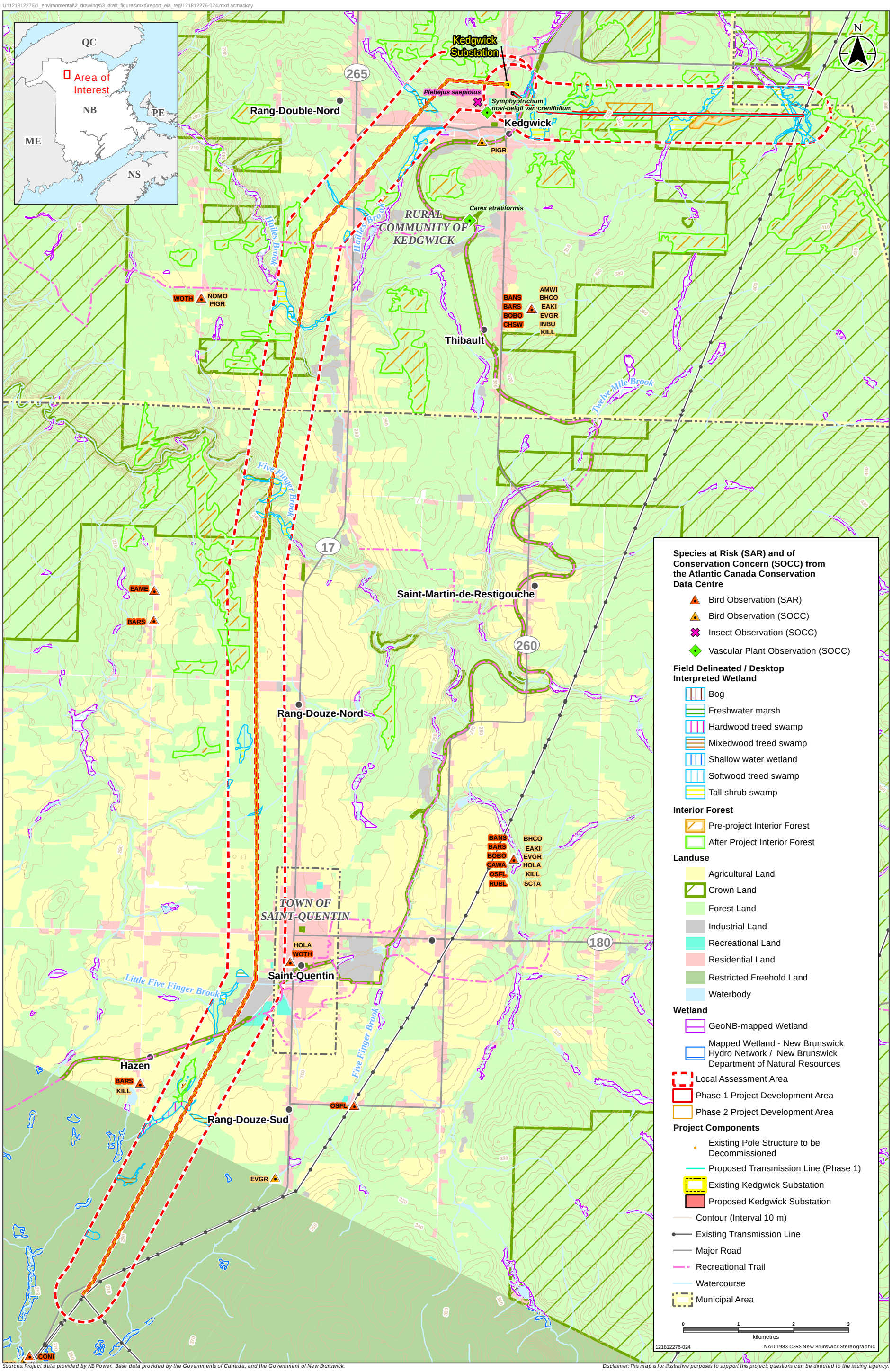

Sources: Project data provided by NB Power. Base data provided by the Governments of Canada, and the Government of New Brunswick.

Disclaimer: This map is for illustrative purposes to support this project; questions can be directed to the issuing agency.

Local Assessment Area for Terrestrial Environment - Phase 2

Stantec

121812276 - KEDGWICK TRANSMISSION LINE - NEW BRUNSWICK POWER CORPORATION

Figure 4.5

4.3.4.1.1.2 Temporal Boundaries

The temporal boundaries for the assessment of the potential environmental interactions of the Project with the Terrestrial Environment include the following periods:

- Construction – anticipated to be seven months in spring to fall 2017;
- Operation and Maintenance – approximately 50 years or the end of useful life; and,
- Decommissioning and Abandonment – anticipated to be three months.

4.3.4.2 Existing Conditions for the Terrestrial Environment

4.3.4.2.1 Information Sources

Records for wildlife, including avian species, known within the LAA and surrounding area were obtained from various sources including the AC CDC, Maritimes Breeding Bird Atlas (MBBA), and Atlantic Canada Nocturnal Owl Survey (ACNOS). These data sources are described below.

The North American Breeding Bird Survey (BBS) and Christmas Bird Count (CBC) were also consulted; however, neither of these data sources contained data within 10 km of the LAA.

Various sources were consulted to obtain data on ECMCs, wetlands and vegetation communities within the LAA. These data sources included the AC CDC, the New Brunswick Department of Energy and Resource Development (NBDERD), the Nature Trust of New Brunswick (NTNB), the New Brunswick Hydrographic Network (NBHN), and the GeoNB website (Provincially Significant Wetlands (PSW) and those wetlands currently mapped and regulated by NBDELG).

4.3.4.2.2 Vegetation and Wetlands, Phase 1 – New 138 kV Transmission Line and New Substation to be Constructed

Vegetation and wetland surveys were conducted simultaneously from July 11 to July 14, 2016, within a 90 m wide corridor (i.e., the 30 m wide PDA and an additional 30 m on either side). Most plants were identified in the field, and any species requiring further identification were collected and later identified using several botanical reference texts, including “Flora of New Brunswick” (Hinds 2000), “Sedges of Maine” (Arsenault *et al.* 2013), and “Flora Novae Angliae” (Haines 2011).

Wetland boundaries were identified and delineated using a combination of hydrology and hydrophytic vegetation. Wetland classification followed the classes and types of the Canadian Wetland Classification System (NWWG 1997). In this system, there are five wetland classes: bog, fen, swamp, marsh, and shallow water, and eight wetland types, which distinguish wetland communities based on dominant vegetation. Vascular plant species were recorded at a minimum when first encountered. Each observation of vascular plant SAR or SOCC is recorded.

A total of 172 vascular plant species were encountered in the PDA and surrounding surveyed area. No SAR were observed during the field surveys. A single vascular plant SOCC species was observed during the surveys: six individuals of swamp valerian (*Valeriana uliginosa*, S2S3) were observed approximately 15 m south of the PDA in a softwood treed swamp. A full list of all vascular plants observed during the

surveys can be found in Table D.1, Appendix D. Other than the noted occurrence of swamp valerian, all vascular plant species observed are considered apparently secure or secure (i.e., ranked S4 or S5 by the AC CDC) in New Brunswick.

Land use classes in the PDA and LAA are primarily forest (88.5% and 82.4%, respectively) (Table 4.4). Nearly equally common within the PDA are regen-sapling hardwood stands, young-immature softwood stands, and mature-overmature hardwood stands. Regen-sapling and mature-overmature mixedwood stands are also present.

Table 4.4 Land Classification within the PDA and LAA, Phase 1

Land classification type	Area (ha) or percentage (%) within Land classification type			
	PDA		LAA	
	hectares (ha)	%	hectares (ha)	%
Agricultural	-	-	1.9	0.3
Anthropogenic	0.3	1.8	44.1	6.9
Forest	14.3	88.5	524.3	82.4
Regen-sapling Hardwood	4.9	30.5	141.1	22.2
Regen - Sapling Mixedwood	-	-	11.2	1.8
Regen-sapling Softwood	-	-	24.4	3.8
Young-immature Hardwood	-	-	26.2	4.1
Young-immature Mixedwood	-	-	13.2	2.1
Young-immature Softwood	3.6	22.4	167.7	26.3
Mature-overmature Hardwood	4.2	25.6	62.1	9.8
Mature-overmature Mixedwood	1.6	10.0	58.4	9.2
Mature-overmature Softwood	-	-	20.1	3.2
Industrial	-	-	2.2	0.3
Transmission Line	0.1	0.5	4.1	0.6
Wetland	1.5	9.2	59.8	9.4
Tall Shrub Swamp	1.3	8.2	38.3	6.0
Mixedwood Treed Swamp	-	-	0.00020	0.00002
Softwood Treed swamp	0.2	1.0	21.5	3.4
Total	**16.2**	**100**	**636.5**	**100**

Wetlands account for a relatively low percentage of the PDA and LAA (9.2% and 9.4%, respectively) relative to the average amount of wetland in the rest of New Brunswick, which from previous experience on other linear projects is typically approximately 18%. Five wetlands were delineated within the PDA; of these, four are tall shrub swamps, usually associated with watercourses or drainageways. These tall shrub swamps are typically dominated by speckled alder (*Alnus incana*) and various species of willow (*Salix* spp.), and occasionally silky dogwood (*Cornus sericea*). Typically, there are tree species such as black spruce (*Picea mariana*) and balsam fir (*Abies balsamea*) on the margins of these shrub

wetlands. For those wetlands that are associated with watercourses, the tall shrub wetlands provide bank stabilization and watercourse shading functions, as well as providing habitat for wildlife (including amphibians). Two of these wetlands are associated with mapped watercourses which were found to provide fish habitat (Section 4.3.3.2.1.1); these wetlands support resident fish habitat.

Near the eastern end of the new transmission line corridor for the Project, there is a riparian wetland complex containing both tall shrub swamp and softwood treed swamp. The tall shrub swamp component is associated with a beaver dam; it contains a small amount of open water habitat, and is dominated by speckled alder, stunted balsam fir and black spruce, fowl manna grass (*Glyceria striata*), and golden groundsel (*Packera aurea*). The softwood treed swamp portion of the wetland is dominated by black spruce, balsam fir, dwarf raspberry (*Rubus pubescens*), cinnamon fern (*Osmunda cinnamomea*), various manna grasses (*Glyceria* spp.), star sedge (*Carex echinata*), and two-seeded sedge (*C. disperma*). This wetland provides water storage function, particularly in the portion upstream from the beaver dam, and stream flow support, as well as supporting resident fish habitat. It also provides habitat for wildlife, including beavers (*Castor canadensis*), songbirds, and amphibians. The open water component of the wetland is likely not large enough to support waterfowl or waterbirds.

Of the five wetlands crossed by the PDA, the western-most wetland and the two eastern-most wetlands are provincially mapped on the GeoNB website (SNB 2011)(Figure 4.4).

There are no ECMCs, either previously mapped or field-identified, within the Phase 1 PDA or LAA.

4.3.4.2.3 Wildlife and Wildlife Habitat, Phase 1 – New 138 kV Transmission Line and New Substation to be Constructed

4.3.4.2.3.1 Information from Existing Data Sources

Information sources including the MBBA, AC CDC, and ACNOS indicate that 90 species of birds have been recorded near the LAA for Phase 1 (i.e., within 5 km of the PDA, or within the MBBA squares crossed by the Project) (Table 4.5; Appendix D, Table D.2). Of the species recorded, two are SAR and seven are SOCC (Table 4.5). All other species are considered apparently secure or secure by the AC CDC.

Table 4.5 Bird SAR and SOCC Reported within or near the LAA

Common Name	4-letter Alpha Code1	Scientific Name	SARA Status	COSEWIC Status	NB SARA Status	AC CDC S-Rank2	Data Source
SAR							
chimney swift	CHSW	*Chaetura pelagica*	Schedule 1, Threatened	Threatened	Threatened	S2S3B,S2M	AC CDC MBBA
barn swallow	BARS	*Hirundo rustica*	No Schedule, No Status	Threatened	Threatened	S2B,S2M	MBBA

Table 4.5 Bird SAR and SOCC Reported within or near the LAA

Common Name	4-letter Alpha Code1	Scientific Name	SARA Status	COSEWIC Status	NB SARA Status	AC CDC S-Rank2	Data Source
SOCC							
killdeer	KILL	*Charadrius vociferus*				S3B,S3M	MBBA
cliff swallow	CLSW	*Petrochelidon pyrrhonota*				S2S3B,S2S3M	MBBA
Cape May warbler	CMWA	*Setophaga tigrina*				S3B,S4S5M	AC CDC, MBBA, Stantec
brown-headed cowbird	BHCO	*Molothrus ater*				S3B,S3M	MBBA
indigo bunting	INBU	*Passerina cyanea*				S3B,S3M	MBBA
pine siskin	PISI	*Carduelis pinus*				S3	Stantec
evening grosbeak	EVGR	*Coccothraustes vespertinus*				S3B,S3S4N, SUM	MBBA, Stantec

[1] Alpha Codes are presented at the locations of observed SAR and SOCC on accompanying figures

[2] S1 = critically imperiled, S2 = imperiled, S3 = vulnerable, S4 = apparently secure, S5 = secure, SNA = not applicable (typically exotic species) S#S# = a numeric range rank used to indicate any range of uncertainty about the status of the species or community. B= Breeding, N = Nonbreeding, M = Migrant, U = Unrankable. (AC CDC 2014)

Atlantic Canada Data Conservation Centre

The AC CDC reported a total of 82 bird species within a 5 km radius of the PDA (AC CDC 2016). This list includes one SAR (chimney swift) and one SOCC (Cape May warbler).

Maritimes Breeding Bird Atlas

The Project interacts with one MBBA square (19FN27). During the most recent atlas period (2006-2010) a total of 88 bird species were recorded within the square crossed by the Project, including two SAR (chimney swift and barn swallow), and six SOCC (killdeer, cliff swallow, Cape May warbler, brown-headed cowbird, indigo bunting, pine siskin, and evening grosbeak). Of the 88 recorded species, 15 were confirmed as breeding, 17 were recorded as probable breeders, and 56 were recorded as possible breeders.

Atlantic Canada Nocturnal Owl Surveys

There were no records of owls reported by the ACNOS within 5 km of the Project.

4.3.4.2.3.2 Field Surveys

Wildlife surveys were carried out in 2016 within the Phase 1 LAA to characterize the use of the area by wildlife species and to facilitate an assessment of potential environmental interactions of the Project with wildlife and wildlife habitat. The focus of these surveys was on avian species, and wildlife SAR.

Early Breeding Bird Field Surveys

Early breeding bird species surveys were conducted at nine locations within forested habitats in the LAA on the morning of April 26, 2016. Weather conditions during the surveys were good with light winds, no precipitation, and cool temperatures. Point count surveys and playbacks were conducted in forested habitats in an effort to detect breeding woodpecker and raptor species within the LAA. All bird species observed during the surveys were recorded.

Of the targeted species, observers detected the presence of two woodpecker species, northern flicker (*Colaptes auratus*) and yellow-bellied sapsucker (*Sphyrapicus varius)*. Both species were recorded as possibly breeding within the LAA. No raptor species were detected during the early breeding bird surveys.

Nocturnal Owl Field Surveys

Roadside surveys targeting breeding owl species in the LAA were conducted at five locations on the evening of April 26, 2016. Surveys were conducted following the protocol set out in the Guidelines for Nocturnal Owl Monitoring in North America (Takats *et al.* 2001), which involved a 10-minute period of alternating playbacks and silent listening periods. The species used in the playbacks were boreal owl (*Aegolius funereus*), and barred owl (*Strix vaira*). Surveys began approximately 30 minutes following sunset, and continued until approximately 11:00 pm. Survey stations were chosen along assessable roads, and were spaced no closer than 1.6 km from each other. The presence of nocturnal species, including other wildlife species, was recorded in addition to general information about environmental conditions including temperature, general noise level, and amount of passing vehicle traffic.

No owl species were observed.

Crepuscular Bird Field Surveys

Crepuscular bird surveys targeting common nighthawk (*Chordeiles minor*), a SAR, were conducted at four locations within the LAA on June 15, 2016. Survey stations were placed near open areas with potential to provide breeding habitat for common nighthawk. These types of areas include open forest, grasslands, areas of exposed sand and gravel, recently logged or burned forest, and other anthropogenic habitats such as pastures. Surveys were conducted at roadside and began approximately 60 minutes prior to sunset, and continued until approximately 9:30 pm. Surveys were conducted following a point count procedure (BC RIC 1998). Any common nighthawks present were recorded, along with general information about environmental conditions at the time of survey including temperature, wind conditions, and the anecdotal level of background noise.

No common nighthawk were detected during these surveys.

Forest Breeding Bird Field Surveys

Forest breeding bird surveys were conducted from June 14 through June 17, 2016 to provide an overview of forest breeding bird species present in the predominantly forested LAA. Survey stations were established within various habitat types including forest stands of various ages, as defined by the NBDNR landbase inventory data, using a stratified random selection approach. Other habitat types including wetland habitats were also sampled. Table 4.6 provides statistics on the habitats including the number of point counts conducted.

All surveys were established within 500 m of the PDA, and were placed a minimum of 250 m from another survey point, and 100 m from the edge of another habitat type where possible. Ten-minute surveys based on a modified fixed-radius point count sampling procedure (Bibby *et al.* 2000) were conducted once at each survey point. Surveys began near dawn, and continued until approximately 10:00 am. Observers collected data on each bird species observed, and information about environmental conditions at each survey point including wind conditions, cloud cover, and wind conditions.

Breeding bird surveys identified a total of 54 species (including species observed incidentally) during June 2016. The surveys identified the presence of two SAR (olive-sided flycatcher and Canada warbler) and three SOCC (Cape May warbler, pine siskin, and evening grosbeak). Table D.2 in Appendix D presents the species observed during the point count surveys, and their highest breeding evidence (available from MBBA or as collected in the field).

Species richness (defined as the number of different species recorded within a habitat type) was calculated for each of the habitat types sampled within the LAA (Table 4.6). Due to the highly fragmented habitat within the LAA, it was not feasible to obtain a sufficient number of habitat replicate points to calculate density for each species.

Due to the highly fragmented nature of the habitats within the LAA, birds were recorded in patches of habitat which differed from the habitat where the observer was preforming a survey. Because of this, Table 4.6 presents species richness for habitat types in which no point counts were dedicated. Additionally, one survey was completed in habitat considered anthropogenic. Although birds were recorded during this survey, all of the individuals were present in habitat adjacent to that where the observer was located.

Table 4.6 Habitat Types Sampled During Field Surveys, and Species Richness

Land classification type	Breeding Bird Point Counts Completed	Area within LAA (ha)	Species Richness (Number of Species)
Anthropogenic	1	44.1	0
Forest	-	-	-
Regen-sapling Hardwood	6	141.1	28
Regen-sapling Mixedwood	1	11.2	13
Regen-sapling Softwood	2	24.4	15

Table 4.6 Habitat Types Sampled During Field Surveys, and Species Richness

Land classification type	Breeding Bird Point Counts Completed	Area within LAA (ha)	Species Richness (Number of Species)
Young-immature Hardwood	2	26.2	6
Young-immature Mixedwood	1	13.2	5
Young-immature Softwood	4	167.7	20
Mature-overmature Hardwood	3	62.1	12
Mature-overmature Mixedwood	1	58.4	11
Mature-overmature Softwood	0	20.1	11
Wetland	-	-	-
Tall Shrub Swamp	1	38.3	22
Softwood Treed Swamp	1	21.5	3

4.3.4.2.3.3 Bird Species at Risk (SAR)

Based on data provided by the AC CDC and MBBA, and on field surveys conducted in June and July 2016, four bird SAR have been identified which have the potential to be found within the LAA, as follows.

Chimney Swift

The chimney swift (*Chaetura pelagica*) is a small slender bird, with long, narrow wings. The breeding range of this species is limited to eastern North America, with approximately one quarter of the breeding range located in Canada (COSEWIC 2007a). This species is considered Threatened under Schedule 1 of *SARA* and under NB *SARA*. The AC CDC lists this species as S2S3B, indicating this species is considered between imperiled and vulnerable in New Brunswick.

The chimney swift is primarily associated with urban and rural areas where chimneys are available for nesting and roosting. Chimney swift formerly nested in hollow trees; however, they now nest almost exclusively in anthropogenic structures due to the relative scarcity of hollow trees (COSEWIC 2007a). This species is an aerial insectivore, and often concentrates near water, where insects are abundant (COSEWIC 2007a). No suitable nesting habitat for this species was noted in the PDA, and no observations of chimney swift were made in the PDA during the field surveys; however, this species was observed in the surrounding MBBA square and the AC CDC data includes a record of this species within the LAA.

The BBS (EC 2014) reports that this species is in decline at a Canada-wide and NB-wide level. The main factor thought to be responsible for the decline of this species is the rapidly falling number of suitable breeding and roosting sites including old abandoned buildings and traditional chimneys (COSEWIC 2007a). Pesticide spraying which reduces the availability of insect prey may also be a factor.

Olive-sided Flycatcher

The olive-sided flycatcher (*Contopus cooperi*) is a stout, medium-sized passerine which breeds in scattered locations throughout most of forested Canada (COSEWIC 2007b). This species is listed as Threatened under Schedule 1 of *SARA* and NB *SARA*. The AC CDC lists the olive-sided flycatcher as S3B, indicating that the breeding population of this species is considered vulnerable in New Brunswick.

Olive-sided flycatchers are most often associated with open areas, where they are found foraging for flying insects, and perching in tall live trees (COSEWIC 2007b). Suitable habitat for this species is found within the LAA. This species was observed in the LAA during field surveys.

The BBS (EC 2014) reports that this species is in decline at a Canada-wide and NB-wide level. The main factors thought to be associated with the decline of olive-sided flycatchers are habitat loss and alteration (COSEWIC 2007b). Declining insect populations on breeding and wintering grounds may also be a contributing factor.

Barn Swallow

The barn swallow is a mid-sized passerine that is closely associated with rural human settlements. This species is the most widespread swallow in the world, and is known to breed in all provinces and territories in Canada (COSEWIC 2011a). The barn swallow is ranked as threatened by COSEWIC and NB *SARA*, and S3B by the AC CDC indicating that the breeding population of this species considered vulnerable in New Brunswick. It has no *SARA* rank at this time.

Following European settlement of North America, barn swallows shifted from nesting in caves and on ledges to nesting largely in man-made structures. This insectivorous species prefers open habitats for foraging such as pastoral lands, shorelines, and cleared rights-of-way. No suitable nesting habitat was noted for this species in the PDA nor was it observed in the PDA during field surveys, though it was observed within the surrounding MBBA square, and some potential habitat may exist within the western portion of the LAA at Kedgwick.

The BBS (EC 2014) indicates that this species is undergoing a decline in population, although the species is still common and widespread (COSEWIC 2011a). The main threats to the species include loss of nesting and foraging habitat, and the large-scale declines in some insect populations which provide food for this species.

Canada Warbler

Canada warbler (*Cardellina canadensis*) is a small and brightly coloured passerine. Approximately 80% of the entire breeding range of this species is located in Canada (COSEWIC 2008), where it can be found breeding in every province and territory except Newfoundland and Labrador and Nunavut. Canada warbler is ranked as Threatened on Schedule 1 of *SARA* and under NB *SARA*, and S3B by the AC CDC, indicating that the breeding population of this species is considered vulnerable in New Brunswick.

Canada warblers breed in a wide range of forest types, including hardwood, softwood, and mixedwood forests. It is often associated with moist mixedwood forest and riparian shrub forests on slopes and ravines (COSEWIC 2008). The presence of a well-developed shrub layer also seems to be associated with preferred Canada warbler habitat. Suitable habitat for this species, such as shrub swamps, is found within the LAA. This species was observed in the LAA during field surveys.

The BBS (EC 2014) reports that this species is in decline Canada-wide and at a province-wide level. Key threats to this species are unclear, but loss of primary forest in the wintering grounds in South America is a potential cause.

4.3.4.2.3.4 Incidental Wildlife Observations

Incidental observations of other wildlife species (i.e., species other than birds) were collected opportunistically during all field surveys.

Excluding birds, a total of 13 wildlife species (or evidence thereof) were observed in the LAA including:

- black bear (*Ursus americanus*);
- moose (*Alces alces*);
- white-tailed deer (*Odocoileus virginianus*);
- beaver (*Castor canadensis*);
- North American porcupine (*Erethizon dorsatum*);
- varying hare (*Lepus americanus*);
- red squirrel (*Tamiasciurus hudsonicus*);
- American toad (*Bufo americanus*);
- wood frog (*Lithobates sylvaticus*);
- green frog (*Rana clamitans*);
- spring peeper (*Pseudacris crucifer*);
- American bullfrog (*Lithobates catesbeianus*); and,
- common garter snake (*Thamnophis sirtalis*).

Each of these mammal and herpetile species is listed as S5 by the AC CDC, which is considered secure, or "common, widespread, and abundant in the province" (AC CDC 2014).

No evidence of any other terrestrial wildlife SAR, including Canada lynx (*Lynx canadensis*), wood turtle (*Glyptemys insculpta*), tri-coloured bat (*Perimyotis subflavus*), little brown myotis (*Myotis lucifugus*), or northern myotis (*Myotis septentrionalis*), was observed within the PDA, and none of these species have been recorded within 5 km of the Project (AC CDC 2016). Appropriate habitat for Canada lynx and appropriate basking or nesting habitat for wood turtle was not observed within the PDA, but could occur within the LAA. There are no bat hibernacula known within 5 km of the Project (AC CDC 2016). It is possible, though unlikely, that mature-overmature hardwood stands crossed by the Phase 1 PDA could contain maternal roosting trees, though none were observed.

4.3.4.2.3.5 Interior Forest

Interior forest is defined as mature forest patches greater than 10 ha in size, and a minimum of 100 m from an edge (e.g., waterbodies, open wetlands, clearcuts, industrial or other anthropogenic areas,

and linear features such roads or transmission lines). Interior forest are areas which are relatively free from fragmentation, and are important within the greater landscape and to some wildlife species (known as interior species) which are particularly sensitive to fragmentation. Examples of interior species include bay-breasted warbler, black-throated blue warbler, and the SAR eastern wood-pewee, as well as Canada warbler, which has been recorded within the LAA.

There is approximately 173.1 ha of interior forest contiguous to the LAA (i.e., part of the interior forest patch lies within the LAA), within 5 patches. The patches range in size from 14.4 ha to 68.5 ha.

4.3.4.2.4 Vegetation and Wetlands, Phase 2 – Existing 69 kV Transmission Line 0028 and Existing Substation to be Decommissioned

No vegetation and wetland field work was conducted for Phase 2; data for vegetation and wetlands are compiled from existing data sources and aerial photo interpretation of wetlands. As expected, land use classes in the PDA are over 50% transmission line (Table 4.7). Dominant land classes within the remaining area include forest of various ages and types, which accounts for 31.5%, and agricultural which makes up 14.8% of the PDA. Only 2.5% of the Phase 2 PDA is wetland. A review of the pole locations within Phase 2 indicates one pole is within an existing wetland and three are adjacent to wetlands.

Over two-thirds of the Phase 2 LAA is forest (67.3%). Approximately 14.0% of the LAA is J.D. Irving-owned forested land for which no information is available. Wetlands occupy little of the LAA, approximately 3.9%, relative to other areas within New Brunswick, where the percentage of land that is wetland is typically closer to 18%.

Table 4.7 Land Classification within the PDA and LAA, Phase 2

Land classification type	Area (ha) or percentage (%) within Land classification type			
	PDA		LAA	
	hectares (ha)	%	hectares (ha)	%
Agricultural	11.1	14.8	453.3	17.3
Anthropogenic	3.6	4.8	204.2	7.8
Forest	23.6	31.5	1,766.3	67.3
Regen-sapling Hardwood	2.2	2.9	222.9	8.5
Regen-sapling Mixedwood	1.0	1.3	67.0	2.6
Regen-sapling Softwood	0.4	0.5	74.9	2.9
Young-immature Hardwood	1.8	2.3	173.6	6.6
Young-immature Mixedwood	2.1	2.7	168.1	6.4
Young-immature Softwood	0.4	0.5	332.2	12.7
Mature-overmature Hardwood	1.1	1.5	96.2	3.7
Mature-overmature Mixedwood	2.1	2.8	223.8	8.5
Mature-overmature Softwood	2.9	3.8	39.8	1.5

Table 4.7 Land Classification within the PDA and LAA, Phase 2

Land classification type	Area (ha) or percentage (%) within Land classification type			
	PDA		LAA	
	hectares (ha)	%	hectares (ha)	%
No Data/Private Land	9.9	13.2	367.7	14.0
Industrial	3.1	4.2	55.5	2.1
Transmission Line	31.6	42.2	37.4	1.4
Waterbody	0.001	0.001	6.8	0.3
Wetland	1.9	2.5	101.7	3.9
Bog	0.3	0.4	4.4	0.2
Shallow Water Wetland			1.4	0.1
Freshwater Marsh	0.2	0.3	3.8	0.1
Tall Shrub Swamp	0.7	1.0	43.0	1.6
Hardwood Treed Swamp	0.4	0.5	10.4	0.4
Mixedwood Treed Swamp	0.2	0.3	13.7	0.5
Softwood Treed Swamp	0.0	0.0	25.0	1.0
Total	**74.9**	**100**	**2,625.1**	**100**

Wetland vegetation descriptions or functional assessment are not possible based on aerial photo interpretation. There are no mapped ECMCs within the PDA or LAA. As field surveys were not completed, there are also no field-identified ECMCs within the PDA or LAA. As there were also no ECMCs in the Phase 1 PDA or LAA, ECMCs will not be discussed further.

4.3.4.2.5 Wildlife and Wildlife Habitat, Phase 2 – Existing 69 kV Transmission Line 0028 and Existing Substation to be Decommissioned

4.3.4.2.5.1 Information from Existing Data Sources

Information sources including the MBBA, AC CDC, and ACNOS indicate the presence of 119 species of birds which have been recorded near the LAA for Phase 2 (i.e., within 5 km of the PDA, or within the MBBA squares crossed by the Project) (Appendix D, Table D.3). Of the species recorded, 11 are SAR and 6 are SOCC (Table 4.8).

Table 4.8 Bird SAR and SOCC Reported within or near the LAA (Phase 2)

Common Name	4-letter Alpha Code[1]	Scientific Name	*SARA* Status	COSEWIC Status	NB *SARA* Status	AC CDC S-Rank[2]	Data Source
SAR							
common nighthawk	CONI	*Chordeiles minor*	Schedule 1, Threatened	Threatened	Threatened	S3B,S4M	AC CDC MBBA
chimney swift	CHSW	*Chaetura pelagica*	Schedule 1, Threatened	Threatened	Threatened	S2S3B,S2M	MBBA
olive-sided flycatcher	OSFL	*Contopus cooperi*	Schedule 1, Threatened	Threatened	Threatened	S3B,S3M	AC CDC MBBA
eastern wood-pewee	EAWP	*Contopus virens*	No Schedule, No Status	Special Concern	Special Concern	S4B,S4M	AC CDC MBBA
barn swallow	BARS	*Hirundo rustica*	No Schedule, No Status	Threatened	Threatened	S2B,S2M	AC CDC MBBA
bank swallow	BANS	*Riparia riparia*	No Schedule, No Status	Threatened		S2S3B,S2S3M	AC CDC MBBA
wood thrush	WOTH	*Hylocichla mustelina*	No Schedule, No Status	Threatened	Threatened	S1S2B,S1S2M	AC CDC
bobolink	BOBO	*Dolichonyx oryzivorus*	No Schedule, No Status	Threatened	Threatened	S3B,S3M	AC CDC MBBA
rusty blackbird	RUBL	*Euphagus carolinus*	Schedule 1, Special Concern	Special Concern	Special Concern	S3B,S3M	AC CDC MBBA
eastern meadowlark	EAME	*Sturnella magna*	No Schedule, No Status	Threatened	Threatened	S1B,S1M	AC CDC
Canada warbler	CAWA	*Cardellina canadensis*	Schedule 1, Threatened	Threatened	Threatened	S3B,S3M	AC CDC MBBA
SOCC							
common eider	COEI	*Somateria mollissima*				S3B,S4M, S3N	AC CDC
turkey vulture	TUVU	*Cathartes aura*				S3B,S3M	AC CDC
killdeer	KILL	*Charadrius vociferus*				S3B,S3M	AC CDC MBBA
horned lark	HOLA	*Eremophila alpestris*				S1B,S4N,S5M	AC CDC
cliff swallow	CLSW	*Petrochelidon pyrrhonota*				S2S3B,S2S3M	AC CDC, MBBA
northern mockingbird	NOMO	*Mimus polyglottos*				S2B,S2M	AC CDC

Table 4.8 Bird SAR and SOCC Reported within or near the LAA (Phase 2)

Common Name	4-letter Alpha Code[1]	Scientific Name	*SARA* Status	COSEWIC Status	NB *SARA* Status	AC CDC S-Rank[2]	Data Source
Cape May warbler	CMWA	*Dendroica tigrina*				S3B,S4S5 M	AC CDC, MBBA
brown-headed cowbird	BHCO	*Molothrus ater*				S3B,S3M	AC CDC MBBA
scarlet tanager	SCTA	*Piranga olivacea*				S3B,S3M	AC CDC, MBBA
pine siskin	PISI	*Carduelis pinus*				S3	AC CDC, MBBA
evening grosbeak	EVGR	*Coccothraustes vespertinus*				S3B,S3S4 N,SUM	AC CDC, MBBA
pine grosbeak	PIGR	*Pinicola enucleator*				S2B,S4S5 N,S4S5M	AC CDC

[1] Alpha Codes are presented at the locations of observed SAR and SOCC on accompanying figures

[2] S1 = critically imperiled, S2 = imperiled, S3 = vulnerable, S4 = apparently secure, S5 = secure, SNA = not applicable (typically exotic species) S#S# = a numeric range rank used to indicate any range of uncertainty about the status of the species or community. B= Breeding, N = Nonbreeding, M = Migrant, U = Unrankable. (AC CDC 2014)

Atlantic Canada Data Conservation Centre

The AC CDC reported a total of 116 bird species within a 5 km radius of the PDA. This list includes 10 SAR and twelve SOCC.

Maritimes Breeding Bird Atlas

The Project interacts with four MBBA squares (19FN27, 19FN16, 19FN26, and 19FN15). During the most recent atlas period (2006-2010) a total of 104 bird species were recorded within or near the LAA. Of these, 40 were confirmed as breeding, 36 were recorded as probable breeders, and 28 were recorded as possibly breeding. Of the 104 recorded species, nine were SAR and seven were SOCC.

Atlantic Canada Nocturnal Owl Surveys

There were no records of owl species reported by the ACNOS within 5 km of the Project.

4.3.4.2.5.2 Bird Species at Risk (SAR)

Based on data provided by the AC CDC and MBBA, 11 SAR have been identified which have the potential to be found within the LAA of Phase 2. Seven of these species are in addition to those identified near Phase1 of the Project (discussed in Section 4.3.4.2.3.2), and include the species discussed below.

Common Nighthawk

The common nighthawk is a medium-sized bird which nests in almost all of North America. This species occurs in all of the Canadian provinces and territories with the exception of Nunavut (COSEWIC 2007c). The common nighthawk is considered Threatened under Schedule 1 of *SARA* and under COSEWIC and NB *SARA*. The AC CDC ranks common nighthawk as S3B indicating the breeding population of this species is vulnerable in New Brunswick.

Common nighthawks are most commonly observed in a wide range of open, vegetation-free habitats including beaches, recently cleared forests, rocky outcrops, and grasslands (SARA 2015). Newly-opened habitats created by the forestry industry have likely been of benefit to this species (COSEWIC 2007c).

The BBS (EC 2014) reports that this species is in decline at a Canada-wide and NB-wide level. The exact causes of the decline of this species are not well understood, however it may be related to the widespread decline in insect populations which this species relies upon for food. This theory is supported by the widespread declines observed among many other insectivorous bird species (COSEWIC 2007c).

Eastern Wood-pewee

The eastern wood-pewee is a small song-bird which breeds across most of Canada from Saskatchewan to the Maritimes provinces (COSEWIC 2012a). This species is ranked as Threatened by COSEWIC and NB *SARA*. The AC CDC ranks this species as S4B, indicating the breeding population of this species is apparently secure in New Brunswick.

During breeding, the eastern wood-pewee is generally associated with the mid-canopy layer within forest clearings and edges of hardwood and mixed forest stands (COSEWIC 2012a). In migration periods this species utilizes a variety of habitats including edges, and clearings (COSEWIC 2012a).

The BBS (EC 2014) reports that this species is in decline at a Canada-wide and NB-wide level. The main factors thought to be responsible in the decline of the eastern wood-pewee have not been clearly identified, due largely, to a lack of research. Possible threats include loss of habitat, and degradation of habitat quality, changes in availability in flying-insect prey, and changes in forest structure due to white-tailed deer over-browsing (COSEWIC 2012a).

Bank Swallow

The bank swallow is a small, social songbird which feeds primarily on aerial insects (COSEWIC 2013). This species occurs on every continent except Antarctica and Australia. In North America this species breeds in every province with the possible exception of Nunavut (COSEWIC 2013). Bank swallow has no *SARA* status or schedule, but is ranked as Threatened by COSEWIC. The AC CDC ranks bank swallow as S3B, indicating the breeding population of this species is vulnerable in New Brunswick.

Bank swallows breed in a wide variety of natural and anthropogenic sites including riverbanks, aggregate pits, road cuts, and vertical sand banks or stock piles of soil. Nesting sites are generally situated adjacent to open terrestrial habitat used for aerial foraging (COSEWIC 2013).

The BBS (EC 2014) reports that this species is in decline in Canada and at the province level in NB. The main factors thought to be responsible for the decline of this species includes the loss of breeding and foraging habitat, and the loss of food sources through the widespread use of pesticides (COSEWIC 2013).

Wood Thrush

The wood thrush is a medium sized bird which breeds in southeastern Canada from southern Ontario east to Nova Scotia (COSEWIC 2012b). This species is listed as Threatened by COSEWIC and NB *SARA*. The AC CDC ranks wood thrush as S1S2B, indicating the breeding population of this species is considered between critically imperiled and imperiled in New Brunswick.

Wood thrush nest mainly in second-growth and mature forests, both hardwood and mixedwood, with saplings and well-developed understory layers. There is suitable habitat for wood thrush within the PDA and LAA. There is potential for this species to be found within the PDA.

The BBS (EC 2014) reports that this species is in decline in Canada and in NB. The main factors thought to be responsible in the decline of this species include habitat degradation and fragmentation due to over-browsing by white-tailed deer and human development (COSEWIC 2012b). High rates of nest predation and parasitism by species such as brown-headed cowbird are also contributing to the decline of the wood thrush.

Bobolink

Bobolink is a medium-sized song-bird that breeds in the southern part of all Canadian provinces from British Columbia to Newfoundland and Labrador (COSEWIC 2010). Bobolink is ranked as Threatened by COSEWIC and NB *SARA*. The AC CDC ranks bobolink as S3B indicating the breeding population of this species is vulnerable in New Brunswick. It has no *SARA* rank at this time.

Bobolink originally nested in the tall-grass prairies of the mid-western U.S and south central Canada. As this habitat was converted to agricultural land, and forests of eastern North America were cleared to hayfields and meadows, the range of bobolink expanded (COSEWIC 2010). Bobolink presently nest in a variety of forage crop habitats, and natural grassland habitats including wet prairie, fens, and abandoned fields dominated by tall grasses.

The BBS (EC 2014) indicates that this species is in decline at a Canada-wide and province-wide level. The main threats to this species include land-use change, especially the loss of meadows and hay fields, and the early mowing of hay fields in which the species is nesting.

Rusty Blackbird

The rusty blackbird is a medium-sized passerine most commonly associated with open-water forested wetlands. This species is listed as Special Concern on Schedule 1 of *SARA* and under NB *SARA*. The AC CDC ranks the rusty blackbird as S3B, indicating the breeding population of this species is vulnerable in New Brunswick.

The rusty blackbird nests in boreal forests, generally near the shores of forest wetlands, slow-moving streams, beaver ponds, and pasture edges (COSEWIC 2006). This species' main diet consists primarily of aquatic invertebrates, and occasionally salamanders and small fish.

The BBS (EC 2014) reports that this species is in decline Canada-wide and at the provincial level in NB. The main factor thought to be associated with the decline of Rusty Blackbirds is the conversion of its main wintering grounds (forests in Mississippi Valley flood plains) into agricultural lands or other anthropogenic environments (COSEWIC 2006). Other factors include destruction of wetlands within the species breeding range, and the spread of more dominant, competing, species such as the red-winged blackbird.

Eastern Meadowlark

A medium-sized bird, the eastern meadowlark is a member of the blackbird family. In Canada, this species is found in the eastern provinces including Ontario, Quebec, New Brunswick, and southern Nova Scotia (COSEWIC 2011b). The eastern meadowlark is ranked as Threatened by COSEWIC and under NB *SARA*. The AC CDC ranks this species as S1S2B, indicating the breeding population of this species is considered between critically imperiled and imperiled in New Brunswick.

Eastern meadowlarks prefer to nest in grassland habitats including pastures, hayfields, and weedy meadows. Nests are concealed within vegetation on the ground (COSEWIC 2011b).

The BBS (EC 2014) reports that this species is in decline at a Canada-wide and NB-wide level. The main factors thought to be responsible in the decline of the eastern meadowlark include loss of breeding habitat, and the intensification and modernization of agricultural techniques (COSEWIC 2011b).

4.3.4.2.5.3 Other Wildlife

Based on the habitat present (Table 4.7), it is expected that the Phase 2 PDA and LAA likely contains similar species as were observed within the Phase 1 PDA and LAA (Section 4.3.4.2.3.4). Non-avian wildlife SAR are not expected to occur within the Phase 2 PDA, though appropriate habitat may exist within the Phase 2 LAA.

4.3.4.3 Potential Environmental Interactions with the Terrestrial Environment

This section describes how the Project activities could interact with the Terrestrial Environment, as well as the techniques and practices that will be applied to mitigate the potential effects of these interactions.

4.3.4.3.1 Construction – New 138 kV Transmission Line and New Substation

Construction activities have the potential to result in adverse environmental interaction with the terrestrial environment, which could result in changes to vegetation and wetlands, including:

- The loss of vascular plant and wildlife SAR and SOCC; and,
- The loss of or change to vegetation communities (including wetland).

Changes to wildlife and wildlife habitat are also possible, such as:

- The loss of or change to wildlife habitat (including wetland);
- Sensory disturbance to wildlife resulting in habitat avoidance; and,
- Mortality of wildlife from collision with construction equipment or infrastructure.

A direct loss of vegetation communities and wildlife habitat (including wetlands and interior forest), could result from vegetation clearing. Clearing will remove trees and shrubs within the PDA, and will likely damage understory vegetation. Soil compaction may also occur, depending on the seasonal timing of vegetation clearing and the types of machinery used to clear vegetation and excavate soils.

There are approximately 15.9 ha of vegetation communities and wildlife habitat (which excludes 0.7 ha of anthropogenic land class) within the PDA of Phase 1, primarily forest, which will be lost or changed due to the Project. Most of the forested habitat, which represents approximately 87.5% of the Phase 1 PDA, will likely be converted to tall shrub habitat during the Operation phase. Tall shrub habitat may be used by a number of wildlife species, including migratory bird species such as common yellowthroat; however, it will likely become occupied by different species than those that use the currently forested habitat, such as Canada warbler. The amount of forested habitat within the PDA that will be converted to tall shrub habitat represents approximately 2.7% of the available forested habitat within the LAA. The softwood treed swamp wetland within the PDA, which may be used by species such as olive-sided flycatcher will also be converted, likely to tall shrub swamp, which could provide additional habitat for Canada warbler. The amount of softwood treed swamp that will be converted represents approximately 2.0% of the softwood treed swamp in the LAA.

Excavation for pole placement will result in the permanent loss of some amount of vegetation communities and wildlife habitat (possibly including wetland). The number and placement of poles and the area required for pole excavation is not currently known, but placement of poles within wetlands or their 30 m buffers will be avoided, if possible. If avoidance of wetlands is not possible, poles placed in GeoNB-mapped wetlands will require compensation according to the New Brunswick Wetland Conservation Policy and current wetland guidance from NBDELG.

There are no known vascular plant SAR, nor vascular plant SOCC, within the PDA; however, one vascular plant SOCC was observed outside of the PDA in the LAA. Areas adjacent to the PDA can be indirectly affected by vegetation clearing through edge effects, and through changes in the hydrology of wetlands. Edge effects refer to changes in abiotic environmental conditions, such as temperature, humidity, light availability, and wind. The success of species that inhabit an area can be affected by changes in these abiotic factors, which can in turn change community dynamics through the introduction of invasive or exotic species. Many invasive and exotic plants are strong competitors and can thrive in disturbed (i.e., cleared) habitats; their introduction to an area could lead to native species being outcompeted and lost. The vascular plant SOCC observed outside of the PDA could experience change in abiotic conditions resulting from edge effects caused by the clearing of the PDA.

The creation of edges can result in increased access by herbivores and predators. This can lead to changes to indirect mortality through herbivory or predation, and can also lead to increased nest

parasitism. Nest predators and nest parasites (e.g., brown-headed cowbirds) are more abundant near forest edges than within interior forest (Lloyd *et. al.* 2005; Rich *et al*. 1994).

The Project, as designed, will reduce the amount of interior forest contiguous with the LAA from 173.1 ha to 124.4 ha; a loss of 48.7 ha of interior forest, or 28.1%. Of the five patches of interior forest contiguous with the LAA, three of these will be reduced in size. One patch will be reduced to the point that none of the remaining area is above the 10 ha threshold. The other two patches are reduced by 33.4 ha and 1.0 ha; 35.1 ha and 21.4 ha remaining, respectively.

Vegetation clearing and excavation for placement of poles will cause sensory disturbance to wildlife. Lights and noise of construction equipment could result in reduced productivity or nest abandonment, which could lead to reduced breeding and rearing success. Some wildlife species may also experience temporary habitat loss via avoidance (Bayne *et al.* 2008). Increased predation may occur on some small mammals or herpetiles which flee cover in response to construction noise.

Collisions between birds and construction equipment could result in a Project-related increase in bird mortality. Lighted equipment can attract birds during migration periods; this phenomenon is most pronounced at night and in poor weather conditions (Avery *et. al* 1976; Longcore and Rich 2004; Ogden 1996; Wiese *et al.* 2001).

Minor changes to vegetation communities and wildlife habitat may occur through Construction activities required for access and staging. Clearing of additional areas to widen existing roads and trails, grading and adding gravel to existing roads and trails, and installing cross-drainage and culverts could be required. These activities will presumably result in minor changes to vegetation communities and wildlife habitat, possibly including wetlands, though the areas where these activities will occur have not yet been identified. Once the locations for these activities are determined, vegetation community types will be reviewed from existing data sources to determine the need for any further mitigation, including potential field investigation.

A positive interaction will result with the Terrestrial Environment during clean-up and revegetation. Disturbed areas will return to natural vegetation communities through activities such as mulching and seeding. Cleaned up and revegetated areas will represent a change, but not a loss, of vegetation communities and wildlife habitat from pre-Project conditions.

NB Power will reduce the potential for interactions between the Project and the Terrestrial Environment during the Construction stage by adhering to best management practices and the EPP. The following well-established practices will be implemented during Construction:

- Known locations of individuals of SOCC will be flagged and avoided, when possible.
- The existing NB Power EPP will be used for all phases of the Project.
- Construction, particularly clearing activities, will be avoided in areas of native vegetation during the normal breeding season for migratory birds (April 1 to August 31).
- Approved noise arrest mufflers will be used on equipment to reduce potential environmental interactions between noise and wildlife.
- Full cut-off lighting will be used during Construction to reduce attraction to migrating birds.
- Clearing activities will be restricted to the minimum amount required, particularly around wetlands.

- Standard erosion and sedimentation control measures will be employed, particularly to avoid silt laden runoff into wetlands.
- Standard dust control measures will be implemented to avoid siltation of wetlands.
- Quarried, crushed material will be used for road building in and near wetlands, to reduce the risk of introducing or spreading exotic and/or invasive vascular plant species.
- All equipment will arrive at the site clean and free of soil or vegetative debris.
- Vehicles and equipment will be operated on previously disturbed areas, wherever feasible.
- The size of temporary workspaces will be limited.
- Construction site wastes that might attract wildlife will be properly stored and disposed of.
- The project will allow natural regeneration when possible, and when not possible, a native seed mix will be used for revegetation.
- Disturbance of all wetlands will be avoided to the extent possible, and where avoidance is not possible, NB Power will compensate for the permanent net loss of wetland function (for GeoNB-mapped wetlands) according to a plan to be developed in coordination with, and approved by, NBDELG.

The mitigation described above will limit the potential adverse interactions between the Construction stage of Project and vegetation communities and wildlife habitat, including wetlands, and will also reduce the potential for wildlife mortality that might be caused by the Project. Some loss of vegetation communities and wildlife habitat is unavoidable if the Project is to proceed, and while not planned, it is possible that some mortality of wildlife could occur, but the mitigation will reduce potential interactions with the Terrestrial Environment. Vegetation communities and habitat for wildlife species will remain available in the surrounding landscape.

4.3.4.3.2 Operation and Maintenance – New 138 kV Transmission Line and New Substation

Operation and Maintenance activities have the potential to result in adverse environmental interactions through the loss of vascular plant and wildlife SAR and SOCC, a further change to vegetation communities and wildlife habitat (including wetland), sensory disturbance to wildlife resulting in habitat avoidance, and mortality of wildlife from electrocution and collision with transmission lines.

Vegetation management during the Operation and Maintenance phase could result in adverse environmental interactions through further change to previously disturbed vegetation communities and wildlife habitat (including wetlands). Vegetation within the PDA may provide nesting habitats for bird species, and if vegetation management occurs during breeding bird season, this could result in a Project-related mortality of unfledged birds.

Operation includes the presence of transmission lines and substation ground grid, which can lead to increased wildlife mortality, primarily of birds. The design of transmission lines can influence bird mortality through aspects such as inadequate spacing between energized conductors or inadequate space between energized conductors and grounded hardware. This is often found on medium-voltage distribution lines, which cause more electrocutions than transmission lines with adequate spacing between components. Most poles to be used for the Project are H-frame poles with 3.8 m between conductors. This distance provides adequate clearance for a large bird (APLIC and USFWS 2016).

Bird mortality can also occur through collisions. Calvert *et al.* (2013) recently estimated transmission line collision to be the third leading cause of human-related bird mortality in Canada. Waterfowl and

waterbirds are at greater risk of collision with transmission lines due to their higher wing loading (body weight relative to wing area), which limits their reaction time over other species of birds (APLIC 2012; Bevanger 1998; Rioux *et al.* 2013). Although no known migration pathways intersect the Project (Bird Nature n.d.) there is still potential that some migrating birds may pass through the area. Nocturnal migrants (i.e., most passerines) are generally high-flyers and are at low risk of suffering collision with transmission lines in flight. However, diurnal migrants, including waterfowl, waterbirds, and raptors, may fly at lower elevations during migration. Although these species are more susceptible to wire collision than many other birds (Erickson *et al.* 2001), there are no major waterfowl staging areas available near the PDA of Phase 1; thus, it is likely these species pass over at an elevation higher than the transmission line wires, limiting their potential for collision. Transmission line collisions, if they occur, will likely be limited to local movements of resident birds.

NB Power will reduce the potential for interactions between the Project and the Terrestrial Environment during the Operation stage by adhering to best management practices and the EPP. In addition to applicable Construction mitigation outlined in Section 4.3.4.3.1, the following well-established practices will be implemented during Operation and Maintenance.

- Vegetation management will be restricted to necessary areas, and mechanical means will be used wherever possible.
- Travel through wetlands for the purposes of inspection or maintenance activities will be limited.
- Temporarily disturbed areas will be allowed to restore to pre-construction conditions.
- Invasive species will be managed through minimizing Operation activities in wetland areas and cleaning equipment before entering a wetland.
- NB Power will adhere to its Integrated Vegetation Management Plan (IVMP) (NB Power 2015), and will employ mechanical or hand clearing when possible, particularly within 30 m of wetlands.
- NB Power will comply with the vegetation management permit received from the NBDELG.

The mitigation described above will limit the potential adverse interactions between the Operation and Maintenance stage of Project and vegetation communities and wildlife habitat, including wetlands, and will also reduce the potential for wildlife mortality that might be caused by the Project. While not planned, it is possible that some mortality of wildlife could occur, but the mitigation will reduce potential interactions with the Terrestrial Environment.

4.3.4.3.3 Decommissioning and Abandonment – 69 kV Transmission Line 0028 and Existing Substation

Decommissioning and Abandonment of Line 0028 and the existing Kedgwick substation is unlikely to result in adverse environmental interactions with the Terrestrial Environment, but some adverse environmental interactions are possible. Based on aerial interpretation, there are approximately 1.3 ha of wetland within the PDA of Line 0028, of a variety of types. One pole is located within a wetland and three are located adjacent to wetlands. If Decommissioning and Abandonment takes place under non-frozen ground conditions, particularly in spring, the machinery used to remove poles and other existing infrastructure could damage or remove vegetation, and cause soil compaction and rutting, particularly in wetlands. This kind of soil disturbance can result in changes to wetland hydrology; alterations to wetland function are also possible.

It is possible that birds, including osprey, and some woodpeckers, may build nests on or in Project components such as transmission line poles. In these cases, Decommissioning poles may interact with nesting birds.

Similar to Construction, Decommissioning and Abandonment activities may result in sensory disturbance to wildlife species. Temporary habitat loss because of reduced habitat effectiveness may result if species avoid the area. Additionally, breeding and rearing success of some wildlife species may be decreased by sensory disturbance (Bayne *et al.* 2008).

Reclamation activities will result in an increase in native vegetation communities and wildlife habitat, relative to the Operation and Maintenance phase, allowing vegetation regrowth to occur in the PDA for Phase 2, over time.

NB Power will reduce the potential for interactions between the Project and the Terrestrial Environment during the Decommissioning and Abandonment of Line 0028 and the existing substation by adhering to best management practices and the EPP. In addition to any applicable Construction mitigation outlined in Section 4.3.4.3.1 and Operation and Maintenance mitigation outlined in Section 4.3.4.3.2, the following well-established practices will be implemented during Decommissioning and Abandonment.

- Tracked machinery will be used to remove poles, to reduce soil compaction, rutting, and other ground disturbance.
- Decommissioning and Abandonment activities will occur under frozen ground conditions, if possible. If this is not possible, Decommissioning and Abandonment activities will not occur during spring, or other seasonally wet periods.
- Poles will not be accessed through wetlands except for cases where other access is not possible.
- Decommissioning and Abandonment activities will occur outside during the normal breeding season for migratory birds (April 1 to August 31).
- Nesting platforms will be provided during and following Decommissioning if stick nests are found on the poles.

The mitigation described above will limit the potential adverse interactions between the Decommissioning and Abandonment stage of Project and the Terrestrial Environment.

4.3.4.4 Summary for the Terrestrial Environment

With mitigation and environmental protection measures, it is not anticipated that there will be any substantial interaction between the Project and the Terrestrial Environment during all phases. The Project as planned is not anticipated to result in any substantial changes in vegetation communities or wildlife habitat within the LAA, and no SAR or SOCC (vascular plant or wildlife) are expected to be lost as a result of the Project as planned. Regulated wetland lost because of the Project will be compensated for, as discussed in Section 4.3.4.1.

4.3.5 Socioeconomic Environment

This section describes potential environmental interactions between Construction, Operation and Maintenance, and Decommissioning and Abandonment of the Project and the Socioeconomic Environment.

4.3.5.1 Scope of Assessment

The Project has the potential to interact with the Socioeconomic Environment, which includes land use, the economy, transportation, and infrastructure and services.

Land use refers to current and future uses of public and private land and resources. It includes uses such as industrial and commercial use, private ownership, and the use of land for recreational purposes. For the Socioeconomic Environment, the potential interactions between the Project and the current use of land (both public and private), the economy, transportation, and infrastructure and services in the PDA and LAA are considered.

The scope of the assessment is based on applicable regulations and policies, anticipated issues and concerns, existing knowledge and potential interactions. Aboriginal engagement related to the Current use of Land and Resources for Traditional Purposes by Aboriginal peoples is discussed separately in Section 4.3.7. Additionally, the terrestrial environment and local heritage resources as they relate to the socioeconomic environment are also discussed separately, in Sections 4.3.4 and 4.3.6 respectively.

4.3.5.1.1 Boundaries

4.3.5.1.2 Spatial Boundaries

The assessment of potential environmental interactions with the Socioeconomic Environment encompasses two spatial boundaries: Project Development Area (PDA) and Local Assessment Area (LAA).

Project Development Area (PDA)

The PDA is the immediate area encompassing the Project footprint, and is limited to the anticipated area of physical disturbance associated with the Construction, Operation and Maintenance, and Decommissioning and Abandonment of the Project. The PDA includes the footprint of the 5.3 km-long, 30 m-wide RoW for the new 138 kV transmission line to be constructed and the 0.18 ha footprint of the new Kedgwick substation The PDA also includes the footprint of the existing substation, and the RoW for Line 0028, both of which will be decommissioned as part of the Project. The PDA is illustrated in Figure 2.1. The PDA is illustrated in Figure 2.1.

Local Assessment Area (LAA)

The LAA for the Socioeconomic Environment includes the PDA plus an additional 500 m perimeter around the PDA, resulting in a 1 km wide corridor surrounding the transmission line route. The LAA for the Socioeconomic Environment is illustrated in Figure 4.6.

4.3.5.1.3 Temporal Boundaries

Temporal boundaries identify when an interaction is evaluated in relation to specific Project phases and activities. The temporal boundaries for the assessment of the potential interactions of the Project on the Socioeconomic Environment include the following periods:

- Construction – anticipated to be seven months in spring to fall 2017;
- Operation and Maintenance– approximately 50 years or the end of useful life; and,
- Decommissioning and Abandonment – anticipated to last three months.

4.3.5.2 Existing Conditions for Socioeconomic Environment

4.3.5.2.1 Overview

The new 138 kV transmission line and new substation, as well as the existing transmission line 0028 and existing substation, are located in the rural community of Kedgwick, within Restigouche County, New Brunswick. Combined with Gloucester and Northumberland Counties, the area makes up the Northeast Economic Region of the province (GNB 2013a). Of the estimated 158,741 people who live in this region, approximately 20.5% of them are settled in Restigouche County (NBPETL 2013). The Northeastern region is the province's largest geographic area, but has the lowest population density (NBPETL 2013).

In 2012, approximately 40% of the Northeast region was part of the core working age population but had an employment rate of 45.9%, well below the New Brunswick average of 56.6% (NBPETL 2013). The largest labour force in this region was the private, services-producing sector (accounting for upwards of 40% of employment), followed by the public sector (including healthcare and social assistance, education services and public administration) which accounted for approximately 32.2% of the labour force (NBPETL 2013). Key industries driving the economy in the Northeast include trade, forestry, fishing, mining, quarrying, oil and gas, and manufacturing (GNB 2013a).

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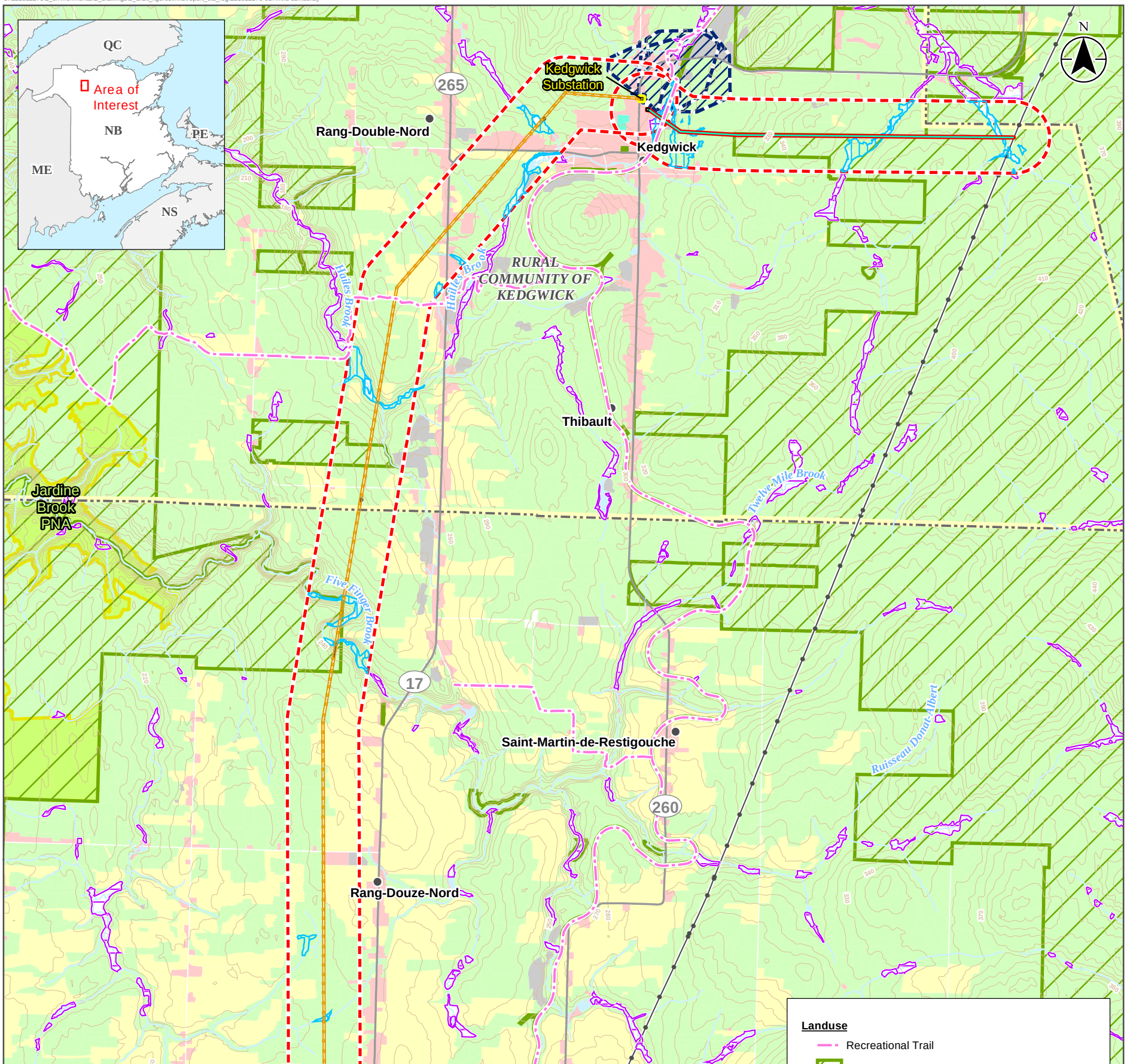

Sources: Project data provided by NB Power. Base data provided by the Governments of Canada, and the Government of New Brunswick.

Disclaimer: This map is for illustrative purposes to support this project; questions can be directed to the issuing agency.

Local Assessment Area for Socio-Economic

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121812276 - KEDGWICK TRANSMISSION LINE - NEW BRUNSWICK POWER CORPORATION

Figure 4.6

Property ownership within the LAA of the new 138 kV transmission line (Phase 1) is primarily private land (345.1 ha), with Crown land occupying 281.8 ha. Consistent with the key industries in the area, about 550 ha of land within the LAA of Phase 1 is forested, primarily with immature softwood and sapling hardwood trees. Approximately 8.81% of the area is being used for anthropogenic purposes (buildings, residential and industrial purposes, transportation, utilities, and recreation) as well as agricultural uses.

The existing transmission line 0028 crosses one major road, Route 17; however, one additional major road, rue St. Camille, and 12 minor/local roads are located within the LAA.

Fishing is a popular recreation activity in the Kedgwick and Restigouche Rivers. These rivers are located in close proximity to the rural community of Kedgwick, though neither pass through the Project PDA. The RoW contains three small (less than 30 m wide) watercourses, including Hailes Brook, which may be used for recreational fishing. Fish species in these watercourses are discussed further in the Freshwater Fish and Fish Habitat section (Section 4.3.3).

Hunting is also a popular recreational activity in the region. The LAA is located within New Brunswick Wildlife Management Zones (WMZ) 4 and 6, which are typically open for deer, game bird, varmint, small game, moose, and bear hunting (GNB 2013b). In 2016, a combined total of 687 moose licenses were issued for WMZ 4 and 6, which were among the most licensed zones in the province (GNB 2016c). Deer hunting season was closed for WMZ 4 in 2015, but remained open in WMZ 6 from October 3 (archery season) and October 24 (firearm season) to November 19. More information on the wildlife species observed in the LAA is discussed in Section 4.3.4.2. Historic hunting activities by Indigenous populations and early European settlers are discussed further in Section 4.3.6.

Services, including regional and local land use planning, emergency measures planning and solid waste management, within the rural community of Kedgwick are the responsibility of the Restigouche Regional Service Commission (Regional Service Commission 2). The commission is also responsible for the planning and cost-sharing of major sport, recreational and cultural facilities within the region. One recreational site, a sports field, was identified within the LAA for use by the rural community of Kedgwick. One trail, a portion of Zone 8 of the New Brunswick Trail system (and also a component of the International Appalachian Trail), crosses through the PDA (Conseil Sentiers NB Trails Council Inc. 2016).

Policing services in the Kedgwick area are under the control of the Royal Canadian Mounted Police, with the nearest detachment located approximately 18 km away in Saint-Quentin, NB. Fire services are provided by the rural community of Kedgwick which staffs a fire chief, one assistant fire chief, three captains and three lieutenants, a security and monitoring officer and a six-person administrative team, as well as 13 volunteer firefighters. Health services, including mental health, extra-mural programs, and addictions treatment programs, are provided by the Réseau de Santé Vitalité Health Network. The Kedgwick Medical Clinic, a part of the Vitalité Health Network is located within the rural community and staffs three family physicians, while the nearest hospital, the Hôtel-Dieu Saint-Joseph de Saint-Quentin, is located in Saint-Quentin.

4.3.5.3 Potential Environmental Interactions with Socioeconomic Environment

This section describes how the Project activities could interact with the Socioeconomic Environment as well as the techniques and practices that will be applied to mitigate these potential interactions.

4.3.5.3.1 Construction – New 138 kV Transmission Line and New Substation

Construction of the proposed 138 kV transmission line and new substation are expected to employ a small contingent of skilled workers. If hiring of the labour force takes place in the immediate vicinity of the Project, this could provide a small economic benefit to the area. Should workers from outside of the Kedgwick area be employed on the Project, local businesses, particularly restaurants and accommodations, could experience a positive economic benefit from the increased use of their services. Due to the size of the Project, any interaction with the local economy during Construction is expected to be relatively small and short in duration. Because of the expected small crew size and short duration of the work, the Project is not expected to put an increased demand on emergency services, the housing market, or other infrastructure and services in the area.

The proposed new 138 kV transmission line, new substation, and their corresponding PDA are adjacent to a major roadway, but do not cross any major roads, while a portion of the existing transmission line 0028 crosses New Brunswick Route 17. Due to the proximity of the new 138 kV transmission line to a major roadway and the crossing of Route 17 by the existing transmission line 0028 (to be decommissioned), minor traffic disruptions during Construction and Decommissioning may occur. These disruptions are expected to take place in a single interaction of short duration and no further disruption to transportation is anticipated. Should construction vehicles carrying heavy loads be required to travel existing roads to the construction site, the appropriate permits will be obtained in advance of this work.

Changes to land use are expected along the new RoW, particularly throughout the RoW for the transmission towers. Because much of the area is forested, with mature hardwood and mixedwood trees as well as immature softwood and sapling hardwoods, trees will need to be cleared for access as well as within the entire 5.3 km-long, 30 m-wide RoW. Wherever possible, NB Power will avoid placing transmission towers within land currently being used for agricultural purposes, minimizing the impact to these lands during construction. For safety reasons, recreational land uses such as snowmobiling and ATV use and hunting will be restricted during construction. Hunting disruptions are expected to take place in a single interaction of short duration with no ongoing disruptions anticipated.

There are no changes in land use anticipated for the footprint of the new substation as it will be built on a previously disturbed site.

Interaction with the Socioeconomic Environment during Construction will be managed through the use of standard mitigation measures. These measures are described below.

- Owners of private land will be consulted prior to Construction.
- The New Brunswick Trappers Association will be consulted prior to Construction and NB Power will work with owners of established traplines to discuss their concerns.
- All cleared merchantable timber will be sold by the contractor and any remaining cleared vegetation will be stockpiled or used for corduroy access.

- Sites requiring little or no modification, such as forestry landings or harvested fields, will be used for temporary staging areas.
- Activities will be managed by NB Power in accordance with its Environmental Protection Plan.
- NB Power will communicate schedules for Project activities, particularly those related to clearing activities and related access restrictions.
- Access restrictions will be defined in advanced and will be limited in size to reduce the interactions with land and resource users.

4.3.5.3.2 Operation and Maintenance – New 138 kV Transmission Line and New Substation

The Operation and Maintenance of the new 138 kV transmission line and new substation is expected to have minimal interactions with the Socioeconomic Environment with no changes to the economy, transportation, or infrastructure and services once these facilities are in operation. Vegetation management activities within the RoW will limit vegetation growth, preventing further maturation and harvesting, but will be restored upon Decommissioning at the end of its useful life. If agricultural lands are incorporated into the RoW, and are able to be avoided during the placement of transmission towers, fields of low-growing crops and hayfields will be allowed to continue as such throughout the operation and maintenance of the transmission line. The use of lands along the RoW for recreational purposes such as snowmobiling and ATV use is currently not encouraged by NB Power; however, the decision to allow access to the RoW for such purposes is ultimately at the discretion of the property owner.

4.3.5.3.3 Decommissioning and Abandonment – 69 kV Transmission Line 0028 and Existing Substation

The Decommissioning and Abandonment of line 0028 and existing substation is expected to have an economic benefit similar to that anticipated during Construction due to the temporary hiring of workers for the Project. Interactions with transportation will continue to be temporary (when work is being completed adjacent to roadways) and short in duration. Land use that was affected by the placement of transmission towers will be allowed to return to its former land use (e.g., agriculture) or near natural state, following the removal of these structures.

Where applicable, hunting will be restricted during Decommissioning and Abandonment activities for safety reasons. These disruptions are expected to take place in a single interaction of short duration and no further disruption to hunting or other recreational land uses are anticipated. As decommissioning activities are anticipated to occur outside of the normal bird breeding season of April 1 to August 31 (Section 4.3.4.3.1), and there is little agricultural activity outside of this period, there are no disruptions expected to occur with respect to agricultural land uses.

4.3.5.4 Summary for Socioeconomic Environment

With mitigation and the avoidance of agricultural lands for the placement of transmission towers as well as environmental protection measures such as obtaining appropriate permits and restricting access for safety reasons during Construction activities, there will not be a substantial interaction between the Project and the socioeconomic environment during all phases of the Project. Hiring workers during

Construction will provide an enhanced benefit to the local economy. The Project is not expected to place an exceeding demand on local transportation or existing infrastructure and services.

4.3.6 Heritage Resources

This section includes an analysis of potential environmental interactions between Construction, Operation and Maintenance, and Decommissioning and Abandonment of the Project and Heritage Resources.

4.3.6.1 Scope of Assessment

Heritage Resources are those resources, both human-made and naturally occurring, related to human activities from the past that remain to inform present and future societies of that past. Heritage resources are relatively permanent, although highly tenuous, features of the environment. If heritage resources are present, their integrity is highly susceptible to construction and ground-disturbing activities. Heritage Resources has been selected as a VC in recognition of the interest of: provincial and federal regulatory agencies who are responsible for the effective management of these resources; the general public as a whole; and First Nations that have an interest in the preservation and management of heritage resources related to their history and culture. For this VC, Heritage Resources include consideration of historical, archaeological, built heritage, and palaeontological resources. Heritage Resources will focus on archaeological, built heritage, and palaeontological resources, as all resources that would be understood to be "historical" are captured under one of the other heritage resource types.

Any Project activity that includes surface or sub-surface ground disturbance has the potential for interaction with Heritage Resources, where they are present. Accordingly, Construction represents the Project phase with the greatest potential for interaction with Heritage Resources, as it is during this phase that the majority of the ground breaking and earth moving activities of surface soils will take place to construct Project components.

Heritage resources in New Brunswick are regulated under the *Heritage Conservation Act*. The regulatory management of heritage resources falls under the New Brunswick Department of Tourism, Heritage and Culture, and is administered by its Archaeological Services Unit (for archaeological resources), Historic Places Section (for built heritage resources), and Natural Sciences Section (for palaeontological resources).

The review for Heritage Resources has been undertaken through the completion of historical, archaeological, built heritage, and palaeontological research. The Province of New Brunswick does provide some guidance for conducting heritage assessments, such as the *Guidelines and Procedures for Conducting Professional Archaeological Assessments in New Brunswick* (the "Archaeological Guidelines"; Archaeological Services 2012).

Consultation and engagement activities have been ongoing as part of the Heritage Resources component of the Project. During the background research for Heritage Resources, regional experts,

and regulatory agencies were contacted in order to gather information on potential Heritage Resources within the PDA (Table 4.9).

Table 4.9 Experts Consulted as Part of Engagement Activities for Heritage Resources

Name of Expert	Affiliation
Archaeological Services Staff Members (various)	Archaeological Services – New Brunswick Department of Tourism, Heritage and Culture
Dr. Randall Miller	Curator, Geologist, New Brunswick Museum
Gilles Bourque	Manager, Historic Places and Toponymy Unit– New Brunswick Department of Tourism, Heritage and Culture

NB Power has initiated First Nations consultation for the Project. As the engagement process progresses, any areas of interest and concern regarding heritage resources expressed by First Nations representatives, with respect to the potential for them to be located within the PDA, will be taken into consideration.

Consultation has occurred with staff at Archaeological Services, New Brunswick Department of Tourism, Heritage and Culture. This consultation involved requesting and reviewing the provincial archaeological potential maps and map data to identify registered archaeological sites and heritage resources in the Archaeological Services Sites Database, identifying any potential Palaeo-shorelines, and areas of elevated archaeological potential within, or potentially interacting with, the PDA. Additionally, an Archaeological Field Research Permit (AFRP) application, detailing the methodology to be employed in the Archaeological Impact Assessment for the Project, was submitted to, and approved by, Archaeological Services.

Consultation has occurred with Dr. Randall Miller, Curator at the New Brunswick Museum, to discuss any concerns with respect to palaeontological resources. No specific concerns were expressed by Dr. Miller who noted that there are no known fossil occurrences in the PDA. Dr. Miller did note that the age of the bedrock in the PDA was determined by the presence of microfossils which are not included under the *Heritage Conservation Act* as requiring a permit to collect or disturb (Miller 2016).

Consultation has occurred with Mr. Gilles Bourque, Manager of the Historic Places and Toponymy Unit, to discuss local heritage sites. Mr. Bourque noted that the only registered historic place near the PDA is the Former Kedgwick Railway Station which is located over 1 km away from the PDA.

No other issues were raised by individuals who were contacted regarding the assessment of Heritage Resources for the Project.

4.3.6.1.1 Boundaries

4.3.6.1.1.1 Spatial Boundaries

The assessment of potential environmental interactions with Heritage Resources encompasses two spatial boundaries: Project Development Area (PDA) and Local Assessment Area (LAA).

Project Development Area (PDA)

The PDA is the immediate area encompassing the Project footprint, and is limited to the anticipated area of physical disturbance associated with the Construction, Operation and Maintenance, and Decommissioning and Abandonment of the Project. The PDA includes the footprint of the 5.3 km-long, 30 m-wide RoW for the new 138 kV transmission line to be constructed and the 0.18 ha footprint of the new Kedgwick substation. The PDA also includes the footprint of the existing substation, and the RoW for Line 0028, both of which will be decommissioned as part of the Project. The PDA is illustrated in Figure 2.1.

Local Assessment Area (LAA)

The LAA for Heritage Resources is limited to the PDA, as it is only construction and ground-disturbing activities that could interact with heritage resources located in that area. Heritage resources located outside of the PDA will not be directly affected by the Project and are not considered further in this assessment. The PDA, which is the LAA for Heritage Resources, is illustrated in Figure 2.1.

4.3.6.1.1.2 Temporal Boundaries

The temporal boundaries for the assessment of the potential environmental interactions of the Project on the Heritage Resources include the following periods:

- Construction – anticipated to be seven months in spring to fall 2017
- Operation and Maintenance – approximately 50 years or the end of service life
- Decommissioning and Abandonment – anticipated being three months

Particular emphasis is placed on Construction as that is the phase where most new ground disturbance of surface soils associated with the Project are conducted.

Ground disturbing activities are not anticipated during the Operation and Maintenance phase of the Project, or during Decommissioning and Abandonment of Line 0028. Therefore, should any sub-surface heritage resources be present within the RoW, they will not be affected or disturbed during these phases of the Project and are not considered further in this assessment. However, contaminated soils (if present) could be removed during the Decommissioning and Abandonment of the existing Kedgwick substation.

4.3.6.2 Existing Conditions for Heritage Resources

Archaeological resources, palaeontological resources, and built heritage were considered when describing existing conditions as part of this VC.

4.3.6.2.1 Archaeological Resources

A review of the Archaeological Potential Map (Archaeological Services 2016) did not identify any Pre-Contact Period or Historic Period archaeological sites within the PDA.

In addition to the background research, a walkover survey of properties within the PDA was conducted in June 2016. During the course of the walkover survey, one linear stone feature was identified within the

PDA. Additional features were identified on the same property, outside of the PDA, and included one linear stone feature, one rock-lined cellar feature, one rock-lined well feature, and three rock-lined depressions. A second survey was conducted in November 2016 for a portion of the PDA that had been realigned since the initial survey in June. During the second survey, one additional linear stone feature was identified. Additional research was conducted on both sites and resulted in the registration of two archaeological sites with the Province.

In addition to the stone features, three watercourse crossings and one landform feature were identified as holding elevated potential for heritage resources, and will be recommended for further mitigation (i.e., shovel testing) (Figure 4.7).

4.3.6.2.1.1 Pre-Contact Period Resources

A review of the Archaeological Potential Map for the Project revealed that there are no known Pre-contact archaeological sites located inside of the PDA (Archaeological Services 2016). According to the Archaeological Services Potential Map, there are no areas within the PDA that cross potential Palaeo-shorelines. However, it should be noted that there is the potential to encounter post glacial landforms, especially in areas adjacent to glaciofluvial outwash and glacial drainage, as identified by the surficial geology of the PDA (NBFME 1976; Rampton et al.1984).

Archaeological evidence from Debert, Nova Scotia, and Pennfield, New Brunswick, indicates that the first peoples to inhabit modern day New Brunswick likely arrived in the region at the end of the Pleistocene (McMillan and Yellowhorn 2004; Suttie *et.al* 2013). Much of northwestern New Brunswick would have remained under glacial ice sheets until around10,600 years before present (BP). After that time the retreating glaciers would have opened the land for human occupation and early Indigenous populations could have settled the PDA (Bonnichsen *et.al* 1985; Cwyner *et.al* 1994).

The PDA lies near the border of the traditional territory of the Indigenous people of the Wolastoqiyik (Maliseet) and Mi'kmaq First Nations. The name Kedgwick derives its original from *Madawamkedjwik,* the Mi'kmaq name for the river (Hamilton 1996; Rayburn 1975). Indigenous populations who inhabited the northwestern part of New Brunswick would have likely travelled across this area while hunting for the various fauna occupying the landscape by using one of the major portage routes that linked the Saint John, Restigouche, and Nepisiguit Rivers (NBDNR 2007). The portage between the Saint John and the Restigouche was known as the most travelled of all routes across New Brunswick and involved canoeing from Grand River up to Wagansis, followed by a two or three mile portage to Wagan Brook, which flows into the Restigouche (Ganong 1899). According to Ganong, another portage (which has an "old and new path") links the Saint John and Restigouche River watersheds through a difficult portage between the Pemouit (or 4th) branch of the Green River and the Southwest branch of the Kedgwick River (Bailey 1894; Cooney 1832; Ganong 1899; Wilkinson 1852). Neither of these portage routes are located within the PDA for the Project.

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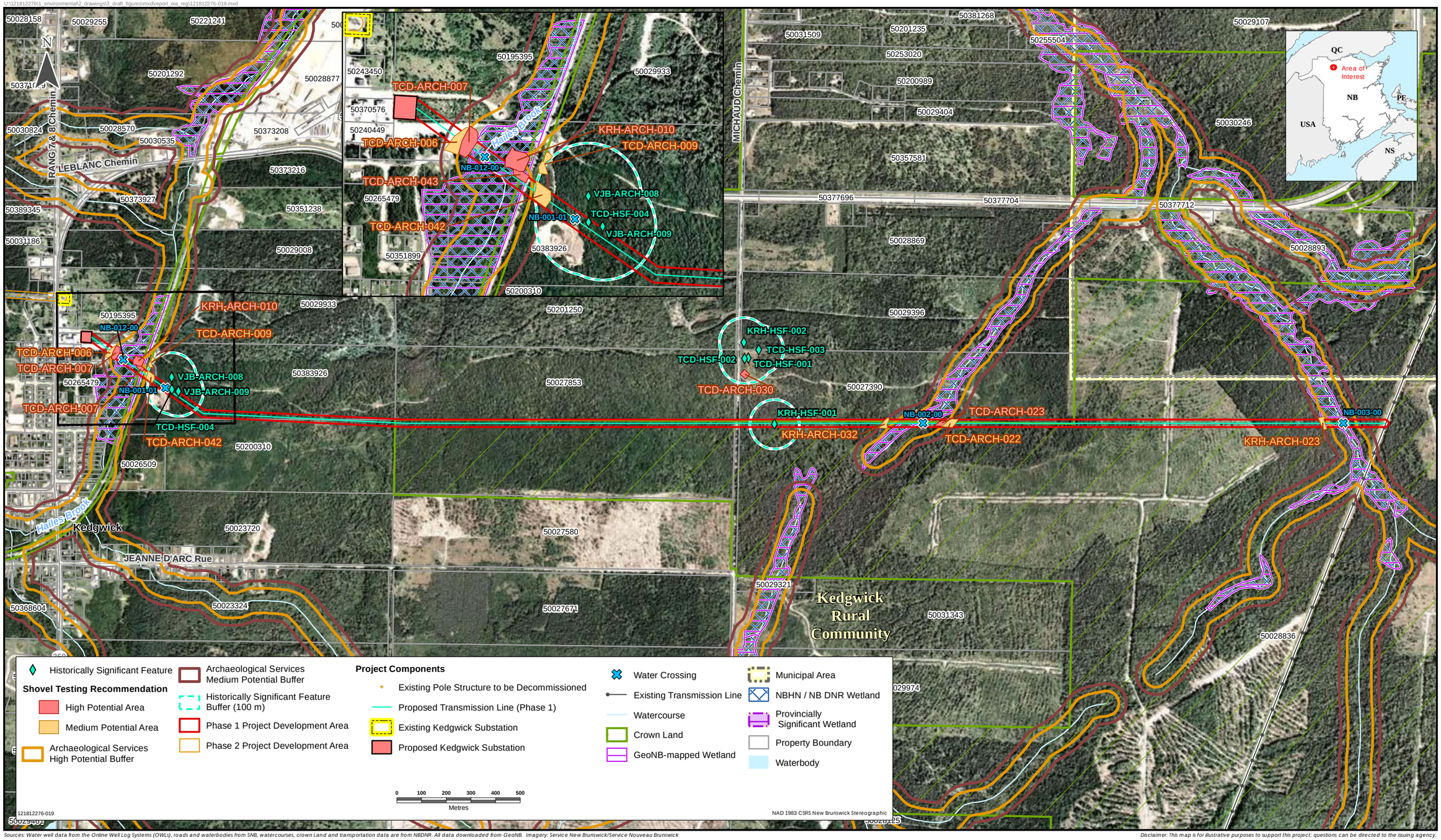

Sources: Water well data from the Online Well Log Systems (OWLs), roads and waterbodies from SNB, watercourses, crown Land and transportation data are from NBDNR. All data downloaded from GeoNB. Imagery: Service New Brunswick/Service Nouveau Brunswick

Disclaimer: This map is for illustrative purposes to support this project; questions can be directed to the issuing agency.

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Shovel Testing Recommendations and Archaeological Features

Figure 4.7

4.3.6.2.1.2 Historic Period Resources

A review of the Archaeological Potential Map for the Project (Archaeological Services 2016) revealed that there are no known historic period archaeological sites located inside the proposed PDA. While no documented sites were identified in the general area of the Project, it should be noted that early Euro-Canadian settlers began occupying the land in this area in the early 20th century. The PDA is located along the major transportation corridor between the communities of Saint-Léonard and Campbellton. Forestry has been, and remains, the main industry in the Kedgwick area (NBPA 2016a; Rayburn 1975). The Tobique and Restigouche Rivers, as well as their tributaries, were logged extensively throughout the 1800's by European immigrants.

Permanent settlement by Europeans did not occur until after the International Railway was completed between Saint-Léonard and Campbellton. In 1910, with the construction of the railway complete, the ecodistrict's interior flourished with the establishment of villages such as Saint Quentin and Kedgwick and the boom of the timber industry (Soucoup 2010). The earliest land grants in the PDA were issued to Anicet St. Glais, Damase Chartier, and Adelard Dumoulin between 1918 and 1922 (NBPA 2016b, NBPA 2016c, NBPA 2016d). Some mixed farming has occurred throughout the ecodistrict, dominated mainly by potato production. The forested areas of the ecodistrict are divided between industrial freehold land, small private woodlots, and Crown land with the economy relying on forestry, agriculture, hunting, fishing, and tourism to survive (Hamilton 1996; NBDNR 2007; Rayburn 1975).

4.3.6.2.2 Palaeontological Resources

A palaeontological report based on known data sources within the PDA, was prepared by the New Brunswick Museum (Miller 2016). The report states there are no known fossil localities located within the PDA. Dr. Miller noted that geological formations along the PDA are Ordivician Age sedimentary rocks of marine origin and that these formations whose age was determined by the presence of microfossils called chitinozoia. These microfossils are not included under the *Heritage Conservation Act* as requiring a permit to collect or disturb (Miller 2016).

4.3.6.2.3 Built Heritage Resources

A search of the Canadian Register of Historic Places (Parks Canada Agency 2016) and the New Brunswick Register of Historic Places (NBTHC 2016) revealed that no historic places or heritage sites are located within or near the PDA. The only historic place located in the Kedgwick area is the former CN Railway Station which is located over 1 km away from the PDA.

4.3.6.3 Potential Environmental Interactions with Heritage Resources

This section describes how the Project activities could interact with Heritage Resources as well as the techniques and practices that will be applied to mitigate these potential interactions.

4.3.6.3.1 Construction – New 138 kV Transmission Line and New Substation

During Construction, activities that could result in a potential interaction with Heritage Resources include: site preparation, and excavation and structure assembly. Though the RoW will be cleared for

the Project, ground breaking and earth moving activities will be limited to the areas where excavations are carried out to place the transmission line poles (i.e., two 1 m diameter holes for each of the approximately 68 H-poles within the new section of the RoW). Construction activities associated with the new substation are planned in an areas of previous industrial disturbance (i.e., site is already cleared and has been used for commercial or industrial use). At this time, no excavation activities are planned for the construction of the new substation and it is expected that the site will be built up using fill materials. Archaeological resources, where present, are typically located in the upper soil layers of the earth and therefore potential interactions between these resources, if they are present, and the Project would take place during Construction. Any potentially adverse interactions with Heritage Resources that might occur due to Construction activities will be permanent, as no archaeological site can be returned to the ground in its original state.

Vegetation clearing for the Project will largely be carried out by mechanical means and has the potential to interact with Heritage Resources as these activities may result in some ground disturbance, as a result of rutting along the RoW. Where access and staging occurs, there is the potential for the use of heavy equipment which may also cause rutting resulting in ground disturbance and potential interaction with subsurface Heritage Resources. Excavation and structure assembly involve mechanical augering, excavation, or blasting all of which have the potential to interact with Heritage Resources.

Activities listed under Construction that are not anticipated to interact with Heritage Resources include: conductor stringing, connection of the transmission line, inspection and energization, and clean-up/revegetation. Clean-up and revegetation may involve back blading, but will occur within the existing previously disturbed construction footprint and thus, no new ground disturbing activities will occur., conductor stringing, connection of the transmission line, and inspection and energization of the transmission lines will not involve ground breaking activities; therefore, no interactions with Heritage Resources will occur from these activities and they are not considered further in this assessment.

Two archaeological sites were encountered during the field assessments; however, it is anticipated that these features will be avoided during the design and planning phase. Therefore, the potential for interactions of the Project on built heritage resources as a component of Heritage Resources during all phases of the Project is not considered further in this assessment.

The following mitigation measures, through careful design and planning, will be implemented to avoid or reduce the potential for adverse interactions with Heritage Resources:

- Planned avoidance (e.g., transmission tower placement) of areas of elevated potential will be implemented for archaeological resources identified during the walkover survey;
- Shovel testing as per the Archaeological Guidelines, where avoidance is not practicable, will be implemented to identify potential sites in areas determined to have elevated potential for archaeological resources;
- Additional mitigation, as required, will be developed with provincial regulators;
- Archaeological monitoring will be implemented in areas where shovel testing is not practicable; and,
- A heritage resource discovery response procedure outlined in NB Power's EPP (NB Power 2012) will be followed during all phases of the Project.

4.3.6.3.2 Operation and Maintenance – New 138 kV Transmission Line and New Substation

During Operation, it is anticipated that there will be no interaction between Heritage Resources and any equipment brought onto the RoW during Vegetation Management. In the unlikely event that a heritage resource is discovered during this activity, NB Power would implement the Archaeological and Heritage Resources Contingency Plan in the NB Power EPP (NB Power 2012) and contact the appropriate regulating agency to assess the discovery and develop appropriate mitigation.

Maintenance of hardware in the form of ground and air line inspections will not result in ground disturbance and, therefore, a potential environmental effect on Heritage Resources is not anticipated.

4.3.6.3.3 Decommissioning and Abandonment – 69 kV Transmission Line 0028 and Existing Substation

The activities associated with the Decommissioning and Abandonment of line 0028 will occur within the existing footprint of the RoW and no new ground disturbing activities are expected to take place. The Decommissioning and Abandonment of the existing Kedgwick substation may require the removal of contaminated soils and fill material, if they are found to be present; however, no environmental interactions with Heritage Resources would be expected to occur.

4.3.6.4 Summary for Heritage Resources

With mitigation and environmental protection measures, there will not be any substantial interaction between the Project and Heritage Resources during all phases of the Project. Two linear stone features were identified within the PDA during the field assessments. If avoidance of these features during Construction is not possible, additional mitigation may be required, in consultation with provincial regulators.

4.3.7 Current Use of Land and Resources for Traditional Purposes by Aboriginal Persons

This section includes an analysis of potential environmental effects between Construction, Operation and Maintenance, and Decommissioning and Abandonment of the Project and Current Use of Land and Resources for Traditional Purposes by Aboriginal Persons.

4.3.7.1 Scope of Assessment

Current Use of Land and Resources for Traditional Purposes by Aboriginal Persons is a VC because Aboriginal persons carry out traditional activities that use the land and resources as an integral part of their lives and culture. Included in this VC is the practice of hunting, trapping, fishing, gathering, and following Aboriginal customs, practices and traditions on ancestral lands. In this VC, "Current Use" is limited to the PDA as the area that will be directly affected by Project activities, within approximately the last 100 years of "living memory".

The PDA lies near the border of the traditional territory of the Indigenous people of the Wolastoqiyik (Maliseet) and Mi'kmaq First Nations. There are five First Nation communities located within 100 km of

the PDA (Figure 4.8); the closest community being the Listuguj Mi'gmaq First Nation in Québec (approximately 55 km northeast of the Project). This community was located in what is now New Brunswick until the community was moved across the Restigouche River to Québec in 1853 (NNI and NCFNG 2010). The proposed route for new 138 kV transmission line, as well as that of the existing Line 0028, cross both private and Crown land, with the majority (20.3 km) of the RoW for Line 0028 located on private land. While Indigenous people have a constitutionally protected right to practice their traditional activities on Crown or publicly-owned land (as those lands were not ceded as part of peace and friendship treaties with colonial Europeans), any current use activities that may be taking place on privately-owned land within the RoW are anticipated to be incidental (i.e., at the convenience of the private landowner and subject to landowner permission).

In addition to Crown land identified on Figure 2.1, all watercourses within the PDA and a section of the NB Trail that crosses the RoW are also considered Crown land. As these watercourses are considered Crown land, they include riparian rights by all members of the public including First Nations. Therefore, the ability to access and fish watercourses as well as to hunt and gather resources within the Crown portion of the RoW is also included in the assessment of Current Use of Land and Resources for Traditional Purposes by Aboriginal persons for this VC.

4.3.7.1.1 Boundaries

4.3.7.1.1.1 Spatial Boundaries

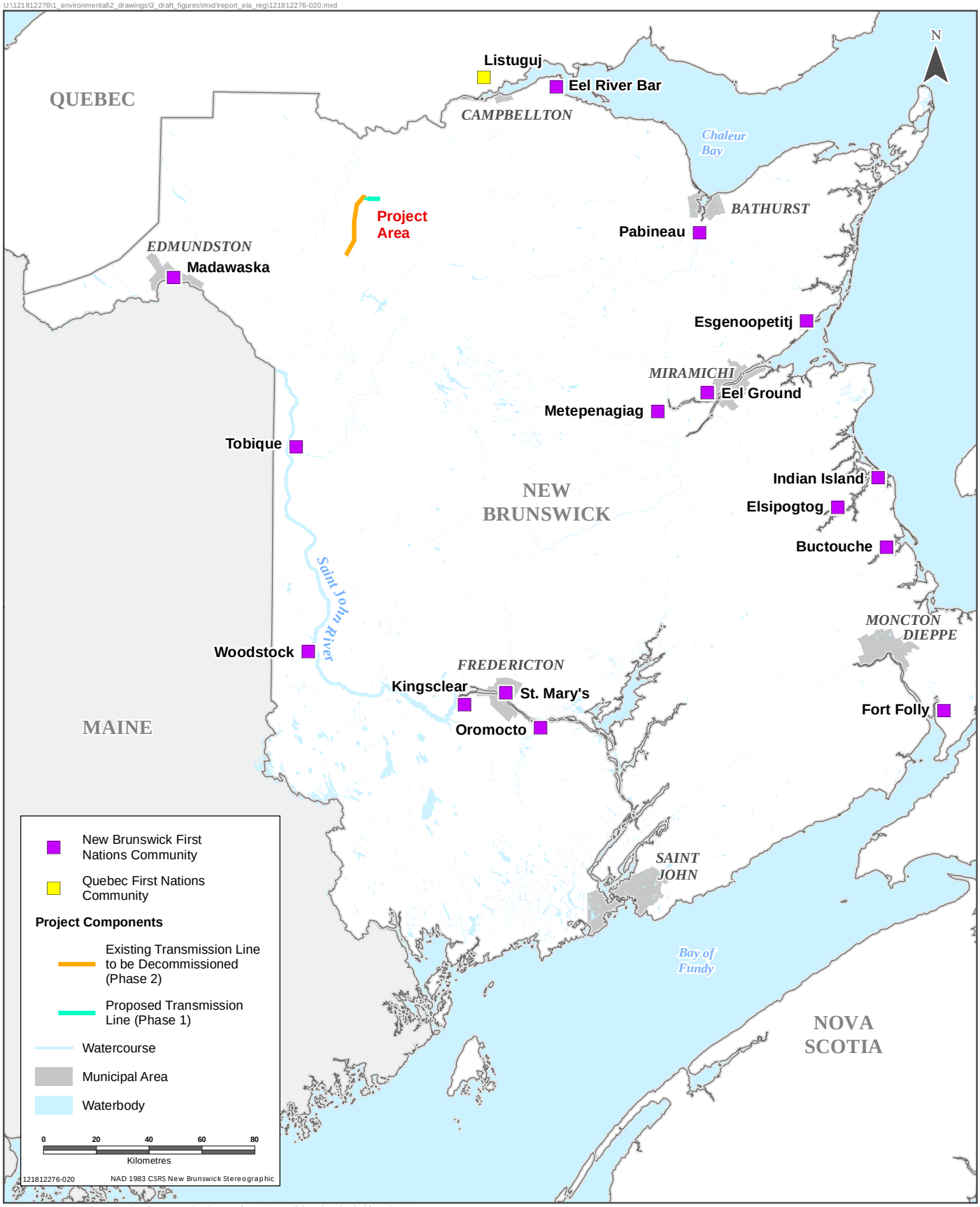
The assessment of potential environmental effects on the Current Use of Land and Resources for Traditional Purposes by Aboriginal Persons encompasses two spatial boundaries: Project Development Area (PDA) and Local Assessment Area (LAA).

Project Development Area (PDA)

The PDA is the immediate area encompassing the Project footprint, and is limited to the anticipated area of physical disturbance associated with the Construction, Operation and Maintenance, and Decommissioning and Abandonment of the Project. The PDA includes the footprint of the 5.3 km-long, 30 m-wide RoW for the new 138 kV transmission line to be constructed and the 0.18 ha footprint of the new Kedgwick substation. The PDA also includes the footprint of the existing substation, and the RoW for Line 0028, both of which will be decommissioned as part of the Project. The PDA is illustrated in Figure 2.1.

Local Assessment Area (LAA)

The LAA for Current Use of Land and Resources for Traditional Purposes by Aboriginal Persons for this Project is the same as the PDA and is limited to areas of Crown Land within the PDA, as it is not anticipated that potential environmental effects to the land and resources that may be used by First Nations persons will extend to beyond the PDA. The LAA for Current Use of Land and Resources for Traditional Purposes by Aboriginal Persons is illustrated in Figure 2.1.



Sources: Watercourses, Crown Land and Transportation data are from NBDNR. All data downloaded from GeoNB. First Nations points created from First Nations Reserve areas from SNB.

Disclaimer: This map is for illustrative purposes to support this project; questions can be directed to the issuing agency.

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New Brunswick First Nations Communities

Figure 4.8

4.3.7.1.1.2 Temporal Boundaries

Temporal boundaries identify when an environmental effect is evaluated in relation to specific project phases and activities. The temporal boundaries for the assessment of the potential environmental effects of the Project on Current Use of Land and Resources for Traditional Purposes for Aboriginal Persons include the following periods:

- Construction – anticipated to be seven months in spring to fall 2017;
- Operation and Maintenance – approximately 50 years or the end of useful life; and,
- Decommissioning and Abandonment – anticipated to three months.

4.3.7.2 Existing Conditions for Current Use of Land and Resources for Traditional Purposes by Aboriginal Persons

There are many areas in New Brunswick which have historical and cultural significance to Aboriginal people. These areas include locations where Aboriginal people continue to pursue traditional activities that are an element of a practice, custom, or tradition integral to the distinctive culture of the Aboriginal group.

Engagement activities with First Nation leaders and organizations in northern New Brunswick have been initiated by NB Power and are on-going. The exact nature, scope, and detail of First Nations engagement will be determined with the First Nation individuals and organizations involved. At this time, the discussion below should be considered preliminary as such engagement is ongoing. This discussion is derived primarily from information included in biophysical assessments associated with other VCs (e.g., Fish and Fish Habitat), in combination with information from a literature review, past project experience in relation to Current Use of Land and Resources for Traditional Purposes by Aboriginal Persons as documented through engagement of Aboriginal communities for those past projects, and professional judgment of the Stantec study team.

The reliance on other VC assessments is based on the assumption that assessments of resources such as fish, wildlife, and vegetation species can be used to inform an assessment of traditional land and resource-use activities. The assessment of effects on fish species for example, may not capture the conditions that influence the act of harvesting (e.g., personal choice); however, effects by the Project on the availability of such species will directly affect the current use of those species.

The majority of land within the PDA is forested or wetland and is primarily rural in nature. The RoW for the new 138 kV transmission line to be constructed crosses three mapped watercourses, including one unnamed tributary to Whites Brook and two unnamed tributaries to Hailes Brook. The RoW for the existing 69 kV transmission line to be decommissioned crosses six watercourses. Based on the literature review and field observations as outlined in the Freshwater Fish and Fish Habitat VC (Section 4.3.3), the watercourses crossed by the Project contain freshwater fish and fish habitat that are likely to support commercial, recreational, or Aboriginal (CRA) fisheries, including rearing and migratory habitat for Atlantic salmon, brook trout, and American eels. The PDA is located on both privately-owned land and on Crown land; however, at this time, it is not known if any traditional use activities are taking place within the PDA.

Should any information regarding First Nations current use be identified during the regulatory approval process for the Project, this information will be provided to the NBDELG.

4.3.7.3 Potential Environmental Interactions with Current Use of Land and Resources for Traditional Purposes by Aboriginal Persons

This section describes how the Project activities could interact with Current Use of Land and Resources for Traditional Purposes by Aboriginal Persons as well as the techniques and practices that will be applied to mitigate those potential interactions.

4.3.7.3.1 Construction – New 138 kV Transmission Line and New Substation

The Project could result in a change in Current Use of Land and Resources for Traditional Purposes by Aboriginal Persons if Project Construction activities result in temporary loss of access to resources on Crown land within the PDA.

During Construction, it is anticipated that activities that require the use of heavy equipment, including access and staging, excavation, structure assembly, anchoring, and conductor stringing, could result in temporary restrictions in access to portions of the RoW as well as the watercourses within the PDA. It is anticipated that temporary exclusion zones will be established for safety reasons and the need for heavy equipment to operate within the RoW and cross the watercourses. These exclusions zones could, during the Construction phase, result in a short-term restriction to Aboriginal fishing, harvesting hunting, gathering opportunities, and ceremonial activities (if practiced), within the PDA.

Vegetation clearing required for the RoW for the new transmission line and the new substation has the greatest potential to interact with Current Use of Land and Resources for Traditional Purposes by Aboriginal Persons as the removal of trees and shrubs within the PDA will result in the loss of vegetation communities and wildlife habitat that could be used for hunting and gathering opportunities. While the majority of the new transmission line will be constructed on privately-owned land, vegetation clearing required for the development of the RoW for the new 5.3 km-long 138 kV transmission line and the excavation for placement of poles will result in the loss of vegetation and trees and the consequential loss of wildlife habitat, and may also cause sensory disturbance to wildlife. These activities may affect current use if traditional activities are practiced there, on a short-term basis while construction is taking place. The lights and noise generated by construction equipment could result in reduced productivity or nest abandonment. These activities can also have subsequent indirect effects to wildlife habitat due to the changing habitat; however, most of the new RoW will be on privately-owned land (thus any traditional activities carried out by Aboriginal persons is at the convenience of the landowner), the cleared width of the RoW will be relatively narrow (i.e., typical maximum width of 30 m), the construction period will be relatively short-term, and similar wildlife habitat will remain adjacent to the RoW and surrounding area.

Vegetation clearing required for the Project may also result in the removal of some vegetative canopy (overhang) in the RoW, where it currently exists, which has the potential to result in a change in fish habitat (Freshwater Fish and Fish Habitat VC, Section 4.3.3) and potentially in vegetation habitat in the riparian areas. While complete clearing of the riparian zone is not likely (no in-water work will be done,

and any alteration within the 30 m watercourse buffer will be minimized and subject to a Watercourse and Wetland Alteration permit), it is likely that tall trees will be removed so as to not interfere with transmission conductors. Such an alteration in habitat may result in a change in the ability to participate in traditional activities, if practiced, at the specific RoW location for each watercourse, but given the limited amount of disturbance in the riparian zone (i.e., limited to the width of the RoW—30 m), a substantive change in availability of resources (e.g., fish) at these crossing locations is not likely.

Given the location of the new substation in a semi-urban setting within the former village limits, there is no likely interaction between the construction of the new substation and Current Use of Land and Resources for Traditional Purposes by Aboriginal Persons.

The mitigation for this VC relies on other assessments where terrestrial and aquatic resources may be affected by the Project.

Mitigation that will be implemented to protect habitats and species of traditional importance to Aboriginal people that may use land within the PDA for traditional purposes include the following:

- Measures used to mitigate the risk of fish mortality and fish habitat as included in the Freshwater Fish and Fish Habitat VC, Section 4.3.3.3.
- Measures used to mitigate a change in plants and vegetation and wildlife habitat or risk of wildlife mortality as included in the Terrestrial Environment VC, Section 4.3.4.3.
- Measures used to mitigate sites of cultural and/or ceremonial importance as included in the Heritage Resources VC, Section 4.3.6.3.

The changes to forest conditions as a result of the clearing of trees are not anticipated to affect wildlife or fish populations within or adjacent to the PDA. Traditional activities will be able to resume following the completion of Construction and Decommissioning activities. Signage will be placed on access roads used by construction equipment to warn the public of the activities in that area.

NB Power is committed to continuing engagement of, and dialogue with, First Nation groups that may have an interest in the Project by providing information about the Project and its potential environmental effects. Should any additional interaction be identified, appropriate mitigation will be developed in consultation with the affected First Nations and regulatory agencies as warranted. As engagement is ongoing, should traditional knowledge information become available, this information will be considered and residual effects on current use of land and resources for traditional purposes by Aboriginal persons will be reviewed.

4.3.7.3.2 Operation and Maintenance – New 138 kV Transmission Line and New Substation

During the Operation and Maintenance phase, Vegetation Management will consist of limiting the extent of revegetation within the RoW through manual and mechanical means, on a periodic basis (e.g., every five years). After the completion of the Construction phase, the vegetation communities and wildlife habitat within the 138 kV transmission line RoW will convert from primarily forest to tall shrub habitat (with periodic vegetation management to maintain access to the line and its safe operation), for the life of the transmission line. Species that prefer forested habitat will likely relocate to adjacent forested areas outside of the RoW, while different species than those that use the current forested

habitat will occupy the new habitat (Section 4.3.4.3.1). There is no critical habitat for any species at risk in the RoW for the new 138 kV transmission line, and there is an abundance of similar habitat nearby to the Project. Some larger mammal species such as deer may be drawn to the open area of the RoW as it revegetates with tall shrub. This could result in an environment suitable for hunting by Aboriginal people on the Crown land within the PDA, resulting in a positive environmental effect on Current Use of Land and Resources for Traditional Purposes by Aboriginal Persons. An additional benefit is that the presence of a cleared RoW for the new transmission line will facilitate access to areas that may be suitable to practice traditional activities, even though ATV or snowmobile use of transmission line corridors is generally not preferred by NB Power.

Vegetation management will be carried out periodically by NB Power. These activities could also result in some temporary restricted access to watercourses in the PDA used for fishing, plant harvesting, and ceremonial activities, if practiced there. Any interruption in access due to Vegetation Management would be infrequent and temporary.

During Operation and Maintenance activities, there could be brief restrictions to Aboriginal persons' access to the portions of Crown land within the PDA where equipment is operating (e.g., for vegetation maintenance), due to health and safety protocols. However, these restrictions will be brief and access would resume after the maintenance activities are completed.

4.3.7.3.3 Decommissioning and Abandonment – 69 kV Transmission Line 0028 and Existing Substation

During Decommissioning and Abandonment of the existing 69 kV transmission line 0028 and the existing substation, any activities that could temporarily restrict access to the Crown land portions within the PDA and watercourse crossings within the PDA could result in very brief access restrictions (e.g., a few days) to areas used for fishing, plant harvesting, and ceremonial activities by Aboriginal persons on any sections of Crown land.

Any interruption to access to the PDA will be very temporary and not affect areas immediately adjacent to the PDA, which would still be available for use. After Decommissioning activities are complete, any watercourses and the portion of the RoW on Crown land will be readily available for use so that traditional activities could resume following decommissioning. Over time, natural vegetation growth will occur in the formerly cleared RoW, such that vegetation and wildlife might return to this area and enable the resumption of traditional activities.

4.3.7.4 Summary for Current Use of Land and Resources for Traditional Purposes by Aboriginal Persons

With mitigation and environmental protection measures, it is not anticipated that there will be any substantial interaction between the Project and Current Use of Land and Resources for Traditional Purposes by Aboriginal Persons. The Project is not anticipated to result in large-scale changes to an Aboriginal person's ability to participate in traditional activities due to changes in availability of resources (e.g., change in fish species or populations or terrestrial environment). Areas immediately adjacent to the PDA will remain unaffected by Project activities and will be available for traditional

uses. Following the removal of the poles, conductors, and insulators as part of Decommissioning of the existing line 0028, the RoW will be allowed to revegetate naturally, returning it to a near natural state, over time. Any current use in this area will be able to resume as it was prior to the construction of Line 0028.

4.3.8 Effects of the Environment on the Project

This section describes the potential interactions between the environment and the Construction, Operation and Maintenance, and Decommissioning and Abandonment of the Project.

4.3.8.1 Scope of Assessment

Effects of the Environment on the Project are associated with risks of natural hazards and the influences of the environment on the Project. These effects may occur due to naturally-occurring events associated with climate (including weather), climate change, seismic activity, and forest fires. The potential effects of the environment on any project are typically addressed through project design and operational procedures developed in consideration of expected normal and extreme environmental conditions. Effects of the environment, if unanticipated or unmanaged, could result in adverse changes to Project components, schedule, and/or costs.

Generally accepted engineering practice, designs and design criteria tend to consistently overestimate and account for the potential forces of the natural environment. Therefore, engineering design inherently incorporates a considerable margin of safety so that a project is safe and reliable throughout its lifetime. NB Power will monitor any observed effects of the environment on the Project, and take action as required to repair and upgrade Project infrastructure and modify operations so as to permit its continued safe operation.

Some effects, such as damage to infrastructure, could also result in consequential effects on the environment; these environmental effects are addressed as Accidents, Malfunctions, and Unplanned Events in Section 2.8.

This section defines the scope of assessment and evaluates the potential Effects of the Environment on the Project, with consideration of the following environmental attributes:

- Climate (including weather and weather variables such as air temperature, precipitation, winds, and extreme weather events);
- Climate change;
- Seismic activity; and,
- Forest fires (from causes other than the Project).

4.3.8.1.1 Boundaries

4.3.8.1.1.1 Spatial Boundaries

The spatial boundaries for the assessment of the Effects of the Environment on the Project include all areas where Project-related activities are expected to occur. For the purposes of this assessment, there are two spatial boundaries: Project Development Area (PDA) and Local Assessment Area (LAA).

Project Development Area (PDA)

The PDA is the immediate area encompassing the Project footprint, and is limited to the anticipated area of physical disturbance associated with the Construction, Operation and Maintenance, and Decommissioning and Abandonment of the Project. The PDA includes the footprint of the 5.3 km-long, 30 m-wide RoW for the new 138 kV transmission line to be constructed and the 0.18 ha footprint of the new Kedgwick substation. The PDA also includes the footprint of the existing substation, and the RoW for Line 0028, both of which will be decommissioned as part of the Project. The PDA is illustrated in Figure 2.1.

Local Assessment Area (LAA)

The LAA for Effects of the Environment on the Project is the same as the PDA (Figure 2.1).

4.3.8.1.1.2 Temporal Boundaries

Temporal boundaries identify when an environmental effect is evaluated in relation to specific project phases and activities. The temporal boundaries for the assessment of the potential Effects of the Environment on the Project include the following periods:

- Construction – anticipated to be seven months in spring to fall 2017;
- Operation and Maintenance– approximately 50 years or the end of useful life; and,
- Decommissioning and Abandonment – anticipated to be three months.

4.3.8.2 Existing Conditions for Effects of the Environment on the Project

4.3.8.2.1 Climate

Climate is the long-term trend in meteorological conditions experienced in an area or region, and is characterized by the statistical average (mean and variability) of meteorological/weather conditions of a region over a substantial period of time (typically 30 years). Climate includes, but is not limited to, parameters such as temperature, precipitation, sunshine, cloudiness, wind, and fog (EC 2013).

The current climate conditions are generally described by the most recent 30-year period (1981 to 2010; Government of Canada 2016a) for which the Government of Canada has developed statistical summaries, referred to as climate normals. The closest Environment Canada weather station with available historical data is located in Nictau, approximately 48 km south-southeast of the PDA (Government of Canada 2016a). However, fog (visibility) data and wind data are unavailable at this weather station. Data from the Fredericton weather station, located approximately 195 km south of

Kedgwick, are reviewed to provide some indication of the fog experienced in the region, and some additional indication of the average wind speeds and general wind direction in the region.

4.3.8.2.2 Air Temperature and Precipitation

Annual climate readings at the Nictau weather station indicate that January is typically the coldest month of the year, with a daily average temperature of -13.2 °C. July is typically the warmest month of the year, with a daily average temperature of 17.4 °C.

The average annual precipitation (including snow as water equivalent) in Nictau is 1,160 mm, with July being the rainiest month (118 mm on average) and January being the snowiest month (79 cm on average) (Government of Canada 2016a).

4.3.8.2.3 Wind

The winds in Fredericton, which is the nearest weather station to provide data on wind direction and speed, are generally from the west from November to January, from the northwest from February to April, from the south from May to August, and from the southwest in September and October. The winds are the most frequently from the west on an annual basis. The average annual wind speed is approximately 12.2 km/h. The highest wind speeds occur during the month of April (14 km/h), and the lowest wind speeds occur during the month of August (9.6 km/h) (Government of Canada 2016a). Maximum gust speeds in Fredericton in a given month have ranged from 93 km/h in August, 1991 to 132 km/h in June, 1971.

4.3.8.2.4 Fog

Environment Canada (2013) defines fog as being ground-level cloud consisting of tiny water droplets suspended in the air that reduces visibility to a distance of less than 1 km. The Fredericton weather station, which is the nearest weather station to provide fog (visibility) data has experienced, on average, 108.4 hours of fog per year (4.5 days). Visibility is lowest during the months of December and January when there are approximately 12 hours per month when visibility is reduced to a distance of less than 1 km (Government of Canada 2016a).

4.3.8.2.5 Extreme Weather Events

The Government of Canada (2015) lists severe storms, storm surges, hurricanes, floods, tornadoes, and earthquakes amongst the regional environmental hazards monitored by the New Brunswick Emergency Measures Organization (NBEMO). Although tornadoes are rare, they do occasionally occur in New Brunswick, although there are no confirmed or probable tornados indicated for the Kedgwick area (ECCC 2015). Earthquakes (seismic activity) are discussed in Section 4.3.8.2.7.

Extreme storms and precipitation can occur in New Brunswick throughout the year, but tend to be more common and severe during the winter. Winter storms are typically associated with high winds and a combination of snow, rain, and ice. Ice storms, resulting from freezing rain adhering to objects, can cause substantial damage if ice thickness builds to a point where trees and built structures are unable to withstand the weight. In December 2010, a low pressure system brought torrential rain to the

southwestern and midwestern regions of New Brunswick. Damage from flooding and heavy rainfall threatened public safety and transportation systems, and cost the province over $17.8 million (NBDELG 2012c). More recently, extreme snowfall events exceeded the province's average winter snowfall totals in 2015 (CBC 2015).

4.3.8.2.6 Climate Change

Climate change is defined by the Intergovernmental Panel on Climate Change (IPCC 2014) as:

> ``*a change in the state of climate that can be* identified (e.g., *using statistical tests) by changes in the mean and/or variability of its properties and that persists for an extended period, typically decades or longer*. ``

Climate change can be due to natural forces and/or human activities that cause changes to the composition of the atmosphere, or changes to land use. The United Nations Framework Convention on Climate Change makes a distinction between climate change attributed to human activities and climate variability attributable to natural causes. Climate change is a change of climate directly or indirectly attributed to human activity that alters the composition of the global atmosphere, which is in addition to natural climate variability observed over comparable time periods (IPCC 2007).

Predictions of future climate change are limited by the inherent uncertainty of climate change models. While climate change models can provide useful information for predicting and preparing for climate change, their ability to forecast regional changes is quite limited compared to larger-scale predictions (e.g., continental climate change) (Randall *et al.* 2007; Flato *et al.* 2013). However, like all modelling projections, the results obtained from climate change models can be used as a guide for the planning process, and can facilitate Project design and adaptation.

4.3.8.2.7 Seismic Activity

Seismic activity is characterized by the local geography of an area and the movement and/or fracture of rocks within the Earth (e.g., movement of tectonic plates). These movements release seismic waves that cause vibration of the ground, otherwise known as earthquakes (NRCan 2013a).

The Project lies near the northern boundary of the Northern Appalachians seismic zone, which includes most of New Brunswick and extends towards New England). Historically, seismic activity in the Northern Appalachians zone has been low, although there have been earthquakes with a magnitude of 3 (on the Richter scale) in the general area of the Project. It is unlikely that an earthquake with a magnitude of less than 5 would cause damage (NRCan 2013b).

4.3.8.2.8 Forest Fires

The Canadian Wildland Fire Information System (CWFIS) is a computer-based fire management information system that monitors the risk of forest fires in Canada on a short-term (daily and seasonally) and long-term basis (NRCan 2016b). The average Fire Weather Index, a component of the Canadian Wildland Fire Information System, is a numeric rating of fire intensity. It combines the Initial Spread Index

and the Buildup Index, and is a general index of fire danger throughout the forested areas of Canada (NRCan 2016b).

The Fire Weather Index for the general area of the Project is rated as 0 - 5 in August (the month which typically has the highest risk of forest fire in the province) for the years 1981 - 2010. This is in the lower range of possible fire risk, which at its highest, can exceed a rating of over 30 (NRCan 2016c). Although the period of late April through May also has a relatively higher risk of forest fires due to the incidental lighting of forests from grass fires when compared with other months in New Brunswick (GNB 2016d), Natural Resources Canada (2016c) also gives this period a low rating of 0 – 5.

4.3.8.3 Potential Project Interactions with the Environment

This section describes how the environment could interact with planned Project activities to result in change to Project schedule and/or damage to the Project. The techniques and practices that will be applied to mitigate the potential negative effects of these environmental interactions are also noted.

4.3.8.3.1 Climate

During Construction, and Operation and Maintenance of the Project, extreme low temperatures have the potential to reduce the ductility of construction materials and increase susceptibility to brittle fracture. All aspects of Project design, including selection of materials and equipment to be used, planning, and maintenance, will consider normal and extreme climate/weather conditions that may be encountered throughout the life of the Project.

High winds, especially those greater than 90 km/h have the potential to break trees and limbs which can strike and break transmission infrastructure (NB Power 2016b). Wind also has the potential to increase structural loadings on infrastructure and could result in damage to Project infrastructure and/or equipment. A minimum RoW width and the removal of danger trees adjacent to the RoW (NB Power 2012) will be maintained to avoid wind-related tree strikes.

Wet snow and freezing rain (ice) pose some of the most serious risks to transmission infrastructure. The excessive build-up of snow and ice can increase loadings on Project infrastructure, and has the potential to exceed the tensile strength of the conductors, causing them to break (NB Power 2016b).

During electrical storms, fault currents (electric currents that flow from one conductor to ground, or to another conductor due to an abnormal connection between the two (IESO 2010)) may occur during a lightning strike. This could result in danger to workers and/or damage to Project infrastructure and equipment. Lightning strikes during electrical storms can also ignite a fire (see Section 2.8.2 for additional discussion of fire as an accidental event).

Extreme precipitation has potential to result in flooding, erosion, and other events (such as access roads being washed out). These events could lead to the release of total suspended solids in runoff, and the related environmental effects of such an occurrence. Heavy rains can also exacerbate the effects of freezing or high winds on project infrastructure, by allowing water to enter stress fractures in the insulators resulting in a power failure (NB Power 2016b).

Extreme winter precipitation could also affect winter Construction activities, including those associated with the Decommissioning of Line 0028, by causing a delay in the receipt of materials, and result in additional effort for snow clearing and removal. Extreme precipitation, storms, and hurricanes could result in the inability for workers to access the site, cause damage to infrastructure/equipment, and/or cause an interruption of Project Operation (electrical power services) for extended periods of time. However, delays due to poor weather are anticipated and can often be predicted, and allowance for them will be included in the Construction schedule.

Fog (reduced visibility) could cause difficulties with manoeuvring equipment and other Project-related activities, as could high winds (due to blowing snow or dust and debris). However, these delays are anticipated and can often be predicted, and allowance for them will be included in the Construction schedule.

The Project will be constructed to meet applicable building, safety and industry codes and standards for wind, snowfall, extreme precipitation, and other weather variables associated with climate (CSA 2015). These standards and codes provide factors of safety regarding environmental loading and Project specific activities and events. Measures to mitigate the potential effects of the environment on the Project will include the following.

- All components and physical activities associated with the project will follow NB Power's Environmental Protection Plan (EPP) (NB Power 2012).
- Infrastructure will be designed and maintained to the standards of the Canadian Electrical Code (CSA 2015).
- Implementation of a maintenance and safety management program.
- Implementation of contingency plans, including emergency back-up power for necessary operations and dispatch of crews for emergency repairs of storm damage.
- Emergency measures will be in place, in conjunction with existing NB Power, community, and provincial plans to provide rapid detection and response to any fire threat, and quickly control and extinguish the flames prior to contact with any flammable structures (e.g., wood). Mitigation for Project-caused fires is discussed in Section 2.8.
- There will be a cleared safety buffer zone established around Project components to decrease the likelihood of a fire causing substantive damage to the Project, and to reduce the risk of fallen trees or other debris damaging Project infrastructure.

4.3.8.3.2 Climate Change

Future climate change, such as increases in temperature, frequency and magnitude of precipitation, and increased incidences and intensity of storm events, could affect the long-term integrity and reliability of the Project. Despite differences in climate change model outputs, there is an overall consensus among the climatological community in that, over the next century, Atlantic Canada will likely experience warmer temperatures, more frequent storm events, increased storm intensity, and increased flooding (Lemmen *et al.* 2008; Lines *et al.* 2005, 2008). This average temperature change is expected to be gradual and is likely to affect precipitation types and patterns including later freeze up, wetter, heavier snow, more liquid precipitation occurring later into the fall, and possibly more freezing precipitation during both seasons (Lines *et al.* 2008).

All aspects of Project design will consider predictions for climate change and measures for adaptation. Several publications and engineering protocol guidance documents are available to guide design engineers in this regard, including those available from the Public Infrastructure Engineering Vulnerability Committee (PIEVC 2016). NB Power will also implement a maintenance and safety management program, as well as contingency plans, including emergency back-up power for necessary operations and dispatch of crews for emergency repairs of storm damage.

4.3.8.3.3 Seismic Activity

The level of seismic activity in the province and near the PDA is low, and the earthquakes that have been recorded in the general area of the Project have been low on the Richter scale (Section 4.3.8.2.7). Therefore, the likelihood of a seismic event occurring in the vicinity of the Project that would cause substantive damage to the Project or interruption to any Project-related activities or phases is low.

4.3.8.3.4 Forest Fires

The average incidence of forest fires in New Brunswick is relatively low (Section 4.3.8.2.8). Thus, the likelihood of a forest fire event occurring in the vicinity of the Project that would cause substantive damage to equipment or infrastructure, or interruption of Project-related Construction or Operation and Maintenance activities is low. A forest fire that occurs following the Decommissioning and Abandonment of Line 0028 could delay the reclamation of the site; however, natural revegetation of the RoW would be anticipated to commence in the following growing season. Measures that will be implemented to mitigate the potential effects of a fire include the following.

- Emergency measures will be in place, in conjunction with existing NB Power, community, and provincial plans to provide rapid detection and response to any fire threat, and quickly control and extinguish the flames prior to contact with any flammable structures (e.g., wood). Mitigation for Project-caused fires is assessed in Section 2.8.
- There will be a cleared safety buffer zone established around Project components to decrease the likelihood of a fire causing substantive damage to the Project, and to reduce the risk of fallen trees or other debris damaging Project infrastructure.

4.3.8.4 Summary for Effects of the Environment on the Project

Environmental factors including extreme weather conditions and climate predictions are accounted for in Project Construction techniques and best practices and equipment design codes. Therefore the chance of environmental conditions affecting Project infrastructure or operations resulting in a change to Project schedule and/or damage to the Project is considered low over the life of the Project. If such damage or interruption of service was to occur, NB Power will rely on standard contingency and response plans to repair damaged equipment and reduce service interruptions

5.0 SUMMARY OF PROPOSED MITIGATION

Proposed mitigation for the Project is summarized in Table 5.1 below.

Table 5.1 Summary of Proposed Mitigation

#	Valued Component (VC) (if applicable)	Project Phase	Proposed Mitigation/Compensation Measure	Location within EIA Registration Document where Mitigation Measure is Identified
1.	N/A	Construction	In order to mitigate impact to the proposed transmission line, cables called "ground wires" will be strung above the conductor to protect them from the high current and voltage surges present in lightning. In the event the line suffers a direct or indirect strike, these wires provide a path for the high current and voltage to safely discharge down through the structures and into the ground.	Section 2.4.1.4 Overhead Ground Wires and Counterpoise
2.	N/A	All Phases	The training of personnel in spill prevention and response, and Workplace Hazardous Materials Information System (WHMIS).	Section 2.8.1 Hazardous Materials
3.	N/A	All Phases	Following proper procedures within the existing NB Power Environmental Protection Plan (EPP).	
4.	N/A	Operation and Maintenance	Routine cleaning, preventative maintenance, and visual inspections of hydraulic equipment and vehicles.	
5.	N/A	All Phases	On-site spill response equipment.	
6.	N/A	All Phases	Reporting spill to the appropriate project personnel and New Brunswick Power System Operator (PSO) (1-800-756-8411). During normal business hours (i.e., Monday to Friday from 8:15 a.m. to 4:30 p.m.), the PSO will notify the appropriate authorities (i.e., NBENV). Outside of normal business hours, on weekends and on holidays, the PSO will notify the Canadian Coast Guard/Spills Action Centre (1-800-565-1633).	
7.	N/A	All Phases	Equipping all vehicles with fire extinguishers sized and rated as appropriate.	Section 2.8.2 Fire
8.	N/A	All Phases	Training personnel in the location and use of fire extinguishers.	
9.	N/A	All Phases	Safely storing wastes that may be soaked in flammable materials (i.e. oily rags).	

Table 5.1 Summary of Proposed Mitigation

#	Valued Component (VC) (if applicable)	Project Phase	Proposed Mitigation/Compensation Measure	Location within EIA Registration Document where Mitigation Measure is Identified
10	N/A	All Phases	Avoiding the parking of vehicles in areas of long grass.	
11	N/A	All Phases	Immediately reporting a fire to local emergency response services.	
12	N/A	All Phases	The implementation, as needed, of traffic control measures to reduce the potential for vehicle-to-vehicle collisions.	Section 2.8.3 Vehicular Collisions
13	N/A	All Phases	Project staff will be appropriately licensed to operate vehicles on-site, will obey traffic rules and regulations, and will exercise due care and attention while on-site.	
14	N/A	All Phases	Trucks will use only designated truck routes.	
15	N/A	All Phases	If a collision does occur, Project personnel will immediately contact emergency services.	
16	N/A	All Phases	Documentation, mapping and species identification of all nests on Project infrastructure.	Section 2.8.4 Wildlife Encounters
17	N/A	Operation and Maintenance	Scheduling of maintenance activities outside of nesting periods.	
18	N/A	All Phases	Consultation with New Brunswick Department of Energy and Resource Development biologists prior to unplanned/emergency maintenance during nesting periods.	
19	Atmospheric Environment	All Phases	Preventative maintenance schedules for Project equipment (which will help reduce air contaminant, GHG, and noise emissions).	Section 4.3.1.3 Potential Environmental Interactions with the Atmospheric Environment
20	Atmospheric Environment	All Phases	An idling awareness program to reduce emissions associated with unnecessarily vehicle idling.	
21	Atmospheric Environment	All Phases	Standard dust control mitigation practices (such as revegetation of exposed soil in a timely manner to limit dust emissions, as well as the use of dust suppressants (such as water sprays) on unpaved areas during dry periods.	
22	Atmospheric Environment	Construction	Construction during daytime hours only to reduce disturbances (such as noise) to nearby residences.	
23	Water Resources (Surface Water and Groundwater)	Construction	Mitigation for interactions with existing wells could include rehabilitation, deepening, replacement, or water treatment, as necessary.	Section 4.3.2.3 Potential Environmental Interactions with Water Resources

Table 5.1 Summary of Proposed Mitigation

#	Valued Component (VC) (if applicable)	Project Phase	Proposed Mitigation/Compensation Measure	Location within EIA Registration Document where Mitigation Measure is Identified
24	Water Resources (Surface Water and Groundwater)	Construction	Mitigation for increased runoff associated with removal of vegetation will include the installation of silt fencing, sediment traps and revegetation.	
25	Water Resources (Surface Water and Groundwater)	Construction	Mitigation for interactions with existing wells will include using mechanical rock breaking instead of blasting, where feasible.	
26	Water Resources (Surface Water and Groundwater)	Construction	Mitigation for increased runoff associated with removal of vegetation will include locating centerlines to make use of topographical features which contribute to terrain stability.	
27	Water Resources (Surface Water and Groundwater)	Construction	Mitigation for increased runoff associated with removal of vegetation will include grading exposed faces to a maximum slope of 2:1.	
28	Water Resources (Surface Water and Groundwater)	All Phases	Mitigation for vehicle fluids entering water resources will include inspection of vehicles for fluid leaks prior to going into the field.	
29	Freshwater Fish and Fish Habitat	All Phases	NB Power will adhere to Codes of Practice (including best management procedures) and an established environmental protection policy that have proven effective at mitigating the risk of fish mortality and the alteration of fish habitats related to the Construction, Operation and Maintenance, and Decommissioning and Abandonment of transmission lines.	Section 4.3.3.3 Potential Environmental Interactions with Freshwater Fish and Fish Habitat
30	Freshwater Fish and Fish Habitat	All Phases	Clearly marking all watercourses and buffers prior to the use of heavy equipment to mitigate the risk of fish mortality.	
31	Freshwater Fish and Fish Habitat	Construction, Decommissioning & Abandonment	Placing temporary bridges across watercourses, where access is required, to mitigate the risk of fish mortality.	
32	Freshwater Fish and Fish Habitat	Construction, Decommissioning & Abandonment	Establishing silt fencing in all areas where soil disruption could result in the transport of sediment or woody debris to watercourses to mitigate the risk to fish habitat.	

Table 5.1 Summary of Proposed Mitigation

#	Valued Component (VC) (if applicable)	Project Phase	Proposed Mitigation/Compensation Measure	Location within EIA Registration Document where Mitigation Measure is Identified
33	Freshwater Fish and Fish Habitat	Construction	Maintaining silt fencing in place until revegetation has occurred, then removing the silt fencing to prevent it from washing into the watercourse where it could alter (cover) substrates or facilitate the creation of a barrier to fish passage to mitigate the risk to fish habitat.	
34	Freshwater Fish and Fish Habitat	All Phases	Relocating (windrowing) large woody debris to the edges of the RoW to prevent it from washing into the watercourse to mitigate the risk to fish habitat.	
35	Freshwater Fish and Fish Habitat	Construction, Decommissioning & Abandonment	Placing temporary bridges across watercourses, where access is required, to prevent bank and substrate erosion, or disruption of watercourse substrates to mitigate the risk to fish habitat.	
36	Freshwater Fish and Fish Habitat	Construction	Adhering to the Project design for a maximum RoW width of 30 m to mitigate the risk to fish habitat.	
37	Terrestrial Environment (Including Wetlands, Vegetation and Wildlife)	All Phases	Flag and avoid known locations of individuals of SOCC, when possible.	Section 4.3.4.3 Potential Environmental Interactions with the Terrestrial Environment
38	Terrestrial Environment (Including Wetlands, Vegetation and Wildlife)	All Phases	Use the existing NB Power EPP for all phases of the Project.	
39	Terrestrial Environment (Including Wetlands, Vegetation and Wildlife)	Construction	Avoid construction, particularly clearing activities, in areas of native vegetation during the breeding season for migratory birds (April 1 to August 31).	
40	Terrestrial Environment (Including Wetlands, Vegetation and Wildlife)	All Phases	Use approved noise arrest mufflers on equipment to reduce potential environmental effects of noise.	

Table 5.1 Summary of Proposed Mitigation

#	Valued Component (VC) (if applicable)	Project Phase	Proposed Mitigation/Compensation Measure	Location within EIA Registration Document where Mitigation Measure is Identified
41	Terrestrial Environment (Including Wetlands, Vegetation and Wildlife)	All Phases	Use full cut-off lighting during construction to reduce attraction to migrating birds.	
42	Terrestrial Environment (Including Wetlands, Vegetation and Wildlife)	Construction	Restrict clearing activities to the minimum amount required, particularly around wetlands.	
43	Terrestrial Environment (Including Wetlands, Vegetation and Wildlife)	All Phases	Employ standard erosion and sedimentation control measures, particularly to avoid silt laden runoff into wetlands.	
44	Terrestrial Environment (Including Wetlands, Vegetation and Wildlife)	Construction	Implement standard dust control measures to avoid siltation of wetlands.	
45	Terrestrial Environment (Including Wetlands, Vegetation and Wildlife)	Construction	Use quarried, crushed material for road building in and near wetlands, to reduce the risk of introducing or spreading exotic and/or invasive vascular plant species.	
46	Terrestrial Environment (Including Wetlands, Vegetation and Wildlife)	Construction	Ensure that all equipment arrives at the site clean and free of soil or vegetative debris.	
47	Terrestrial Environment (Including Wetlands, Vegetation and Wildlife)	All Phases	Operate vehicles and equipment on previously disturbed areas, wherever feasible.	

Table 5.1 Summary of Proposed Mitigation

#	Valued Component (VC) (if applicable)	Project Phase	Proposed Mitigation/Compensation Measure	Location within EIA Registration Document where Mitigation Measure is Identified
48	Terrestrial Environment (Including Wetlands, Vegetation and Wildlife)	Construction	Limit size of temporary workspaces.	
49	Terrestrial Environment (Including Wetlands, Vegetation and Wildlife)	Construction	Properly store and dispose of construction site wastes that might attract wildlife.	
50	Terrestrial Environment (Including Wetlands, Vegetation and Wildlife)	All Phases	Allow for natural regeneration when possible, and when not possible, use a native seed mix for revegetation.	
51	Terrestrial Environment (Including Wetlands, Vegetation and Wildlife)	Operation	Restrict vegetation management to necessary areas, and by mechanical means wherever possible.	
52	Terrestrial Environment (Including Wetlands, Vegetation and Wildlife)	All Phases	Restrict travel through wetlands for inspection or maintenance activities.	
53	Terrestrial Environment (Including Wetlands, Vegetation and Wildlife)	Construction	Restore temporarily disturbed areas to pre-Construction conditions.	
54	Terrestrial Environment (Including Wetlands, Vegetation and Wildlife)	Operation	Manage invasive species through minimizing Operation activities in wetland areas and clean equipment before entering a wetland.	

Table 5.1 Summary of Proposed Mitigation

#	Valued Component (VC) (if applicable)	Project Phase	Proposed Mitigation/Compensation Measure	Location within EIA Registration Document where Mitigation Measure is Identified
55	Terrestrial Environment (Including Wetlands, Vegetation and Wildlife)	All Phases	NB Power will adhere to its Integrated Vegetation Management Plan (IVMP) (NB Power 2015), and will employ mechanical or hand clearing when possible, particularly within 30 m of wetlands.	
56	Terrestrial Environment (Including Wetlands, Vegetation and Wildlife)	All Phases	Comply with the vegetation management permit received from the NBDELG.	
57	Terrestrial Environment (Including Wetlands, Vegetation and Wildlife)	Decommissioning and Abandonment	Avoid Decommissioning and Abandonment activities during the breeding season for migratory birds (April 1 to August 31).	
58	Terrestrial Environment (Including Wetlands, Vegetation and Wildlife)	Decommissioning and Abandonment	Provide nesting platforms during and following Decommissioning if any birds are nesting on poles.	
59	Terrestrial Environment (Including Wetlands, Vegetation and Wildlife)	All Phases	Avoid disturbance of all wetlands to the extent possible, and where avoidance is not possible, compensate for the permanent net loss of wetland function (for GeoNB-mapped wetlands only) according to a plan to be developed in coordination with, and approved by, NBDELG.	
60	Socioeconomic Environment	Pre-Construction	Owners of private land will be consulted prior to Construction.	Section 4.3.5.3 Potential Environmental Interactions with the Socioeconomic Environment
61	Socioeconomic Environment	Pre-Construction	The New Brunswick Trappers Association will be consulted prior to Construction and NB Power will work with owners of established traplines to discuss their concerns.	
62	Socioeconomic Environment	Construction	All cleared merchantable timber will be sold and any remaining cleared vegetation will be stockpiled or used for corduroy access.	
63	Socioeconomic Environment	Construction	Sites requiring little or no modification, such as forestry landings or harvested fields, will be used for temporary staging areas.	

Table 5.1 Summary of Proposed Mitigation

#	Valued Component (VC) (if applicable)	Project Phase	Proposed Mitigation/Compensation Measure	Location within EIA Registration Document where Mitigation Measure is Identified
64	Socioeconomic Environment	All Phases	Activities will be managed by NB Power in accordance with its Environmental Protection Plan.	
65	Socioeconomic Environment	All Phases	NB Power will communicate schedules for all Project activities, particularly those related to clearing activities and related access restrictions.	
66	Socioeconomic Environment	All Phases	Access restrictions will be defined in advanced and will be limited in size to reduce the interactions with land and resource users.	
67	Heritage Resources	Construction	Planned avoidance (e.g., transmission tower placement) of areas of elevated potential for archaeological resources identified during walkover survey.	Section 4.3.6.3 Potential Environmental Interactions with Heritage Resources
68	Heritage Resources	Pre-Construction	Shovel testing as per the Archaeological Guidelines, where avoidance is not practicable, to identify potential sites in areas determined to have elevated potential for archaeological resources.	
69	Heritage Resources	All Phases	Additional mitigation, as required, to be developed with provincial regulators.	
70	Heritage Resources	All Phases	Archaeological monitoring of areas where shovel testing is not practicable.	
71	Heritage Resources	All Phases	A heritage resource discovery response procedure outlined in NB Power's EPP will be followed during all phases of the Project.	
72	Current Use of Land and Resources for Traditional Purposes by Aboriginal Persons	All Phases	Measures used to mitigate the risk of fish mortality and fish habitat are included in the Freshwater Fish and Fish Habitat VC, Section4.3.3.3.	Section 4.3.7.3 Potential Environmental Interactions with Current Use of Land and Resources for Traditional Purposes by Aboriginal Persons
73	Current Use of Land and Resources for Traditional Purposes by Aboriginal Persons	All Phases	Measures used to mitigate a change in plants and vegetation located in the riparian zone of any watercourses crossed by the Project, are included in the Terrestrial Environment VC, Section 4.3.4.	

Table 5.1 Summary of Proposed Mitigation

#	Valued Component (VC) (if applicable)	Project Phase	Proposed Mitigation/Compensation Measure	Location within EIA Registration Document where Mitigation Measure is Identified
74	Current Use of Land and Resources for Traditional Purposes by Aboriginal Persons	All Phases	Measures used to mitigate sites of cultural and/or ceremonial importance are included in the Heritage Resources VC, Section 4.3.6.	
75	Effects of the Environment on the Project	All Phases	All components and physical activities associated with the project will follow NB Power's Environmental Protection Plan (EPP)	Section 4.3.8.3 Potential Environmental Interactions for Effects of the Environment on the Project
76	Effects of the Environment on the Project	All Phases	All aspects of Project design, including selection of materials and equipment to be used, planning, and maintenance, will consider normal and extreme climate/weather conditions that may be encountered throughout the life of the Project. Work will also be scheduled, where feasible, to avoid predicted times of extreme weather for the safety of crews and Project infrastructure.	
77	Effects of the Environment on the Project	Construction	The Project will be constructed to meet applicable building, safety and industry codes and standards for wind, snowfall, extreme precipitation, and other weather variables associated with climate (CSA 2015). These standards and codes provide factors of safety regarding environmental loading and Project specific activities and events.	
78	Effects of the Environment on the Project	All Phases	All aspects of Project design will consider predictions for climate change and measures for adaptation. Several publications are available to guide design engineers in this regard, such as those available from the Public Infrastructure Engineering Vulnerability Committee (PIEVC 2016).	
79	Effects of the Environment on the Project	All Phases	Implementation of a maintenance and safety management program.	
80	Effects of the Environment on the Project	All Phases	Implementation of contingency plans, including emergency back-up power for necessary operations and dispatch of crews for emergency repairs of storm damage.	

Table 5.1 Summary of Proposed Mitigation

#	Valued Component (VC) (if applicable)	Project Phase	Proposed Mitigation/Compensation Measure	Location within EIA Registration Document where Mitigation Measure is Identified
81	Effects of the Environment on the Project	All Phases	Emergency measures will be in place, in conjunction with existing NB Power, community, and provincial plans to provide rapid detection and response to any fire threat, and quickly control and extinguish the flames prior to contact with any flammable structures (e.g., wood). Mitigation for Project-caused fires is assessed in Section 2.8.	
82	Effects of the Environment on the Project	All Phases	There will be a cleared safety buffer zone established around Project components to decrease the likelihood of a fire causing substantive damage to the Project, and to reduce the risk of fallen trees or other debris damaging Project infrastructure.	

6.0 PUBLIC INVOLVEMENT

NB Power initiated a Public Involvement Program to inform landowners, stakeholders and the general public about the Project. The key elements of the Public Involvement Program are presented below, as well as future involvement initiatives to fulfill the public involvement requirements of the New Brunswick *Environmental Impact Assessment Regulation* under the *Clean Environment Act* and the "Guide to Environmental Impact Assessment in New Brunswick" (NBDELG 2012a).

The Public Involvement Program will use a multi-faceted approach so that Project information reaches as many people as possible. The approach will include maintaining a Project mailing list, distributing printed information, placing information on the NB Power website.

6.1 OBJECTIVES

The objectives of the Public Involvement Program will be as follows:

- Provide information directly to the general public, stakeholders, community groups and other interested parties on the proposed Project;
- Provide information directly to elected officials and local service districts;
- Address issues and concerns raised during this process;
- Identify measures that will mitigate or resolve any public issues or concerns; and,
- Identify proposed future consultation initiatives.

6.2 PUBLIC INVOLVEMENT PROGRAM ELEMENTS

The following section describes those elements as they relate to the Project.

6.2.1 Communication Methods

The methods to be employed to communicate with affected property owners, stakeholders, and individuals are described below:

- **Letters to Landowners –** NB Power informed potentially affected landowners of the Project in spring 2016, with the goal of seeking their permission to access private land in order to carry out the required field surveys for the Project. Telephone discussions with each landowner were subsequently held to answer their questions or provide additional information.
- **Information Package –** Bilingual information packages were used to provide all interested parties with basic information about the Project (Appendix E). The package included a cover letter addressed to the various stakeholders and fact sheets on the proposed undertaking.
- **Meetings with Stakeholders –** Information packages were sent to elected officials, and representatives of relevant key organizations or interest groups in the local area (Table 6.1). An offer to meet was also be extended to each key stakeholder group.
- **Web Postings –** The NB Power website (www.nbpower.com) will serve as an electronic method for members of the public to access Project documents, view maps, and send comments.
- **Public Notice –** A paper copy of the EIA Registration document will be made available for viewing during the public review period at the following locations:
  - rural community of Kedgwick municipal office

  - New Brunswick Department of Environment and Local Government, Project and Approvals Branch (Fredericton)

  The general public will be encouraged to forward comments and concerns to Project personnel.
- **Open House –** To date, one public open house has been conducted on October 13, 2016, to share information about the Project. Advertising in local newspapers and radio stations was used to notify the public of the Open House and provide them with an opportunity to learn more about the Project (Appendix E). Prior to the Open House, a mail out (e.g., information package) was also sent to stakeholders. Further open houses may be considered during the EIA review period, if required.
- **Summary Report –** A brief summary report on the public notification initiatives carried out, and the key issues raised by the public during the EIA review, will be provided to NBDELG within 60 days following registration.
- **Project Telephone Number –** A toll-free Project Information Line (1-866-754-7727) appeared on all communications and provided an easy-to-access means of contacting Project personnel without requiring computer capability, subscription to a newspaper, or attendance at an Open House.

Table 6.1 List of Key groups, Stakeholders and Organizations

NB Department of Environment and Local Government Marysville Place P. O. Box 6000 Fredericton, NB E3B 5H1	**NB Department of Environment and Local Government – Woodstock Local Services** P. O. Box 5001 Woodstock, NB E7M 5C6
New Brunswick Department of Energy and Resource Development Hugh John Flemming Forestry Centre P.O. Box 6000 Fredericton, NB E3B 5H1 Tel: (506) 453-3826	**Aboriginal Affairs Secretariat, Province of New Brunswick** Kings Place Room: 237, King Tower Floor: P. O. Box 6000 Fredericton, NB E3B 5H1 Tel.: (506) 462-5177
New Brunswick Department of Tourism, Heritage and Culture Centennial Building P.O. Box 6000 Fredericton, NB E3B 5H1 Tel: (506) 453-3115	**New Brunswick Department of Agriculture, Aquaculture and Fisheries** Agricultural Research Station (Experimental Farm) P.O. Box 6000 Fredericton, NB E3B 5H1 Tel: (506) 453-2666
New Brunswick Department of Transportation and Infrastructure Kings Place, P.O. Box 6000 Fredericton, NB E3B 5H1 Tel: (506) 453-3939	**Rural Community of Kedgwick (Municipalité de Kedgwick)** Mayor: Janice Savoie 114 Notre-Dame Street Kedgwick, NB E8B 1H8 Tel: (506) 284-2160 Email: reception@kedgwick.ca

Table 6.1 List of Key groups, Stakeholders and Organizations

Town of Saint-Quentin (Ville de Saint-Quentin) Mayor: Nicole Somers 10, rue Deschênes Street Saint-Quentin, NB E8A 1M1 Tel: (506) 235-2425 ville@saintquentin.nb.ca	**New Brunswick Federation of Snowmobile Clubs and Local Clubs** 147-B Houlton Road Woodstock, NB E7M 1Y4 Tel: (506) 325-2625 E-mail: info@nbfsc.com
New Brunswick Club VTT/ATV Federation and Local Clubs 1925 Hanwell Road, Unit C Hanwell, NB E3C 1M4 Tel: (506) 472-5130 Email: info@nbatving.com	**NB Outfitters Association Inc.** President: Mike Roy P.O. Box 451 Bathurst, NB E2A 3Z4 Tel: (506) 548-5157
NB Trails Council 1350 Regent St. Fredericton, NB E3C 2G6 Tel: (506) 459-1931	**NB Trappers & Fur Harvesters Federation - Restigouche** Carl Cyr (Director) 8 Ortana Street Campbellton, NB E3N 2Y7 Tel: (506) 753-4543
Bird Studies Canada (Atlantic Program) P.O. Box 6227, 17 Waterfowl Lane Sackville, NB E4L 1G6 Tel: (506) 364-5047 Email: bsc atlantic@birdscanada.org	**New Brunswick Botany Club** Jim Goltz marph@nbnet.nb.ca
Conservation Council of New Brunswick 180 St. John St. Fredericton, NB E3B 4A9 Tel: (506) 458-8747 Email: info@conservationcouncil.ca	**New Brunswick Wildlife Association** President: Charles Leblanc P.O. Box 549 Moncton, NB E1C 8L9 Tel: (506) 386-3144 Email: cleblan618@rogers.com
Nature NB (NB Federation of Naturalists) 924 Prospect St., Suite 110 Fredericton, NB E3B 2T9 Tel: (506) 459-4209 Email: nbfn@nb.aibn.com	**Agriculture Alliance of New Brunswick** 259 Brunswick Street Fredericton, NB E3B 1G8 Tel: (506) 452-8101 Email: alliance@fermeNBfarm.ca
Kedgwick Salmon Club Tel.: (506) 284-4554 Email: kedgwicksalmonclub@hotmail.com	**Atlantic Salmon Federation** P.O. Box 5200 St. Andrews, NB E5B 3S8 Tel: (506) 529-4581 Email: savesalmon@asf.ca

Table 6.1 List of Key groups, Stakeholders and Organizations

Restigouche River Water Management Council CP 995 Campbellton, NB E3N 3H4 Tel: (506) 759-7300 Email: restigouche@globetrotter.net	**Restigouche Regional Service Commission** Betty-Ann (Mercier) Fortin (Executive Director) 68A Water Street Campbellton, NB E3N 1B1 Tel: (506) 759-6688 Email: bettyann@commissionrestigouche.ca
Provincial MLA Gilles LePage (Liberal) Restigouche West P.O. Box 6000 (MLA NB Office) Fredericton, NB E3B 5H1 Tel: (506) 453-2548 Email: gilles.lepage@gnb.ca	**Federal MP** René Arseneault (Liberal) Madawaska—Restigouche 19 Aberdeen Street, Suite 204 (Main Constituency Office) Campbellton, NB E3N 3G4 Tel: (506) 789-4593 Email: rene.arseneault@parl.gc.ca

6.2.2 Issues Tracking and Reporting

A major effort of the Public Involvement Program will be to track, synthesize, and present comments to the applicable regulatory agencies. NB Power will maintain a database that is used to track issues and concerns raised during the public involvement process. The database will provide Project staff with the ability to conduct queries, print specific reports, and review the status of all issues, concerns or commitments.

Issues or concerns raised by, or commitments made to, affected landowners and stakeholders will be entered into the database and monitored regularly during Project meetings until appropriate actions have been taken to address them. During any meetings, outstanding items will be reviewed and updates provided to the Project Team. Upon completion of each outstanding item, the necessary information will be forwarded to administrative support personnel in order to identify the item as "complete".

NB Power will provide a report to the NBDELG within 60 days of registering the Project under the EIA Regulation, in order to summarize the results of the public engagement program, including activities conducted, key issues raised, and how they were or will be addressed, as applicable.

6.3 RESULTS OF PUBLIC INVOLVEMENT PROGRAM TO DATE

Based on the methods described above, NB Power was able to inform and identify potential issues and concerns associated with the Kedgwick Transmission Line Project. The following summarizes the results of the public involvement activities:

6.3.1 Meeting with Village Officials

A meeting was held on October 4, 2016 with elected Officials to inform the Mayor and Councillors of the Project and provide them with the opportunity to ask questions prior to the Open House. A presentation was provided to attendees. The presentation focused on the issue of electrical transmission reliability in the area, the proposed solution (i.e., the Project), and the associated timelines. The Project was well received by attendees and everyone understood the need for it. Several questions were asked by participants. These questions included, but are not limited to the following:

- Have landowners directly affected by the transmission line been contacted?
- Will landowners be compensated?
- What is the size of the expanded substation?
- Will the easement agreements on the existing transmission line be released once the line is decommissioned?
- Will local businesses be provided with the opportunity to bid on this Project?
- What approvals are required for the Project?

All questions were answered by NB Power representatives. The only request made by the Mayor was that NB Power contact the landowners directly affected by the transmission line to personally invite them to the Open House. NB Power representatives agreed and noted that this was common practice.

6.3.2 Open House

NB Power hosted an Open House on October 13, 2016, from 5:00 pm until 8:00 pm, at the Kedgwick Town Hall in Kedgwick. This Open House was arranged to provide information directly to adjacent property owners and stakeholders, to discuss their comments and concerns, and to receive input from them on the Project. The Open House was advertised in two newspapers, L'Acadie-Nouvelle and L'Infoweekend on October 8, 2016, and October 12, 2016, respectively (Appendix E). A bilingual NB Power representative greeted the public and asked them to sign-in. A series of information displays about various aspects of the Project, as well as the EIA process, were set up at the Open House. Each display station was staffed by project representatives to provide specific information about the Project, and to answer questions. Right-of-Way Agents were also available to speak with landowners regarding land issues. An Exit Questionnaire was prepared to further elicit comments on the Project and attendees were encouraged to fill one out.

Approximately twelve people attended the Open House. Not everyone who attended the session signed the sign-in sheet. For the most part, participants viewed the Project as being beneficial for the area. There were some minor concerns and issues raised that were subsequently addressed by members of the Project team. Discussions arising from the Open House included such topics as electrical supply to the area, land acquisition process, access to facilities, timing of project activities and future energy demand (Table 6.2). Other general inquiries not specifically related to the Project were also received. These inquiries included but are not limited to, current power rates, renewable energy, energy conservation initiatives and other NB Power projects. Specific details on how each concern was addressed are provided in the table below.

Table 6.2 Summary of Key Comments Heard at October 13, 2016 Open House

General Concern	Details of Concern (s)	Response
Access Restriction to ATV/Snowmobile Trail	The President of the local ATV Club expressed concerns about restriction of the trail in behind the substation during construction activities.	NB Power representative noted that restriction to the ATV trail during construction of the substation and transmission line is not anticipated since most of the activities would take place on either side of the trail. The only time when access might be restricted would be during stringing of the conductors which is of short duration (i.e., less than a day). NB Power noted that signage would be posted along the trail during construction and that a more detailed schedule could be provided to the local Club prior to the start of construction. No further issues or concerns were expressed by the President.
Release of Easement Agreements	Two landowners affected by the existing transmission line (Line 0028) asked about whether or not NB Power would release the easement agreements once the line was decommissioned in 2018.	NB Power noted that is it not common practice to release easements on transmission lines that are decommissioned for future planning reasons. It was suggested that a formal request be made to the Real Estate Department and that this request would be assessed and a response would be provided. No further issues or concerns were raised by the landowners on this topic.
Location of Substation and Noise from Existing Transformer	The landowners currently located next to the existing substation questioned the exact location of the expansion and noted that during calm nights the noise from the transformer was loud.	Maps of the expansion were viewed with the landowners. It was explained that the expansion would be setback behind the existing site and that the dimensions would be slightly larger. It was also explained that older transformers such as the one in the existing substation are louder than newer transformers. It was noted that a noise fence could be installed to mitigate this issue. (Note that since the Open House, NB Power has decided to relocate the substation to a new location as identified in this document, rather than expand the existing substation, partially to address the noise concern. No further issues or concerns were expressed by the landowners on this topic.
Alignment of Transmission Line	One landowner affected by the new proposed transmission line alignment questioned why the preferred option crossed his property diagonally. He noted that he was not opposed to the Project but preferred that the line didn't cut his property in half.	NB Power representatives explained that the reason the proposed alignment crossed his property on a diagonal was because an attempt was made to parallel the existing access road and to avoid an active gravel pit on his property. The landowner noted that the gravel pit was for personal use and that the transmission line would not interfere with its operation. A new proposed alignment was

Table 6.2 Summary of Key Comments Heard at October 13, 2016 Open House

General Concern	Details of Concern (s)	Response
		drawn on a map and the landowner agreed with it. NB Power stated that this new alignment would be re-evaluated but didn't foresee any issues. Note that this realignment has been reflected in the Project design for the Preferred Option. The landowner was satisfied with the response.
Proposed Zoning Plan	A representative of the Restigouche Planning Commission attended the Open House to view the details of the Project and to ensure that it didn't interfere with the draft zoning plan currently under development.	NB Power provided information about the location of the substation and the proposed transmission line. A copy of the draft zoning plan was made available by the Planning Commission representative and compared to the proposed Project. It was noted that the Project did not interfere with the zoning plan. Discussions also focused on when the zoning plan would be finalized and approved. NB Power committed to keeping the Commission apprised of the EIA submission and approval. No further issues or concerns were expressed on this topic.
Timing of Project Related Activities	Several participants' asked general questions about the Project schedule.	A display of the Project schedule was available and viewed with participants that had questions about Project related activities. No specific timing issues or concerns were raised by participants (other than the ATV local Club, discussed above).
Land Acquisition Process	Of the few landowners directly affected by the Project who attended the Open House, some questions were asked of the land acquisition process.	NB Power Real Estate Agents were available to speak with landowners regarding the land acquisition process (i.e., compensation, conditions of agreement, etc.). See below for details.

Following the Open House, a site visit was conducted of the Kedgwick substation, and the land required for the expansion of the new 138 kV substation yard. Based on issues and concerns (e.g., low frequency hum, proximity to Wellfield Protected Area) expressed by landowners living next to the substation, and the fact that the expansion of the substation required the purchase of additional land, it was suggested by NB Power's Real Estate Department that a different property be considered for the substation. The property identified was located behind an old commercial building just south of the existing substation, and was owned by the rural community of Kedgwick. NB Power contacted the rural community of Kedgwick to discuss the idea and no significant issues or concerns were raised. Kedgwick officials agreed to work with NB Power to negotiate the purchase of the land for the purpose of building a new 138 kV electrical substation.

6.3.3 Meetings with Stakeholders

The information package sent to the various stakeholders extended an invitation to meet and discuss the Project in greater detail with NB Power personnel. To date, no meeting or additional information requests have been received from any of the stakeholders identified. NB Power will continue to work with stakeholders to address any comments or concerns that may arise during the Project.

6.3.4 Web Postings

NB Power continues to monitor comments or concerns received from the general public regarding the Project. To date, no comments or concerns have been received by Project personnel.

6.3.5 Land Acquisition

The process for the acquisition of land rights required for the construction and operation of the transmission line is well underway. Land rights will be acquired in accordance with New Brunswick legislation and compensation will be paid to landowners based upon appraised value of the affected lands.

There are six properties affected by the proposed Kedgwick substation and transmission line. Of these properties, four are privately owned while two are owned by the Province of New Brunswick. Preliminary discussions have been held with all landowners about the Project. No significant issues or concerns have been raised regarding the Project or the land acquisition process. NB Power is currently negotiating with the rural community of Kedgwick for the purchase of the property for the substation site. Once legal survey plans are finalized for the transmission line, it is expected that easement agreements will be signed by all landowners. Table 6.3 provides a summary of property-owner discussions to date.

Table 6.3 Summary of Land Acquisition

Property Identification (PID)	Ownership	Status of Easement Agreement
PID 50195395 (Substation Lot)	Communauté Rurale de Kedgwick	Kedgwick Council has approved the sale of the property for the new substation. Negotiations are ongoing with elected Officials. No issues are anticipated.
PID 50383926 PID 50383926	Private landowner #1	Discussions have been held with the landowner. Once a final legal survey plan is available, an easement agreement is expected to be signed. No issues are anticipated.
PID 50025063 PID 50028836	Crown Land	Application for easement will be submitted to the Crown Lands Branch of NBDERD once the legal survey plan is available.

Table 6.3 Summary of Land Acquisition

Property Identification (PID)	Ownership	Status of Easement Agreement
PID 50200310	Private landowner #2	Discussions have been held with the landowner. Once a final legal survey plan is available, an easement agreement is expected to be signed. No issues are anticipated.

6.4 FUTURE ENGAGEMENT

NB Power will publish a one-day notice in local French newspapers informing the public that the Project had been registered with NBDELG and identify locations where the EIA registration document could be reviewed. The public will be asked to forward comments or concerns about the proposed Project to NB Power. Following the registration of this Project with the NBDELG, and during the Determination Review process, NB Power will track, respond to, and report on key issues raised by the public, First Nations, and elected officials.

7.0 ABORIGINAL ENGAGEMENT

NB Power has initiated an Aboriginal Engagement Program to inform First Nations communities and groups about the Project. The Aboriginal Engagement Program used a multi-faceted approach to ensure that Project information reached as many First nation persons as possible. The approach includes maintaining a Project mailing list, distributing printed information, placing information on the website, meeting with Aboriginal groups and providing presentations or briefings.

7.1 OBJECTIVES

As with the Public Involvement Program, the objectives of the Aboriginal Engagement Program are as follows:

- Provide information directly to First Nations communities in the vicinity of the Project and associated First Nations groups
- Address issues and concerns raised during this process
- Identify measures that will mitigate or resolve First Nations issues or concerns proposed during future consultation initiatives.

7.2 ABORIGINAL ENGAGEMENT PROGRAM ELEMENTS

An effective Aboriginal Engagement program has many elements. The following section describes those elements as they relate to the Project.

7.2.1 Communication Methods

The methods employed to communicate with affected First Nations communities and groups are described below:

- **First Nations Engagement –** Involvement began with the identification of First Nations communities and groups in the area of the Project. An initial telephone call was made by NB Power's First Nations Affairs Department to notify each community or group of NB Power's intent to send an information package about the Project. Once received, a follow-up call was made to suggest a face-to-face meeting, if desired. The Chiefs and Councils of First Nations communities were solicited to determine if and how they wish to be engaged as part of the Project, and the engagement program for each community was specifically developed based on the wishes of that community. A list of First Nations communities and groups that were engaged as part of the Project is presented in Table 7.1 below.
- **Information Package –** Bilingual information packages were used to provide interested First Nations that wish to receive it with basic information about the Project. The package included a cover letter addressed to the various First Nations communities and groups (Appendix F) with fact sheets on the proposed undertaking (Appendix E).
- **Web Postings –** The NB Power website (www.nbpower.com) will serve as an electronic method for members of the public to access Project documents, view maps, and send comments.

- **Viewing of the EIA Registration –** A paper copy of the EIA Registration document will be made available for viewing during the review period at the following locations:
  - Rural Community of Kedgwick municipal office
  - New Brunswick Department of Environment and Local Government, Project and Approvals Branch (Fredericton)

  In addition, an electronic or paper copy of the EIA Registration document will be provided to any First Nation community requesting it, upon request.

  A brief summary report on the First Nations engagement initiatives carried out, and the key issues raised during the EIA review, will be provided to NBDELG within 60 days following registration.

- **Project Telephone Number –** A toll-free Project Information Line (1-866-754-7727) will appear on all communications and will provide an easy-to-access mean of contacting Project personnel without requiring computer capability, subscription to a newspaper, or attendance at an Open House.

Table 7.1 List of First Nation Communities and Groups

Bouctouche First Nation Chief: Ann Mary Steele 9 Reserve Road Bouctouche Reserve, NB E4S 4G2 Tel.: (506) 743-2520	**Eel Ground First Nation** Chief: George Ginnish 47 Church Road Eel Ground, NB E1V 4E6 Tel.: (506) 627-4600
Eel River Bar First Nation Chief: Thomas (Everett) Martin 11 Main Street, Unit 201 Eel River Bar, NB E8C 1A1 Tel.: (506) 684-6277	**Elsipogtog First Nation** Chief: Arren Sock 373 Big Cove Road Elsipogtog First Nation, NB E4W 2S3 Tel.: (506) 523-8200
Esgenoôpetitj First Nation Chief: Alvery Paul 620 Bayview Dr. Burnt Church, NB E9G 2A8 Tel.: (506) 776-1200	**Fort Folly First Nation** Chief: Rebecca Knockwood PO Box 1007 Dorchester, NB E4K 3V5 Tel.: (506) 379-3400
Indian Island Chief: Kenneth Barlow 61 Indian Island Drive Indian Island, NB E4W 1S9 Tel.: (506) 523-8110	**Kingsclear First Nation** Chief: Gabriel Atwin 77 French Village Road Kingsclear First Nation, NB E3E 1K3 Tel.: (506) 363-3028
Madawaska Maliseet First Nation Chief: Patricia Bernard 1771 Main Street Madawaska Maliseet First Nation, NB E7C 1W9 Tel.: (506) 739-9765	**Metepenagiag Mi'kmaq Nation** Chief: William (Bill) Ward PO Box 293 Metepenagiag Mi'kmaq Nation, NB E9E 2P2 Tel.: (506) 836-6111

Table 7.1 List of First Nation Communities and Groups

Oromocto First Nation Chief: Shelley Sabattis PO Box 417 Oromocto, NB E2V 2J2 Tel.: (506) 357-2083	**Pabineau First Nation** Chief: David Peter-Paul 1290 Pabineau Falls Road Pabineau First Nation, NB E2A 7M3 Tel.: (506) 548-9211
St. Mary's First Nation Chief: Candice Paul 150 Cliffe Street Fredericton, NB E3A 0A1 Tel.: (506) 458-9511	**Tobique First Nation** Chief: Ross Perley 13156 Route 105 Tobique First Nation, NB E7H 5M7 Tel.: (506) 273-8439
Woodstock First Nation Chief: Timothy (Tim) Paul 3 Wulastook Court Woodstock, NB E7M 4K6 Tel.: (506) 328-3303	**Mi'gmawe'l Tplu'taqnn Incorporated (MTI)** Stuart Gilby, Executive Director 40 Micmac Road Eel Ground, NB E1V 4B1 Tel.: (506) 455-1881 or (506) 627-4696

7.2.2 Issues Tracking and Reporting

A major effort of the Aboriginal Engagement Program will be to track, synthesize, and present comments to the applicable regulatory agencies. NB Power will maintain a database that is used to track issues and concerns raised during the Aboriginal engagement process. The database will provide Project staff with the ability to conduct queries, print specific reports, and review the status of all issues, concerns or commitments.

Issues or concerns raised by, or commitments made to, Aboriginal groups will be entered into the database and monitored regularly during Project meetings until appropriate actions have been taken to address them. During the meetings, outstanding items will be reviewed and updates provided to the Project Team. Upon completion of each outstanding item, the necessary information will be forwarded to administrative support personnel in order to identify the item as "complete". Results of the Aboriginal engagement activities conducted will be reported to the NBDELG along with the public engagement summary report, mentioned in Section 6.2.2 above.

7.3 RESULTS OF ABORIGINAL ENGAGEMENT PROGRAM TO DATE

7.3.1 Initiation of Aboriginal Engagement Program

Consultation began with the identification of First Nations communities potentially affected by the Project. A meeting was held in May 2016 with representatives of the Aboriginal Affairs Secretariat (AAS) to discuss the scope of the Project and obtain guidance and direction on how to consult with First Nation communities. The AAS works with legal counsel, technical advisors, regulatory authorities, departments, industry, First Nations and other parties to assess the risk of infringement, define the scope of the consultation process, and determine whether the duty to consult has been fulfilled.

Given the nature and location of the Project, it was suggested that formal consultation be initiated with the Maliseet communities, and that Mi'gmawe'l Tplu'taqnn Incorporated (MTI)—representing Mi'kmaq communities, Elsipogtog First Nation, and the Passamaquoddy Nation—be informed of the Project. It was also suggested that since NB Power had two other planned transmission line Projects underway, that all three projects (i.e., Kedgwick Transmission Line Project, Houlton Waters Transmission Line Project and Fundy Isles Submarine Cable Replacement Project) be combined into one letter to avoid multiple correspondences. Additionally, The inclusion of all three transmission projects in a single letter was intended to provide greater clarity to First Nations communities about pending NB Power transmission projects, and to achieve efficiencies in soliciting early responses and direction on these projects from First nations representatives.

Formal consultation notice letters were sent on June 13, 2016 to the Maliseet First Nation communities and copied to their Consultation Coordinators notifying the Chiefs of the proposed Projects and providing an opportunity for comments (Table 7.1: Appendix F). A letter was also sent to MTI and Elsipogtog First Nation on June 13, 2016, and to the Passamaquoddy Nation on June 21, 2016. The purpose of consultation has been to provide First Nations communities with a brief description about to the proposed Projects and to identify current use of lands and resources for traditional purposes by First Nations persons within the Project area.

7.3.2 Summary of Aboriginal Engagement

Communication with First Nations communities potentially affected by the Project began in June 2016, with preliminary information being provided on the scope of the Project. This initial contact eventually led to meetings with the Maliseet and MTI Consultation Coordinators on July 19, 2016 and September 26, 2016, respectively. During these meetings, more detailed information was provided on the need for the Project, regulatory framework and schedule. The purpose of these meetings was to better understand how the proposed Project may potentially affect past or current Aboriginal practices, traditions and customs, and how measures could be incorporated into the Project to avoid, mitigate or otherwise address those potential effects. Several issues and concerns were raised during meetings with both the Maliseet and MTI's Consultation Coordinators, including most notably the need for capacity funding to perform Traditional Land Use (TLU) Studies and technical review of Project related documents. Additional details on key issues and concerns raised and how these were addressed are described in Table 7.2. While Table 7.2 reflects some discussion and issues related to all three NB Power transmission line Projects (i.e., Kedgwick Project, Houlton Waters Transmission Line, and the Fundy Isles Submarine Cable Replacement Project), the Consultation Log has been edited to include only those elements that are directly or indirectly related to the Kedgwick Project. Information specific to the other two NB Power transmission projects will be included in their respective EIA registration documents, and can be obtained from NB Power upon request. This record of consultation will be updated as the EIA process progresses.

With respect to the Kedgwick Transmission Line Project, neither the Maliseet Consultation Coordinators nor AAS have advised NB Power that an independent technical review and TLU study are required in order for them to assess potential effects to Aboriginal or treaty rights since the scope of potential environmental effects from this Project will be temporary and of short duration. NB Power will continue to work with Consultation Coordinators to discuss potential effects to Aboriginal or treaty rights as a result

of construction of the transmission line and substation, as well as decommissioning of the 25 km of existing transmission line, in an effort to identify avoidance and mitigation strategies that will be implemented.

MTI also advised NB Power during a meeting held on October 17, 2016, that the Project could generate interest in an independent technical review and TLU study in order to assess potential effects to Aboriginal or treaty rights. AAS suggested that a TLU would likely not be required since the scope of potential environmental effects from this Project will be temporary and of short duration. Rather, AAS asked that MTI provide any documentation on historical Aboriginal uses in the area. Since that meeting, there have been staff changes and discussions have been on hold; no further documentation has since been provided by MTI at the time of registration of this Project. A meeting was held on January 20, 2017 to meet the new Consultation Coordinator and re-establish discussions.

A summary of consultation with Maliseet First Nations and MTI follows in Table 7.2.

Table 7.2 Summary of Key Comments Received As Part of the Aboriginal Engagement Program

ID #	Date (YY/MM/DD)	Means of Engagement	Proponent Contact	First Nation Contact	Subject	Summary of Discussions	Issues / Comments / Concerns	Means of Addressing Issues / Comments / Concerns and Status
1	2016/06/13	Email/Letter	C. St-Pierre	Maliseet Chiefs/ Consultation Coordinators	The purpose of the letter was a request to initiate formal consultation on the three current Transmission Line Projects (described in more detail in Appendix F), as well as provide all the Maliseet communities with the opportunity to submit comments or information on current use of resources for traditional purposes and how the projects may affect established and asserted Aboriginal and Treaty rights.	Not applicable	Not applicable	Not applicable
2	2016/06/13	Email	C. St-Pierre	Amanda McIntosh, Woodstock FN Consultation Coordinator	In response to NB Power's letter requesting formal consultation, an email was received from the Woodstock Consultation Coordinator on July 13, 2016.	The email expressed interest in receiving more information on the proposed Transmissions Line Projects. The Consultation Coordinator noted that she was currently booking into July and requested potential dates for a meeting.	Not applicable	NB Power responded via email on June 20, 2016, thanking the Consultation Coordinator for her interest in the projects and welcoming the opportunity to meet and discuss projects in further detail. The following dates were proposed for July 6, 2016, or July 7, 2016.
3	2016/06/16	Email	C. St-Pierre	Deana Sappier, Tobique FN Consultation Coordinator	In response to NB Power's letter dated July 13, 2016 requesting formal consultation, an email was received from the Tobique Consultation Coordinator on July 16, 2016.	The email expressed interest in receiving more information on the proposed Transmissions Line Projects.	Questions and concerns raised by D. Sappier related to the Kedgwick Project were as follows: • All three projects seem to trigger a NB EIA registration, what projects have already been registered and what steps have already been taken?	NB Power responded via email on June 20, 2016 thanking the Consultation Coordinator for her interest in the projects and provided the following response: • All three projects trigger the NB EIA process. NB Power is in early planning stages therefore, has not yet registered projects with the province. Field studies are currently being conducted and will continue over the next few months. NB Power welcomed the opportunity to meet and discuss projects in further detail. It was suggested that a meeting be held in July. The Consultation Coordinator was asked to provide potential dates.
4	2016/06/20	Email	C. St-Pierre	Deana Sappier, Tobique FN Consultation Coordinator	An email was received from the Tobique Consultation Coordinator informing NB Power of available dates in July to meet to initiate dialog on proposed projects.	It was noted by D. Sappier that she was available the last two weeks of July. It was also suggested that other Consultation Coordinators may want to join the meeting.	Not applicable	NB Power responded via email on June 20, 2016 advising that all Consultation Coordinators would be contacted to coordinate a meeting date for July. C. St-Pierre noted that she would get back to D. Sappier shortly with potential dates.
5	2016/06/22	Email	C. St-Pierre	Maliseet Consultation Coordinators	An email was sent to all Consultation Coordinators proposing potential dates for a meeting to start discussions/dialogue on the proposed transmission line projects.	It was suggested by NB Power that the meeting be held on the following dates below: • Tuesday July 19, 2016 or • Wednesday July 20, 2016	Not applicable	All Consultation Coordinators responded to confirm their availability for the proposed dates. It was agreed that a meeting would be held on July 19, 2016.
6	2016/06/	Email/ Meeting Request	C. St-Pierre	Maliseet Consultation Coordinators	A meeting request was sent out to all Consultation Coordinators and scheduled for July 19, 2016 @ 1:30pm, NB Power Head Office 515 King Street – HO5.	The purpose of the meeting was to provide additional information to the Maliseet Consultation Coordinators about the Projects and to start discussions/dialog regarding current use of resources for traditional purposes and how the projects may affect established and asserted Aboriginal and Treaty rights.	Not applicable	Not applicable

Table 7.2 Summary of Key Comments Received As Part of the Aboriginal Engagement Program

ID #	Date (YY/MM/DD)	Means of Engagement	Proponent Contact	First Nation Contact	Subject	Summary of Discussions	Issues / Comments / Concerns	Means of Addressing Issues / Comments / Concerns and Status
7	2016/07/19	Email	C. St-Pierre	Maliseet Consultation Coordinators	An email was sent to the Maliseet Consultation Coordinators on July 19, 2016, prior to the meeting, providing a copy of the presentation for those attendees that would be calling-in to the meeting.	Not applicable	Not applicable	Not applicable
8	2016/07/19	Meeting	C. St-Pierre	Maliseet Consultation Coordinators	A meeting was held with the Maliseet Consultation Coordinators to provide further details on the proposed transmission line projects currently in the early planning stages. The intent of the meeting was to share information about the projects and have meaningful dialogue to ensure and understand potential impacts of Maliseet communities' current use of land and resources and established and asserted Aboriginal and Treaty rights.	The presentation provided more details about each projects and included information on the scope, schedule, regulatory framework and studies underway. The presentation also focused on the First Nations consultation approach that was being proposed by NB Power to consult with First Nations and the next steps to initiate this process.	There were no questions, concerns, or issues related to the Kedgwick Project that were raised during the meeting.	Not applicable
9	2016/07/25	Email	C. St-Pierre	Maliseet Consultation Coordinators	On July 25, 2016, summary notes of the meeting held on July 19, 2016 were sent to the Consultation Coordinators.	Not applicable	Not applicable	Not applicable
10	2016/09/30	Phone Call	C. St-Pierre	Deana Sappier, Tobique FN Email copied to all Consultation Coordinators	A phone call was made to the Tobique Consultation Coordinator to provide an update on the proposed transmission line projects and to discuss the outcome of the Chiefs meeting held on August 8, 2016.	• An update on all three transmission line projects were provided to D. Sappier since the last meeting held in July 2016 as follows: Kedgwick: An Open House was scheduled for October 13, 2016 Discussions were held regarding the need for a TLU Study for the Houlton Waters and Kedgwick Transmission Line Projects. NB Power noted that it understood, based on discussions with AAS, that a TLU Study would not be required for these projects due to the scope and nature of these Projects.	D. Sappier asked if a 5-10 year transmission development plan was available and could be shared with all Consultation Coordinators.	Copies of the scoping letter for the Fundy Isles Submarine Cable Replacement Project and an invitation to the Kedgwick Open House were provided to D. Sappier, via email, on September 30, 2016. See ID #11 below for details. The 10-year transmission plan was provided on October 20, 2016. See ID#20 for details.
11	2016/09/30	Email	C. St-Pierre	Deana Sappier, Tobique FN Email copied to all Consultation Coordinators	The call was followed-up by an email summarizing the discussions. An invitation to the Kedgwick Information Session was attached to the email.	Not applicable	Not applicable	Not applicable
12	2016/09/29	Phone call	C. St-Pierre	Russ Letica, Madawaska FN	A voice message was left with the Madawaska Consultation Coordinator to inform him of an upcoming Open House for the Kedgwick Transmission Line Project and to invite community members to participate. An offer was made to host a session at the community at a later date.	Not applicable	Not applicable	Not applicable
13	2016/09/30	Email/Follow-up	C. St-Pierre	Russ Letica, Madawaska FN	A follow-up email to the voice message of September 29, 2016 was sent to the Madawaska Consultation Coordinator regarding the Kedgwick Transmission Line	Not applicable	Not applicable	On the same day, R. Letica responded via email noting that after speaking with Chief Bernard, they would like to reserve the right for a meeting in the future. He also stated that he would print the information about

Table 7.2 Summary of Key Comments Received As Part of the Aboriginal Engagement Program

ID #	Date (YY/MM/DD)	Means of Engagement	Proponent Contact	First Nation Contact	Subject	Summary of Discussions	Issues / Comments / Concerns	Means of Addressing Issues / Comments / Concerns and Status
					Project Open House scheduled for October 13, 2016.			the Kedgwick meeting and send it out to the community members, inviting them to attend.
14	2016/10/04	Email/invitation	C. St-Pierre	All Maliseet Consultation Coordinators	By way of email, a formal invitation was extended to all Consultation Coordinators to attend the Open House for the Kedgwick Transmission Line scheduled for October 13, 2016. The email noted that should anyone be interested in attending the session that a pre-view could be arranged before it was opened to the general public. The email also requested a potential date to meet to provide an update on the proposed transmission line projects and to confirm what support is needed to facilitate further consultation.	Not applicable	Not applicable	Not applicable
15	2016/10/13	Email	C. St-Pierre	Maliseet Consultation Coordinators and Shyla O'Donnell, Consultation Director for the Maliseet Nations	An email was sent to all Maliseet Consultation Coordinators summarizing the status of discussions to date regarding the need for TLU Studies for the various Transmission Line Projects. It was noted that due to the scope and nature of the Kedgwick Transmission Line and the Houlton Waters Projects, the need for TEK/TLU Studies were not required. However, a TLU Study would be required for the Fundy Isles Submarine Cable Project. The email also introduced NB Power's newest First Nations Field Monitor, Tessa Francis, and summarized her duties related to these transmission line projects.	Not applicable	Not applicable	Not applicable
16	2016/10/14	Email	C. St-Pierre	Deana Sappier, Tobique FN	On October 14, 2016 an email was received from D. Sappier in response to the October 13, 2016 email.	The email requested, amongst other things, NB Power's 10-year transmission plan.	Not applicable	See ID#18 and ID#20 below for response
17	2016/10/17	Email	C. St-Pierre	Russ Letica, Madawaska FN	On October 17, 2016, an email was received from R. Letica in response to the October 13, 2016 email.	The email noted that after speaking with Chief and Council, it was preferable to learn more about the Kedgwick Transmission Line Project and other projects before bringing a meeting to the Madawaska community.	Not applicable	See ID #18 below for response.
18	2016/10/18	Email	C. St-Pierre	Maliseet Consultation Coordinators	An email was sent out to all Maliseet Consultation Coordinators to propose potential dates for a follow-up meeting to go over details of each project, as well as, introduce other projects pending. The following dates in 2016 were proposed: • Wednesday, November 2 – am or pm • Thursday, November 3 – am or pm • Wednesday, November 9 – am or pm • Thursday, November 10 – am or pm	Not applicable	Not applicable	Emails were received from all Consultation Coordinators noting their availability. It was agreed that November 10, 2016 in the afternoon would work for all.

Table 7.2 Summary of Key Comments Received As Part of the Aboriginal Engagement Program

ID #	Date (YY/MM/DD)	Means of Engagement	Proponent Contact	First Nation Contact	Subject	Summary of Discussions	Issues / Comments / Concerns	Means of Addressing Issues / Comments / Concerns and Status
19	2016/10/	Email/Meeting Notification	C. St-Pierre	Maliseet Consultation Coordinators and Shyla O'Donnell, Consultation Director	A meeting request was sent out to all Consultation Coordinators for November 10, 2016 at NB Power HO5 Floor, 12-3 PM. The purpose of the meeting was to provide an update on the Transmission Line Projects and other NB Power projects.	Not applicable	Not applicable	Not applicable
20	2016/10/20	Email/Follow up	C. St-Pierre	Deana Sappier, Tobique FN Consultation Coordinator Copied to all Consultation Coordinators	The purpose of the email was to follow-up on a request made by D. Sappier regarding a 10-year transmission plan to better understand projects that may require Aboriginal consultation. A copy of the 10-year transmission plan was attach to the email.	Not applicable	Not applicable	On November 20, 2016, D. Sappier provided an email response thanking C. St-Pierre for the information she received. S. Paul also responded thanking C. St-Pierre for the information, as well as stating she had a few questions she would like to discuss during the next meeting scheduled November 10, 2016.
21	2016/11/10	Meeting	C. St-Pierre A. Allen A. Bielecki A. Paul T. Francis External: Mary-Ann Mann, ERD	Deana Sappier, Tobique FN Sydney Paul, Kingsclear FN (phone) Russ Letica, Madawaska FN	The purpose of the meeting was to provide an update on the proposed Transmission Line Projects and a brief overview of the Grand Falls Project. A copy of the presentation, as well as a copy of the Archaeological Field Report for the Houlton Waters Transmission Line Project was sent electronically prior to meeting.	Although an update on the Kedgwick Project was not provided (due to a lack of time), C. St-Pierre noted that the presentation contained information on the Project and to contact her if anyone had questions or concerns.	The following concerns/issues were raised as follows: • S. Paul noted she is currently working on a funding proposal for Fisheries expert. • Discussions were held with respect to the possibility of a multi-year funding contact for technical reviews and conduct studies associated with projects.	The following action item noted from meeting: • S. Paul to provide proposal to NB Power for fisheries expert
22	2016/11/18	Email	A. Allen	Sydney Paul, Woodstock FN and Shyla O'Donnell, Consultation Director	An email was received from S. Paul with an attached proposal for funding for a Fisheries Expert.	The proposal requested funding for a Fisheries Expert for a five year term. The Fisheries Expert would be hired to assist the Consultation Coordinators with, expert fisheries advice on NB Power projects, also incorporating Traditional Knowledge into their advice. The Fisheries Expert would be accountable to the Maliseet Nation and annual reports would be presented to NB Power.	Not applicable	Not applicable
23	2016/11/24	Email / Draft Minutes of Meeting	T. Francis, Aboriginal Field Monitor	Maliseet Consultation Coordinators and Shyla O'Donnell, Consultation Director	An email was sent out to all Consultation Coordinators with attached draft Minutes of Meeting of the November 10, 2016 meeting.	Not applicable	Not applicable	Not applicable
24	2016/12/13	Email/Phone call	A. Allen	Shyla O'Donnell, Consultation Director	An email was sent to provide a summary on what was discussed Friday December 9, 2016 via conference call with S. O'Donnell regarding a proposal for a long term capacity funding agreement .	The email provided a summary of discussions concerning a preliminary proposal for capacity funding. Discussions consisted of: • Proposed Objective • Background	Not applicable	Not applicable

Table 7.2 Summary of Key Comments Received As Part of the Aboriginal Engagement Program

ID #	Date (YY/MM/DD)	Means of Engagement	Proponent Contact	First Nation Contact	Subject	Summary of Discussions	Issues / Comments / Concerns	Means of Addressing Issues / Comments / Concerns and Status
						• Current Situation • Current/short term Activity • Proposed components • Benefits		
25	2016/12/14	Meeting	C. St-Pierre A. Allen Ed Genova T. Francis A. Bielecki A. Paul	D. Sappier R. Letica S. Paul (via phone) M. Fullarton (via phone)	The purpose of the meeting was to provide an update on the proposed Transmission Line Projects and the Grand Falls Project.	A summary of the discussions held with Shyla and AAS regarding a multi-year agreement for funding for key positions to provide the Consultation Coordinators with expertise to review projects and conduct TLU studies was also provided to all attendees.	The following issues and concerns related to the Kedgwick Project were raised during the meeting: • Deana Sapier expressed concerns that, to keep these projects moving forward, a fisheries expert would need to be involved between January – April 2017, until permanent expert is hired through the multi-year funding agreement. • Russ questioned the need to increase the transmission infrastructure from 69 kV to 138 kV. Chantal stated that the current situation is a reliability issue and not a demand issue. • NB Power agreed to inform the Maliseet Consultation Coordinators of any discussions with the Houlton Band of Indians in Maine.	The following action items were noted during the meeting: • Andrea and Anthony to work with Shyla in developing a multi-year funding capacity agreement. • Chantal to inform Consultation Coordinators of any discussions with the Houlton Band of Indians. • Chantal to provide shape files of the substation and transmission line for the Kedgwick project.
26	2017/01/10	Email	T. Francis Aboriginal Field Monitor	Maliseet Consultation Coordinators and Shyla O'Donnell	An email was sent to all Consultation Coordinators with a copy of the draft Minutes of Meeting of the meeting held on December 14, 2016.	Not applicable	Not applicable	Not applicable

7.4 FUTURE ENGAGEMENT

NB Power will continue to engage First Nations communities regarding the Project. Concerns identified during engagement with First Nations, particularly those in relation to the practice of traditional activities in the PDA, will be documented and appropriate mitigation measures will be implemented as necessary to minimize any interactions of the Project with the practice of traditional activities.

NB Power will meet regularly and engage the First Nations during the regulatory review of the Project. The purpose of this engagement will be to:

- Maintain on-going engagement with First Nations regarding the Project;
- Review the results of environmental studies;
- Invite feedback and to identify opportunities to reduce, mitigate, or otherwise accommodate potential adverse effects to First Nations' treaty rights and other interests; and,
- Identify long-term interests in capacity-building opportunities including economic, business, employment, education, and training.

8.0 CLOSURE

This report has been prepared by Stantec for the sole benefit of the New Brunswick Power Corporation (NB Power). The report may not be relied upon by any other person or entity, other than for its intended purposes, without the express written consent of Stantec and NB Power.

This report was undertaken exclusively for the purpose outlined herein and was limited to the scope and purpose specifically expressed in this report. This report cannot be used or applied under any circumstances to another location or situation or for any other purpose without further evaluation of the data and related limitations. Any use of this report by a third party, or any reliance on decisions made based upon it, are the responsibility of such third parties. Stantec accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken based on this report.

Stantec makes no representation or warranty with respect to this report, other than the work was undertaken by trained professional and technical staff in accordance with generally accepted engineering and scientific practices current at the time the work was performed. Any information or facts provided by others and referred to or used in the preparation of this report were assumed by Stantec to be accurate. Conclusions presented in this report should not be construed as legal advice.

The information provided in this report was compiled from existing documents and data provided by NB Power and by applying currently accepted industry standard mitigation and prevention principles. This report represents the best professional judgment of Stantec personnel available at the time of its preparation. Stantec reserves the right to modify the contents of this report, in whole or in part, to reflect the any new information that becomes available. If any conditions become apparent that differ significantly from our understanding of conditions as presented in this report, we request that we be notified immediately to reassess the conclusions provided herein.

This report has been prepared by a team of Stantec professionals on behalf of NB Power.

9.0 REFERENCES

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Appendix A ADDITIONAL INFORMATION (REQUIREMENTS OF NEW BRUNSWICK EIA GUIDE)

Stantec

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REGISTRATION FOR THE MODERNIZATION OF ELECTRICAL TRANSMISSION INFRASTRUCTURE NEAR KEDGWICK, NEW BRUNSWICK

February 14, 2017

Stantec

THE PROPONENT

Name of Undertaking	Construction of New Kedgwick Substation, Transmission Line to tap into Transmission Line 1110, and Decommissioning of Existing Kedgwick Substation and Transmission Line 0028
Project Overview	Please refer to Section 1.1of the EIA Registration Document
Purpose / Rationale / Need for Undertaking	Please refer to Section 1.3 of the EIA Registration Document
Project Location	The proposed Project is located near the rural community of Kedgwick, in Restigouche County, New Brunswick. The Construction of New Transmission Line and New Substation begins near Kedgwick, NB at: Latitude: 47.651420 Longitude: -67.341611 The Construction of New Transmission Line and New Substation ends 5.3 km east of Kedgwick, NB at: Latitude: 47.648331 Longitude: -67.27153 The Decommissioning of Line 0028 begins near Kedgwick, NB at: Latitude: 47.6522841 Longitude: -67.342841 The Decommissioning of Line 0028 ends near St. Quentin, NB at: Latitude: 47.454567 Longitude: -67.441819 Parcel Identifiers (PIDs) of the Project are included in Table A.1 for the Construction of the New Transmission Line and New Substation, and Table A.2 for the Decommissioning of Line 0028 and the existing Kedgwick substation at the end of this Appendix. Please refer to Figure 2.1 of the EIA Registration Document for a site location map showing the location of the Project and the Preferred Option.
Siting Considerations	A description of the considerations that were taken in to account in choosing the Project location is provided in Section 2.2.
Physical Components and Dimensions of the Project	A description of the Project components and infrastructure is provided in Section 2.4 of the EIA Registration Document.
Construction Details	An overview of Project Construction activities is provided in Section 2.5.1.1 of the EIA Registration Document.
Operation and Maintenance Details	An overview of Project operation activities is provided in Section 2.5.1.2 of the EIA Registration Document.

Future Modifications, Extensions, or Abandonment	An overview of Project Decommissioning activities is provided in Section 2.5.1.3 and Section 2.5.2 of the EIA Registration Document.
Project-Related Documents	NB Power's Environmental Protection Plan (EPP) will be submitted to NBDELG under separate cover. A letter from the Restigouche Regional Service Committee confirming that the Project conforms to rural land use planning for the rural community of Kedgwick Zoning By-laws is provided in Appendix B.

Description of the Existing Environment

The description of relevant features that are found within the Project location and surrounding areas that could potentially be affected by the Project are provided in Section 3.0, and within the descriptions of the specific VCs, found in Section 4.0 of the EIA Registration Document.

Summary of Environmental Impacts

Potential environmental interactions, or "impacts," of the various Project phases are provided in Section 4 of the EIA Registration Document.

Summary of Proposed Mitigation

Mitigation by design in relation to the potential Project-related environmental interactions is discussed in detail in Section 5.0 of the EIA Registration Document. These mitigation measures follow NB Power's EPP (NB Power 2012), which will be submitted under separate cover.

Public Involvement

A brief summary of the public involvement activities planned as part of the Project is provided in Section 6.0 of the EIA Registration Document. The activities planned for the engagement of First Nations communities and groups is provided in Section 7.0.

Approval of the Undertaking

Permits, licenses, approvals, and other regulatory requirements and authorizations that may be required for the Project are discussed in Section 1.4 of the EIA Registration Document. A federal environmental assessment under the *Canadian Environmental Assessment Act 2012* is not required, as it is not a designated project.

February 14, 2017

Funding

Funding for the Project is being provided entirely by NB Power.

Signature

Signature

Date

Table A.1 Parcel Identifiers (PID) of Properties Crossed by the Construction of New Transmission Line and New Substation

50025063	50027390	50027853	50028836	50195395	50200310
50370576	50383926	3- NBDTI (road)			

Table A.2 Parcel Identifiers (PID) of Properties Crossed by the Decommissioning of Line 0028 and Existing Substation

50009794	50361070	50231646	50031103	50028091	50017474
50011055	50368992	50236025	50031707	50028323	50017672
50012145	50370733	50244409	50031848	50028356	50017722
50012459	50374495	50259407	50032309	50028901	50017896
50012574	50375567	50262948	50032507	50028992	50018860
50012756	50377860	50263680	50086818	50029032	50019504
50012780	50382308	50345800	50195577	50029040	50019561
50012798	50385251	50345909	50199868	50029339	50020999
50012913	50390251	50347103	50214949	50029420	50021385
50013119	50390327	50348986	50222587	50029669	50021393
50013531	50390392	50358498	50222900	50029776	50027226
50015346	65111031	50358746	50225580	50030345	50027382
50014422	65140865	50015692	50016450	50030402	50027697
50014430	50015536	50015718	50017011	50030485	50027721
50014489	50015569	50016021	50017441	50030618	50027788
50014554	50015643	50015395	50017466	50015353	50027903
50014588	50015346	50015049	50015353	50393529	50238716
NBDTI – 1 (road)		NBDTI – 3 (road)			

Appendix B

A LETTER FROM THE RESTIGOUCHE REGIONAL SERVICE COMMITTEE CONFIRMING THAT THE PROJECT CONFORMS TO THE RURAL COMMUNITY OF KEDGWICK ZONING BY-LAWS

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REGISTRATION FOR THE MODERNIZATION OF ELECTRICAL TRANSMISSION INFRASTRUCTURE NEAR KEDGWICK, NEW BRUNSWICK

February 14, 2017

Stantec

Restigouche
Regional Service Commission

Planning

Commission de services régionaux
Restigouche

Urbanisme

July 18, 2016

Chantal St-Pierre
Director – Regulatory and Environmental Affairs
NB Power
PO Box 2000
Fredericton, NB
E3B 4X1

Re: Zoning confirmation certificate #1622301 regarding the Kedgwick proposed transmission line project, located on PID 50383926, 50025063, 50027853, 50027390 and 50028836.

Dear Ms. St-Pierre:

The Rural Community of Kedgwick was established on July 1st, 2012. This newly incorporated community is comprised of the former Village of Kedgwick and the Local Service District of the parish of Grimmer. The former Village of Kedgwick had a Municipal Plan and a Zoning By-law in effect at the time of incorporation of the Rural Community of Kedgwick that remains in effect today. However, a large portion of the new rural community has no plan or zoning in effect.

We have prepared a map showing the proposed transmission lines (option 1 and 2) and the existing zoning according to the Zoning By-law.

PID	Zoning assigned by the Zoning By-law
50383926	Single and Two Family Residential Special (R (2A)) Zone and Resource (X) Zone
50025063	None (Crown Land)
50027853	None
50027390	None
50028836	Exempt from zoning provisions (Crown Land)

According to Section 3 "Interpretation" of the Zoning By-law:

"Structure" means an erection other than a building, a pole or a telephone or electrical line;

...2

Le 18 juillet 2016

Chantal St-Pierre
Directrice, Affaires réglementaires et environnementale
Énergie NB
C.P. 2000
Fredericton, N-B
E3B 4X1

Certificat #1622301, confirmation de zonage concernant le projet proposé de ligne de transmission de Kedgwick, située sur les NID 50383926, 50025063, 50027853, 50027390 et 50028836.

Madame St-Pierre,

La Communauté rurale de Kedgwick a été créée le 1er juillet 2012. Cette communauté nouvellement constituée est composée de l'ancien Village de Kedgwick et du district de services locaux de la paroisse de Grimmer. L'ancien Village de Kedgwick avait un plan municipal et un arrêté de zonage en vigueur au moment de la constitution de la Communauté rurale de Kedgwick qui demeurent en vigueur aujourd'hui. Toutefois, une grande partie de la nouvelle communauté rurale n'a aucun plan ou zonage en vigueur.

Nous avons préparé une carte qui montre les lignes de transmission proposées (option 1 et 2) et le zonage existant selon l'Arrêté de zonage.

NID	Zonage attribué par l'Arrêté de zonage
50383926	Zone résidentielle unifamiliale et bifamiliale spéciale, zone R (2A) et la zone de ressource, zone X
50025063	Aucun zonage (terres de la Couronne)
50027853	Aucun zonage
50027390	Aucun zonage
50028836	Exempté des dispositions de zonage (terres de la Couronne)

Selon l'Article 3 « Interprétation » de l'Arrêté de zonage :

« Construction » désigne un ouvrage autre qu'un bâtiment, un poteau ou une ligne téléphonique ou électrique;

...2

68 A, rue Water Street Campbellton NB E3N 1B1 Tel.: (506) 789-2595 Fax: (506) 789-2594

Zoning By-law, Section 9, "Conformity" states:

9 In any zone mentioned above, no land shall be used, and no building or structure or part thereof shall be placed, erected, altered or used, unless otherwise specified, except in conformity with the provisions established by the part of this by-law pertaining to this zone, except for variances provided.

Therefore, the proposed transmission lines (option 1 and 2) located on PID 50383926, 50025063, 50027853, 50027390 and 50028836 and within the limits of the Rural Community of Kedgwick <u>are permitted</u> by the Zoning By-law.

The Restigouche Regional Service Commission is presently seeking proposals from a professional planning consultant to undertake the preparation of a first draft of a new rural plan for the Rural Community of Kedgwick. RFP 2016-02 was released on June 28th, 2016, and the closing date is July 22nd, 2016.

Please note that new zoning provisions may be assigned to all parcels within the limits of the Rural Community of Kedgwick in the future.

If you have further questions, please do not hesitate to contact the undersigned.

Sincerely,

L'article 9, « Obligation de conformité » stipule :

9) Pour toutes les zones ci-haut mentionnées, les terrains ne doivent être utilisés et les bâtiments et constructions, ou parties de ceux-ci, ne doivent être implantés, édifiés, modifiés ou utilisés, sauf dispositions contraires, qu'en conformité des prescriptions établies par la partie du présent arrêté visant cette zone, sauf dérogations prévues.

Par conséquent, les lignes de transmission proposées (option 1 et 2) situées sur les NID 50383926, 50025063, 50027853, 50027390 et 50028836 et à l'intérieur des limites de la Communauté rurale de Kedgwick <u>sont permises</u> par l'Arrêté de zonage.

La Commission de services régionaux Restigouche sollicite des propositions d'un(e) urbaniste-conseil professionnel (elle) pour l'élaboration d'une première ébauche d'un nouveau plan rural pour la Communauté rurale de Kedgwick. DDP 2016-02 a été sortie le 28 juin 2016 et la date de clôture est le 22 juillet 2016.

Veuillez noter que les nouvelles dispositions de zonage peuvent être attribuées à toutes parcelles à l'intérieur des limites de la Communauté rurale de Kedgwick à l'avenir.

Si vous avez des questions, n'hésitez pas à contacter la soussignée.

Veuillez agréer, Madame, l'expression de mes salutations distinguées.

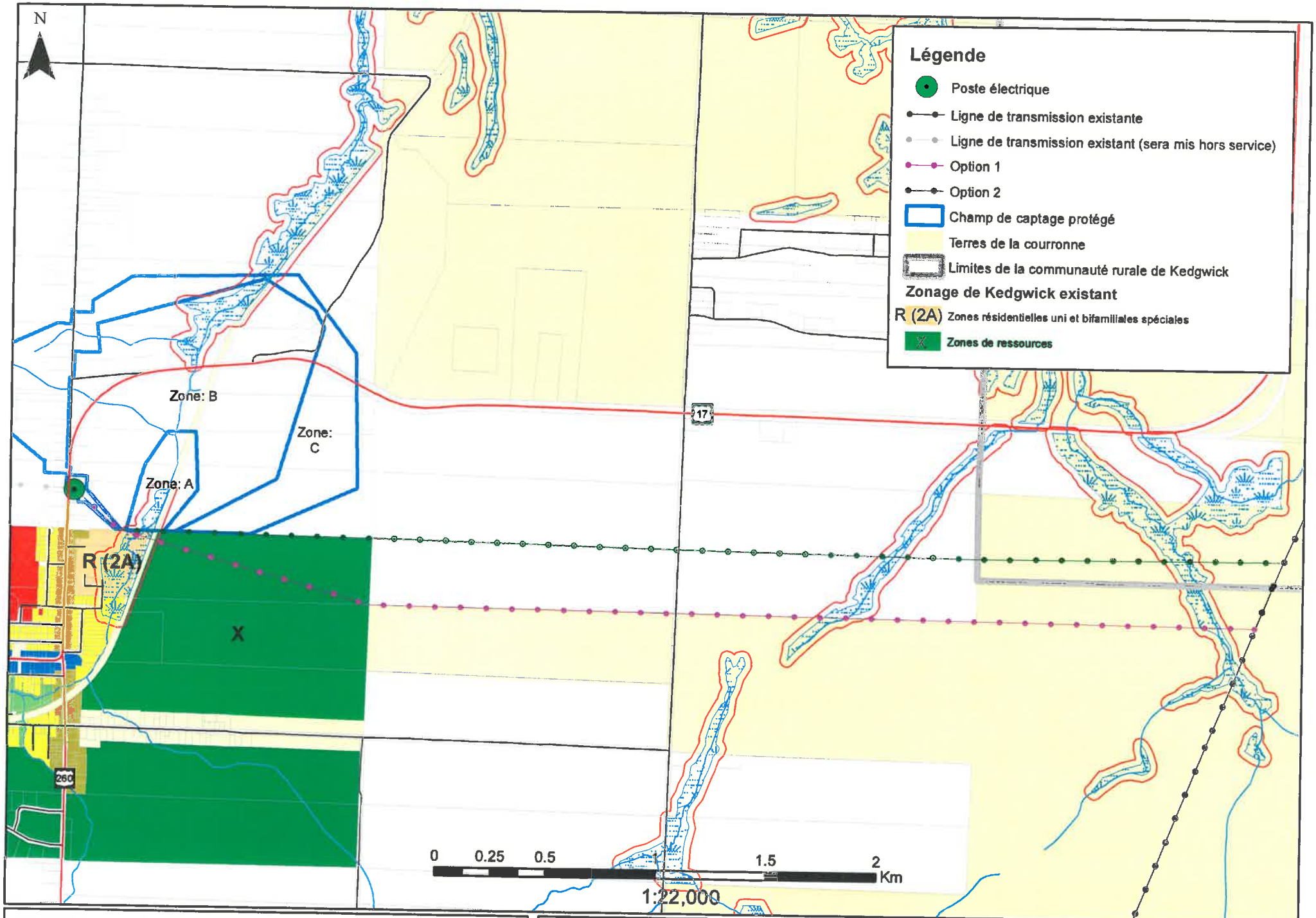
Kim Thompson P.Eng/ing., MCIP/MICU, RPP/UPC
Planning Director/Directrice de la planification

KT/as

Encls. Map

KT/as

p. j. Carte



Commission de services régionaux Restigouche
Division d'urbanisme
Restigouche Regional Service Commission
Planning Department

February 14, 2017

Appendix C

CONSTRAINTS ANALYSIS AND ENVIRONMENTAL REVIEW FOR THE MODERNIZATION OF ELECTRICAL TRANSMISSION INFRASTRUCTURE NEAR KEDGWICK, NEW BRUNSWICK: CONSTRUCTION OF NEW KEDGWICK SUBSTATION, NEW TRANSMISSION LINE TO TAP INTO EXISITNG TRANSMISSION LINE 1110, AND DECOMMISSIONING OF EXISTING KEDGWICK SUBSTATION AND TRANSMISSION LINE 0028

Stantec

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REGISTRATION FOR THE MODERNIZATION OF ELECTRICAL TRANSMISSION INFRASTRUCTURE NEAR KEDGWICK, NEW BRUNSWICK

February 14, 2017

Stantec

Constraints Analysis and Environmental Review for the Modernization of Electrical Transmission Infrastructure near Kedgwick, New Brunswick

Construction of New Kedgwick Substation, New Transmission Line to tap into Existing Transmission Line 1110, and Decommissioning of Existing Kedgwick Substation and Transmission Line 0028

Prepared for:
New Brunswick Power Corporation
PO Box 2040, 515 King Street
Fredericton, NB E3B 5G4

Prepared by:
Stantec Consulting Ltd.
130 Somerset Street
Saint John, NB E2K 2X4

Project No. 121812276
February 2, 2017

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1.0 INTRODUCTION

The New Brunswick Power Corporation (NB Power) is proposing to construct, operate, and maintain a new 5 km-long 138 kV transmission line from a new substation to a nearby 138 kV transmission line (Line 1110), along with the decommissioning of the existing Kedgwick substation and 25 km-long 69 kV transmission line (Line 0028) (herein referred to as "the Project"). In support of the Environmental Impact Assessment (EIA) registration for the Project being developed by Stantec Consulting Ltd. (Stantec) on behalf of NB Power, preliminary environmental, socio-economic, and physical constraints were assessed for two potential Project routes provided by NB Power. Environmental attributes were compiled for the 69 kV transmission line; however, the focus of this report is on environmental constraints relating to two potential routes for the new 5 km-long 138 kV transmission line portion of the Project.

NB Power provided two potential transmission line routes as well as three potential new substation footprints. Based on the preliminary results of the constraint analysis, the only environmental differentiator between the three substation footprints (A, B, and C) was their amount of overlap with the Kedgwick Protected Wellfield. Option C is the only option of the three that does not intersect the Kedgwick Protected Wellfield and is the preferred option identified by NB Power. Therefore, both routes provided by NB Power were modified to originate from substation option C for the purposes of this report.

The two modified potential routes for the proposed new 5 km-long 138 kV transmission line are as follows.

- Option 1, a 5.3 km-long route that originates south of the existing Kedgwick substation within the Rural Community of Kedgwick on PID 50195395, and continues towards the southeast on private land for 0.5 km. This proposed route then continues towards the east on private land for 0.8 km and towards the east on Crown land for 4 km, until it connects with existing transmission line 1110.
- Option 2, a 5.4 km-long route that originates at the same location as Option 1 and continues towards the southeast on private land for 65 m. This proposed route then continues towards the east on private land for 3.9 km and then towards the east on Crown land for 1.4 km until it connects with existing transmission line 1110.

The existing Kedgwick substation to be decommissioned is on property currently owned by NB Power (PID No. 50030618) and shares its property boundary with the Kedgwick Protected Wellfield to the north and east of the substation.

The existing transmission line 0028 to be decommissioned is 25 km in length, from the existing Kedgwick substation to approximately 5 km south of Rang-Douze-Sud where the line crosses Route 17 and starts to parallel existing transmission line 1110. The line is mostly on private land (20.3 km) but also crosses Crown land and restricted freehold land. Once the new 138 kV transmission line is constructed and operational, existing transmission line 0028 will be decommissioned as part of the Project.

A desktop review of pertinent available data was conducted to identify potential environmental, socio-economic, and physical attributes for each of the Project components. This report includes an analysis of constraints for two route options, and a review of environmental attributes for the Kedgwick

substation to be decommissioned and the 25 km-long transmission line to be decommissioned (Line 0028). The results of this analysis and review will assist NB Power in choosing a final route for the proposed transmission line and to manage environmental and other constraints in relation to the other Project components.

This report provides a summary of the constraints analysis and recommendations on final routing for the proposed new transmission line, along with a summary of the environmental review of the existing Project components. This report has been updated from its June 21, 2016 version to review environmental attributes and constraints of the route options for the new 138 kV transmission line that were modified following public and stakeholder input received at an Open House held for the Project on October 13, 2016 in Kedgwick. This report therefore supersedes the June 21, 2016 version.

2.0 METHODS

A map of two potential routes for the new 5 km-long 138 kV transmission line was provided to Stantec by NB Power. The two potential routes are shown in Figure 2.1. The route of the existing transmission line to be decommissioned (Line 0028) was also provided to Stantec by NB Power, and is shown in Figure 2.2.

Publicly available spatial datasets within 500 m of each Project component (i.e., 500 m on either side of each of the two route options), including environmental, socio-economic, and physical constraints and attributes, were compiled. A summary of these datasets, including sources, is provided in Table 2.1.

Table 2.1 Datasets used in Constraints Analysis and Environmental Review

Dataset	Agency Responsible/Data Source	Year of Dataset
Watercourses, Wetlands and Waterbodies		
Watercourses	New Brunswick Department of Energy and Resource Development (NBDERD)	2014
Wetlands (mapped)	New Brunswick Department of Environment and Local Government (NBDELG) NBDERD	2011 (NBDELG) 2014 (NBDERD)
Provincially Significant Wetlands	NBDELG	2011
Depth to Water Table	University of New Brunswick, Forest Watershed Research Group	2010
Waterbodies	NBDERD	2014
Protected Areas		
Protected Natural Areas	NBDERD	2014
Provincial Parks	NBDERD	2011
Federal Parks and Protected Areas	Service New Brunswick (SNB)	2012
Wildlife Refuges and Management Areas	NBDERD	2013
Protected Wellfields	NBDELG	2015
DNR Old Forest Wildlife Habitat	NBDERD	2015
DNR Old Forest Community	NBDERD	2015
Protected Watersheds	NBDELG	2014
Sensitive Areas/Species at Risk		
AC CDC Managed Area	Atlantic Canada Conservation Data Centre (AC CDC)	2016
Environmentally Significant Area	AC CDC	2015
Fish Hatcheries	SNB	1998
Rare Species (Species at Risk or Species of Conservation Concern)	AC CDC (includes Maritimes Breeding Bird Atlas data)	2016
Deer Wintering Areas	NBDERD	2015
Socio-economic		
Pits/Quarries/Mines	SNB	1998
Educational Buildings	SNB	1998
Cemeteries	SNB Archaeological Services	1998 (SNB) 2016
Religious Buildings	SNB	1998

Table 2.1 Datasets used in Constraints Analysis and Environmental Review

Dataset	Agency Responsible/Data Source	Year of Dataset
Buildings	SNB	1998
Towers	SNB	1998
Landfills	SNB	1998
Historic Sites	SNB Archaeological Services	1998 (SNB) 2016
Industrial Sites	NBDERD	2015
Recreation Sites	NBDERD	2015
Transformer Stations	SNB	1998
Agricultural Land	NBDERD	2015
Forested Land	NBDERD	2015
Shrubland	NBDERD	2015
Blueberry Fields	NBDERD	2015
Designated Lands/Public vs. Private Lands		
Crown Lands	NBDERD	2015
Private Land	NBDERD	2016
Freehold Land	NBDERD	2016
Property Boundaries	SNB	2016
First Nations Lands	SNB	2016
Military Bases	SNB	2005
Municipal Areas	NBDELG	2016
Mining Claims	NBDERD	2016
Mining Agreements	NBDERD	2016
Archaeological Sites		
Palaeo Shorelines	Archaeological Services	2016
Registered Archaeological Sites	Archaeological Services	2016
High and Medium Archaeological Potential Areas	Archaeological Services	2016
Watercourse Confluences	Archaeological Services	2016
Waterbody Confluences	Archaeological Services	2016
Physical Constraints		
Topography: Steep slopes (> 25%)	SNB	1998
Topography: 20 m Contours	NBDERD	2015
Bedrock Outcrops	NBDERD	2013
Infrastructure		
Pipelines	NBDERD, SNB	1998 (SNB) 2013 (NBDERD)
Roads	New Brunswick Road Network (NBRN), SNB	2016
Railroads	SNB	2015

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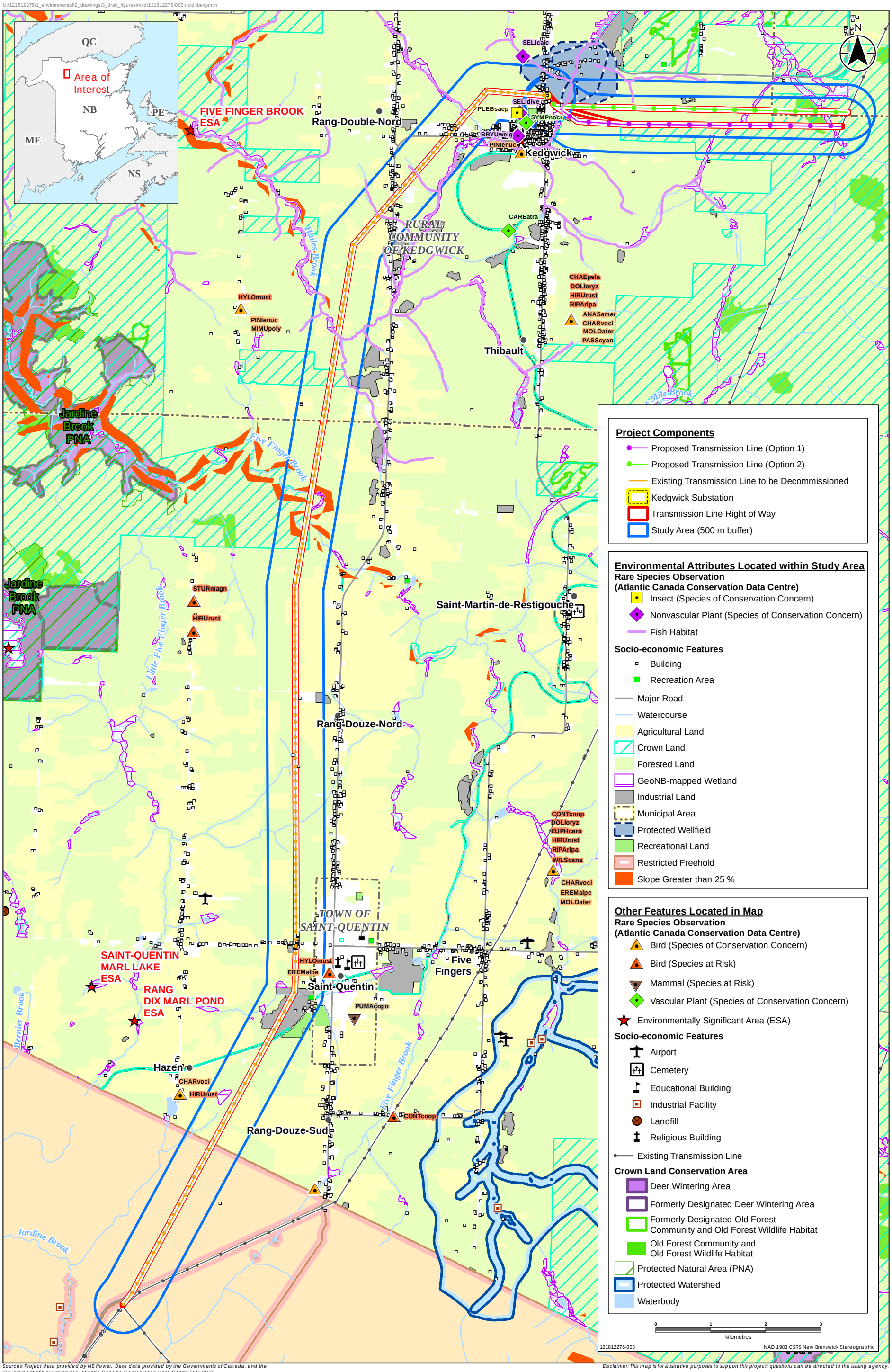

Sources: Project data provided by NB Power. Base data provided by the Governments of Canada, and the Government of New Brunswick. Atlantic Canada Conservation Data Centre (AC CDC).

Disclaimer: This map is for illustrative purposes to support this project; questions can be directed to the issuing agency.

Route of Existing Transmission Line 0028 to be Decommissioned, and Associated Environmental, Socio-economic, and Physical Attributes

Stantec

Figure 2.2

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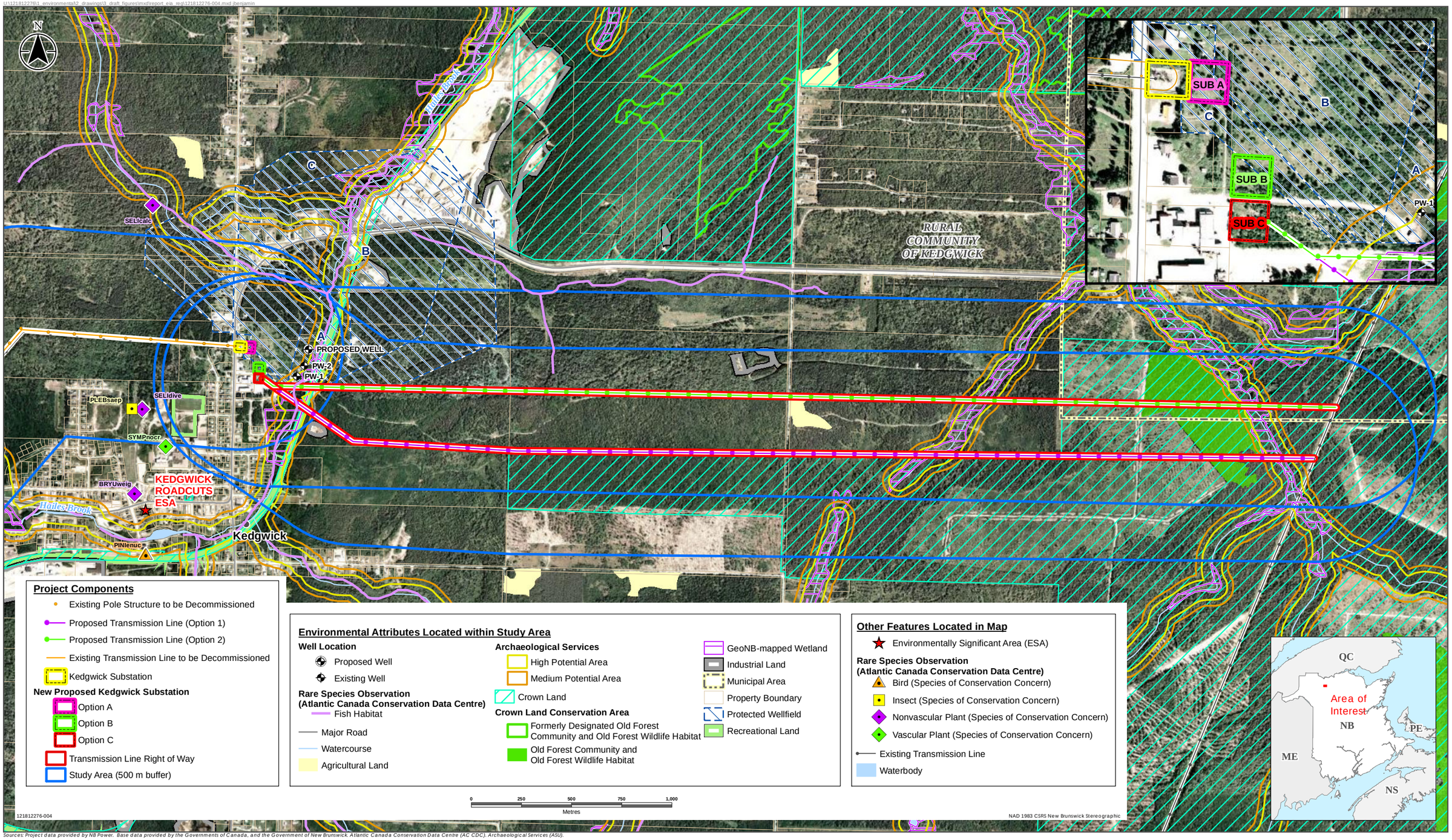

Sources: Project data provided by NB Power. Base data provided by the Governments of Canada, and the Government of New Brunswick; Atlantic Canada Conservation Data Centre (AC CDC); Archaeological Services (ASU).

Route **Options** for New 138 kV Transmission Line, Proposed Substation Locations, and Associated Environmental, Socioeconomic, and Physical Constraints

Stantec

121812276 - KEDGWICK TRANSMISSION LINE - NEW BRUNSWICK POWER CORPORATION

Figure 2.1

Upon compilation of the datasets listed in Table 2.1, a constraints map was generated by overlaying the applicable datasets identified in Table 2.1 on top of the two route options to visually identify potential constraints for each route. A similar map was produced for the existing Project components displaying the compiled data.

The number of crossings of various features (*e.g.*, watercourses), and the distance or area of the route traversing specific areas (*e.g.*, agricultural land) were calculated by Stantec using ArcGIS 10.2 software. Maps were generated at a 1:18,000 scale for the two route options for the new transmission line, and 1:65,000 for the line to be decommissioned. A 500 m buffer was used on either side of each route to identify potential constraints and environmental attributes.

2.1 CONSTRAINTS AND ATTRIBUTES

The following sections, presented by environmental, socio-economic, and physical criteria, provide details on the constraints and attributes considered in this analysis and review.

2.1.1 Environmental Criteria

Environmental criteria are natural features or areas identified as important habitats that could be interacted with by construction or operational activities. The following sections describe the environmental constraint and attribute datasets that were compiled.

2.1.1.1 Watercourses, Waterbodies, and Wetlands

In New Brunswick, a Wetland and Watercourse Alteration (WAWA) permit is required for construction within 30 m of watercourses, waterbodies, and GeoNB-mapped wetlands. The following sections discuss the methodology for identifying these features in relation to the potential and existing routes.

Stantec determined the number of watercourse crossings along the transmission line routes and categorized them according to size (less than, and greater than, 30 m wide) for inclusion in the constraints analysis. To determine the number of watercourse crossings less than 30 m in width, the transmission line routes were first buffered by 15 m on either side to simulate a 30 m-wide RoW. All watercourses represented as linear features which intersected the 30 m-wide RoW were assumed to be less than 30 m in width.

To determine the number of watercourse crossings greater than 30 m wide, the transmission line routes were intersected with two-dimensional polygons, and the widths of the waterbody at the crossings were measured. Those less than 30 m were added to those in the category of watercourse crossings less than 30 m wide, and the remainder were categorized as greater than 30 m.

All waterbody crossings (*e.g.,* lakes) were included as waterbody crossings, regardless of the crossing length.

The location and extent of current wetlands within the review area were determined by combining wetland datasets from GeoNB (www.geonb.snb.ca), which includes the identification of mapped wetlands, Provincially Significant Wetlands (PSW), and NB Hydro Network wetlands (NBHN, a wetland

layer currently maintained by NBDERD). Collectively, these are referred to as "mapped wetlands". The amount of GeoNB-mapped wetland, PSW, and NBHN wetland crossed by each route is included in the analysis. The analysis does not include unmapped wetlands or unmapped watercourses, which will be field-characterized through a walkover during the summer of 2016.

In addition to mapped wetlands, it is assumed that additional wetlands may be present along the transmission line routes. In order to estimate the potential for additional wetlands or wet areas, a dataset created by the University of New Brunswick (UNB) Forested Watershed Research Group was used to indicate areas where the depth to water table is less than 25 cm, as an indicator of potential unmapped wetlands along the transmission line routes. The total length of each route over these areas is included in the analysis. These distances include only those areas that are outside of known mapped watercourses, wetlands and waterbodies, and their respective 30 m buffers.

2.1.1.2 Protected Areas and Conservation Areas

Protected areas include Protected Natural Areas (PNAs), protected wellfields, and protected watersheds. Crown land conservation areas were also compiled. All protected areas and conservation areas within 500 m on either side of each route were identified.

2.1.1.3 Existing Corridors

Existing cleared corridors (roads, pipelines, transmission lines, and railways) were identified within 500 m on either side of each route. The length of each route that was parallel to an existing corridor was calculated.

2.1.1.4 Species at Risk, Species of Conservation Concern, and Sensitive Areas

Several datasets were used to identify Species at Risk (SAR) and Species of Conservation Concern (SOCC) in New Brunswick, as well as potential environmentally sensitive areas. Any identified SAR, SOCC and sensitive areas (including Environmentally Significant Areas (ESAs), managed areas and other sensitive areas) were assessed in the constraints analysis.

SAR are here defined as species listed as extirpated, endangered, threatened, or special concern under the New Brunswick *Species at Risk Act* (NB *SARA)*, the federal *Species at Risk Act* (*SARA)*, or by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). While some SAR included under this definition currently have regulatory protection under Schedule 1 of *SARA* or the *Prohibitions Regulation* of NB *SARA*, the above definition also includes those species on the NB *SARA List of Species at Risk Regulation* and COSEWIC listings that are candidates for further review which have potential to become protected within the timeframe of this Project.

Locations of wildlife and plant SAR were obtained from the Atlantic Canada Conservation Data Centre (AC CDC). These data include rare bird species data from the Maritimes Breeding Bird Atlas (MBBA). Wildlife and plant SAR which are known to occur within 500 m of the routes are displayed on the maps and listed in the results.

SOCC are not listed under federal or provincial legislation, but are considered rare in New Brunswick. SOCC are typically included in the assessment of any project as a precautionary measure, reflecting observations and trends in the provincial population status. SOCC are defined as species that do not meet the above definition of SAR but are ranked by the AC CDC as S1 (critically imperilled), S2 (imperilled), or S3 (vulnerable). Known locations of wildlife and plant SOCC were obtained from the AC CDC. These data include rare bird species data from the Maritimes Breeding Bird Atlas. Wildlife and plant SOCC which occur within 500 m of the routes are displayed on the maps and listed in the results.

Environmentally Significant Areas (ESAs) are natural features that are likely sensitive to disturbance, and may represent known locations or important habitat for SAR. ESAs have been identified by the Nature Trust of New Brunswick (NTNB), in partnership with the New Brunswick Department of Environment and the New Brunswick Department of Natural Resources and Energy (Tims and Craig 1995). There is no legislation protecting ESAs within New Brunswick, but the New Brunswick Department of Environment and Local Government (NBDELG) considers these sites when evaluating and reviewing EIAs and environmental permit applications. The database of ESAs was provided by AC CDC.

Managed areas include wildlife management zones, deer wintering areas, Ducks Unlimited Canada (DUC) wetlands, and other managed or regulated areas.

ESAs, managed areas, and other sensitive areas occurring within 500 m on either side of each route are included in the analysis.

2.1.1.5 Forested Areas

Forested areas as identified by NBDERD were compiled within 500 m on either side of each route.

2.1.2 Socio-economic Criteria

Socio-economic criteria are existing or historic land uses that could be interacted with by construction or operational activities. The following sections describe the socio-economic constraint and attribute datasets that were compiled.

2.1.2.1 Designated Lands and Private Land

The length of each route through public and private properties was calculated and the number of private properties intersecting each route was tabulated. Municipal areas, mining claims, military bases and First Nations Lands within 500 m on either side of each route were identified; distances through these features, if present, were determined.

2.1.2.2 Public Land Use

Locations of potential public land use were identified within 500 m on either side of each route. These include locations of cemeteries, educational buildings, religious buildings, towers, transformer stations, and recreation sites (*i.e.*, picnic areas, sports fields, and arenas, race tracks, campgrounds, community centers, exhibition grounds, golf courses).

2.1.2.3 Industrial Land Use

Locations of potential industrial land use were identified within 500 m on either side of each route. These include locations of pits, quarries, mines, and any other industrial activity identified as such by NBDERD.

2.1.2.4 Agricultural Land Use

Locations of potential agricultural land use were identified within 500 m on either side of each route. These include locations of blueberry fields, fallow pastures, and other agricultural land uses.

2.1.2.5 Archaeological Features

Locations of archaeological features were provided by Archaeological Services of the New Brunswick Department of Tourism, Culture and Heritage and include registered archaeological sites, palaeo-shorelines, and areas of elevated (high and medium) archaeological potential. Features within 500 m on either of each route were identified.

2.1.3 Physical Criteria

Physical criteria are naturally occurring features that could be problematic for construction or operational activities. The following sections describe the physical constraint and attribute datasets that were compiled.

2.1.3.1 Steep Slopes and Bedrock Outcrops

Terrain constraints are naturally occurring features of the landscape that can affect the construction or operation of the Project, such as steep slopes and bedrock outcrops. Potentially problematic terrain was identified within 500 m on either side of each route. Terrain units were delineated using elevation data, with the support of existing cartographic datasets such as surficial geology and bedrock data.

2.1.3.2 Infrastructure Crossings

Existing roads, railways and pipeline datasets were compiled and the number of crossings was determined for each route.

2.2 RANKING AND WEIGHTED SCORING

The two route options were evaluated through a weighted ranking process that incorporated the three general categories of constraints: environmental, socio-economic, and physical. Each category was subdivided into smaller components. For each route, individual components within a category of constraints were evaluated and ranked using pre-determined criteria, according to the following methodology.

1. Components were ranked on a scale of 0 – 10 using the team's professional judgment. A ranking of 10 was given to the most favourable potential routes, whereas a ranking of 0 was given to potential routes of low favourability based on their respective criteria. Potential routes of equal favourability

were ranked equally. No rankings of less than 0 were assigned. The methodology of ranking components is provided in greater detail in Appendix B.

2. The ranking of each component within a category was then multiplied by its associated weighting factor to give a weighted component ranking (score).
3. All weighted component rankings (scores) were then summed to give an overall category ranking (score) for each of the environmental, socio-economic, and physical criteria categories.
4. The overall category ranking was then multiplied by its weighting factor to give a weighted category ranking.
5. Weighted category rankings from each of the three categories were summed to give an overall weighted score for each route Option. The overall weighted scores are displayed as a score out of possible score of 100, such that a score of 100 will be an ideal route, while a score of 0 signifies a very unfavourable route. The route with the highest overall weighted score is the preferred route.

3.0 RESULTS

There were several potential environmental, socio-economic, and physical attributes that were not found to be crossed by any of the Project components. Specifically, in the areas of review for the two routes and 500 m on either side of them, there were none of the following:

- First Nations Lands;
- military bases;
- mining claims, or mining agreements;
- ESAs;
- deer wintering areas;
- fish hatcheries;
- steep slopes or rock outcroppings;
- registered archaeological sites or palaeo shorelines;
- pipelines; or,
- active railways.

The following sections provide summaries of the constraints identified for the two proposed transmission line routes, and the environmental attributes identified for the transmission line to be decommissioned and the substation to be decommissioned.

3.1 CONSTRUCTION OF NEW 138 KV TRANSMISSION LINE

The results of the constraints analysis for the two route options for the proposed new 5 km-long 138 kV transmission line are summarized in Table 3.1.

Table 3.1 Constraint Analysis Results –Routes for the Proposed New 5 km-Long 138 kV Transmission Line

Criteria	Weight (%)	Route Option 1		Route Option 2	
		Ranking	Score	Ranking	Score
Environmental Criteria					
Watercourse and Waterbody Crossings	25%	6	1.5	7	1.75
GeoNB-Mapped and NBDERD Wetland Crossings	20%	2	0.4	3	0.6
Protected Areas and Conservation Areas	20%	7	1.4	6	1.2
Parallel to Existing Corridor	15%	0	0	0	0
Species at Risk, Species of Conservation Concern, and Sensitive Areas	10%	10	1	10	1
Forested Areas	10%	1	0.1	1	0.1
Score for Environmental Criteria			**4.4**		**4.65**
Weighted Score for Environmental Criteria	**40%**		**17.6**		**18.6**
Socio-economic Criteria					
Designated Lands and Private Land	30%	4	1.2	2	0.6
Total Number of Properties Crossed	15%	10	1.5	8	1.2
Public Land Use	10%	10	1	10	1
Industrial Land Use	10%	10	1	10	0.9
Agricultural Land Use	20%	10	2	8	1.6

Table 3.1 Constraint Analysis Results –Routes for the Proposed New 5 km-Long 138 kV Transmission Line

Criteria	Weight (%)	Route Option 1		Route Option 2	
		Ranking	Score	Ranking	Score
Registered Archaeological Sites and Elevated Archaeological Potential Areas	15%	5	0.75	4	0.6
Score for Socio-Economic Criteria			**7.45**		**6**
Weighted Score for Socio-Economic Criteria	**30%**		**22.35**		**18**
Physical Criteria					
Length	50%	9	4.5	9	4.5
Steep Slopes and Bedrock Outcrops	25	10	2.5	10	2.5
Infrastructure Crossings	25	10	2.5	10	2.5
Score for Physical Criteria			**9.5**		**9.5**
Weighted Score for Physical Criteria	**30%**		**28.5**		**28.5**
Overall Weighted Score			**68.45**		**65.1**

In addition to the summary presented in Table 3.1, a description of the constraints for each route is provided below. A detailed constraints table for each route for the new transmission line is presented in Appendix A, and includes the constraints that were not crossed by any of the Project components.

A sensitivity analysis was completed to see if minor changes to the weightings would result in differences to the overall weighted scores for each route option. Weights that were factors in weighted category scores were changed by 5 percent and the overall weighted scores were re-calculated. The changes in weights still resulted in route Option 1 having the highest overall weighted score.

3.1.1 Route Option 1

This 5.3 km-long route is the shorter of the two options, and crosses the least amount of private land (1.4 km) and properties (8). It possesses the shorter transection of conservation forest (0.2 km) and it does not cross land used for agricultural purposes.

Route Option 1 crosses the greatest amount of wetland area (1.7 ha). The route crosses Haile Brook and two unnamed tributaries, and the N.B. Trail.

Overall, it was determined that route Option 1 possesses not only the highest overall weighted score (68.45), but also the highest weighted score in the socio-economic criteria category. It is therefore identified as the preferred route.

3.1.2 Route Option 2

This 5.4 km-long route crosses the least amount of wetland area (1.5 ha).

Route Option 2 crosses the greatest amount of private land (4.0 km), conservation forest (0.5 km), and lands of medium archaeological potential (0.6 km). It also crosses land used for agricultural purposes (0.1 km). The route crosses Haile Brook and two unnamed tributaries, and the N.B. Trail.

Overall, Option 2 ranks second with an overall weighted score of 65.1.

3.2 DECOMMISSIONING OF EXISTING TRANSMISSION LINE 0028

This 25 km-long existing transmission line crosses mostly private land (20.3 km), including 8 km within the boundary of the Rural Community of Kedgwick, but also crosses Crown land (1.3 km) and restricted freehold land (3.3 km). The route crosses 0.04 km of wetland and 8 watercourses, including Five Finger Brook, Hailes Brook, Little Five Finger Brook, and multiple unnamed tributaries. The route also crosses one major road (Highway 17), 6 local roads, and 3 trails. The land crosses by the route is primarily forest and shrub land (15.7 km) but also includes land used for agricultural purposes (3.58 km), industrial purposes (1.1 km), and residential purposes (0.9 km). The existing transmission line does not appear to cross conservation forest or protected areas.

A detailed environmental attributes table for transmission line 0028 to be decommissioned is presented in Appendix C, and includes the attributes that were not crossed by any of the Project components.

3.3 DECOMMISSIONING OF EXISTING KEDGWICK SUBSTATION

The existing Kedgwick substation property (PID No. 50030618) is 0.18 ha in area, of which 0.08 ha is cleared area, based on aerial imagery. The property boundary shares a boundary with the Kedgwick Protected Wellfield to the north and to the east. No other environmental attributes were identified within the substation property.

4.0 DISCUSSION

The analyses of constraints associated with the two route options for the new 138 kV transmission line determined that overall, route Option 1 possesses the most preferable environmental, socio-economic, and physical characteristics, though both routes scored more or less similarly for most constraints. In general, environmental and physical criteria were not found to be a differentiator between the two routes, due to their relatively similar attributes and the relative proximity of the routes to each other. Furthermore, the consistent preferential ranking of route Option 1 across the socio-economic criteria category and its top-ranked weighted category score further supports the contention that route Option 1 possesses characteristics that are somewhat preferable to the other route option. Therefore, in consideration of the above, the preferred route is route Option 1.

While the current positioning of route Option 1 is preferred over route Option 2, validation of these results will occur through field verification from the pending field studies. Field study results may indicate the value in re-aligning portions of route Option 1, to avoid any field-identified constraints that may arise from field validation of these results.

The compilation of attributes associated with the existing Kedgwick substation and Line 0028 to be decommissioned did not present any environmental or socio-economic attributes beyond expected watercourse, wetland, and road crossings and various typical land use types. There is no need to analyze these constraints given these Project components already exist; however, field work will be conducted to confirm their environmental attributes as necessary in order to inform the EIA registration.

5.0 CLOSURE

This report has been prepared by Stantec Consulting Ltd. (Stantec) for the sole benefit of the New Brunswick Power Corporation (NB Power). The report may not be relied upon by any other person or entity, other than for its intended purposes, without the express written consent of Stantec and NB Power.

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Please contact the undersigned if you have any questions or require further information.

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Appendix A

Constraints Summary Tables

ROUTE OPTION 1

	Crossings (Number, or Length in km)	RoW (Number of Features Within, or Area in ha)	Details	Study Area 500 m (Number of Features Within, or area in ha)
Total Length (All Segments)	5.3	16.1	NB Power (modified by Stantec)	612.5
Length Following Existing Corridors	-	-	-	0.-
Required New Corridor	5.3	16.1	-	-
Watercourses, Wetlands and Waterbodies				
Watercourse Crossings (< 30m wide)	3	3	Hailes Brook and multiple unnamed tributaries	8
Watercourse Crossings (> 30m wide)	-	-	-	-
GeoNB Mapped Wetlands	0.3	0.8	DELG	20.9
NBHN Wetlands	0.3	0.8	NBDERD (NBHN)	20.9
Provincially Significant Wetlands	-	-	NBDELG	-
30 m Buffer of Watercourses, Wetlands and Waterbodies	0.2	1.7	-	50.0
Potentially Wet Areas (UNB)	0.4	1.2	UNB Depth to water table of 25 cm	59.7
Waterbodies	-	-	-	-
Designated Lands/Public vs. Private Lands				
Crown Land	3.9	10.5	-	281.9
Private Land	1.4	6.6	-	330.6
Freehold Land	-	-	-	-
First Nations Lands	-	-	-	-
Military Base	-	-	-	-
Municipal Areas	5.3	16.1	Rural Community of Kedgwick	563.00
Existing Mining Claims	-	-	-	-
Mining Agreements	-	-	-	-
Protected Areas				
Protected Natural Areas	-	-	-	-
Candidate/Proposed Protected Natural Areas	-	-	-	-
Provincial Parks	-	-	-	-
Federal Protected Areas	-	-	-	-
Protected Wellfields	-	-	-	8.7 (Zone A) 18.2 (Zone B) 11.9 (Zone C)
Wildlife Refuges and Management Areas	-	-	-	-
Deer Wintering Areas	-		-	-
Formerly Designated Deer Wintering Areas	-	-	-	-

ROUTE OPTION 1

	Crossings (Number, or Length in km)	RoW (Number of Features Within, or Area in ha)	Details	Study Area 500 m (Number of Features Within, or area in ha)
Old Forest Communities and Old Forest Wildlife Habitats	0.2	0.6	Crown Land Conservation Areas (NBDERD)	20.4
Formerly Designated Old Forest Communities and Old Forest Wildlife Habitats	-	-	-	-
Protected Watersheds	-	-	-	-
Infrastructure				
Pipeline Crossings	-	-	-	-
Number of Road Crossings	1	1	Rang 9 & 10 Chemin	2 Major Roads: Hwy 17 & St. Camille Rue. 12 Minor/Local Roads: Bellevue rue, Du Parc rue, Des Colibris rue, De l'Ecole rue, Des Merles rue, Fraser rue, LeBlanc rue, Leopold rue, Noranda rue, Rang 7 & 8 chemin, Rang 9 & 10 chemin & Restigouche rue
Number of Railway Crossings	-	-	-	-
Number of Trail Crossings	1	1	Provincial	1
Sensitive Areas/Species at Risk				
ACCDC Managed Areas	*0.4*	*1.1*	*Kedgwick - NBDERD confirmed no areas in Crown Lands database.*	*9.5*
Environmentally Significant Areas	-	-	-	-
Fish Hatcheries	-	-	-	-
ACCDC Fish Habitat	1	1	Atlantic Salmon - Gaspe - Southern Gulf of St. Lawrence pop. (Restigouche River system)	1
Rare Species (Species at Risk or Species of Conservation Concern)	-	-	-	-
Socio-economic				
Pits/Quarries/Mines	-	-	-	-
Educational Building	-	-	-	-
Cemeteries	-	-	-	-

ROUTE OPTION 1

	Crossings (Number, or Length in km)	RoW (Number of Features Within, or Area in ha)	Details	Study Area 500 m (Number of Features Within, or area in ha)
Religious Buildings	-	-	-	-
Buildings	-	-	SNB (General Points)	118
Land Reserved for Residential Purposes	0.1	0.23	NBDERD Non Forest	33.6
Towers	-	-	SNB (General Points)	1
Landfills	-	-	-	-
Historic Sites	-	-	-	-
Industrial Sites	-	-	-	-
Land Reserved for Industrial Purposes			NBDERD Non Forest	2.1
Recreational Sites	-	-	Sports Field - SNB (General Points)	1
Land Reserved for Recreational Purposes	0.01	0.02	Land used for recreational purposes (NBDERD Non Forest)	3.8
Transformer Stations	-	-	SNB (General Points)	1
Land Reserved for Transportation, Communication and/or Utilities	0.02	0.08	NBDERD Non Forest	6.5
Length Through Agriculture	-	-	NBDERD Non Forest	1.9
Length Through Forest	4.9	14.9	NBDERD Forest	543.6
Length Through Shrubland	0.02	0.08	NBDERD Non Forest	5.9
Length Through Blueberry Fields	-	-	-	-
Physical				
Steep Slopes (> 25 %) Based on 50 m Elevation Model	-	-	Based on a 50 x 50 m Digital Elevation Model	-
Length Through Rock Outcrop	-	-	-	-
Archaeology				
Palaeo Shoreline	-	-	-	-
Registered Sites	-	-	-	-
High Potential	0.4	1.2	-	50.9
Medium Potential	0.6	1.8	-	90.4
Watercourse Confluence	-	-	-	18.6
Waterbody Confluence	-	-	-	-

ROUTE OPTION 2

	Crossings (Number, or Length in km)	RoW (Number of Features within, or area in ha)	Details	Study Area 500 m (Number of Features Within, or area in ha)
Total Length (All Segments)	5.4	16.2	NB Power (modified by Stantec)	614.8
Length Following Existing Corridors	-	-	-	0
Required New Corridor	5.4	16.2	-	-
Watercourses, Wetlands and Waterbodies				
Watercourse Crossings (< 30m wide)	3	3	Hailes Brook and multiple unnamed tributaries	8
Watercourse Crossings (> 30m wide)	-	-	-	-
GeoNB Mapped Wetlands	0.3	0.7	NBDELG	31.2
NBHN Wetlands	0.3	0.7	NBDERD (NBHN)	31.2
Provincially Significant Wetlands	-	-	NBDELG	-
30 m Buffer of Watercourses, Wetlands and Waterbodies	0.5	1.5	-	62.4
Potentially Wet Areas (UNB)	0.4	1.1	UNB Depth to water table of 25 cm	73.9
Waterbodies	-	-	-	-
Designated Lands/Public vs. Private Lands				
Crown Land	1.4	4.2	-	218.4
Private Land	4.0	11.9	-	396.4
Freehold Land	-	-	-	-
First Nations Lands	-	-	-	-
Military Base	-	-	-	-
Municipal Areas	4.0	12.0	Rural Community of Kedgwick	513.4
Existing Mining Claims	-	-	-	-
Mining Agreements	-	-	-	-
Protected Areas				
Protected Natural Areas	-	-	-	-
Candidate/Proposed Protected Natural Areas	-	-	-	-
Provincial Parks	-	-	-	-
Federal Protected Areas	-	-	-	-
Protected Wellfields	-	-	-	9.7 (Zone A) 28.3 (Zone B) 21.7 (Zone C)
Wildlife Refuges and Management Areas	-	-	-	-
Deer Wintering Areas	-	-	-	-
Formerly Designated Deer Wintering Areas	-	-	-	-

ROUTE OPTION 2

	Crossings (Number, or Length in km)	RoW (Number of Features within, or area in ha)	Details	Study Area 500 m (Number of Features Within, or area in ha)
Old Forest Communities and Old Forest Wildlife Habitats	0.5	1.5	Crown Land Conservation Areas (NBDERD)	21.1
Formerly Designated Old Forest Communities and Old Forest Wildlife Habitats	-	-	-	-
Protected Watersheds				
Infrastructure				
Pipeline Crossings	-	-	-	-
Number of Road Crossings	1	1	Rang 9 & 10 Chemin	2 Major Roads: Hwy 17 & St. Camille Rue. 12 Minor/Local Roads: Bellevue rue, de L'Ecole rue, des Colibris rue, des Merles rue, du Parc rue, Fraser rue, LeBlanc chemin, Leopold rue, Noranda rue, Rang 7 & 8 chemin, Rang 9 & 10 chemin, Restigouche rue
Number of Railway Crossings	-	-	-	-
Number of Trail Crossings	1	1	Provincial	1
Sensitive Areas/Species at Risk				
ACCDC Managed Areas	0.2	0.7	*Kedgwick - NBDERD confirmed no areas in Crown Lands database.*	9.5
Environmentally Significant Areas	-	-	-	-
Fish Hatcheries	-	-	-	
ACCDC Fish Habitat	1	1	Atlantic Salmon - Gaspe - Southern Gulf of St. Lawrence pop. (Restigouche River system)	1
Rare Species (Species at Risk or Species of Conservation Concern)	-	-	-	-
Socioeconomic				
Pits/Quarries/Mines	-	-		1
Educational Building	-	-		-
Cemeteries	-	-		-

ROUTE OPTION 2

	Crossings (Number, or Length in km)	RoW (Number of Features within, or area in ha)	Details	Study Area 500 m (Number of Features Within, or area in ha)
Religious Buildings	-	-		-
Buildings	-	-	SNB (General Points)	114
Land Reserved for Residential Purposes	0.08	0.3	NBDERD Non Forest	29.8
Towers	-	-	SNB (General Points)	1
Landfills	-	-	SNB (General Points)	1
Historic Sites	-	-	-	-
Industrial Sites	-	-	-	-
Land Reserved for Industrial Purposes	-	-	NBDERD Non Forest	2.8
Recreational Sites	-	-	Sports Field - SNB (General Points)	1
Land Reserved for Recreational Purposes	0.01	0.02	Land used for recreational purposes (NBDERD Non Forest)	3.9
Transformer Stations	-	-	SNB (General Points)	1
Land Reserved for Transportation, Communication and/or Utilities	0.02	0.09	NBDERD Non Forest	6.4
Length Through Agriculture	0.1	0.3	NBDERD Non Forest	1.9
Length Through Forest	4.9	14.7	NBDERD Forest	538.7
Length Through Shrubland	0.1	0.4	NBDERD Non Forest	1.9
Length Through Blueberry Fields	-	-	-	-
Physical				
Steep Slopes (> 25 %) Based on 50 m Elevation Model	-	-	Based on a 50 x 50 m Digital Elevation Model	-
Length Through Rock Outcrop	-	-	-	-
Archaeology				
Palaeo Shoreline	-	-	-	-
Registered Sites	-	-	-	-
High Potential	0.4	1.5	-	55.7
Medium Potential	0.6	2.8	-	98.5
Watercourse Confluence	0.3	0.9	-	23.8
Waterbody Confluence	-	-	-	-

Appendix B

Component Ranking Methodology and Detailed Results

Methodology for Component Ranking

The ranking of environmental and socio-economic criteria was determined by comparing the amount of a particular constraint to the amount of that constraint in a larger surrounding area. The larger area was selected to be the Sisson Ecodistrict in the Central Uplands Ecoregion based on availability of constraint data and similarities in land classification (NBDNR 2007).

Most of the environmental criteria ranking classes were determined by first calculating the percentage of the specific criteria within the proposed transmission lines RoWs. A grid was then created throughout the ecodistrict with a cell size of 407 m² (the mean of the two RoW areas) to determine the mean amount of the environmental criteria in each cell. This grid was then summarized to determine the mean amount of the environmental criteria for all 407 m² cells in the Sisson Ecodistrict. The standard deviation was then calculated and the mean values broken into classes based on their deviation from the mean. Those standard deviation classes were then used to develop comparative ranking scores for the two options. Watercourse crossings, wetland crossings, protected areas, forest, private land, agricultural land, and archaeological potential area ranking classes were all determined through this process. For example, for watercourse and waterbody crossings, the mean for all cells within the Sisson Ecodistrict was calculated to be 6.75% with a standard deviation of 6.3%. The means were broken into classes based on their difference from 0.5 of the standard deviation. A ranking of 6 was therefore calculated by adding 3.15 to 5.18 (the high break value for ranking 5) to get 8.33.

The ranking score for total properties crossed was determined by the relative difference of the number of properties crossed by the option compared to the lowest number of properties crossed of any options.

The ranking score for total length of route was determined by the relative difference of the option lengths compared to the straightest route from both terminal points. This length was determined to be 5.1 km from the existing substation to the closest connection point on existing transmission Line 1110.

Ranking Classes and Results

A summary of the ranking classes for the environmental and socio-economic criteria described above follows. Criteria that did not contain any features within the RoW were assigned ranks of 10.

Table B.1 Watercourse and Waterbody Crossings Ranking Classes and Results

Ranking Classes	
Classes (Percentages)	**Ranking**
0	10
0 – 0.10	9
0.11 – 2.02	8
2.02 – 5.18	7
5.19 – 8.33	6
8.34 – 11.48	5
11.49 – 14.63	4
14.64 – 17.78	3
17.79 – 20.93	2
20.94 – 82.55	1
82.56 - 1	0

Ranking Results		
	Route Option 1	**Route Option 2**
Total Area of RoW (ha)	16.1	16.2
Area of Crossings in RoW (ha)	0.98	0.75
Percentage	6.0	4.6
Rank	6	7

Table B.2 Wetland Crossings Ranking Classes and Results

Ranking Classes	
Classes (Percentages)	**Ranking**
0	10
0 – 0.10	9
0.11 – 1.31	8
1.32 – 2.91	7
2.92 – 4.51	6
4.52 – 6.11	5
6.12 – 7.71	4
7.72 – 9.31	3
9.32 – 10.91	2
10.92 – 21.13	1
21.14 - 1	0

Ranking Results		
	Route Option 1	**Route Option 2**
Total Area of RoW (ha)	16.1	16.2
Area of Crossings in RoW (ha)	1.68	1.49
Percentage	10.4	9.2
Rank	2	3

Table B.3 Protected Areas Ranking Classes and Results

Ranking Classes	
Classes (Percentages)	**Ranking**
0	10
0 – 0.10	9
0.11 – 0.54	8
0.55 – 6.27	7
6.28 – 11.98	6
11.99 – 17.70	5
17.71 – 23.43	4
23.44 – 29.15	3
29.16 – 34.87	2
34.88 – 85.64	1
85.65 - 1	0

Ranking Results		
	Route Option 1	**Route Option 2**
Total Area of RoW (ha)	16.1	16.2
Protected Area in RoW (ha)	0.56	1.51
Percentage	3.5	9.3
Rank	7	6

Table B.4 Forested Areas Ranking Classes and Results

Ranking Classes	
Classes (Percentages)	**Ranking**
0	10
0 – 0.10	9
0.11 – 0.21	8
0.22 – 14.25	7
14.26 – 28.30	6
28.31 – 42.34	5
42.35 – 56.38	4
56.39 – 70.43	3
70.44 – 84.47	2
84.48 – 98.52	1
98.53 - 1	0

Ranking Results		
	Route Option 1	**Route Option 2**
Total Area of RoW (ha)	16.1	16.2
Forested Area in RoW (ha)	14.91	14.73
Percentage	92.6	91.2
Rank	1	1

Table B.5 Private Land Ranking Classes and Results

Ranking Classes	
Classes (Percentages)	**Ranking**
0	10
0 – 0.10	9
0.11 – 0.56	8
0.57 – 10.68	7
10.69 – 20.79	6
20.79 – 30.90	5
30.91 – 61.24	4
61.25 – 71.35	3
71.36 – 81.46	2
81.47 – 91.57	1
91.58 - 1	0

Ranking Results		
	Route Option 1	**Route Option 2**
Total Area of RoW (ha)	16.1	16.2
Private Land Area in RoW (ha)	6	12.5
Percentage	37.3	77.4
Rank	4	2

Table B.6 Agricultural Land Ranking Classes and Results

Ranking Classes	
Classes (Percentages)	**Ranking**
0	10
0 – 0.10	9
0.11 – 2.48	8
2.49 – 7.22	7
7.23 – 11.96	6
11.97 – 16.71	5
16.72 – 35.68	4
35.69 – 40.42	3
40.43 – 45.16	2
45.17 – 99.48	1
99.49 - 1	0

Ranking Results		
	Route Option 1	**Route Option 2**
Total Area of RoW (ha)	16.1	16.2
Agricultural Land Area in RoW (ha)	0	0.29
Percentage	0	1.8
Rank	10	8

Table B.7 Archaeological Potential Ranking Classes and Results

Ranking Classes	
Classes (Percentages)	**Ranking**
0	10
0 – 0.10	9
0.11 – 2.72	8
2.73 – 6.73	7
6.74 – 10.73	6
10.74 – 14.73	5
14.74 – 30.73	4
30.74 – 34.73	3
34.74 – 38.73	2
38.74 – 71.55	1
71.56 - 1	0

Ranking Results		
	Route Option 1	**Route Option 2**
Total Area of RoW (ha)	16.1	16.2
Archaeological Potential Area in RoW (ha)	1.8	2.8
Percentage	11.4	17.1
Rank	5	4

Table B.8 Properties Crossed Ranking Classes and Results

Ranking Classes	
Classes (Percentages)	**Ranking**
100	10
90.1 – 99.9	9
80.1 - 90	8
70.1 - 80	7
60.1 - 70	6
50.1 - 60	5
40.1 - 50	4
30.1 - 40	3
20.1 - 30	2
10.1 – 20	1
0 - 10	0

Ranking Results		
	Route Option 1	**Route Option 2**
Properties Crossed by RoW	8	9
Percentage	8/8 = 100	8/9 = 88.9
Rank	10	8

Table B.9 Length Ranking Classes and Results

Ranking Classes		
Classes (Percentages)	**Ranking**	
100	10	
90.1 – 99.9	9	
80.1 - 90	8	
70.1 - 80	7	
60.1 - 70	6	
50.1 - 60	5	
40.1 - 50	4	
30.1 - 40	3	
20.1 - 30	2	
10.1 – 20	1	
0 - 10	0	
Ranking Results		
	Route Option 1	**Route Option 2**
Total Length (km)	5.342	5.364
Percentage	5.3 / 5.342 = 99.2	5.3/ 5.364 = 98.9
Rank	9	9

Appendix C

Environmental Attributes of the Existing Transmission Line 0028

Environmental Attributes of the Existing Transmission Line 0028

	Crossings (Number, or Length in km)	RoW (Number of Features Within, or Area in ha)	Details	Study Area 500 m (Number of Features Within, or Area ha)
Total Length (All Segments)	24.9	74.9	NB Power	2,570.4
Length Following Existing Corridors	24.9	74.9	-	2,570.4
Required New Corridor	0.0	0.0	-	0
Watercourses, Wetlands and Waterbodies				
Watercourse Crossings (< 30m wide)	8	8	Five Finger Brook, Hailes Brook, Little Five Finger Brook and multiple unnamed tributaries.	Multiple unnamed tributaries, and Five Finger Brook, Hailes Brook and Little Five Finger Brook.
Watercourse Crossings (> 30m wide)	-	-	-	-
GeoNB Mapped Wetlands	0.04	0.26	NBDELG	25.2
NBHN Wetlands	0.04	0.26	NBDERD (NBHN)	25.2
Provincially Significant Wetlands	-	-	NBDELG	-
30 m Buffer of Watercourses, Wetlands and Waterbodies	0.8	2.5	-	143.8
Potentially Wet Areas (UNB)	3.9	11.7	UNB Depth to water table of 25 cm	344.9
Waterbodies	0.04	0.1	The TL crosses Five Finger Brook 3 times.	2.2 (Hailles Brook), 3.0 (Five Fingers Brooks) & 0.1 (Unnamed pond)
Designated Lands/Public vs. Private Lands				
Crown Land	1.3	3.9	-	95.4
Private Land	20.3	61.2		2,106.3
Freehold Land	3.3	9.9	-	368.8
First Nations Lands	-	-	-	-
Military Base	-	-	-	-
Municipal Areas	8.0	24.1	Rural Community of Kedgwick	36.1 (Saint Quentin) & 841.6 (Kedgwick)
Existing Mining Claims	-	-	-	-
Mining Agreements	-	-	-	-
Protected Areas				
Protected Natural Areas	-	-	-	-
Candidate/Proposed Protected Natural Areas	-	-	-	-
Provincial Parks	-	-	-	-

Environmental Attributes of the Existing Transmission Line 0028

	Crossings (Number, or Length in km)	RoW (Number of Features Within, or Area in ha)	Details	Study Area 500 m (Number of Features Within, or Area ha)
Federal Protected Areas	-	-	-	-
Protected Wellfields	-	-	Kedgwick	7.5 (Zone A) 19.6 (Zone B) 14.9 (Zone C)
Wildlife Refuges and Management Areas	-	-	-	-
Deer Wintering Areas	-	-	-	-
Formerly Designated Deer Wintering Areas	-	-	-	-
Old Forest Communities and Old Forest Wildlife Habitats	-	-	-	-
Formerly Designated Old Forest Communities and Old Forest Wildlife Habitats	-	-	-	-
Protected Watersheds	-	-	-	-
Infrastructure				
Pipeline Crossings	-	-	-	-
Number of Road Crossings	1 Major Road:Hwy 17. 6 Minor/Local Road: Armand rue, Chasse rue, Labrie chemin, Monseigneur Martin West chemin, Petit-Ouest chemin & Valcour chemin.	1 Major Road:Hwy 17. 6 Minor/Local Road: Armand rue, Chasse rue, Labrie chemin, Monseigneur Martin West chemin, Petit-Ouest chemin & Valcour chemin.	-	3 Major Roads: Hwy 17, Notre Dame rue, St-Camille rue. >30 Minor/Local Roads.
Number of Railway Crossings	-	-	-	-
Number of Trail Crossings	3	3	Provincial	3
Sensitive Areas/Species at Risk				
ACCDC Managed Areas	-	-	-	-
Environmentally Significant Areas	-	-	-	-
Fish Hatcheries	-	-	-	-
ACCDC Fish Habitat	-	1	Atlantic Salmon - Gaspe - Southern Gulf of St. Lawrence pop. (Restigouche River system)	1
Rare Species (Species at Risk or Species of Conservation Concern)	-	-	*Seligeria diversifolia* (a moss) and *Plebejus saepiolus* (a butterfly)	2

Environmental Attributes of the Existing Transmission Line 0028

	Crossings (Number, or Length in km)	RoW (Number of Features Within, or Area in ha)	Details	Study Area 500 m (Number of Features Within, or Area ha)
Socioeconomic				
Pits/Quarries/Mines	-	-	-	-
Educational Building	-	-	-	-
Cemeteries	-	-	-	-
Religious Building	-	-	-	-
Buildings	-	3	SNB (General Points)	250
Land Reserved for Residential Purposes	0.91	2.9	NBDERD Non Forest	156.88
Towers	-	-	SNB (General Points)	1
Landfills	-	-	Auto Salvage Yard	2
Historic Sites	-	-	-	-
Industrial Sites	-	-	Sewage Treatment (5) and Burner/Incinerator (2)	7
Land Reserved for Industrial Purposes	1.09	3.1	NBDERD Non Forest	56.96
Recreational Sites	-	-	Sports Field and Swimming Pool - SNB (General Points)	3
Land Reserved for Recreational Purposes	0.01	0.04	Land used for recreational purposes (NBDERD Non Forest)	17.48
Transformer Stations	-	2	SNB (General Points)	2
Land Reserved for Transportation, Communication and/or Utilities	14.69	33.44	NBDERD Non Forest	60.83
Length Through Agriculture	3.58	11.08	NBDERD Non Forest	443.03
Length Through Forest	1.30	14.07	NBDERD Forest	1,435.99
Length Through Shrubland	14.44	32.68	NBDERD Non Forest	41.41
Length Through Blueberry Fields	-	-	-	-
Physical				
Steep Slopes (> 25 %) Based on 50 m Elevation Model	0.2	0.6	Based on a 50 x 50 m Digital Elevation Model	32.2
Length Through Rock Outcrop	-	-	-	-
Archaeology				
Palaeo Shoreline	We did not order Archaeological Services data for Line 0028.			
Registered Sites				
High Potential				
Medium Potential				
Watercourse Confluence				
Waterbody Confluence				

Appendix D TERRESTRIAL ENVIRONMENT SURVEY DATA

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REGISTRATION FOR THE MODERNIZATION OF ELECTRICAL TRANSMISSION INFRASTRUCTURE NEAR KEDGWICK, NEW BRUNSWICK

February 14, 2017

Stantec

Table D.1 Vascular Plant Species Observed in the PDA and Surrounding Areas

Common Name	Scientific Name	AC CDC S-Rank[1]
balsam fir	*Abies balsamea*	S5
striped maple	*Acer pensylvanicum*	S5
red maple	*Acer rubrum*	S5
sugar maple	*Acer saccharum*	S5
mountain maple	*Acer spicatum*	S5
common yarrow	*Achillea millefolium*	S5
red baneberry	*Actaea rubra*	S5
colonial bent grass	*Agrostis capillaris*	SNA
speckled alder	*Alnus incana*	S5
a serviceberry	*Amelanchier* sp.	
pearly everlasting	*Anaphalis margaritacea*	S5
Virginia anemone	*Anemone virginiana*	S4
field pussytoes	*Antennaria neglecta*	SNA
spreading dogbane	*Apocynum androsaemifolium*	S5
wild sarsaparilla	*Aralia nudicaulis*	S5
common lady fern	*Athyrium filix-femina*	S5
yellow birch	*Betula alleghaniensis*	S5
heart-leaved birch	*Betula papyrifera* var. *cordifolia*	S5
gray birch	*Betula populifolia*	S5
nodding beggarticks	*Bidens cernua*	S5
northern shorthusk	*Brachyelytrum septentrionale*	S5
bluejoint reed grass	*Calamagrostis canadensis*	S5
marsh water-starwort	*Callitriche palustris*	S5
Pennsylvania bittercress	*Cardamine pensylvanica*	S5
Bebb's sedge	*Carex bebbii*	S4
silvery sedge	*Carex canescens*	S5
dense sedge	*Carex cumulate*	S4S5
two-seeded sedge	*Carex disperma*	S5
star sedge	*Carex echinata*	S5
nodding sedge	*Carex gynandra*	S5
bladder sedge	*Carex intumescens*	S5
bristly-stalked sedge	*Carex leptalea*	S5
finely-nerved sedge	*Carex leptonervia*	S5
pale sedge	*Carex pallescens*	S5
necklace sedge	*Carex projecta*	S5
awl-fruited sedge	*Carex stipata*	S5

Table D.1 Vascular Plant Species Observed in the PDA and Surrounding Areas

Common Name	Scientific Name	AC CDC S-Rank[1]
fireweed	*Chamerion angustifolium*	S5
common pipsissewa	*Chimaphila umbellata*	S5
small enchanter's nightshade	*Circaea alpine*	S5
Canada thistle	*Cirsium arvense*	SNA
bull thistle	*Cirsium vulgare*	SNA
yellow bluebead lily	*Clintonia borealis*	S5
goldthread	*Coptis trifolia*	S5
bunchberry	*Cornus canadensis*	S5
red osier dogwood	*Cornus sericea*	S5
beaked hazel	*Corylus cornuta*	S5
orchard grass	*Dactylis glomerata*	SNA
tufted hair grass	*Deschampsia caespitosa*	S5
northern bush honeysuckle	*Diervilla lonicera*	S5
hairy flat-top white aster	*Doellingeria umbellata*	S5
spinulose wood fern	*Dryopteris carthusiana*	S5
crested wood fern	*Dryopteris cristata*	S5
evergreen wood fern	*Dryopteris intermedia*	S5
quack grass	*Elymus repens*	SNA
Virginia wild rye	*Elymus virginicus*	S5
northern willowherb	*Epilobium ciliatum*	S5
field horsetail	*Equisetum arvense*	S5
woodland horsetail	*Equisetum sylvaticum*	S5
rough fleabane	*Erigeron strigosus*	S5
spotted Joe-pye-weed	*Eupatorium maculatum*	S5
large-leaved aster	*Eurybia macrophylla*	S5
red fescue	*Festuca rubra*	S5
wild strawberry	*Fragaria virginiana*	S5
black ash	*Fraxinus nigra*	S4S5
common hemp-nettle	*Galeopsis tetrahit*	SNA
rough bedstraw	*Galium asprellum*	S5
creeping snowberry	*Gaultheria hispidula*	S5
yellow avens	*Geum aleppicum*	S5
common tall manna grass	*Glyceria grandis*	S5
fowl manna grass	*Glyceria striata*	S5
common oak fern	*Gymnocarpium dryopteris*	S5
common cow parsnip	*Heracleum maximum*	S5

Table D.1 Vascular Plant Species Observed in the PDA and Surrounding Areas

Common Name	Scientific Name	AC CDC S-Rank[1]
orange hawkweed	*Hieracium aurantiacum*	SNA
field hawkweed	*Hieracium caespitosum*	SNA
shining firmoss	*Huperzia lucidula*	S5
common St. John's-wort	*Hypericum perforatum*	SNA
harlequin blue flag	*Iris versicolor*	S5
toad rush	*Juncus bufonius*	S5
path rush	*Juncus tenuis*	S5
sheep laurel	*Kalmia angustifolia*	S5
tamarack	*Larix laricina*	S5
common Labrador tea	*Ledum groenlandicum*	S5
oxeye daisy	*Leucanthemum vulgare*	SNA
twinflower	*Linnaea borealis*	S5
meadow fescue	*Lolium pretense*	SNA
Canada fly honeysuckle	*Lonicera canadensis*	S5
large-leaved lupine	*Lupinus polyphyllus*	SNA
hairy woodrush	*Luzula acuminate*	S5
stiff clubmoss	*Lycopodium annotinum*	S5
running clubmoss	*Lycopodium clavatum*	S5
round-branched tree-clubmoss	*Lycopodium dendroideum*	S5
northern water horehound	*Lycopus uniflorus*	S5
three-leaved false Soloman's seal	*Maianthemum trifolium*	S5
pineapple weed	*Matricaria discoidea*	SNA
ostrich fern	*Matteuccia struthiopteris*	S5
Indian cucumber root	*Medeola virginiana*	S5
American cow wheat	*Melampyrum lineare*	S5
wild mint	*Mentha arvensis*	S5
square-stemmed monkeyflower	*Mimulus ringens*	S5
naked bishop's-cap	*Mitella nuda*	S5
pinesap	*Monotropa hypopithys*	S4
Indian pipe	*Monotropa uniflora*	S5
whorled wood aster	*Oclemena acuminata*	S5
one-sided wintergreen	*Orthilia secunda*	S5
cinnamon fern	*Osmunda cinnamomea*	S5
interrupted fern	*Osmunda claytoniana*	S5
sensitive fern	*Onoclea sensibilis*	S5
common wood sorrel	*Oxalis montana*	S5

Table D.1 Vascular Plant Species Observed in the PDA and Surrounding Areas

Common Name	Scientific Name	AC CDC S-Rank[1]
golden groundsel	*Packera aurea*	S4S5
reed canary grass	*Phalaris arundinacea*	S5
common timothy	*Phleum pretense*	SNA
white spruce	*Picea glauca*	S5
black spruce	*Picea mariana*	S5
jack pine	*Pinus banksiana*	S5
eastern white pine	*Pinus strobus*	S5
hoary plantain	*Plantago media*	SNA
white bog orchid	*Platanthera dilatata*	S4
Canada blue grass	*Poa compressa*	SNA
rough cinquefoil	*Potentilla norvegica*	S5
three-leaved rattlesnakeroot	*Prenanthes trifoliolata*	S5
common self-heal	*Prunella vulgaris*	S5
chokecherry	*Prunus virginiana*	S5
bracken fern	*Pteridium aquilinum*	S5
shinleaf	*Pyrola elliptica*	S5
common buttercup	*Ranunculus acris*	SNA
creeping buttercup	*Ranunculus repens*	SNA
skunk currant	*Ribes glandulosum*	S5
smooth gooseberry	*Ribes hirtellum*	S5
bristly black currant	*Ribes lacustre*	S5
red raspberry	*Rubus idaeus*	S5
dwarf red raspberry	*Rubus pubescens*	S5
curled dock	*Rumex crispus*	SNA
Bebb's willow	*Salix bebbiana*	S5
red elderberry	*Sambucus racemose*	S5
black-girdled bulrush	*Scirpus atrocinctus*	S5
small-fruited bulrush	*Scirpus microcarpus*	S5
bladder campion	*Silene vulgaris*	SNA
mountain blue-eyed-grass	*Sisyrinchium montanum*	S5
Canada goldenrod	*Solidago canadensis*	S5
rough-stemmed goldenrod	*Solidago rugose*	S5
American mountain ash	*Sorbus americana*	S5
white meadowsweet	*Spiraea alba*	S5
rose twisted-stalk	*Streptopus lanceolatus*	S5
calico aster	*Symphyotrichum lateriflorum*	S5

Table D.1 Vascular Plant Species Observed in the PDA and Surrounding Areas

Common Name	Scientific Name	AC CDC S-Rank[1]
New York aster	*Symphyotrichum novi-belgii*	S5
purple-stemmed aster	*Symphyotrichum puniceum*	S5
common dandelion	*Taraxacum officinale*	SNA
tall meadow-rue	*Thalictrum pubescens*	S5
New York fern	*Thelypteris noveboracensis*	S5
eastern white cedar	*Thuja occidentalis*	S5
northern starflower	*Trientalis borealis*	S5
rabbit's-foot clover	*Trifolium arvense*	SNA
yellow clover	*Trifolium aureum*	SNA
low hop clover	*Trifolium campestre*	SNA
red clover	*Trifolium pratense*	SNA
white clover	*Trifolium repens*	SNA
nodding trillium	*Trillium cernuum*	S5
painted trillium	*Trillium undulatum*	S5
coltsfoot	*Tussilago farfara*	SNA
stinging nettle	*Urtica dioica*	S4
late lowbush blueberry	*Vaccinium angustifolium*	S5
velvet-leaved blueberry	*Vaccinium myrtilloides*	S5
swamp valerian	***Valeriana uliginosa***	**S2S3**
American speedwell	*Veronica americana*	S5
common speedwell	*Veronica officinalis*	S5
squashberry	*Viburnum edule*	S4?
hobblebush	*Viburnum lantanoides*	S5
northern wild raisin	*Viburnum nudum*	S5
highbush cranberry	*Viburnum opulus*	S4
tufted vetch	*Vicia cracca*	SNA
common vetch	*Vicia sativa*	SNA
a violet	*Viola* sp.	

Note: Species of Conservation Concern (SOCC) are presented in **bold text**.

[1] S1 = critically imperiled, S2 = imperiled, S3 = vulnerable, S4 = apparently secure, S5 = secure, SNA = not applicable (typically exotic species) S#S# = a numeric range rank used to indicate any range of uncertainty about the status of the species or community.

Table D.2 Bird Species Observed near the LAA for the New 138 kV Transmission Line (AC CDC, ACNOS, MBBA, and Stantec records)

Common Name	Scientific Name	Highest Recorded Breeding Status	Source	*SARA* Rank	COSEWIC Rank	NB *SARA* Rank	AC CDC S-rank
American bittern	*Botaurus lentiginosus*	Probable	AC CDC, MBBA, Stantec				S4B,S4S5M
wood duck	*Aix sponsa*	Possible	AC CDC, MBBA				S4B,S4M
American wigeon	*Anas americana*	Probable	MBBA				S4B,S4S5M
green-winged teal	*Anas crecca*	Possible	AC CDC, MBBA				S4B,S5M
mallard	*Anas platyrhynchos*	Confirmed	AC CDC, MBBA				S5B,S4N,S5M
American black duck	*Anas rubripes*	Confirmed	AC CDC, MBBA				S5B,S4N,S5M
ring-necked duck	*Aythya collaris*	Confirmed	AC CDC, MBBA				S5B,S5M
Canada goose	*Branta canadensis*	Probable	AC CDC, MBBA, Stantec				SNAB,S5M
common goldeneye	*Bucephala clangula*	Probable	AC CDC, MBBA, Stantec				S4B,S5M,S4N
common merganser	*Mergus merganser*	Possible	AC CDC, MBBA				S5B,S4N,S5M
red-tailed hawk	*Buteo jamaicensis*	Possible	AC CDC, MBBA				S4
broad-winged hawk	*Buteo platypterus*	Possible	AC CDC, MBBA				S5B,S5M
northern harrier	*Circus cyaneus*	Possible	AC CDC, MBBA				S4B,S4S5M
osprey	*Pandion haliaetus*	Possible	AC CDC, MBBA				S4S5B,S5M
merlin	*Falco columbarius*	Possible	AC CDC, MBBA				S5B,S5M
American kestrel	*Falco sparverius*	Possible	AC CDC, MBBA				S4B,S4S5M
ruffed grouse	*Bonasa umbellus*	Confirmed	AC CDC, MBBA, Stantec				S5
killdeer	***Charadrius vociferus***	**Possible**	**MBBA**				**S3B,S3M**
spotted sandpiper	*Actitis macularius*	Probable	AC CDC, MBBA				S3S4B,S5M
Wilson's snipe	*Gallinago delicata*	Possible	AC CDC, MBBA, Stantec				S3S4B,S5M
American woodcock	*Scolopax minor*	Possible	Stantec				S5B,S5M

Table D.2 Bird Species Observed near the LAA for the New 138 kV Transmission Line (AC CDC, ACNOS, MBBA, and Stantec records)

Common Name	Scientific Name	Highest Recorded Breeding Status	Source	*SARA* Rank	COSEWIC Rank	NB *SARA* Rank	AC CDC S-rank
rock pigeon	*Columba livia (feral pigeon)*	Probable	AC CDC, MBBA				SNA
mourning dove	*Zenaida macroura*	Probable	AC CDC, MBBA, Stantec				S5B,S5M,S4N
chimney swift	***Chaetura pelagica***	**Possible**	**AC CDC, MBBA**	**Schedule 1, Threatened**	**Threatened**	**Threatened**	**S2S3B,S2M**
ruby-throated hummingbird	*Archilochus colubris*	Probable	AC CDC, MBBA				S5B,S5M
belted kingfisher	*Megaceryle alcyon*	Probable	AC CDC, MBBA, Stantec				S5B,S5M
northern flicker	*Colaptes auratus*	Possible	AC CDC, MBBA, Stantec				S5B,S5M
pileated woodpecker	*Dryocopus pileatus*	Possible	AC CDC, MBBA				S5
downy woodpecker	*Picoides pubescens*	Possible	AC CDC, MBBA, Stantec				S5
hairy woodpecker	*Picoides villosus*	Possible	AC CDC, MBBA, Stantec				S5
yellow-bellied sapsucker	*Sphyrapicus varius*	Possible	AC CDC, MBBA, Stantec				S5B,S5M
olive-sided flycatcher	***Contopus cooperi***	**Possible**	**Stantec**	**Schedule 1, Threatened**	**Threatened**	**Threatened**	**S3B,S3M**
alder flycatcher	*Empidonax alnorum*	Possible	AC CDC, MBBA, Stantec				S5B,S5M
yellow-bellied flycatcher	*Empidonax flaviventris*	Possible	AC CDC, MBBA, Stantec				S4S5B,S5M
least flycatcher	*Empidonax minimus*	Possible	AC CDC, MBBA				S5B,S5M
eastern phoebe	*Sayornis phoebe*	Possible	AC CDC, MBBA				S5B,S5M
barn swallow	***Hirundo rustica***	**Possible**	**MBBA**	**No Schedule, No Status**	**Threatened**	**Threatened**	**S2B,S2M**

Table D.2 Bird Species Observed near the LAA for the New 138 kV Transmission Line (AC CDC, ACNOS, MBBA, and Stantec records)

Common Name	Scientific Name	Highest Recorded Breeding Status	Source	*SARA* Rank	COSEWIC Rank	NB *SARA* Rank	AC CDC S-rank
cliff swallow	*Petrochelidon pyrrhonota*	Confirmed	MBBA				S2S3B,S2S3M
tree swallow	*Tachycineta bicolor*	Confirmed	AC CDC, MBBA				S4B,S4M
American crow	*Corvus brachyrhynchos*	Confirmed	AC CDC, MBBA, Stantec				S5
common raven	*Corvus corax*	Possible	AC CDC, MBBA				S5
blue jay	*Cyanocitta cristata*	Confirmed	AC CDC, MBBA, Stantec				S5
gray jay	*Perisoreus canadensis*	Confirmed	AC CDC, MBBA, Stantec				S4
black-capped chickadee	*Poecile atricapillus*	Possible	AC CDC, MBBA, Stantec				S5
boreal chickadee	*Poecile hudsonicus*	Possible	Stantec				S4
red-breasted nuthatch	*Sitta canadensis*	Possible	AC CDC, MBBA, Stantec				S5
brown creeper	*Certhia americana*	Possible	Stantec				S5
winter wren	*Troglodytes hiemalis*	Possible	AC CDC, MBBA, Stantec				S5B,S5M
veery	*Catharus fuscescens*	Possible	AC CDC, MBBA, Stantec				S4B,S4M
hermit thrush	*Catharus guttatus*	Possible	AC CDC, MBBA, Stantec				S5B,S5M
Swainson's thrush	*Catharus ustulatus*	Possible	AC CDC, MBBA, Stantec				S5B,S5M
ruby-crowned kinglet	*Regulus calendula*	Possible	AC CDC, MBBA, Stantec				S4B,S5M
golden-crowned kinglet	*Regulus satrapa*	Possible	AC CDC, MBBA, Stantec				S5
American robin	*Turdus migratorius*	Probable	AC CDC, MBBA, Stantec				S5B,S5M

Table D.2 Bird Species Observed near the LAA for the New 138 kV Transmission Line (AC CDC, ACNOS, MBBA, and Stantec records)

Common Name	Scientific Name	Highest Recorded Breeding Status	Source	*SARA* Rank	COSEWIC Rank	NB *SARA* Rank	AC CDC S-rank
gray catbird	*Dumetella carolinensis*	Possible	AC CDC, MBBA				S4B,S4M
cedar waxwing	*Bombycilla cedrorum*	Possible	AC CDC, MBBA, Stantec				S5B,S5M
European starling	*Sturnus vulgaris*	Confirmed	AC CDC, MBBA				SNA
red-eyed vireo	*Vireo olivaceus*	Possible	AC CDC, MBBA, Stantec				S5B,S5M
Philadelphia vireo	*Vireo philadelphicus*	Possible	AC CDC, MBBA				S5B,S5M
blue-headed vireo	*Vireo solitarius*	Possible	AC CDC, MBBA, Stantec				S5B,S5M
red-winged blackbird	*Agelaius phoeniceus*	Confirmed	AC CDC, MBBA, Stantec				S4B,S4M
black-throated blue warbler	*Setophaga caerulescens*	Possible	AC CDC, MBBA, Stantec				S5B,S5M
bay-breasted warbler	*Setophaga castanea*	Possible	AC CDC, MBBA				S4B,S4S5M
yellow-rumped warbler	*Setophaga coronata*		AC CDC				S5B,S5M
Blackburnian warbler	*Setophaga fusca*	Possible	Stantec				S5B,S5M
magnolia warbler	*Setophaga magnolia*	Probable	AC CDC, MBBA, Stantec				S5B,S5M
palm warbler	*Setophaga palmarum*	Possible	AC CDC, Stantec				S5B,S5M
chestnut-sided warbler	*Setophaga pensylvanica*	Possible	AC CDC, MBBA, Stantec				S5B,S5M
yellow warbler	*Setophaga petechia*	Possible	AC CDC, MBBA, Stantec				S5B,S5M
blackpoll warbler	*Setophaga striata*	Possible	AC CDC, MBBA				S3S4B,S5M

Table D.2 Bird Species Observed near the LAA for the New 138 kV Transmission Line (AC CDC, ACNOS, MBBA, and Stantec records)

Common Name	Scientific Name	Highest Recorded Breeding Status	Source	*SARA* Rank	COSEWIC Rank	NB *SARA* Rank	AC CDC S-rank
Cape May warbler	*Setophaga tigrina*	Possible	AC CDC, MBBA, Stantec				S3B,S4S5M
black-throated green warbler	*Setophaga virens*	Possible	AC CDC, MBBA, Stantec				S5B,S5M
common yellowthroat	*Geothlypis trichas*	Possible	AC CDC, MBBA, Stantec				S5B,S5M
dark-eyed junco	*Junco hyemalis*	Possible	AC CDC, MBBA, Stantec				S5
swamp sparrow	*Melospiza georgiana*	Probable	AC CDC, MBBA, Stantec				S5B,S5M
Lincoln's sparrow	*Melospiza lincolnii*	Possible	AC CDC, MBBA				S4B,S5M
song sparrow	*Melospiza melodia*	Confirmed	AC CDC, MBBA, Stantec				S5B,S5M
black-and-white warbler	*Mniotilta varia*	Possible	AC CDC, MBBA, Stantec				S5B,S5M
brown-headed cowbird	***Molothrus ater***	**Possible**	**MBBA**				**S3B,S3M**
northern parula	*Setophaga americana*	Possible	AC CDC, MBBA, Stantec				S5B,S5M
savannah sparrow	*Passerculus sandwichensis*	Possible	AC CDC, MBBA				S4S5B,S5M
fox sparrow	*Passerella iliaca*	Observed	Stantec				S4B,S5M
indigo bunting	***Passerina cyanea***	**Possible**	**MBBA**				**S3B,S3M**
rose-breasted grosbeak	*Pheucticus ludovicianus*	Possible	AC CDC, MBBA, Stantec				S4B,S4M
common grackle	*Quiscalus quiscula*	Confirmed	AC CDC, MBBA, Stantec				S5B,S5M
ovenbird	*Seiurus aurocapilla*	Possible	AC CDC, MBBA, Stantec				S5B,S5M
northern waterthrush	*Parkesia noveboracensis*	Possible	AC CDC, MBBA, Stantec				S4B,S5M

Table D.2 Bird Species Observed near the LAA for the New 138 kV Transmission Line (AC CDC, ACNOS, MBBA, and Stantec records)

Common Name	Scientific Name	Highest Recorded Breeding Status	Source	*SARA* Rank	COSEWIC Rank	NB *SARA* Rank	AC CDC S-rank
American redstart	*Setophaga ruticilla*	Probable	AC CDC, MBBA, Stantec				S5B,S5M
chipping sparrow	*Spizella passerina*	Confirmed	AC CDC, MBBA, Stantec				S5B,S5M
Tennessee warbler	*Oreothlypis peregrina*	Possible	AC CDC, MBBA, Stantec				S4B,S5M
Nashville warbler	*Oreothlypis ruficapilla*	Possible	AC CDC, MBBA, Stantec				S5B,S5M
Canada warbler	***Cardellina canadensis***	**Possible**	**Stantec**	**Schedule 1, Threatened**	**Threatened**	**Threatened**	**S3B,S3M**
white-throated sparrow	*Zonotrichia albicollis*	Probable	AC CDC, MBBA, Stantec				S5B,S5M
pine siskin	*Carduelis pinus*	Possible	Stantec				S3
American goldfinch	*Spinus tristis*	Probable	AC CDC, MBBA, Stantec				S5
purple finch	*Haemorhous purpureus*	Probable	AC CDC, MBBA				S4S5B,SUN,S5M
evening grosbeak	*Coccothraustes vespertinus*	Confirmed	MBBA, Stantec				S3B,S3S4N,SUM
house sparrow	*Passer domesticus*	Probable	AC CDC, MBBA				SNA

Note: Species at Risk (SAR) and Species of Conservation Concern (SOCC) are presented in **bold text**.

[1] Alpha Codes are presented at the locations of observed SAR and SOCC on accompanying figures

[2] S1 = critically imperiled, S2 = imperiled, S3 = vulnerable, S4 = apparently secure, S5 = secure, SNA = not applicable (typically exotic species) S#S# = a numeric range rank used to indicate any range of uncertainty about the status of the species or community. B= Breeding, N = Nonbreeding, M = Migrant, U = Unrankable. (AC CDC 2014)

Table D.3 Species Observed near the LAA for the 69 kV Transmission Line 0028 (AC CDC, ACNOS, and MBBA records)

Common Name	Scientific Name	Highest Recorded Breeding Status[1]	Source	*SARA* Rank	COSEWIC Rank	NB *SARA* Rank	AC CDC S-rank[2]
great blue heron	*Ardea herodias*		AC CDC				S4B,S4M
wood duck	*Aix sponsa*	Possible	AC CDC, MBBA				S4B,S4M
green-winged teal	*Anas carolinensis*	Possible	MBBA				S4B,S5M
mallard	*Anas platyrhynchos*	Confirmed	AC CDC, MBBA				S5B,S4N,S5M
American black duck	*Anas rubripes*	Confirmed	AC CDC, MBBA				S5B,S4N,S5M
ring-necked duck	*Aythya collaris*	Confirmed	AC CDC, MBBA				S5B,S5M
Canada goose	*Branta canadensis*	Probable	AC CDC, MBBA				SNAB,S5M
common goldeneye	*Bucephala clangula*	Probable	AC CDC, MBBA				S4B,S5M,S4N
hooded merganser	*Lophodytes cucullatus*		AC CDC				S4B,S5M
common merganser	*Mergus merganser*	Confirmed	AC CDC, MBBA				S5B,S4N,S5M
common eider	*Somateria mollissima*		AC CDC				S3B,S4M,S3N
turkey vulture	***Cathartes aura***		**AC CDC**				**S3B,S3M**
sharp-shinned hawk	*Accipiter striatus*	Possible	AC CDC, MBBA				S4B,S5M
red-tailed hawk	*Buteo jamaicensis*	Confirmed	AC CDC, MBBA				S4
broad-winged hawk	*Buteo platypterus*	Possible	AC CDC, MBBA				S5B,S5M
northern harrier	*Circus cyaneus*	Probable	AC CDC, MBBA				S4B,S4S5M
osprey	*Pandion haliaetus*	Possible	AC CDC, MBBA				S4S5B,S5M
merlin	*Falco columbarius*	Possible	AC CDC, MBBA				S5B,S5M
American kestrel	*Falco sparverius*	Probable	AC CDC, MBBA				S4B,S4S5M
ruffed grouse	*Bonasa umbellus*	Confirmed	AC CDC, MBBA				S5
killdeer	***Charadrius vociferus***	**Possible**	**AC CDC, MBBA**				**S3B,S3M**

Table D.3 Species Observed near the LAA for the 69 kV Transmission Line 0028 (AC CDC, ACNOS, and MBBA records)

Common Name	Scientific Name	Highest Recorded Breeding Status[1]	Source	*SARA* Rank	COSEWIC Rank	NB *SARA* Rank	AC CDC S-rank[2]
spotted sandpiper	*Actitis macularius*	Confirmed	AC CDC, MBBA				S3S4B,S5M
Wilson's snipe	*Gallinago delicata*	Probable	AC CDC, MBBA				S3S4B,S5M
American woodcock	*Scolopax minor*	Probable	AC CDC, MBBA				S5B,S5M
herring gull	*Larus argentatus*		AC CDC				S5
rock pigeon	*Columba livia*	Probable	AC CDC, MBBA				SNA
mourning dove	*Zenaida macroura*	Confirmed	AC CDC, MBBA				S5B,S5M,S4N
northern saw-whet owl	*Aegolius acadicus*		AC CDC				S5B,S5M
barred owl	*Strix varia*	Possible	AC CDC, MBBA				S5
common nighthawk	***Chordeiles minor***	**Probable**	**AC CDC, MBBA**	**Schedule 1, Threatened**	**Threatened**	**Threatened**	**S3B,S4M**
chimney swift	***Chaetura pelagica***	**Possible**	**AC CDC, MBBA**	**Schedule 1, Threatened**	**Threatened**	**Threatened**	**S2S3B,S2M**
ruby-throated hummingbird	*Archilochus colubris*	Probable	AC CDC, MBBA				S5B,S5M
belted kingfisher	*Megaceryle alcyon*	Confirmed	AC CDC, MBBA				S5B,S5M
northern flicker	*Colaptes auratus*	Probable	AC CDC, MBBA				S5B,S5M
pileated woodpecker	*Dryocopus pileatus*	Possible	AC CDC, MBBA				S5
downy woodpecker	*Picoides pubescens*	Possible	AC CDC, MBBA				S5
hairy woodpecker	*Picoides villosus*	Confirmed	AC CDC, MBBA				S5
yellow-bellied sapsucker	*Sphyrapicus varius*	Confirmed	AC CDC, MBBA				S5B,S5M

Table D.3 Species Observed near the LAA for the 69 kV Transmission Line 0028 (AC CDC, ACNOS, and MBBA records)

Common Name	Scientific Name	Highest Recorded Breeding Status[1]	Source	*SARA* Rank	COSEWIC Rank	NB *SARA* Rank	AC CDC S-rank[2]
olive-sided flycatcher	***Contopus cooperi***	**Possible**	**AC CDC, MBBA**	**Schedule 1, Threatened**	**Threatened**	**Threatened**	**S3B,S3M**
eastern wood-pewee	***Contopus virens***	**Possible**	**AC CDC, MBBA**	**No Schedule, No Status**	**Special Concern**	**Special Concern**	**S4B,S4M**
alder flycatcher	*Empidonax alnorum*	Probable	AC CDC, MBBA				S5B,S5M
yellow-bellied flycatcher	*Empidonax flaviventris*	Possible	AC CDC, MBBA				S4S5B,S5M
least flycatcher	*Empidonax minimus*	Possible	AC CDC, MBBA				S5B,S5M
eastern phoebe	*Sayornis phoebe*	Confirmed	AC CDC, MBBA				S5B,S5M
eastern kingbird	*Tyrannus tyrannus*	Possible	AC CDC, MBBA				S3S4B,S3S4M
horned lark	***Eremophila alpestris***		**AC CDC**				S1B,S4N,S5M
barn swallow	***Hirundo rustica***	**Confirmed**	**AC CDC, MBBA**	**Schedule 1, Threatened**	**Threatened**	**Threatened**	**S2B,S2M**
cliff swallow	*Petrochelidon pyrrhonota*	Confirmed	AC CDC, MBBA				S2S3B,S2S3M
bank swallow	***Riparia riparia***	**Confirmed**	**AC CDC, MBBA**	**No Schedule, No Status**	**Threatened**		**S2S3B,S2S3M**
tree swallow	*Tachycineta bicolor*	Confirmed	AC CDC, MBBA				S4B,S4M
American crow	*Corvus brachyrhynchos*	Confirmed	AC CDC, MBBA				S5
common raven	*Corvus corax*	Confirmed	AC CDC, MBBA				S5
blue jay	*Cyanocitta cristata*	Confirmed	AC CDC, MBBA				S5
gray jay	*Perisoreus canadensis*	Confirmed	AC CDC, MBBA				S4

Table D.3 Species Observed near the LAA for the 69 kV Transmission Line 0028 (AC CDC, ACNOS, and MBBA records)

Common Name	Scientific Name	Highest Recorded Breeding Status[1]	Source	*SARA* Rank	COSEWIC Rank	NB *SARA* Rank	AC CDC S-rank[2]
black-capped chickadee	*Poecile atricapilla*	Confirmed	AC CDC, MBBA				S5
boreal chickadee	*Poecile hudsonica*	Probable	AC CDC, MBBA				S4
red-breasted nuthatch	*Sitta canadensis*	Probable	AC CDC, MBBA				S5
white-breasted nuthatch	*Sitta carolinensis*		AC CDC				S4
brown creeper	*Certhia americana*	Possible	AC CDC, MBBA				S5
winter wren	*Troglodytes troglodytes*	Probable	AC CDC, MBBA				S5B,S5M
veery	*Catharus fuscescens*	Probable	AC CDC, MBBA				S4B,S4M
hermit thrush	*Catharus guttatus*	Probable	AC CDC, MBBA				S5B,S5M
Swainson's thrush	*Catharus ustulatus*	Probable	AC CDC, MBBA				S5B,S5M
wood thrush	***Hylocichla mustelina***		**AC CDC**	**No Schedule, No Status**	**Threatened**	**Threatened**	**S1S2B,S1S2M**
ruby-crowned kinglet	*Regulus calendula*	Possible	AC CDC, MBBA				S4B,S5M
golden-crowned kinglet	*Regulus satrapa*	Confirmed	AC CDC, MBBA				S5
eastern bluebird	*Sialia sialis*		AC CDC				S4B,S4M
American robin	*Turdus migratorius*	Confirmed	AC CDC, MBBA				S5B,S5M
gray catbird	*Dumetella carolinensis*	Possible	AC CDC, MBBA				S4B,S4M
northern mockingbird	***Mimus polyglottos***		**AC CDC**				**S2B,S2M**

Table D.3 Species Observed near the LAA for the 69 kV Transmission Line 0028 (AC CDC, ACNOS, and MBBA records)

Common Name	Scientific Name	Highest Recorded Breeding Status[1]	Source	*SARA* Rank	COSEWIC Rank	NB *SARA* Rank	AC CDC S-rank[2]
cedar waxwing	*Bombycilla cedrorum*	Probable	AC CDC, MBBA				S5B,S5M
European starling	*Sturnus vulgaris*	Confirmed	AC CDC, MBBA				SNA
red-eyed vireo	*Vireo olivaceus*	Confirmed	AC CDC, MBBA				S5B,S5M
Philadelphia vireo	*Vireo philadelphicus*	Probable	AC CDC, MBBA				S5B,S5M
blue-headed vireo	*Vireo solitarius*	Probable	AC CDC, MBBA				S5B,S5M
red-winged blackbird	*Agelaius phoeniceus*	Confirmed	AC CDC, MBBA				S4B,S4M
black-throated blue warbler	*Dendroica caerulescens*	Probable	AC CDC, MBBA				S5B,S5M
bay-breasted warbler	*Dendroica castanea*	Possible	AC CDC, MBBA				S4B,S4S5M
yellow-rumped warbler	*Dendroica coronata*	Confirmed	AC CDC, MBBA				S5B,S5M
Blackburnian warbler	*Dendroica fusca*	Confirmed	AC CDC, MBBA				S5B,S5M
magnolia warbler	*Dendroica magnolia*	Confirmed	AC CDC, MBBA				S5B,S5M
palm warbler	*Dendroica palmarum*		AC CDC				S5B,S5M
chestnut-sided warbler	*Dendroica pensylvanica*	Probable	AC CDC, MBBA				S5B,S5M
yellow warbler	*Dendroica petechia*	Probable	AC CDC, MBBA				S5B,S5M
Cape May warbler	*Dendroica tigrina*	Possible	AC CDC, MBBA				S3B,S4S5M
black-throated green warbler	*Dendroica virens*	Probable	AC CDC, MBBA				S5B,S5M

Table D.3 Species Observed near the LAA for the 69 kV Transmission Line 0028 (AC CDC, ACNOS, and MBBA records)

Common Name	Scientific Name	Highest Recorded Breeding Status[1]	Source	*SARA* Rank	COSEWIC Rank	NB *SARA* Rank	AC CDC S-rank[2]
bobolink	***Dolichonyx oryzivorus***	**Probable**	**AC CDC, MBBA**	**No Schedule, No Status**	**Threatened**	**Threatened**	**S3B,S3M**
rusty blackbird	***Euphagus carolinus***	**Possible**	**AC CDC, MBBA**	**Schedule 1, Special Concern**	**Special Concern**	**Special Concern**	**S3B,S3M**
common yellowthroat	*Geothlypis trichas*	Probable	AC CDC, MBBA				S5B,S5M
dark-eyed junco	*Junco hyemalis*	Probable	AC CDC, MBBA				S5
swamp sparrow	*Melospiza georgiana*	Probable	AC CDC, MBBA				S5B,S5M
lincoln's sparrow	*Melospiza lincolnii*	Confirmed	AC CDC, MBBA				S4B,S5M
song sparrow	*Melospiza melodia*	Confirmed	AC CDC, MBBA				S5B,S5M
black-and-white warbler	*Mniotilta varia*	Probable	AC CDC, MBBA				S5B,S5M
brown-headed cowbird	***Molothrus ater***	**Probable**	**AC CDC, MBBA**				**S3B,S3M**
mourning warbler	*Oporornis philadelphia*	Possible	AC CDC, MBBA				S4B,S5M
northern parula	*Parula americana*	Confirmed	AC CDC, MBBA				S5B,S5M
savannah sparrow	*Passerculus sandwichensis*	Probable	AC CDC, MBBA				S4S5B,S5M
fox sparrow	*Passerella iliaca*		AC CDC				S4B,S5M
rose-breasted grosbeak	*Pheucticus ludovicianus*	Probable	AC CDC, MBBA				S4B,S4M
scarlet tanager	*Piranga olivacea*	Possible	AC CDC, MBBA				S3B,S3M
common grackle	*Quiscalus quiscula*	Confirmed	AC CDC, MBBA				S5B,S5M

Table D.3 Species Observed near the LAA for the 69 kV Transmission Line 0028 (AC CDC, ACNOS, and MBBA records)

Common Name	Scientific Name	Highest Recorded Breeding Status[1]	Source	*SARA* Rank	COSEWIC Rank	NB *SARA* Rank	AC CDC S-rank[2]
ovenbird	*Seiurus aurocapilla*	Probable	AC CDC, MBBA				S5B,S5M
northern waterthrush	*Seiurus noveboracensis*	Possible	AC CDC, MBBA				S4B,S5M
American redstart	*Setophaga ruticilla*	Probable	AC CDC, MBBA				S5B,S5M
chipping sparrow	*Spizella passerina*	Confirmed	AC CDC, MBBA				S5B,S5M
eastern meadowlark	***Sturnella magna***		**AC CDC**	**No Schedule, No Status**	**Threatened**	**Threatened**	**S1B,S1M**
Tennessee warbler	*Vermivora peregrina*	Possible	AC CDC, MBBA				S4B,S5M
Nashville warbler	*Vermivora ruficapilla*	Confirmed	AC CDC, MBBA				S5B,S5M
Canada warbler	***Wilsonia canadensis***	**Possible**	**AC CDC, MBBA**	**Schedule 1, Threatened**	**Threatened**	**Threatened**	**S3B,S3M**
Wilson's warbler	*Wilsonia pusilla*	Confirmed	AC CDC, MBBA				S4B,S5M
white-throated sparrow	*Zonotrichia albicollis*	Confirmed	AC CDC, MBBA				S5B,S5M
pine siskin	*Carduelis pinus*	Probable	AC CDC, MBBA				S3
American goldfinch	*Carduelis tristis*	Possible	AC CDC, MBBA				S5
purple finch	*Carpodacus purpureus*	Confirmed	AC CDC, MBBA				S4S5B,SUN,S5M
evening grosbeak	*Coccothraustes vespertinus*	Confirmed	AC CDC, MBBA				S3B,S3S4N,SUM
white-winged crossbill	*Loxia leucoptera*	Confirmed	AC CDC, MBBA				S5

Table D.3 Species Observed near the LAA for the 69 kV Transmission Line 0028 (AC CDC, ACNOS, and MBBA records)

Common Name	Scientific Name	Highest Recorded Breeding Status[1]	Source	*SARA* Rank	COSEWIC Rank	NB *SARA* Rank	AC CDC S-rank[2]
pine grosbeak	***Pinicola enucleator***		**AC CDC**				**S2B,S4S5N,S4S5M**
house sparrow	*Passer domesticus*	Probable	AC CDC, MBBA				SNA

Note: Species at Risk (SAR) and Species of Conservation Concern (SOCC) are presented in **bold text**.

[1] Alpha Codes are presented at the locations of observed SAR and SOCC on accompanying figures

[2] S1 = critically imperiled, S2 = imperiled, S3 = vulnerable, S4 = apparently secure, S5 = secure, SNA = not applicable (typically exotic species) S#S# = a numeric range rank used to indicate any range of uncertainty about the status of the species or community. B= Breeding, N = Nonbreeding, M = Migrant, U = Unrankable. (AC CDC 2014)

Appendix E SAMPLE OF INFORMATION PACKAGE

Le 23 septembre, 2016

INVITATION

ADRESSE

XXX,

Dans le cadre de nos améliorations à la fiabilité des équipements, Énergie NB fera d'importantes améliorations à ses installations dans la région de Saint-Quentin et de Kedgwick. Ces nouvelles améliorations permettront d'assurer une alimentation en l'électricité robuste pour les clients de la région.

La ligne de transport actuelle de 69 kV (dénommée la ligne de transport 0028) est environ 73 km de long et parcourt de Saint-Léonard à Kedgwick. Cette ligne alimente la sous-station de Kedgwick et dessert environ 1 293 clients. Au cours des dernières années, cette ligne a démontré un manque de fiabilité et, par conséquent, Énergie NB propose un projet de construction, sur une nouvelle emprise, d'une ligne de transport d'électricité d'une tension de 138 kV ou plus et d'une longueur de 5,2 km à l'est de la sous-station de Kedgwick pour ensuite se joindre à une ligne de transport adjacente. Des travaux d'amélioration à la sous-station seraient effectués afin d'accueillir la nouvelle ligne de 138 kV. Finalement, les structures actuelles sur la ligne 0028 (environ 25 km) seraient démantelées et enlevées pour permettre un reverdissement naturel. Vous trouverez ci-joint une carte qui définit la voie préférée actuellement à l'examen.

Dans le cadre de notre travail de préparation et d'évaluation d'impact environnemental, nous vous invitons à participer une session porte ouverte pour en apprendre davantage sur divers éléments de ce projet, comme l'environnement, les servitudes, le type de travail, l'accès aux terres et le calendrier du projet, **le 13 octobre 2016 entre 17h et 20h à l'hôtel de ville, 114 rue Notre-Dame, Kedgwick, NB**. Ceci sera aidera à sensibiliser la communauté et fournir la possibilité de poser des questions ou de formuler des commentaires aux chefs de projet.

Prière de confirmer à l'avance votre présence à Marie-Andrée Bolduc avant le jeudi 6 octobre par courriel au mbolduc@nbpower.com ou par téléphone au 506-458-3212. Nous espérons que vous vous joindrez à nous.

Veuillez agréer, mes salutations distinguées.

Chantal St-Pierre
Directrice, Affaires réglementaires et environnementales
Énergie NB

September 23, 2016

INVITATION

ADDRESS

Dear XXX,

As part of our improvements to equipment reliability, NB Power will be making significant upgrades to its facilities in the St. Quentin and Kedgwick area. These new upgrades will assure a robust supply of electricity to the customers in the area.

The existing 69 kV transmission line (known as transmission Line 0028) is approximately 73 km in length and runs from St. Leonard to Kedgwick. This line which feeds the Kedgwick Substation serves approximately 1293 customers. Over the last few years, this line has shown poor reliability and as a result, NB Power is proposing the construction of a new 5.2 km higher voltage 138 kV transmission line east of the Kedgwick Substation to join an adjacent transmission line. Upgrades to the substation would be made to accommodate the new 138 kV line. Eventually, the existing structures on line 0028 (approximately 25 km) would be permanently removed and would allow for the area to re-vegetate naturally. I have attached a map which identifies the preferred route currently under consideration.

As part of our preparatory work and Environmental Impact Assessment, we invite you to attend an open house to discuss various components pertaining to this project, like the environment, easements, type of work, access to land and project timelines **between 5 pm and 8 pm on October 13th 2016 at Town Hall, 114 rue Notre-Dame, St., Kedgwick, NB.** This will be a great opportunity for the community to ask questions or provide comments to the project managers.

Please confirm your presence at the open house to Marie-Andrée Bolduc by October 6th via email at mbolduc@nbpower.com or at (506)458-3212.

We hope you will join us.

Kindly,

Chantal St-Pierre
Director, Regulatory and Environmental Affairs
NB Power

Énergie NB Power

Janice Savoie
Mairesse de la ville de Kedgwick
114, rue Notre-Dame
Kedgwick, (Nouveau-Brunswick)
E8B 1H8

Fredericton, le 20 septembre 2016

Chère Madame la Mairesse,

Dans le cadre de nos améliorations à la fiabilité des équipements, Énergie NB fera d'importantes améliorations à ses installations dans la région de Saint-Quentin et de Kedgwick. Ces nouvelles améliorations permettront d'assurer une alimentation en l'électricité robuste pour nos clients.

La ligne de transport actuelle de 69 kV (dénommée la ligne de transport 0028) est environ 73 km de long et parcourt de Saint-Léonard à Kedgwick. Cette ligne alimente la sous-station de Kedgwick et dessert environ 1 293 clients. Au cours des dernières années, cette ligne a démontré un manque de fiabilité et, par conséquent, Énergie NB propose un projet de construction, sur une nouvelle emprise, d'une ligne de transport d'électricité d'une tension de 138 kV ou plus et d'une longueur de 5,2 km à l'est de la sous-station de Kedgwick pour ensuite se joindre à une ligne de transport adjacente. Des travaux d'amélioration à la sous-station seraient effectués afin d'accueillir la nouvelle ligne de 138 kV. Finalement, les structures actuelles sur la ligne 0028 (environ 25 km) seraient démantelées et enlevées pour permettre un reverdissement naturel. Vous trouverez ci-joint une carte qui définit la voie préférée actuellement à l'examen.

Suite à votre discussion avec mon collègue Bob Scott et dans le cadre de notre travail de préparation et d'évaluation d'impact environnemental, nous confirmons une rencontre avec vous et votre conseil pour discuter de divers éléments se rapportant à ce projet, comme l'environnement, les servitudes, le type de travail, l'accès aux terres et le calendrier du projet, le mardi 4 octobre 2016 à midi au restaurant O'Régal à Kedgwick.

Prière de confirmer à l'avance votre présence à la réunion d'ici le 30 septembre par courriel au CStPierre@nbpower.com ou par téléphone au 506 458-6655. Nous espérons que vous vous joindrez à nous.

Veuillez agréer, Madame la Mairesse, mes salutations distinguées.

Chantal St-Pierre
Directrice, Affaires réglementaires et environnementales
Énergie NB

Cc : B. Scott, Énergie NB

Énergie NB Power

1 800 663-6272
www.energienb.com
www.nbpower.com

PROPOSITION DE PROJET

La ligne de transport existante de 69 kV, appelée ligne de transport 0028, est d'une longueur d'environ 73 km, allant de Saint-Léonard à Kedgwick. Cette ligne alimente la sous-station de Kedgwick, fournissant de l'électricité à environ 1 293 clients.

Au cours des dernières années, cette ligne ne s'est pas avérée très fiable et, par conséquent, Énergie NB propose la construction d'une nouvelle ligne de transport à haute tension de 5,2 km de 138 kV à l'est de la sous-station de Kedgwick, rejoignant une ligne de transport adjacente.

La sous-station sera mise à niveau de façon à pouvoir accueillir la nouvelle ligne de 138 kV. Les structures existantes de la ligne 0028, sur une longueur d'environ 25 km, seront retirées de façon permanente et la végétation du secteur sera rétablie de façon naturelle.

THE PROPOSED PROJECT

The existing 69 kV transmission line (known as transmission Line 0028) is approximately 73 km in length and runs from St. Leonard to Kedgwick. This line which feeds the Kedgwick Substation serves approximately 1293 customers.

Over the last few years, this line has shown poor reliability and as a result, NB Power is proposing to construct a new 5.2 km higher voltage 138 kV transmission line east of the Kedgwick Substation to join an adjacent transmission line.

Upgrades to the substation will be made to accommodate the new 138 kV line. Eventually, the existing structures on line 0028 (approximately 25 km) will be permanently removed and will allow for the area to re-vegetate naturally.

UN INVESTISSEMENT À LA FIABILITÉ

INVESTING IN YOUR RELIABILITY

APPROBATIONS ET PERMIS

Le projet proposé est assujetti au Règlement sur les études d'impact sur l'environnement du Nouveau-Brunswick.

En appui au processus de dépôt d'information liée à l'étude d'impact sur l'environnement, des études environnementales ont été effectuées sur le terrain afin de recueillir des renseignements au sujet des options envisagées pour l'emprise de la ligne de transport. Ces études visent les oiseaux migrateurs, l'habitat du poisson, les terres humides, les plantes rares et les aspects archéologiques.

Il est prévu de déposer la demande concernant l'étude d'impact sur l'environnement au ministère de l'Environnement et des Gouvernements locaux tard à l'automne 2016.

Il faut obtenir d'autres approbations et permis dans le cadre du projet :

- Permis de modification d'un cours d'eau et d'une terre humide du ministère de l'Environnement et des Gouvernements locaux
- Ordonnance d'exemption aux exigences du champ de captage du ministère de l'Environnement et des Gouvernements locaux
- Divers permis concernant les travaux de construction

APPROVALS AND PERMITS

The proposed Project is subject to the New Brunswick Environmental Impact Assessment (EIA) Regulation.

To support the EIA Registration process, environmental field studies have been conducted to collect information on the options for the transmission line right-of-way. There studies include migratory birds, fish habitat, wetland, rare plants and archaeological surveys.

The EIA Application is expected to be registered with the Department of Environment and Local Government (DELG) in late Fall 2016.

Other approvals and permits required for the Project:

- Watercourse and Wetland Alteration Permit from DELG
- Wellfield Exemption Order from DELG
- Various construction-related permits

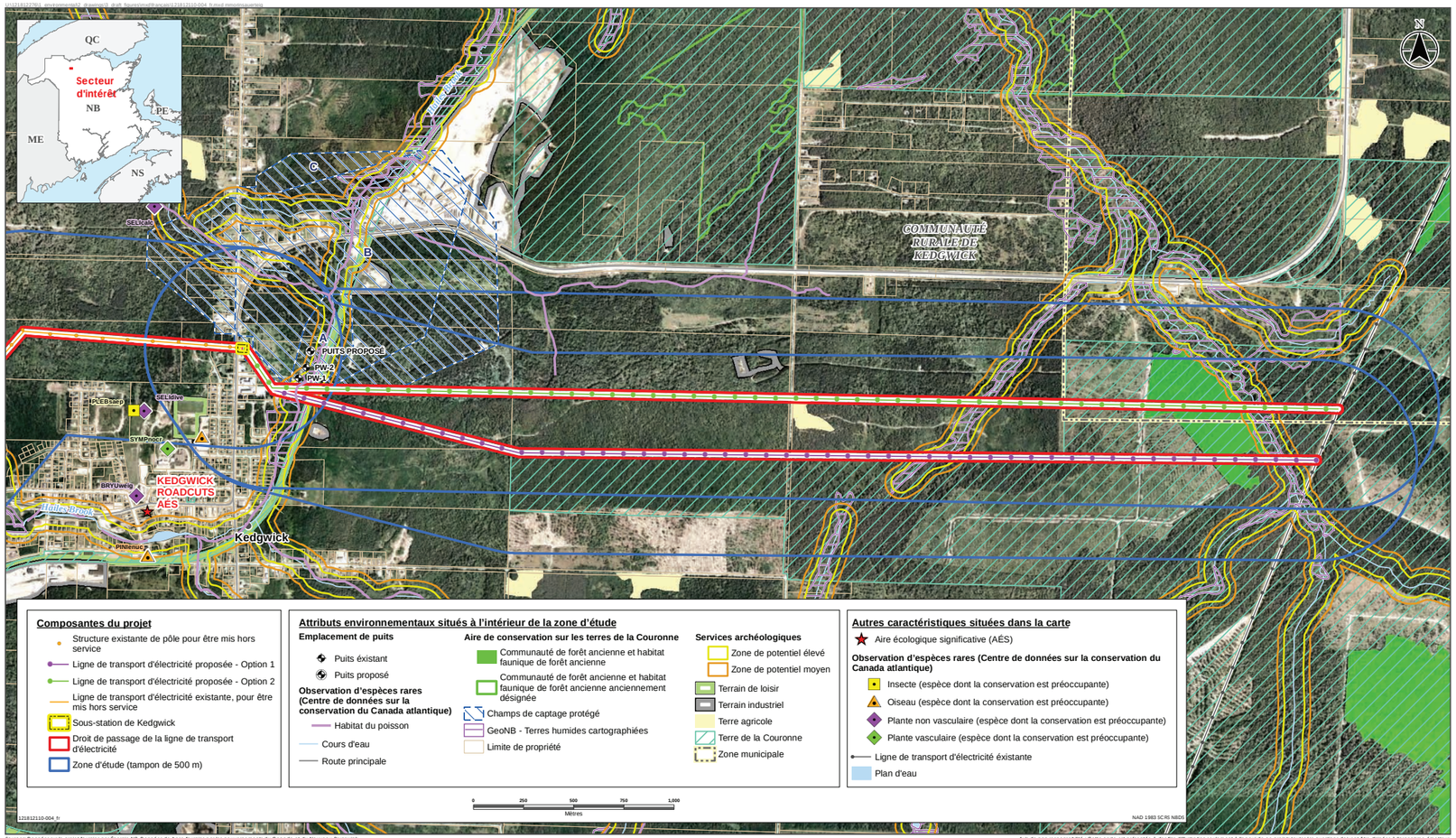
RÉSULTATS DE L'ANALYSE DES CONTRAINTES/ CONSTRAINTS ANALYSIS RESULTS

Critères / Criteria	Pondération (%) / Weight (%)	Trajet modifié Option 1 / Modified Route Option 1		Trajet modifié Option 2 / Modified Route Option 2	
		Rang / Ranking	Note / Score	Rang / Ranking	Note / Score
Critères environnementaux / Environmental Criteria					
Traversées de cours d'eau et de plans d'eau / Watercourse and Waterbody Crossings	25%	7	1.75	7	1.75
Traversées de terres humides cartographiées par GeoNB et le ministère des Ressources naturelles du Nouveau-Brunswick / Geonb-Mapped and NBDNR Wetland Crossings	20%	2	0.4	3	0.6
Zones protégées et aires de conservation / Protected Areas and Conservation Areas	20%	7	1.4	6	1.2
Tracé parallèle au corridor existant / Parallel to Existing Corridor	15%	0	0	0	0
Espèces en péril, espèces dont l'état de conservation est préoccupant et zones sensibles / Species at Risk, Species of Conservation Concern, and Sensitive Areas	10%	10	1	10	1
Régions boisées / Forested Areas	10%	1	0.1	1	0.1
Note pour les critères environnementaux / Score for Environmental Criteria			**4.65**		**4.65**
Note pondérée pour les critères environnementaux / Weighted Score for Environmental Criteria	**40%**		**18.6**		**18.6**
Critères socioéconomiques / Socio-economic Criteria					
Terres désignées et terres privées / Designated Lands and Private Land	30%	4	1.2	2	0.6
Nombre total de propriétés traversées / Total Number of Properties Crossed	15%	8	1.2	10	1.5
Terres à usage public / Public Land Use	10%	10	1	10	1
Terres à usage industriel / Industrial Land Use	10%	10	1	10	0.9
Terres à usage agricole / Agricultural Land Use	20%	10	2	8	1.6
Site archéologiques inscrits et secteurs à potentiel archéologique élevé / Registered Archaeological Sites and Elevated Archaeological Potential Areas	15%	5	0.75	4	0.6
Note pour les critères socioéconomiques / Score for Socio-Economic Criteria			**7.15**		**6.3**
Note pondérée pour les critères socioéconomiques / Weighted Score for Socio-Economic Criteria	**30%**		**21.45**		**18.9**
Critères physiques / Physical Criteria					
Longueur / Length	50%	9	4.5	9	4.5
Pentes abruptes et affleurements rocheux / Steep Slopes and Bedrock Outcrops	25%	10	2.5	10	2.5
Traversées d'infrastructures / Infrastructure Crossings	25%	10	2.5	10	2.5
Note pour les critères physiques / Score for Physical Criteria			**9.5**		**9.5**
Note pondérée pour les critères physiques / Weighted Score for Physical Criteria	**30%**		**28.5**		**28.5**
Total – Note pondérée / Overall Weighted Score			**68.55**		**66.0**

ÉCHÉANCIER DU PROJET/ PROJECT TIMELINE

Activités du projet / Project Activities	Échéancier / Timeline
Communication avec les intervenants et les Premières Nations / Communication with stakeholders and First Nations	Du printemps à l'automne 2016 (et tout au long des activités du projet) / Spring through Fall 2016 (and throughout Project activities)
Études environnementales sur le terrain / Environmental field studies	Avril à août 2016 / April to August 2016
Obtention des permis et des approbations / Permits/approvals acquisition	Automne 2016 au printemps 2017 / Fall 2016 to Spring 2017
Déboisement du corridor / Row clearing	Automne 2017 /Fall 2017
Mise à niveau de la sous-station / Substation Upgrades	Printemps à l'automne 2017 /Spring to Fall 2017
Construction de la nouvelle ligne (Phase 1) / Construction of New Line (Phase 1)	Automne 2017 / Fall 2017
Mise hors service de la ligne 0028 (Phase 2) / Decommissioning of line 0028 (Phase 2)	Printemps 2018 / Spring 2018
Mise en exploitation / In-service date	Automne 2017 / Fall 2017

COMPOSANTES DU PROJET



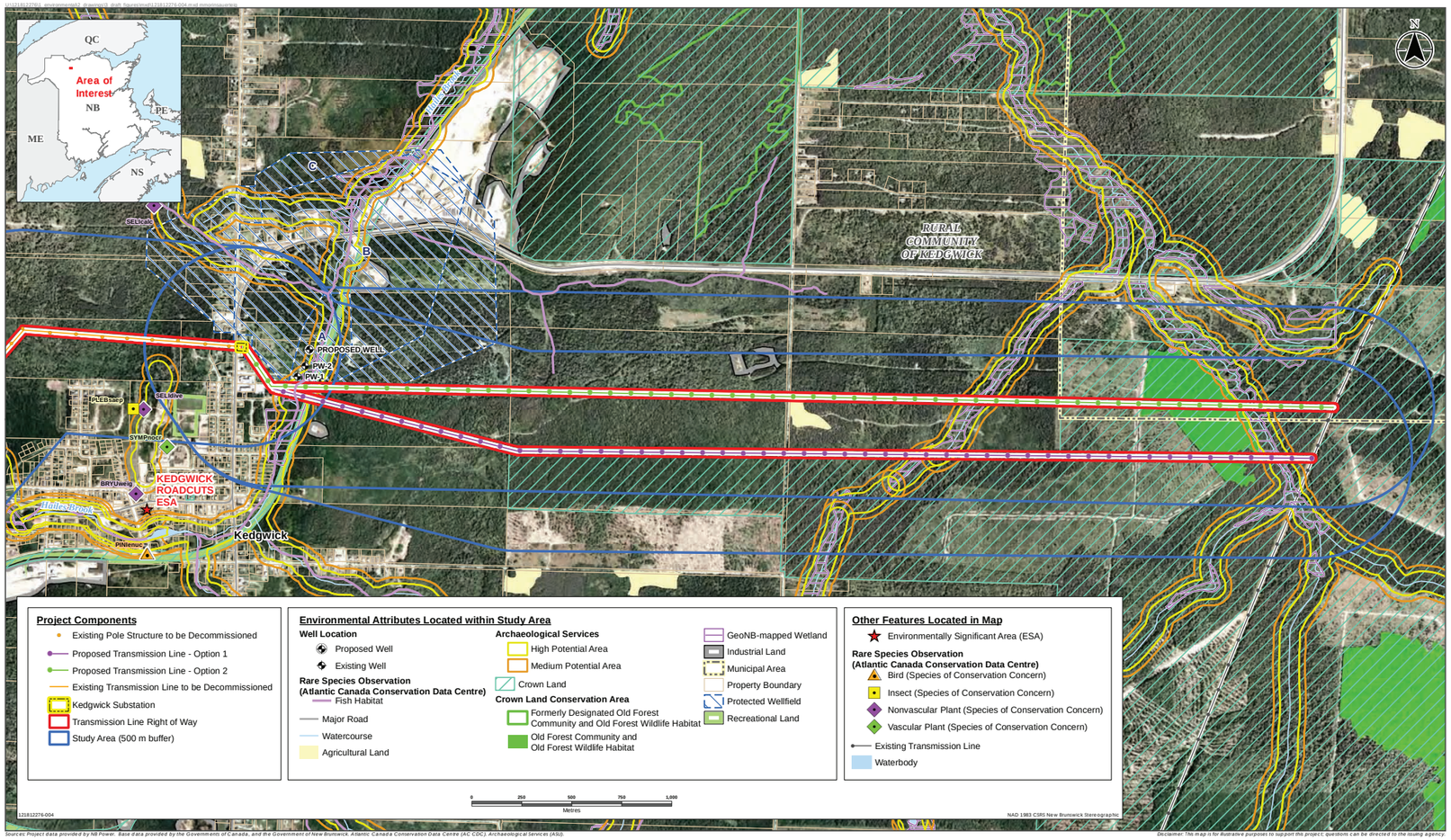
Sources: Données sur le projet fournies par Énergie NB. Données de base fournies par les gouvernements du Canada et du Nouveau-Brunswick, le centre de données sur la conservation du Canada atlantique et les services archéologiques.

Avis de non-responsabilité : Cette carte est présentée à des fins d'illustration seulement à l'appui de ce projet; toutes les questions doivent être dirigées à l'organisme émetteur.

Routes modifiées pour la nouvelle ligne de transport de 138 kV et les contraintes des caractéristiques environnementales, socioéconomiques et physiques associées

Figure 2.1

PROJECT COMPONENTS



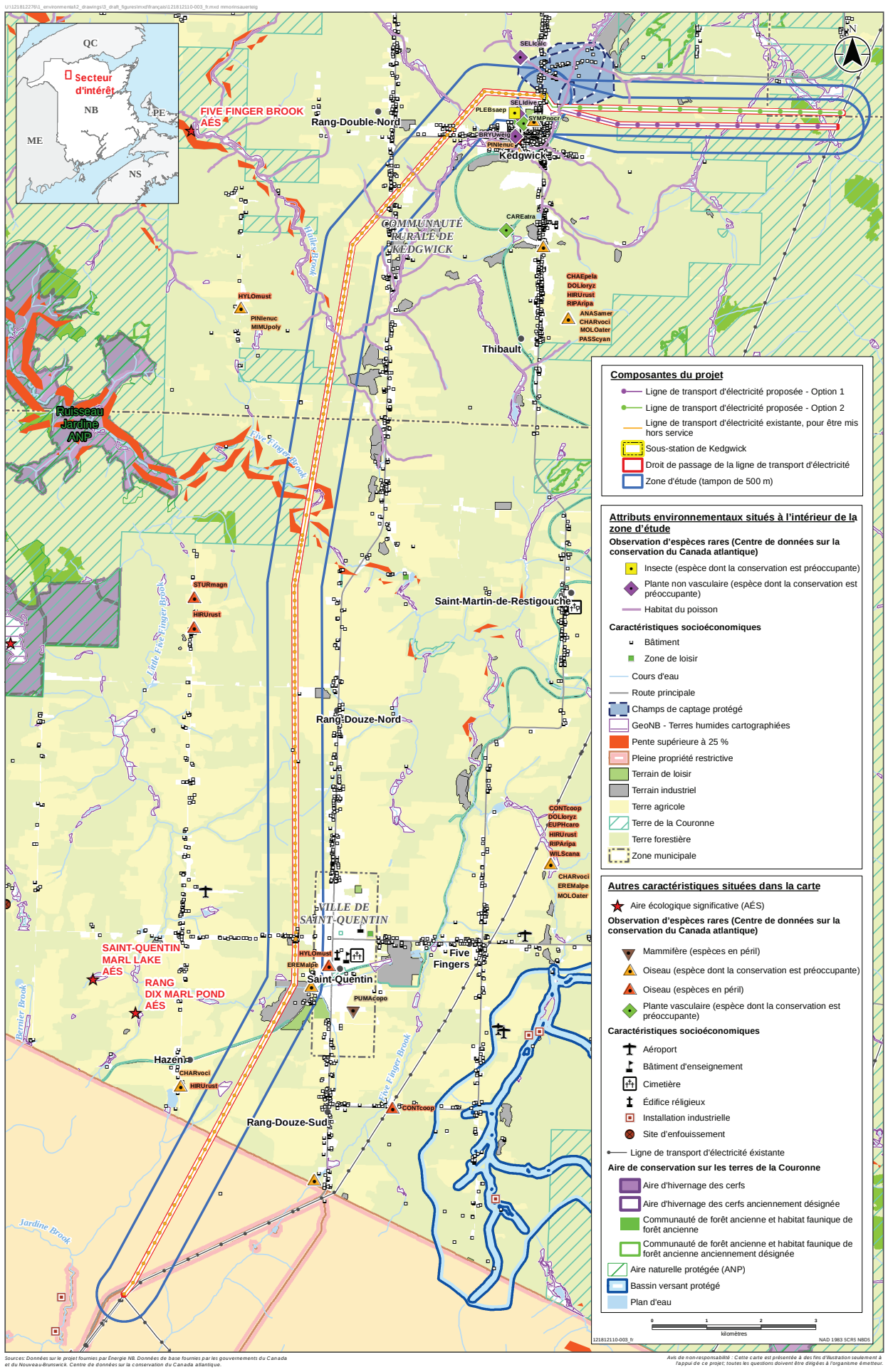
Modified Routes for New 138 kV Transmission Line, and Associated Environmental, Socio-economic, and Physical Constraints

Stantec

121812276 - KEDGWICK TRANSMISSION LINE - NEW BRUNSWICK POWER CORPORATION

Figure 2.1

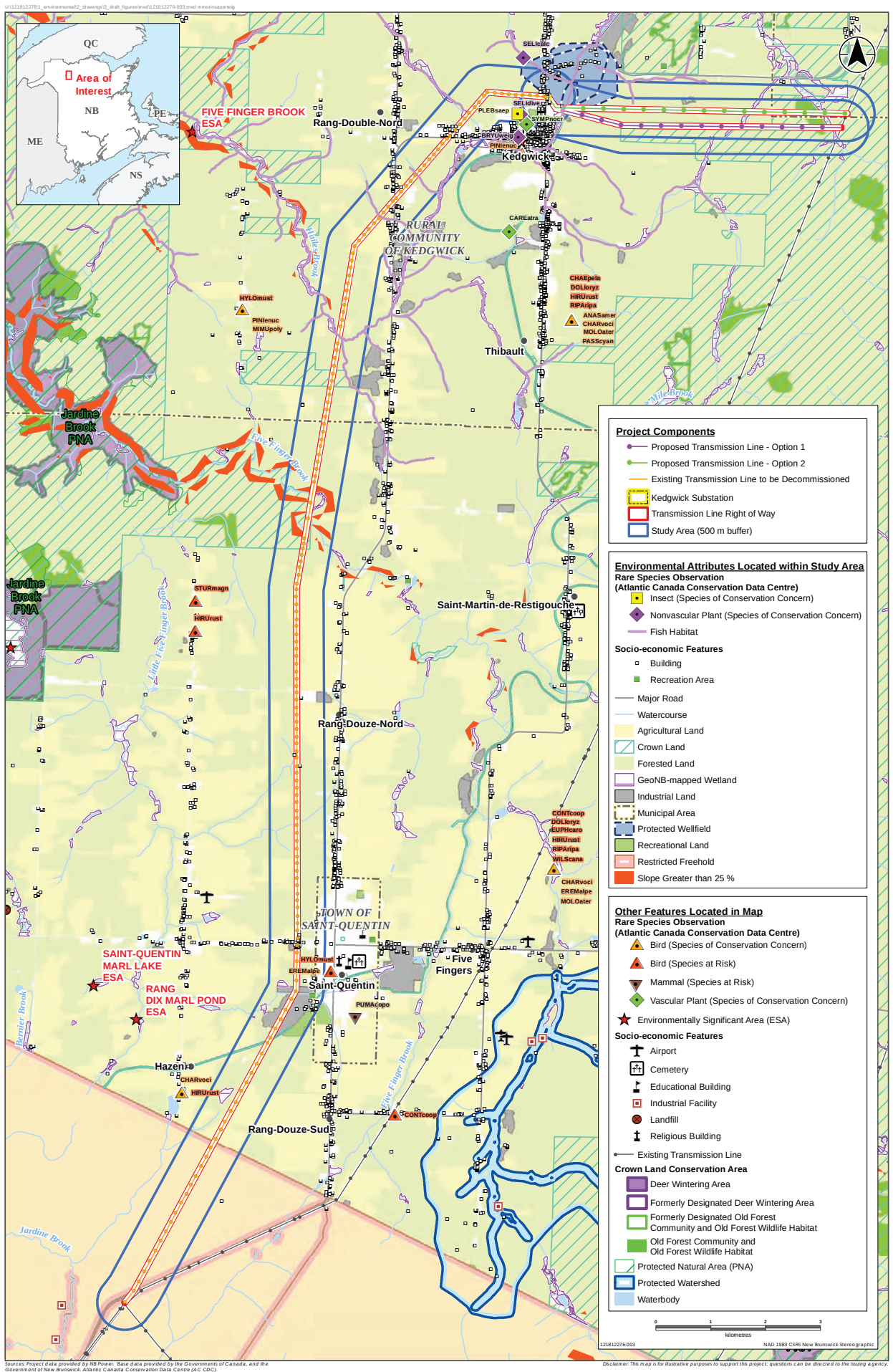
SECTEUR D'INTÉRÊT



Ligne de transport d'électricité éxistante 0028 pour être mis hors service, et les attributs environnementaux, socioéconomiques et physiques associés

Figure 2.2

AREA OF INTEREST



Route of Existing Transmission Line 0028 to be Decommissioned, and Associated Environmental, Socio-economic, and Physical Attributes

Stantec

121812276 - KEDGWICK TRANSMISSION LINE - NEW BRUNSWICK POWER CORPORATION

Figure 2.2

Fête de reconnaissance à l'ÉCSJ

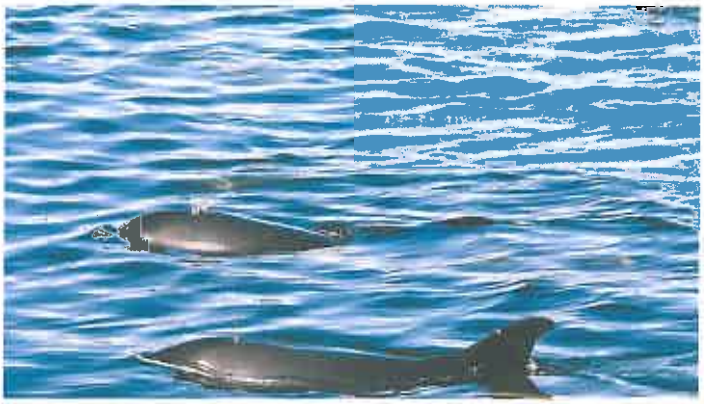
Une petite fête a eu lieu à l'École communautaire Saint-Joseph (ÉCSJ) le jeudi 6 octobre afin de souligner les réussites des élèves au programme de lecture estivale « Un livre-courrier pour bouquiner cet été ».

Les élèves, de même que les bénévoles, étaient invités dans la classe extérieure à l'ÉCSJ pour un pique-nique. Les deux parties en ont donc profité pour faire des liens et jaser un peu de l'expérience vécue cet été. Après le pique-nique, une surprise attendait les élèves, soit l'auteure Hélène Angers et son chien Jack, qui sont venus leur rendre visite.

PROGRAMME DE LECTURE ESTIVALE

Chaque enfant participant était donc jumelé à un adulte bénévole, qui, toutes les deux semaines, était responsable de faire parvenir au jeune lecteur un livre, accompagné d'un message écrit sur une carte postale affranchie.

De son côté, l'élève devait lire le livre, compléter les activités sur la carte et la renvoyer à son expéditeur. Au cours de l'été, cette expérience fut répétée sept fois. Cette activité fut très enrichissante, tant pour les élèves que pour les bénévoles.



Les dauphins près de Lamèque ont finalement été redirigés vers l'océan. - La Presse canadienne: Roger Lanteigne

Les six dauphins coincés à Lamèque ont été sauvés

Six dauphins qui étaient coincés dans une baie peu profonde près de Lamèque depuis plus d'une semaine ont pu être redirigés vers l'océan, vendredi, grâce à de nouvelles tactiques de secours.

La Presse canadienne

Une porte-parole de Pêches et Océans Canada, Krista Petersen, a confirmé que les dauphins rescapés n'ont pas été aperçus depuis qu'ils sont sortis du plan d'eau isolé, près de Lamèque, qu'ils s'obstinaient, jusqu'à maintenant, à occuper.

Un autre animal de la même espèce – le dauphin blanc de l'Atlantique – avait entre-temps péri. Ses comparses secourus semblent être en bonne santé, a précisé Mme Petersen.

Des équipages de cinq navires ont utilisé de nouvelles tactiques pour secourir les mammifères marins. Les maintes tentatives des jours précédents avaient échoué.

Mme Petersen a indiqué, plus tôt vendredi, que les bateaux ont érigé un corridor avec des bouées, des chaînes et des cordes pour aider les six mammifères marins à retourner vers le grand large.

Un premier essai avait échoué vendredi matin, certains dauphins parvenant à passer derrière les cordes.

Comme la veille, les équipes utilisaient aussi des échos-sondeurs pour diriger les dauphins vers l'océan. ■

Énergie NB Power

Projet de transmission a Kedgwick /Kedgwick Transmission Project
Open House Exit Survey / Questionnaire des Portes Ouvertes

1. Comment avez-vous entendu parler des portes ouvertes? / How did you hear about today's open house?
   - ◯ Journaux / Newspaper
   - ◯ Employé(e) d'Énergie NB / NB Power Employee
   - ◯ Twitter
   - ◯ Radio / Radio
   - ◯ Bouche à oreille / Word of Mouth
   - ◯ Autre / Other

2. Depuis combien d'années demeurez-vous dans la région? / How long have you lived in the area?
   - ◯ moins d'un an Less than one year
   - ◯ 6-10 années / years
   - ◯ 16+ années / years
   - ◯ 1-5 années / years
   - ◯ 11-15 années / years

3. Avant aujourd'hui, quel était votre niveau de connaissance du projet de transmission? / Prior to today, how knowledgeable were you about the transmission project?
   - ◯ Très connaissant / Very knowledgeable
   - ◯ Connaissant / Knowledgeable
   - ◯ Un peu connaissant / Somewhat knowledgeable
   - ◯ Pas du tout connaissant / Not knowledgeable at all

4. Après les portes ouvertes, comment connaissant êtes-vous du projet de transmission? / Following the Open House, how knowledgeable are you about the transmission project?
   - ◯ Très connaissant / Very knowledgeable
   - ◯ Connaissant / Knowledgeable
   - ◯ Un peu connaissant / Somewhat knowledgeable
   - ◯ Pas du tout connaissant / Not knowledgeable at all

5. En terme de contenu, l'information que vous avez reçue aujourd'hui, diriez-vous que les placards étaient / In terms of the content of the information you received today, would you say the displays were :
   - ◯ Trop technique / Too technical
   - ◯ Juste correcte / Just right
   - ◯ Pas assez technique / Not technical enough

6. Est-ce que nous avons abordé tous les sujets qui vous intéressent à propos de ce projet? / Were all the areas that are of interest to you about the project covered today ?
   - ◯ Oui / Yes
   - ◯ Non / No

7. Si non, quelle autre information auriez-vous aimé avoir? / If not, what would you have liked to see included ?

_____

_____

_____

8. Quelle était la partie la plus informative de cette session? / What was the most useful part of the information session?

_____

_____

_____

9. Si avez d'autres questions ou commentaires et que vous aimeriez qu'un représentant d'Énergie NB communique avec vous, veuillez nous fournir les renseignements suivants / If you have any remaining questions or concerns and would like for an NB Power representative contact you, please provide us with the follow information :

Nom / Name : _____

Adresse / Address : _____

Numéro de téléphone pendant le jour / Daytime phone number : _____

Type d'information dont vous recherchez / What type of information you are looking for: _____

_____

_____

_____

Merci d'avoir pris le temps de remplir ce questionnaire, vos commentaires sont appréciés.
Thank you for taking the time to fill out this questionnaire, your input is greatly appreciated.

Route 17 - FM90

La Radio des Hauts-Plateaux Inc.

6943 Route 17, C.P. 1043
Kedgwick, N.-B.
E8B 1Z9
(506) 235-0196 | (506) 235-9000
ventes@cfjufm.com

Facture de publicité CFJU

Facture No.: FAC-00159
Contrat No.: 18695
Date de facturation: 12 oct. 2016
Représentant:
TVH: 13426 9265 RT 0001

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Date de vente	Dates de diffusion Du	Au	Durée	Nombre d'occasion	Tarif	Total
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	13-oct.-16	13-oct.-16	30 secondes	10	$ 15.00	$ 150.00
					Cumulatif:	$ 213.00

Production	1	x	$ 20.00	$ 20.00
Sous-total				$ 233.00
Taxe de vente			15%	$ 34.95
Total				**$ 267.95**

Appendix F ABORIGINAL ENGAGEMENT NOTIFICATION LETTERS

Énergie NB Power

June 21, 2016

BY ELECTRONIC MAIL

Chief Hugh Akagi
Passamoquody Nation
akagih@nb.aibn.com
3 Prince of Wales Street
St.Andrews, NB
E5B 3W9

Dear Chief Akagi:

Re: New Brunswick Power Corporation
Proposed Transmission Line Projects

By way of introduction my name is Chantal St. Pierre, Director of Regulatory and Environmental Affairs for the Transmission and Distribution divisions at New Brunswick Power Corporation ("NB Power").

NB Power currently has three (3) transmission line projects in the early planning stages. These projects are as follows:

- Fundy Isles Submarine Cables - The existing 69 kV Fundy Isles Submarine Cables from Deer Island to Campobello (3.4 km) and from Campobello to Grand Manan Island (16.4 km) were installed in 1978 to supply electricity to local residents. These cables have a normal life expectancy of 40 years and are reaching their design operating life. To address this situation, NB Power is proposing to install and commission new 69 kV submarine cables in 2018 while the existing cables remain in-service. I have attached a map which identifies the route currently under consideration.

- Houlton Water Transmission Line - In order to supply 22 MW of secure and reliable power to the Houlton Water Company in Maine, NB Power is proposing to construct a new 15 km 69 kV single wood pole line by tapping the existing transmission line (L0038) on the western side of the Mednuxnekeag River. With the exception of the first 600 m, the line will be built within Route 95 right-of-way on the north side and will terminate at a new 69/34.5 kV substation located near the international border in New Brunswick. A single 34.5 kV distribution line will be constructed to the border crossing where the line will continue into Maine for about 1 km and terminate at an existing substation owned by Houlton Water Company. Additional switches, metering and protection and control devices will also be installed at the Woodstock Terminal. I have attached a map which identifies the route currently under consideration.

- Kedgwick Transmission Line - The existing radial 69 kV transmission line (known as transmission Line 0028) runs approximately 73 km from St. Leonard to Kedgwick. This 69 kV line feeds Kedgwick Substation which has 1293 downstream customers. Transmission line 0028 supplying this substation has the poorest reliability in the province. To address this situation NB Power is proposing to construct a 138 kV transmission line tap from line 1110 (5.2km) to the Kedgwick Substation from structure 246. The substation would be converted to 138 kV and the existing structures on line 0028 between 255A and 420 would be permanently removed and the right-of-way left to revegetate naturally. I have attached a map which identifies the preferred route currently under consideration.

While it is recognized that these projects are in traditional Maliseet territory, I would like to provide you with the opportunity to submit comments or information on current use of resources for traditional purposes in these areas.

NB Power representatives would welcome the opportunity to meet with you. Should you wish to have further dialogue on these projects, please advise me and I can arrange a meeting at our mutual convenience. I will follow up within 30 days if we have not heard from you.

Should either of you require any additional information, please feel free to contact me at your convenience at 458-6655 or 476-2710.

Yours truly,

NEW BRUNSWICK POWER CORPORATION

Chantal St-Pierre
Director, Regulatory and Environmental Affairs

Enclosure

cc:
K. Allen, NB Aboriginal Affairs Secretariat
A. Allen, NB Power
B. Garland, NB Power
K. Duguay, NB Power

Énergie NB Power

June 13, 2016

BY ELECTRONIC MAIL

Chief Shelley Sabattis, Oromocto First Nation
Ssabattis68@hotmail.com

Chief Tim Paul, Woodstock First Nation
chieftimpaul@gmail.com

Chief Candice Paul, Saint Mary's First Nation
ChiefCandicepaul@smfn.ca

Chief Ross Perley, Tobique First Nation
rossperley@hotmail.com

Chief Gabriel Atwin, Kingsclear First Nation
GabrielAtwin@kingsclear.ca

Chief Patricia Bernard, Madawaska First Nation
Madawaskamaliseet1@yahoo.ca

Dear Chiefs:

Re: New Brunswick Power Corporation
Proposed Transmission Line Projects

By way of introduction my name is Chantal St. Pierre, Director of Regulatory and Environmental Affairs for the Transmission and Distribution divisions at New Brunswick Power Corporation ("NB Power").

NB Power currently has three (3) transmission line projects in the early planning stages. These projects are as follows:

- Fundy Isles Submarine Cables - The existing 69 kV Fundy Isles Submarine Cables from Deer Island to Campobello (3.4 km) and from Campobello to Grand Manan Island (16.4 km) were installed in 1978 to supply electricity to local residents. These cables have a normal life expectancy of 40 years and are reaching their design operating life. To address this situation, NB Power is proposing to install and commission new 69 kV submarine cables in 2018 while the existing cables remain in-service. I have attached a map which identifies the route currently under consideration.

- Houlton Water Company Transmission Line - In order to supply 22 MW of secure and reliable power to the Houlton Water Company in Maine, NB Power is proposing to construct a new 15 km 69 kV single wood pole line by tapping the existing transmission line (L0038) on the western side of the Mednuxnekeag River. With the exception of the first 600 m, the line will be built within Route 95 right-of-way on the north side and will terminate at a new 69/34.5 kV substation located near the international border in New Brunswick. A single 34.5 kV distribution line will be constructed to the border crossing where the line will continue into Maine for about 1 km and terminate at an existing substation owned by Houlton Water Company. Additional switches, metering and protection and

control devices will also be installed at the Woodstock Terminal. I have attached a map which identifies the route currently under consideration.

- Kedgwick Transmission Line - The existing 69 kV transmission line (known as transmission Line 0028) is approximately 73 km in length and runs from St. Leonard to Kedgwick. This line which feeds the Kedgwick Substation has 1293 downstream customers. Line 0028 has the poorest reliability in the province. To address this situation NB Power is proposing to construct a new 138 kV transmission line tap from line 1110 located 5.2 km to the east of the Kedgwick Substation. The substation would be converted to 138 kV and the existing structures on line 0028 between 255A and 420 (approximately 25 km) would be permanently removed and the right-of-way left to revegetate naturally. I have attached a map which identifies the preferred route currently under consideration.

As part of the environmental assessment process and a part of our practice to establish early notification and engagement, please consider this letter as a request to initiate formal consultation in relation to these proposed Projects. As such, your Consultation Coordinators are copied on this letter.

NB Power representatives welcome the opportunity to meet with you and/or your Consultation Coordinators at the first mutually convenient time. To best prepare for that meeting, please provide any comments or information on how the proposed actions set out in this letter may affect your established and asserted Aboriginal and Treaty rights. Also, please advise if you have any other comments or information regarding current use of resources for traditional purposes in these areas. An initial response is requested within 30 days. I will follow up if we have not heard from you within the time period requested.

To arrange a meeting time or should any of you require any additional information, please feel free to contact me at your convenience at 458-6655 or 476-2710.

Yours truly,

NEW BRUNSWICK POWER CORPORATION

Chantal St-Pierre
Director, Regulatory and Environmental Affairs

Enclosure

cc:
Consultation Coordinators – F. Sabbatis, E. Paul, S. Paul, A. McIntosh, D. Sappier, R. Letica
K. Allen, NB Aboriginal Affairs Secretariat
A. Allen, NB Power
B. Garland, NB Power

Énergie NB Power

June 13, 2016

BY ELECTRONIC MAIL

Chief Kenneth Barlow, Indian Island First Nation
chief@iifn.ca

Chief David Peter Paul, Pabineau First Nation
Davidpeter-paul@hotmail.com

Chief George Ginnish, Eel Ground First Nation
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Chief Rebecca Knockwood, Fort Folly First Nation
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Chief Ann Mary Steele, Bouctouche First Nation
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Chief Everett Martin, Eel River Bar First Nation
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Chief Alvery Paul, Esgenoopetitj First Nation
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A/Chief Bill Ward, Metepenagiag First Nation
bill_ward86@hotmail.com

Chief Aaren Sock, Elsipogtog First Nation
chief@efnbo.ca

and

Ms. Jennifer Coleman
Director of Policy
Mi'gmawe'l Tplu'taqnn Incorporated ("MTI")

Dear Chiefs and Ms. Coleman:

Re: New Brunswick Power Corporation
Proposed Transmission Line Projects

By way of introduction my name is Chantal St. Pierre, Director of Regulatory and Environmental Affairs for the Transmission and Distribution divisions at New Brunswick Power Corporation ("NB Power").

NB Power currently has three (3) transmission line projects in the early planning stages. These projects are as follows:

- Fundy Isles Submarine Cables - The existing 69 kV Fundy Isles Submarine Cables from Deer Island to Campobello (3.4 km) and from Campobello to Grand Manan Island (16.4 km) were installed in 1978 to supply electricity to local residents. These cables have a normal life expectancy of 40 years and are reaching their design operating life. To address this situation, NB Power is proposing to install and commission new 69 kV submarine cables in 2018 while the existing cables remain in-service. I have attached a map which identifies the route currently under consideration.

- Houlton Water Transmission Line - In order to supply 22 MW of secure and reliable power to the Houlton Water Company in Maine, NB Power is proposing to construct a new 15 km 69 kV single wood pole line by tapping the existing transmission line (L0038) on the western side of the Mednuxnekeag River. With the exception of the first 600 m, the line will be built within Route 95 right-of-way on the north side and will terminate at a new 69/34.5 kV substation located near the international border in New Brunswick. A single 34.5 kV distribution line will be constructed to the border crossing where the line will continue into Maine for about 1 km and terminate at an existing substation owned by Houlton Water Company. Additional switches, metering and protection and control devices will also be installed at the Woodstock Terminal. I have attached a map which identifies the route currently under consideration.

- Kedgwick Transmission Line - The existing radial 69 kV transmission line (known as transmission Line 0028) runs approximately 73 km from St. Leonard to Kedgwick. This 69 kV line feeds Kedgwick Substation which has 1293 downstream customers. Transmission line 0028 supplying this substation has the poorest reliability in the province. To address this situation NB Power is proposing to construct a 138 kV transmission line tap from line 1110 (5.2km) to the Kedgwick Substation from structure 246. The substation would be converted to 138 kV and the existing structures on line 0028 between 255A and 420 would be permanently removed and the right-of-way left to revegetate naturally. I have attached a map which identifies the preferred route currently under consideration.

While it is recognized that these projects are in traditional Maliseet territory, I would like to provide you with the opportunity to submit comments or information on current use of resources for traditional purposes in these areas or how the proposed Project may affect your Aboriginal and Treaty rights.

NB Power representatives would welcome the opportunity to meet with you and/or your staff. Should you wish to have further dialogue on these projects, please advise me and I can arrange a meeting at our mutual convenience.

Should you require any additional information, please feel free to contact me at your convenience at 458-6655 or 476-2710.

Yours truly,

NEW BRUNSWICK POWER CORPORATION

Chantal St-Pierre
Director, Regulatory and Environmental Affairs

Enclosure

cc:
Stuart Gilby, MTI
Derek Simon, MTI
Consultation Coordinators – K. Francis, Elsipogtog First Nation
K. Allen, NB Aboriginal Affairs Secretariat
A. Allen, NB Power
B. Garland, NB Power