Spruce Lake AI Data Centre Project

April 10, 2026

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Acronyms / Abbreviations

AC CDC	Atlantic Canada Conservation Data Centre
AHB	Archaeology and Heritage Branch
AI	Artificial Intelligence
AIA	Archaeological Impact Assessment
ANB	Ambulance New Brunswick
APM	Archaeological Predictive Model
AQMS	Air Quality Management System
ARD	acid rock drainage
AS	Archaeological Services
ASL	ambient sound level
AUC	Alberta Utility Commission
BAF	Basal Area Factor
BBS	Breeding Bird Survey
Beacon	Beacon AI Centers Inc.
BMP	Best Management Practice
BWP	Burchill Wind Project
CAAQS	Canadian Ambient Air Quality Standards
CanSIS	Canada Soil Information System
CCME	Canadian Council of Ministers of the Environment
CER	Canada Energy Regulator
CH_2O	formaldehyde
CH_4	methane
cm	centimetre
CMA	Census Metropolitan Area

CN	Canadian National Railway
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CWD	Coarse Woody Debris
CWQG PAL	Canadian Water Quality Guidelines for the Protection of Aquatic Life
CWS	Canadian Wildlife Service
DAG	drainage area gauged
DAU	drainage area ungauged
dB	decibel
dBA	A-weighted decibel
dBC	C-weighted decibel
DBH	diameter at breast height
DFO	Fisheries and Oceans Canada
DTI	New Brunswick Department of Transportation and Infrastructure
EA	environmental assessment
ECCC	Environment and Climate Change Canada
EF	Enhanced Fujita
EIA	environmental impact assessment
EMP	Environmental Management Plan
ERP	Emergency Response Plan
ESA	Environmentally Significant Area
FEC	Forest Ecosystem Classification
GCDWQ	Guidelines for Canadian Drinking Water Quality

GDP	Gross Domestic Product
GHG	greenhouse gas
GHGRP	Greenhouse Gas Reporting Program
GIS	geographic information system
GPS	global positioning system
ha	hectare
HADD	Harmful Alteration, Disruption or Destruction
HDD	horizontal directional drilling
HPC	high-performance computing
HSF	Historically Significant Feature
HU	Habitat Unit
Hz	hertz
IBA	Important Birds Area
IPCC	International Panel on Climate Change
IRP	Industrial Resource Plan
ISO	International Organization for Standardization
km	kilometre
km/h	kilometre per hour
LAA	Local Assessment Area
Leq	Energy Equivalent Sound Level
LFN	low frequency noise
LiDAR	Light Detection and Ranging
m	metre
m/s	metres per second
MAF	mean annual flow

MBBA	Martimes Breeding Bird Atlas
mm	millimetre
MRIA	Mi'gmaq Rights Impact Assessment
MTI	Mi'gmawe'l Tplu'taqnn Incorporated
MW	megawatt
N_2O	nitrous oxide
NAPS	National Air Pollution Surveillance
NB	New Brunswick
NB OWLS	New Brunswick Online Well Log System
NB SARA	New Brunswick *Species at Risk Act*
NBDELG	New Brunswick Department of Environment ad Local Government
NBDERD	New Brunswick Department of Energy and Resource Development
NBDIA	New Brunswick Department of Indigenous Affairs
NBDNRE	New Brunswick Department of Natural Resources and Energy
NBDNRED	New Brunswick Department of Natural Resources and Energy Development
NBEUB	New Brunswick Energy and Utilities Board
NCC	Nature Conservancy of Canada
NH_3	ammonia
NIA	Noise Impact Assessment
NO_2	nitrogen dioxide
NB SARA	New Brunswick *Species at Risk Act*
NSECC	Nova Scotia Department of Environment and Climate Change
O_3	ozone
OBPS	output-based pricing system
OFC	Old Forest Community

OGPI	Old Growth Probability Index
OMECC	Ontario Ministry of Environment and Climate Change
OMECP	Ontario Ministry of Environment, Conservation, and Parks
PANB	Provincial Archives of New Brunswick
PDA	Project Development Area
PID	Property Identification Number
PM_{10}	particulate matter less than 10 micrometers in diameter
$PM_{2.5}$	particulate matter less than 2.5 micrometres in diameter
PNA	Protected Natural Area
POLs	petroleum, oils, lubricants
POLY	polygon
ppb	parts per billion
Project, the	Spruce Lake AI Data Centre
PSL	permissible sound level
PSW	Provincially Significant Wetland
PWL	Sound Power Level re 10-12 Watt
RAA	Regional Assessment Area
RCMP	Royal Canadian Mounted Police
RDC	Regional Development Corporation
RoW	right-of-way
RPC	Research and Productivity Council
Rule 012	AUC Rule 012: Noise Control
SAR	Species at Risk
SARA	*Species at Risk Act*
SCR	Selective Catalytic Reduction

SJC	Saint John 138kV Corridor Project
SJIP	Saint John Industrial Parks (2024) Ltd.
SNB	Service New Brunswick
SO_2	sulphur dioxide
SOCC	Species of Conservation Concern
SPC	Storm Predictor Centre
SPL	sound pressure level
Stantec	Stantec Consulting Ltd.
t	tonne
TSP	total suspended particulate
UTM	Universal Transverse Mercator
VC	Valued Component
WAWA	watercourse and wetland alteration
WC	watercourse crossing
WESP-AC	Wetland Ecosystem Services Protocol
WSC	Water Survey of Canada
°C	degrees Celsius
µg/m3	micrograms per cubic meter

1 Introduction

Beacon New Brunswick Inc. (Beacon), and VoltaGrid LLC (VoltaGrid) (jointly, the "Proponent"), are proposing the development of the Spruce Lake AI Data Centre Project (the "Project") in Lorneville, New Brunswick (NB). This document is an environmental impact assessment (EIA) registration document to be submitted to the New Brunswick Department of Environment and Local Government (NBDELG) to initiate a Determination Review under Section 5(2) of the New Brunswick Environmental Impact Assessment Regulation 87-83 of the *Clean Environment Act*.

1.1 Project Overview

The Project involves the construction and operation of a 390 MW data centre, which includes four data halls and a 190 MW behind-the-meter natural gas-powered generation facility, in the Spruce Lake Industrial Park. The data centre will be located on a parcel of land being purchased from Regional Development Corporation by Saint John Industrial Parks (2024) Inc.; Beacon and VoltaGrid are in active discussions to purchase the property before construction. The Project also includes two 345 kV transmission lines to supply an additional 200 MW from the New Brunswick Power (NB Power) grid to power the data centre, and two 4.5 km long 8" diameter pipelines connecting to the Maritimes and Northeast Pipeline Management Limited (M&NP) Saint John Lateral and the Emera Inc. Brunswick Pipeline, which will supply the power generation facility with natural gas. The two transmission lines extending from the Data Centre to the Coleson Cove Generating Station area are approximately 3.9 km long, with a 92 m wide right-of-way (RoW). From this point, the lines diverge: one extends north then west towards the community of Five Fathom Hole for 6.4 km to a new substation tie-in and is within a 52 m wide RoW, while the other extends south for 0.7 km to the Coleson Cove Generating Station, also within a 52 m wide RoW. Associated supporting infrastructure includes a substation, switchyards, a gas-metering station, administration facilities, and stormwater management. The site will be supplied by the City of Saint John's industrial water supply for the closed loop cooling system. The transmission line tie-in will provide electricity from the New Brunswick electrical grid to meet the overall power requirements of the facility.

In 2025, the Proponent initiated environmental and archaeological studies to support site selection and to inform Project design and the EIA review process. As the transmission line and pipeline routes were identified after the 2025 field season, field data for these areas is planned to be collected in 2026. It is anticipated that the EIA review may proceed in a phased manner, with the data centre portion being subject to approval in advance of the transmission line and pipeline routes. Addendums with field survey results for the linear corridors will be submitted to regulators for review.

Subject to receipt of the necessary approvals, construction is anticipated to begin in 2026, with commercial operations expected to commence in Q2 2028.

1.2 Proponent Information

Name of Proponent	Beacon New Brunswick Inc. and VoltaGrid LLC	
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Beacon New Brunswick Inc. is a subsidiary of Beacon Data Centers Group. Beacon Data Centers Group is a North America–focused data centre development company delivering large-scale, power-ready digital infrastructure designed to support hyperscale cloud and artificial intelligence workloads. Founded in 2023 and headquartered in Calgary, Alberta, Beacon Data Centers Group develops powered shell, turnkey, and build-to-suit data campuses, with a rapidly growing portfolio of more than 10 campuses in development representing over 6 GW of planned capacity across the U.S. and Canada.

The infrastructure for the Project's behind-the-meter power generation will be supplied by VoltaGrid LLC. VoltaGrid is an energy services company specializing in rapidly deployable, natural gas–powered microgrids and hybrid power solutions for grid-constrained and remote applications. Founded in 2020, the company delivers turnkey, scalable power that integrates generation, energy storage, intelligent controls, and fuel logistics to improve reliability while significantly reducing emissions compared to conventional diesel-based systems. VoltaGrid serves a diverse set of industrial, utility, oil and gas, mining, government agencies and data centre customers, leveraging AI-driven monitoring and optimization to manage loads, costs, and environmental performance, and positioning itself as a key provider of fast, resilient power infrastructure supporting electrification, decarbonization, and data centre growth.

1.3 Purpose, Rationale, and Need for the Undertaking

The purpose of the Project is to develop a modern, reliable, and economically sustainable facility that responds to growing regional, national, and global demand for secure high performance computing capacity and essential services within New Brunswick and provide a platform for sovereign digital infrastructure within Canada. The undertaking is designed to support long-term economic development, reduce constraints on existing infrastructure, and capitalize on emergent market opportunities in sectors experiencing substantial growth (e.g., advanced manufacturing, digital services, energy, or natural resources). The data centre will support technological growth within New Brunswick, enabling the province to participate in one of the fastest-growing global economic sectors.

The Project is expected to generate substantial economic benefits, including:

- direct employment during construction and operations, with a workforce including skilled trades, equipment operators, IT, engineers, and facility management
- contracting and procurement opportunities for trades, fabrication shops, environmental services, security, maintenance, and professional service firms
- municipal and provincial tax revenues

The development of a modern, high-performance data centre provides societal benefits by strengthening the digital infrastructure that supports essential services, public institutions, and private industry. As organizations increasingly depend on advanced computing capacity for analytics, cybersecurity, health-care applications, and public administration, the need for secure and resilient digital systems becomes indispensable. The project will also provide an opportunity for the housing of Canadian data and AI infrastructure on a sovereign basis thereby mitigating the impact of geopolitical instability.



1.4 Regulatory Framework

The Project will be subject to various provincial and federal regulatory requirements. An overview of key legislation and regulatory processes is provided below. This is not meant to be a comprehensive inventory of environmental legislation to which the Project must comply. Instead, the discussion focuses on key legislation under which approvals may be required for the Project. Additional relevant legislation may be referenced throughout the EIA registration document as applicable.

1.4.1 Provincial

1.4.1.1 Clean Environment Act - Environmental Impact Assessment Regulation

The *Clean Environment Act* is the foundational statute for provincial EIA regulation. The New Brunswick Environmental Impact Assessment Regulation 87-83 (EIA Regulation) under the Act requires that all undertakings listed in "Schedule A" of the Regulation (including their proposed construction, operation, modification, extension, abandonment, demolition, or rehabilitation) require registration and a "Determination Review" led by the NBDELG to review the Project's information and its potential environmental effects. At the conclusion of the Determination Review, the NBDELG's technical review committee (TRC) will make a recommendation to the New Brunswick Minister of Environment and Local Government as to whether a proposed undertaking can proceed, with or without conditions, or whether it requires a more formal Environmental Impact Assessment (referred to as a "Comprehensive Review").

Although data centres themselves are not considered an Undertaking under the EIA Regulation, specific components of the Project are considered Undertakings under Schedule A as follows:

- all electric power generating facilities with a production rating of three megawatts or more (Item b)
- all electric power transmission lines exceeding 69 kV in capacity or five kilometres in length (Item d)
- all enterprises, activities, projects, structures, works or programs affecting two hectares or more of bog, marsh, swamp or other wetland (item v)

The Project therefore requires an EIA registration under Section 5(1) of the EIA Regulation and will undergo, at minimum, a Determination Review, coordinated by NBDELG.

1.4.1.2 Pipeline Act, 2005

The two 8" diameter pipelines delivering natural gas to the power generating station will be subject to provisions of the *Pipeline Act, 2005* and its regulations. A Pipeline Construction Permit and Pipeline Operating Licence will be required from the New Brunswick Energy and Utilities Board. A separate approval will be required under the *Canada Energy Regulator Act* for connections with the federally regulated Saint John Lateral and Brunswick Pipeline (Section 1.4.2.2).

1.4.1.3 Clean Air Act

Under the *Clean Air Act* and Air Quality Regulation, no person may construct, operate or modify a source of air pollution with an Air Quality approval, unless specifically exempted. The Regulation and Act provide measures to regulate the release of air contaminants to the atmosphere from “sources”, provides testing and monitoring provisions, and establishes maximum permissible ground-level concentrations of specified air contaminants in the ambient air, among other requirements. The gas plant will require an Air Quality Approval from NBDELG as it will release air contaminants associated with the combustion of natural gas. Additional details on regulatory oversight of Project-related air emissions, including air quality criteria, are provided in Section 7.1.1 of this EIA.

1.4.1.4 Clean Water Act - Watercourse and Wetland Alteration Regulation

Watercourses and wetlands are protected in New Brunswick under the *Clean Water Act*. Activities that could alter watercourses or wetlands are regulated under the Watercourse and Wetland Alteration (WAWA) Regulation of the *Clean Water Act*, administered by the New Brunswick Department of Environment and Local Government (NBDELG). Under the WAWA Regulation, permits are required for activities including vegetation clearing, soil excavation, construction, watercourse crossings, water withdrawal, or landscaping, within 30 m of a watercourse or wetland, or within the bed and banks of a watercourse or boundary of a wetland. If work results in permanent changes to a wetland, off-setting compensation measures are likely to be required. In New Brunswick, NBDELG coordinates the review of WAWA permit applications involving in-water work with DFO. DFO representatives review the WAWA permit application to determine the likelihood for HADD and issue a Letter of Advice to NBDELG and/or the proponent indicating whether authorization is required.

The Project will require alteration of watercourses and wetlands and therefore will acquire the necessary approvals prior to their alteration.

1.4.1.5 Species at Risk Act

Species at risk in New Brunswick are protected under the New Brunswick *Species at Risk Act* (NB SARA). Schedule A of the NB SARA List of Species at Risk Regulations lists species in New Brunswick that are classified as being Extirpated, Endangered, Threatened, or 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 of the Prohibitions Regulation. NB SARA is administered by the New Brunswick Department of Natural Resources (NBDNR) and, under specific circumstances, the Minister may issue a permit for exceptions to the prohibitions that protect SAR individuals (section 34) or for activities not allowed in areas under a habitat designation (section 35). No NB SARA permits are anticipated to be required for the Project.

1.4.1.6 Community Planning Act

The New Brunswick *Community Planning Act* governs the administration of regional development plans in the province and confers administrative power of planning authority and variance on regional service commissions. EIA registrations for undertakings occurring in areas with established regional development plans must include a letter from the planning authority indicating that the undertaking is in conformance with the regional plan. The majority of the Project is located within the City of Saint John, with a portion of the proposed 345kV Transmission Line located within the Rural Community of Fundy Shores (Southwest New Brunswick Service Commission).

1.4.1.7 Heritage Conservation Act

Heritage resources are resources related to 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 present, their integrity is highly susceptible to construction and ground-disturbing activities.

Heritage resources in New Brunswick are regulated under the *Heritage Conservation Act*. The regulatory management of provincial heritage resources falls under the New Brunswick Department of Tourism, Heritage, and Culture, and is administered by its Archaeology and Heritage Branch. All work related to archaeological impact assessments must be completed under a Permit (Archaeological Field Research Permit) issued by the Province to the individual conducting the assessment.

1.4.2 Federal

1.4.2.1 Impact Assessment Act

The federal impact assessment process is governed by the *Impact Assessment Act* (IAA), where an impact assessment considers potential environmental, health, social, and economic impacts of proposed projects. The IAA is administered by the Impact Assessment Agency of Canada.

An impact assessment is required for a “designated project” that includes one or more physical activities that appears on the Physical Activities Regulations under the IAA (known as the Project List). The IAA also includes provisions for projects on federal lands and outside Canada that are not considered “designated projects”. Under Section 82 of the IAA, for projects on federal lands, federal authorities are prohibited from carrying out a project, exercising any power or duty conferred to it under any other Act of Parliament, or providing financial assistance to enable the project to be carried out on federal lands without an environmental effects determination process under section 82 of the IAA.

The Project is not a “designated project” and is not located on federal lands. Therefore, the Project does not require assessment under the IAA.

1.4.2.2 Canada Energy Regulator Act

The *Canada Energy Regulator Act* establishes the Canada Energy Regulator (CER) to oversee the full life cycle of federally regulated pipelines, power lines, and energy development in the public interest, with a focus on safety, environmental protection, Indigenous engagement, and transparent energy information. Since the Saint John Lateral and Brunswick Pipeline are CER-regulated pipelines, the construction and operation of the facilities (e.g., metering station, pipeline) associated with the Project-related lateral pipelines may require an exemption order from the CER under section 214 of the *Canada Energy Regulator Act*. However, it is anticipated that M&NP and/or Emera, as operators of the federally regulated pipelines, will manage this regulatory approval process with input from the Proponent as needed.

1.4.2.3 Species at Risk Act

The federal *Species at Risk Act* (SARA) is administered by Environment and Climate Change Canada (ECCC), Fisheries and Oceans Canada (DFO), and Parks Canada with the intent to prevent wildlife from becoming threatened or endangered and to allow for recovery of species that are considered threatened, endangered, or extirpated. Section 32(1) affords protection to individuals of species that are listed under SARA as Extirpated, Endangered, or Threatened, while Section 33 protects the habitat of these species. Schedule 1 of SARA lists species in Canada that are classified as being extirpated, endangered, threatened, or of special concern. A permit is required to conduct an activity that could potentially result in the killing, harming or harassment of a wildlife species at risk listed on Schedule 1 of SARA, or damage or destroy its residence or any part of critical habitat designated under the Act. A SARA permit is not anticipated to be required for this Project.

1.4.2.4 Fisheries Act

The federal *Fisheries Act*, administered by DFO, includes prohibitions against works, undertakings, or activities that result in the harmful alteration, disruption, or destruction (HADD) of fish habitat (Section 35(1)). Works can be approved by and carried out in accordance with conditions established by the Minister of Fisheries, Oceans and the Canadian Coast Guard (Fisheries Minister) (Section 35(2)(b)). This work requires an authorization with an appropriate offsetting of residual adverse effects after avoidance and mitigation steps have been taken. The siting of the data centre avoids fish habitat and construction activities will employ best management practices to avoid offsite effects to fish habitat. The Project is not expected to require alteration, disruption or destruction of fish habitat, nor require authorization under the *Fisheries Act.*

1.4.2.5 Migratory Birds Convention Act

The *Migratory Birds Convention Act, 1994* (MBCA) provides protection for migratory birds including a prohibition on depositing harmful substances in areas frequented by migratory birds, and a prohibition on disturbing, destroying, taking, or possessing migratory birds, their nests, and eggs. To avoid contravention of the provisions of the MBCA, vegetation clearing activities will be conducted, to the extent practical, outside of migratory bird breeding season (typically April 15 to August 30 of each year).

The Migratory Bird Regulations, 2022*,* establish a list of species (Schedule 1) that continue to have year-round protection for their nests, unless the nests are determined to be abandoned. It also establishes the protocol and waiting period for determining a Schedule 1 species' nest to be abandoned.

Permits are not anticipated to be required for the Project under the MBCA or associated regulations.

1.4.3 Municipal

The Project components, with the exception of a portion of the proposed transmission line near Five Fathom Hole, are within the municipal jurisdiction of the City of Saint John and as such, the Project is subject to the City's Municipal Plan and Zoning-Bylaws (including the Spruce Lake Industrial zoning framework and development standards). The portion of the transmission line RoW near Five Fathom Hole falls within the Rural Community of Fundy Shores under the jurisdiction of the Southwest New Brunswick Service Commission. The Project will abide by applicable land use regulations and obtain municipal approvals as required.

2 Project Description

Beacon New Brunswick Inc. (Beacon), in partnership with VoltaGrid LLC (VoltaGrid), is proposing the development of the Spruce Lake Artificial Intelligent (AI) Data Centre and associated electrical transmission lines and natural gas pipelines (the Project). Situated in the Spruce Lake Industrial Park within the city of Saint John, New Brunswick, the facility will house a high-performance data centre designed to support AI cloud computing systems (Figure 2.1). Beacon will oversee construction and operation of the data centre, while VoltaGrid will manage construction and operation of electrical transmission and power generation.

2.1 Project Location and Property Ownership

The Project is located in southern New Brunswick, primarily within the boundaries of the City of Saint John. The data centre site lies within the Spruce Lake Industrial Park Expansion and is accessible via King William Road that connects to other developments in the area such as Colsen Cove generating station and the Burchill Wind project. The nearest residential community is the community of Lorneville, which borders the Project.

Field investigations have been ongoing since 2025. As the Project has evolved, preliminary RoW routes have been identified to support the Project's power and natural gas requirements. Landowner engagement has not yet commenced for properties within the transmission line or pipeline. Additional field work is planned for 2026, subject to receipt of the appropriate permissions and in the appropriate seasons.

Access to the data centre site has been approved, and field investigations have been ongoing since 2025. As the Project has evolved, preliminary RoW routes have been identified to support the Project's power and natural gas requirements. Landowner engagement has not yet commenced for properties within the proposed transmission line or pipeline RoWs. These properties will not be accessed until all necessary approvals have been obtained and landowner permissions are in place. Additional field work is planned for 2026, subject to receipt of the appropriate permissions and in the appropriate seasons.

The Project is located within the following Parcel Identification Numbers (PIDs), with details in Table 2.1:

Table 2.1 Property Ownership Details

PID	Property Ownership	Intersecting Project Component	Status (Crown/Municipal/ Private)
00274381	Simpson Lane Properties Ltd.	Transmission Line	Private
00286377	Saint John Industrial Parks (2024) Ltd.	Pipeline	Private
55243596	Regional Development Corporation / Saint John Industrial Parks (2024) Ltd.*	Data Centre	Crown
00412189	Energy and Resource Development	Pipeline and Transmission Line	Crown
00434522	New Brunswick Power	Transmission Line	Crown
55154017	Debly Resources Inc.	Pipeline	Private
55161681	City of Saint John	Pipeline	Municipal (Paddys Hill Drive)
55182638	Nature Conservancy of Canada	Transmission Line	Private
55186944	City of Saint John	Pipeline and Transmission Line	Municipal
55186951	City of Saint John	Transmission Line	Municipal
55200901	New Leaf Environmental Inc.	Pipeline	Private
55200927	Debly Resources Inc.	Pipeline	Private
55213276	Galbraith Equipment Co. Ltd.	Pipeline	Private
55235477	Emera Brunswick Pipeline Company Ltd.	Pipeline	Private
55239453	Energy and Resource Development; Power Commission of the City of Saint John	Pipeline	Crown/Municipal
55243588	Regional Development Corporation	Transmission Line	Crown

Note: * A portion of the PID is being purchased by Saint John Industrial Parks (2024) Ltd. from Regional Development Corporation.

GIS shapefiles for the Project are being submitted with the Registration to support Technical Review Committee (TRC) review and spatial analysis.

Figure No.

2.1

Title

Project Location

Client/Project

Beacon Data Centres Inc.
Spruce Lake AI Data Centre

121418636-013

Project Location
Lorneville,
New Brunswick

Prepared by SC on 2026-02-27
QR by NW on 2026-02-27

N

0 2 4 km

(At original document size of 11x17)
1:100,000

Legend

Project Development Areas (PDA)
- Data Centre PDA
- Pipeline PDA
- Transmission Line PDA

Other Features
- Highway
- Collector Road
- Local Road
- Building

Administrative Areas and Land Use
- Local Government Boundary
- Protected Natural Areas
- Spruce Lake Industrial Park
- Spruce Lake Industrial Park Expansion Area - EIA Registration

Primary Land Use
- Agriculture
- Industriel
- Infrastructure
- Recreational
- Residential

Waterways and Wetlands
- Watercourse (NBHN)
- Waterbody (NBHN)
- Wetland (NBELG)
- Provincally Significant Wetland
- Forested Area



Notes
1. Coordinate System: NAD 1983 CSRS New Brunswick Stereographic
2. Data Sources: Beacon Data Centres Inc.; Data License with the Government of New Brunswick (NBDEL3, NBNRED, Service NB); New Brunswick Power; Stantec
3. Background: Esr, USGS

Stantec

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2.2 Siting Considerations

2.2.1 Data Centre

The Project is located on lands being purchased, and that will be managed by, the City of Saint John through its municipal development corporation, Saint John Industrial Parks (2024) Ltd (SJIP). Beacon and VoltaGrid intend to purchase the land. The data centre facility is in an area of the municipality zoned as Spruce Lake Industrial (SLI) for Industrial development.

Access to utilities including electricity, natural gas, industrial water, telecommunications, and municipal servicing was a critical siting requirement. The selected site offers proximity to existing utility corridors and fibre-optic networks, reducing the need for extensive new infrastructure. This is particularly important for high-performance data centre operations, which rely on high-bandwidth, low-latency connectivity.

Multiple potential locations were reviewed during the siting process. These alternative sites were evaluated for land availability, zoning compatibility, access to utilities, potential environmental impacts, and technical feasibility. Several locations were ultimately rejected due to one or more limiting factors, including insufficient parcel size, lack of access to high-capacity telecommunications, greater distance from existing utility infrastructure, proximity to sensitive natural features, or the need for more extensive earthworks. The primary reason for the selection of Lorneville versus other locations is the proximity of power availability and fiber connectivity.

The site layout has been influenced by the following goals:

- Avoiding steep slopes
- Maintaining buffers to residential areas
- Reducing wetland impacts to the extent practical
- Avoiding fish-bearing reaches of watercourses

The chosen site is uniquely suited to support the development of a large-scale, Tier-IV capable data centre due to its industrial zoning, and proximity to major utility corridors.

The availability of supporting infrastructure – including access to fibre-optic connectivity and suitable natural-gas supply – enables the required level of operational resilience.

2.2.2 Siting of Transmission Line

Siting of the transmission line RoW was completed by NB Power and considered environmental constraints, and land-use compatibility as well as the existing NB power grid layout. The transmission line crosses 2 private land PIDs, 2 Municipal PIDs and 2 crown land PIDs. The transmission line RoW from the data centre to the Coleson Cove area was selected to reduce disturbance to sensitive environmental features surrounding Coleson Cove and along King William Road. A more direct route was chosen in a cross-country manner to avoid conflicts with existing infrastructure, connect to the most feasible interconnection point near Coleson Cove, while using existing easements.

The RoW from Coleson Cove to Five Fathom Hole was selected to parallel existing disturbances within the current transmission line corridor easements, thereby reducing new fragmentation. The intertie location near Five Fathom Hole was selected based on the availability of sufficient space for a substation and its location outside the Musquash Estuary Protected Natural Area.

2.2.3 Siting of Pipeline

Siting of the natural gas pipeline RoW considered technical feasibility, safety requirements, environmental constraints, and land-use compatibility. Route selection prioritized avoidance of sensitive environmental features such as wetlands, watercourses, wildlife habitat, and protected or conservation areas. Where feasible, the pipeline alignment follows existing linear disturbances and shared utility corridors to reduce new ground disturbance and habitat fragmentation. Consideration was also given to reducing effects on landowners and current land uses, and maintaining access during construction and operation. The gas pipeline crosses six private land PIDs, three municipal PIDs and two Crown land PIDs.

2.3 Description of Project Components

The project components are discussed below by Project Development Area (PDA) as presented in Figure 2.2:

- Data Centre PDA
- Transmission Line PDA
- Pipeline PDA

The total area of the Data Centre PDA is 89 ha. The transmission line is 10.3 km long total and is 92 m wide when two transmission lines are in the RoW and 52 m wide when the RoW diverges and has single transmission lines The Pipeline PDA is 4.5 km by 40 m wide RoW.

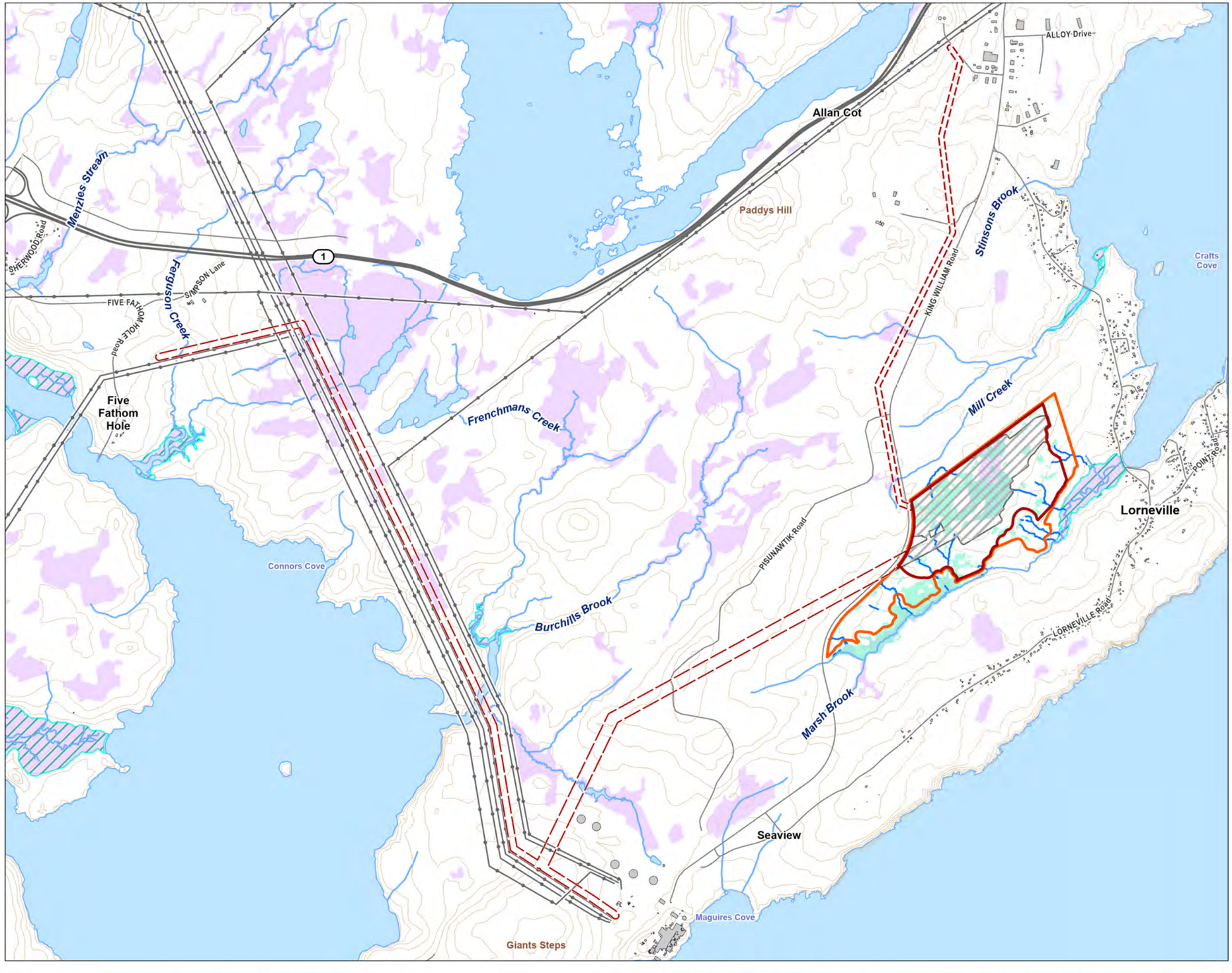


Figure No.
2.2

Title
Overview of Project Development Areas

Client/Project
Beacon Data Centres Inc.
Spruce Lake AI Data Centre

121418636-008

Project Location
Lorneville,
New Brunswick

Prepared by SC on 2026-03-13

N

0 0.5 1 km
(At original document size of 11x17)
1:30,000

Legend

- Project Site (Field Study Area)

Project Development Areas (PDA)
- Data Centre PDA
- Pipeline PDA
- Transmission Line PDA

Site Plan
- Estimated Project Footprint

Other Features
- Highway
- Collector Road
- Local Road
- Contour - 10m
- Building

Waterways and Wetlands
- Field-Delineated Watercourse
- Watercourse (NBHN)
- Wetland (Stantec 2025)
- Wetland (NBELG)
- Provincially Significant Wetland



Notes
1. Coordinate System: NAD 1983 CSRS New Brunswick Stereographic
2. Data Sources: Beacon Data Centres Inc.; Data License with the Government of New Brunswick (NBDELG, NBNRED, Service NB); New Brunswick Power; Stantec
3. Background: Esri, USGS

Stantec

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2.3.1 Data Centre PDA

Figure 2.3 is a conceptual site layout to scale showing the PIDs, proposed infrastructure, and access roads.

2.3.1.1 Data Halls

The Project will include four data halls, each planned to operate at a capacity rating of approximately 95 MW each. These halls are intended to provide the highest levels of reliability and operational redundancy. The data halls are currently under design but dimensions for each data hall are approximately 120 m x 300 m and will be single storey (assumed to be 16 m in height). The onsite power-generation facility will supply up to 190 MW of continuous, dispatchable electricity to meet high-density computing requirements. Each hall will include integrated advanced cooling, power, and connectivity systems consistent with modern data-centres.

2.3.1.2 Natural Gas Power Generation

The onsite power system consists of a natural-gas-fired generation facility built to supply up to 190 MW of continuous, dispatchable electricity to the co-located data centre halls. The facility is composed of modular Quick-deploy Power and Containerized system (QPAC) units, each housing five INNIO Jenbacher J624 lean-burn reciprocating engines along with alternators, emissions-control systems, and air-cooled radiators, all engineered within three-storey acoustic enclosures. Acoustic enclosures are constructed from steel panels treated with anti drumming material to reduce vibration and are internally lined with high density mineral wool acoustic insulation. These modules are arranged into Gas Generation Pods, with natural gas delivered through two new lateral pipelines connected to existing natural gas pipelines (Maritimes and Northeast pipeline and Brunswick pipeline). Electricity produced by the engines is collected through internal switchgear and distributed to both the onsite substation and the data halls (INNIO 2024).

The Jenbacher's QPAC is a modular power generation platform which consists of five subunits each housing a Jenbacher J624 gas genset and supporting equipment. Each subunit includes the genset module, engine exhaust system equipped with selective catalytic reduction and exhaust silencer, genset module ventilation exhaust outlet, radiator and air filtration module, and other auxiliary modules. In accordance with the manufacturer's specifications, each QPAC noise emission will achieve 65 dBA measured at 10 m from the modular. The power facility will consist of eight QPAC modules. A substation is located on the west section of the PDA and will serve the Project. A visual rendering of the power generation can be found below in Figure 2.4.

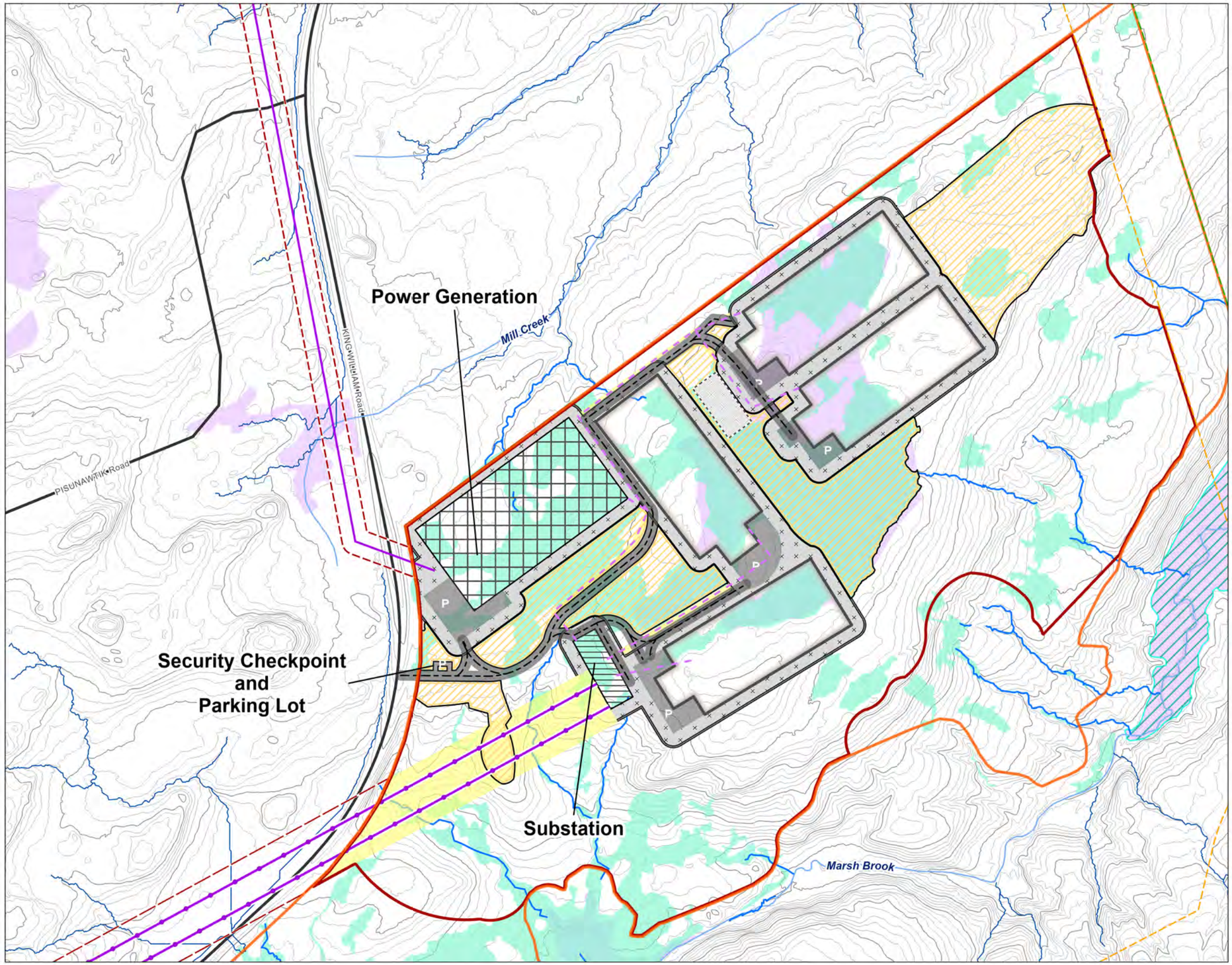


Figure No.
2.3

Title
Data Centre Conceptual Layout

Client/Project
Beacon Data Centres Inc.
Spruce Lake AI Data Centre

121418636-001

Project Location
Lorneville,
New Brunswick

Prepared by SC on 2026-02-27
QR by NW on 2026-02-27

N

0 100 200 metres
(At original document size of 11x17)
1:6,000

Legend

- Project Site (Field Study Area)

Project Development Areas (PDA)

- Data Centre PDA
- Pipeline PDA
- Transmission Line PDA

Site Plan

- Proposed 345kV Transmission Line
- Proposed Pipelines (2, 8-Inch Pipelines)
- Site - Road Centreline
- Site - Transmission Line
- Site - Road Footprint
- Data Hall (Approximately 120 x 300m)
- Data Hut
- Substation (55x168m)
- Parking Lot
- Power Generation (215 x 410m)
- Ancillary Area
- Transmission Line Right-of-Way
- Utility Area

City of Saint John - Zoning Setbacks

- Vegetative Setback - 150m
- Exclusionary Setback - 250m

Waterways and Wetlands

- Field-Delineated Watercourse
- LiDAR-Derived Watercourse (Stantec 2025) [4]
- Watercourse (NBHN)
- Wetland (Stantec 2025)
- Wetland (NBELG)
- Provincially Significant Wetland

Other Features

- Local Road
- Contour - 5m (Stantec)
- Contour - 1m (Stantec)



Notes
1. Coordinate System: NAD 1983 CSRS New Brunswick Stereographic
2. Data Sources: Beacon Data Centres Inc.; Data License with the Government of New Brunswick (NBDELG, NBNRED, Service NB); New Brunswick Power; Stantec
3. Background: Esri, CGIAR, USGS
4. LiDAR-Derived watercourses produced from GIS desktop analysis to support aquatic fieldwork. Service New Brunswick 1m digital elevation model (DEM) used for analysis.

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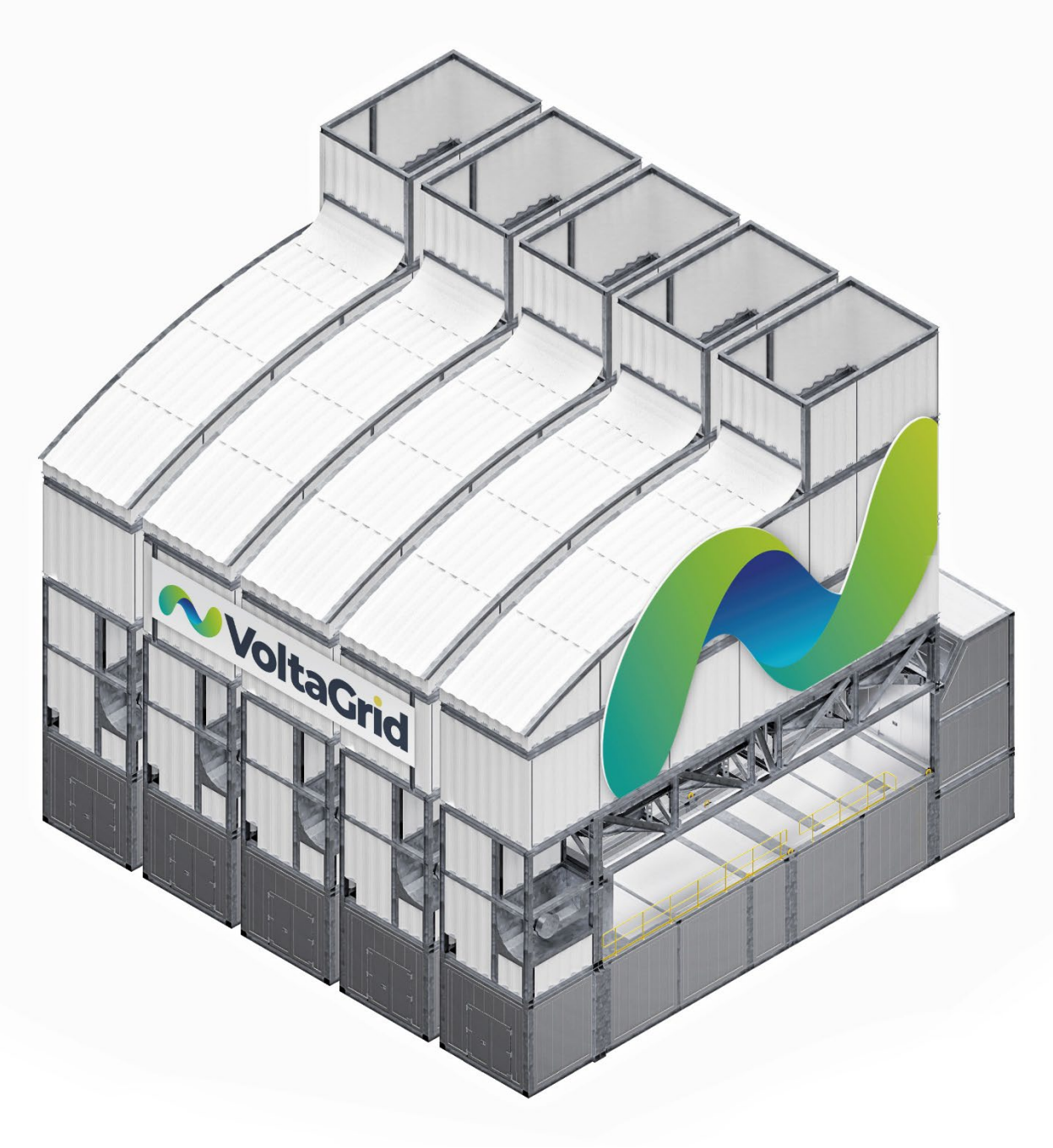


Figure 2.4 Volta Grid Jenbacher's J624 QPAC Rendering

2.3.1.3 Ancillary Systems and Facilities

Ancillary systems and facilities of the Project are summarized in Table 2.2.

Table 2.2 Ancillary Systems and Facilities

Component	Description
Switchyard	A 345 kV switchyard will be developed to tie the grid connection feeders to the Project site. The switch yard will also connect the on site power generation to the data halls. The switchyard will be a double bus configuration with three or four breakers per lineup configured so as to allow any one breaker to be taken out of service without losing connection. The switchyard will be designed to meet NB Power specifications.
Administrative and Operations Building	These spaces will be housed within the data halls.
Fibre Optic Network Connection	The fiber connection on site will provide connectivity to key data center markets both in Canada, transatlantic and US.
Cooling System Water Supply	Cooling infrastructure will be designed to optimize energy efficiency and water use, consistent with modern large-scale data centre design. Cooling for the data halls and power generation facility will use closed-loop liquid cooling, resulting in the need for only small quantities of make-up water, sourced from the Saint John industrial water supply system, to operate the system. The initial fill, which will be supplied from the Saint John industrial water supply, is estimated to be approximately 3,500m^3.
Wastewater System	Wastewater sources for the Project fall into three primary categories: *Domestic sanitary wastewater*- washrooms, sinks, kitchenette, administrative areas. Wastewater quality is equivalent to typical commercial / light-industrial sanitary sewage. *Cooling system blowdown*- Although the data halls use closed-loop, water-based cooling systems, blowdown may be required to control mineral concentration, prevent corrosion and maintain system efficiency. No industrial solvents, hydrocarbons, or hazardous substances are present. Blowdown volumes are controlled and intermittent, not continuous. The potential need for blow down will be determined during detailed design, and will be subject to the commercial agreement with the customer of the data centre. It is anticipated that any requirements for blow down would be addressed through permitting. *Natural Gas Power* - On-site natural gas power generation uses closed-loop liquid cooling systems with air-cooled radiators. No routine wastewater is generated from engine cooling operations. Cooling fluids remain within sealed systems during normal operation. Minor wastewater volumes may be generated intermittently from equipment servicing, floor drains, and maintenance activities. These are infrequent and will be directed to approved sanitary disposal pathways if required.
Stormwater Management	Stormwater at the site will be managed through stormwater management system designed to collect runoff from building roofs, paved areas, and landscaped surfaces and convey it to appropriately sized control measures prior to release. Stormwater infrastructure will be isolated from sanitary systems and may include features such as swales, catch basins, and retention or detention facilities to control flow rates and maintain water quality. Stormwater discharges will be designed to mimic natural drainage patterns to the extent practicable.

Table 2.2 Ancillary Systems and Facilities

Component	Description
Fire Protection System	*Natural Gas Power Generation Facility* - Fire protection is provided through container-level fire detection and automatic shutdown systems (i.e., gas isolation valves), with active fire suppression (e.g., clean-agent or aerosol systems) installed where required by site-specific fire codes or regulatory approvals. Fire hydrants are also installed to surround the outer perimeter of each power block. *Data Halls* -Fire prevention and protection within the data centre buildings is designed to support Tier I- IV-level reliability, with emphasis on Very Early Smoke Detection Apparatus (VESDA) or equivalent high-sensitivity smoke detection and will utilize localized suppression, and protection of sensitive electronic equipment.
Access Roads and Parking	A paved access road network on the Data Centre PDA will connect the structures within the PDA and will be constructed to municipal code for emergency response needs. Parking lots will be used for onsite parking and laydown of equipment as needed.

2.3.2 Transmission Line PDA

The Project will require approximately 200 MW of electricity from the New Brunswick power grid to supplement energy generated onsite by the natural gas-fired generating facility (Section 2.5.2). The Transmission Line PDA includes two 345 kV transmission lines and a substation at the interconnection with the NB Power grid. The RoW extending from the Data Centre PDA to the Coleson Cove Generating Station is approximately 3.9 km long and 92 m wide and includes both transmission lines. From this point, the lines diverge: one extends north to the community of Five Fathom Hole for 6.4 km to the substation tie in within a 52 m wide RoW, while the other extends south for 0.7 km to the Coleson Cove Generating Station, also within a 52 m wide RoW.

2.3.3 Pipeline PDA

The Project will be fueled by natural gas delivered through two new dedicated 8” diameter lateral pipelines connected to the existing Maritimes and Northeast pipeline Saint John Lateral and/or Brunswick Pipeline located approximately 4.5 km north of the PDA. The lateral lines will connect to the mainlines via metering stations. The final routing and engineering details will be determined through the pipeline regulatory process. The Project will require an estimated 1,813 Gigajoules(GJ) per hour of natural gas at full capacity, and on-site gas metering and regulation infrastructure will condition and distribute the fuel to the power-generation modules. As such, the installed consumption capacity will be over 15 million GJ per year.

2.4 Project Phases and Activities

Pending necessary approvals, construction is scheduled to begin in late 2026 and take approximately 18 to 24 months. Construction traffic during this time will be intermittent and variable and include transport of heavy and/or oversized equipment and machinery to site. Construction traffic will use King William Road as primary access.

2.4.1 Construction

2.4.1.1 Site Access and Transportation

Primary PDA access will be via King William Road during construction and operations. The road is an all-weather paved road. Upgrading existing roads is not anticipated, neither are detours or public road closures. An internal PDA road network is being finalized and will provide safe egress on and off the Data Centre PDA in the event of an emergency.

Access to the transmission line and pipeline RoWs will rely primarily on existing roads and trails, though some may require improvements such as brush clearing, grading and gravel placement, or the installation of drainage and culverts. If new access roads are needed, they will meet provincial and municipal standards, and landowner permissions will be obtained where required.

2.4.1.2 Site Preparation

Pending approvals, site preparation is expected to begin on the PDA in Q3 2026 and will include clearing and grubbing of vegetation, removal of topsoil, and levelling the site to a predetermined grade. Vegetation clearing will be scheduled outside the migratory bird breeding season (mid-April to late August) wherever feasible. Existing vegetation within the PDA will be removed, with merchantable timber salvaged where possible, and the heavy organic root mat cleared and relocated to the site perimeter. Topsoil will be stockpiled for future reclamation. Grading may require excavation or fill depending on existing terrain; however, blasting is not anticipated. Excavated rock and overburden will be stockpiled separately for progressive restoration. If additional borrow material is required, it will be sourced from local permitted pits or quarries. Throughout site preparation, erosion and sediment controls—including stormwater management—will be installed and maintained to protect soils and prevent sedimentation.

Preliminary civil works will establish a graded laydown area to allow placement of site trailers and storage containers, and for receiving major equipment. Other key civil works include construction of an onsite gravel road, and installation of environmental controls (e.g., ditching, silt fencing), construction fencing and gates, and temporary construction electrical service. This will facilitate effective management and collection of stormwater and shallow groundwater during construction.

Site preparation and early civil works for the PDA is expected to start in late 2026, pending receipt of necessary approvals. Stormwater works, sanitary drain, potable water, natural gas, data service and electrical systems are scheduled to be installed in 2027.

Clearing of the transmission line and pipeline RoWs will occur following regulatory approval, during a period that avoids the migratory bird nesting season. Detailed design will aim to avoid sensitive areas where possible, and where crossings of watercourses or wetlands are unavoidable, temporary matting, bridging, or corduroy (in wetlands) will be used. Tracked equipment will be preferred near sensitive areas to reduce rutting.

Vegetation clearing will generally be completed using mechanical methods, except within 30 m of watercourses or wetlands, where manual clearing will be used to protect soils and understory vegetation. For transmission line installation, only tower locations and temporary work areas will be grubbed. Trees that pose a safety risk ("danger trees") will also be removed. Felled vegetation will be mulched or piled in low windrows with breaks at trails and watercourses to allow wildlife movement, and material may be used for erosion control. Slash will be left to decompose naturally.

2.4.1.3 Foundations and Earthworks

Earthworks construction will include excavation of materials, preparation of foundation bases and placement of fill materials. Soil excavated from the site that is considered geotechnically and environmental suitable will be stockpiled on site and reused within the PDA.

Blasting is not anticipated to be required for site excavations.

A stormwater management system will be installed early in the construction phase. This will mitigate stormwater impacts throughout construction.

Concrete required for building foundations and other site development features may be batched on site, although some pre-cast components will be transported to the site.

2.4.1.4 Installation of Site Infrastructure

Several prefabricated components have been incorporated into the Project design to improve efficiencies during construction. The construction process will involve a combination of off-site modular manufacturing and on-site construction. VoltaGrid's power generation facilities are pre-fabricated offsite, transported to the site by truck, and assembled on site. On average, less than 2 trucks carrying pre-fabricated components, are expected on site each day, over a period of approximately 6-7 months.

A crane will be mobilized to the site and used to lift building components into position. Once structural components have been secured into position, interior work can proceed, including mechanical, electrical and plumbing connections.

Following site preparation activities, additional excavation may be required for building and equipment foundations. Underground piping installation work will also be conducted at this time. A continuous concrete foundation will be poured for the CTGs and individual building foundations will be constructed for the data halls. Following completion of foundation construction, building construction and equipment installation will occur, including installation of mechanical and electrical systems. Equipment will be trucked to site using transport trailers via the TransCanada Highway and King William Road as necessary.

2.4.1.5 Site Clean-up and Restoration

Following installation of exterior equipment and infrastructure, final civil works such as fine grading, placement of granular material on access roads, installation of curbs and sidewalks, and asphalt surfacing will be completed. Landscaping activities, including hydroseeding, mulching, and planting native tree and grass species, will also be undertaken. Topsoil removed during site preparation will be staged on site and reused for final landscaping or reclamation.

The final stage of construction will involve clean-up and revegetation of disturbed areas. This will occur after temporary construction infrastructure such as temporary access, bridges, fencing, matting, and laydown areas has been removed. Clean-up and reclamation activities will include removing refuse, grading disturbed areas, contouring slopes to a stable profile, and re-establishing natural drainage patterns. Where soil disturbance creates a risk of erosion, stabilization measures such as trimming and back-blading, mulching, seeding, and fabric placement will be applied. Erosion and sediment controls installed during construction will be maintained until vegetation is fully established.

Post-construction environmental monitoring will begin once construction activities are completed and will continue for approximately one to five years into the operation and maintenance phase.

Following completion of the natural gas pipelines, site clean up and restoration will be undertaken within the approved pipeline RoW to stabilize disturbed areas and return them to functional conditions. Trenches will be backfilled using suitable native materials, and disturbed surfaces will be re graded to re establish pre-construction contours and natural drainage patterns. Temporary construction features, including access routes, workspaces, matting, and other temporary infrastructure, will be removed once installation and testing activities are complete. Soils stripped during construction will be replaced in their original sequence, where practicable, to maintain soil structure and support revegetation. Disturbed areas will be stabilized through appropriate reclamation measures such as grading, seeding, mulching, and other erosion control techniques, as required. Erosion and sediment control measures installed during construction will be maintained until disturbed areas are stabilized and vegetation is established. Clean up and restoration activities will be carried out in accordance with the Environmental Protection Plan and applicable regulatory requirements, with oversight by qualified personnel to ensure environmental commitments are met

Site clean-up and restoration are carried out following construction to stabilize disturbed areas and prepare the right-of-way for long-term operation. Temporary materials, waste, and debris are removed, and disturbed ground is graded to address rutting and compaction. Erosion and sediment control measures are maintained until soils are stabilized, using methods such as mulching, seeding, contouring, and erosion control fabric where required. Vegetation debris is left windrowed along the right-of-way edge to decompose naturally, with breaks to allow wildlife movement, and no grubbing or burning is undertaken. Buffers adjacent to wetlands and watercourses are maintained, and restoration activities are designed to preserve soil integrity and drainage patterns. Once stabilized, the corridor transitions to the operations phase and is managed under NB Power’s vegetation management program rather than restored to forest conditions.



2.4.1.6 Pipeline Installation

Construction of the natural gas pipelines is anticipated to be completed using conventional open-cut trenching techniques within a defined and approved pipeline RoW. The RoW intersects multiple watercourses. Currently the watercourse crossings are anticipated to be crossed by horizontal directional drilling (HDD) or pipeline boring techniques. Final crossing design and engineering will be dictated upon completion of aquatics field work and detailed design and construction planning. Activities will begin with clearing and grading limited to the approved construction corridor, followed by the stripping and segregated stockpiling of topsoil and subsoil to preserve soil structure and support post-construction reclamation. A trench will then be excavated to the required depth; hydraulic rock hammering and/or blasting may be required where bedrock is encountered within the trench. Pipes will be placed, aligned, and secured within the trench in accordance with applicable engineering and safety standards. Once installed, the trench will be backfilled using suitable native materials, and the surface will be re-graded to re-establish pre-construction contours and drainage patterns. Construction equipment and vehicles will be confined to designated access routes and work areas to minimize disturbance beyond the approved footprint. Where pipeline installation occurs near wetlands, watercourses, or other sensitive environmental features, additional mitigation measures will be implemented to manage erosion, sedimentation, and surface water flows. Environmental protection measures outlined in the Environmental Protection Plan will be applied throughout construction, and activities will be monitored by qualified personnel to ensure compliance with regulatory requirements and environmental commitments.

2.4.1.7 Transmission Line Installation

Transmission line construction will involve the installation of support structures, conductors, and associated hardware within the approved RoW. Construction activities will require the delivery of equipment and materials to structure locations using existing and approved access routes. Foundation excavation and installation will be completed using standard construction equipment, with methods varying depending on site-specific soil and bedrock conditions.

Ground disturbance at each structure location will depend on the structure and foundation type, which will be finalized during detailed design in consultation with NB Power. Structure locations will be selected to maintain a minimum 30 m setback from watercourses and wetlands, where practicable. Final alignment and structure placement will be informed by environmental field surveys upon completion. Structures will be assembled either at individual structure locations or at a central marshalling area and erected using cranes. Excavated materials will be reused where suitable or backfilled with compacted native material or material sourced from licensed local quarries.

2.4.1.8 Testing and Commissioning

Data Centre

The testing and commissioning phase of the Data Centre is a structured, quality-assurance process undertaken to verify that all building systems, infrastructure, and controls have been installed correctly and operate together as intended under normal and abnormal operating conditions. This phase includes progressive testing of individual components, subsystems, and fully integrated systems, with a particular focus on critical infrastructure such as electrical power distribution, backup generation, uninterruptible power supplies (UPS), cooling and ventilation systems, building management systems, and life-safety systems. Testing typically advances from factory and site acceptance checks through functional performance testing and integrated system testing, during which systems are operated under simulated load and fault scenarios to confirm redundancy, resilience, and reliability. Deficiencies identified during commissioning are documented, corrected, and retested prior to final acceptance. The commissioning process concludes with documentation, system handover, and operational readiness confirmation, providing assurance that the data centre meets design intent, performance requirements, and operational standards prior to occupancy and go-live.

Natural Gas Pipelines

Following completion of construction, the natural gas pipelines would undergo testing and commissioning activities in accordance with the Canadian Energy Regulator Onshore Pipeline Regulations (OPR) and applicable CSA standards. Prior to being placed into service, the pipeline would be cleaned and prepared to ensure it is free of construction debris and suitable for pressure testing. A pressure testing program would then be implemented under the direct supervision of the company or its authorized agent to verify the integrity of the pipeline, including its ability to safely operate at the intended maximum operating pressure. Pressure testing would be conducted using water as the test medium, where practicable, and test pressures, durations, and acceptance criteria would be documented and retained as required by the OPR. Any deficiencies identified during testing would be repaired and the affected sections retested prior to proceeding. Upon successful completion of pressure testing, the pipeline would be dewatered and dried to remove residual test water and to achieve internal moisture conditions suitable for natural gas service, consistent with applicable industry standards. The commissioning phase would include controlled purging and introduction of natural gas, verification of valves, instrumentation, and pipeline control systems, and confirmation that all systems function as designed. Testing and commissioning records would be maintained as part of the company’s management system, and the pipeline would only be placed into service once all regulatory requirements and acceptance criteria under the CER framework have been met.



Transmission Lines

Testing and commissioning of the 345kV transmission lines connecting NB power grid to the data centre would occur after construction to confirm the line is safe, reliable, and ready for energization. Activities would include pre-energization inspections to verify structures, conductors, insulators, grounding, clearances, and RoW conditions, followed by verification of electrical continuity and interfaces with protection, control, and communication systems at the line terminals. Commissioning would then proceed with coordinated high-voltage testing and staged energization, undertaken in consultation with the applicable transmission system operator, to confirm correct phase identification, protection system performance, and stable operation under initial operating conditions. Upon successful completion of testing, commissioning documentation would be finalized and the transmission line placed into service to supply power from the grid to the data centre facility in accordance with applicable regulatory approvals and system operator requirements.

2.4.2 Operation and Maintenance

2.4.2.1 Transmission Line Operations

During the operating life of the transmission line (estimated to be a minimum of 25 years), certain routine activities will be performed in order to maintain reliability of the network. These activities are described in the following sections. The operation and maintenance phase typically involves vegetation control in the first few years, annual air patrols, detailed helicopter patrols every seven years, ground patrol every eight years, and targeted line maintenance after about 20 years of operation.

The System Operator dispatchers located at the Energy Control Centre in Marysville, New Brunswick, will direct normal line operations, using NB Power's facilities to operate circuit breakers, determine the amount of power required to serve the loads, and configure the electric system accordingly. Dispatchers will also schedule the interface flows and proper generation amount and monitor the power system to ensure reliable service to the data centre. Circuit breakers would operate automatically to ensure safe transmission line operation. Third party line crossing agreements would have to be in place prior to any out of normal activities to occur within the RoW. They will be evaluated for based on how they interfere with line operation and maintenance or safety risks.

Significant line maintenance on 345 kV transmission lines is not usually required until after a transmission line has been in-service for more than 20 years. Minor repairs may be necessary because of inspection results, severe weather, or accidents; emergency repairs could be required at any time. During the operating life of the transmission line, certain routine activities will be performed in order to maintain reliability of the network. These activities are described in the following sections.



2.4.2.1.1 Transmission Line Vegetation Management

Line inspections are conducted regularly using ground and aerial patrols to assess the condition of transmission line components, structures, foundations, and surrounding terrain. Aerial inspections are typically completed annually, while ground patrols are conducted approximately every eight years using ATVs or similar equipment along existing access routes. Additional inspections may occur following emergencies such as ice storms. Inspection findings are provided to NB Power field staff to support maintenance planning, and these activities require vehicles and equipment to travel within the RoW.

Uncontrolled vegetation can create fire and safety hazards, hinder routine line maintenance, and cause interruptions in electric service when it grows into or falls on electric power lines. In order to avoid constant interruptions in electric service caused by overgrown or fallen vegetation, NB Power restricts the growth of trees and brush along the lines through its integrated vegetation management program.

Integrated vegetation management involves a variety of methods, including hand cutting with chainsaws, brush saws and axes, mechanical equipment including hydro-axes or excavators with mulching head, and herbicide treatments. The frequency of the vegetation management program varies depending on the vegetation growth rate, but it is typically carried out in 5-to 6-year cycles.

The focus of vegetation management is on danger trees, which are the tall growing tree species that have the potential to grow or fall into, or within, the arching distance of the transmission lines and or facilities and cause an outage. The use of the various vegetation management methods depends upon a number of factors including site conditions and the sensitivity of surrounding areas. The line will be maintained by NB Power as part of its regular maintenance program of the New Brunswick electrical grid, following NB Power's standard environmental management plans and practice.

2.4.2.2 Data Centre Power Generation

During operations, the power generating station will combust natural gas (as the default fuel source) to produce power which will be converted to electrical power by coupled generators. The power generating station will operate continuously. Because the CTGs are modular units capable of starting and stopping independently of each other, they will provide a wide range of dispatch modes including synchronous condensing to meet the generation needs of the data centre.

The 190 MW on-site generation system would be built using INNIO Jenbacher J624 lean-burn natural-gas reciprocating engines. Each J624 unit produces approximately 4.6 MW, requiring 42 engines to achieve the 190 MW output (rounding up to the nearest whole unit). These engines are typically housed in modular QPAC enclosures, each containing five engines along with alternators, emissions-control systems, and air-cooled radiators engineered to meet industrial acoustic and environmental standards.



At a 190 MW buildout, the system would consist of roughly 8–9 QPAC modules (five engines per module), forming a compact, containerized generation block appropriate for data-centre applications requiring rapid deployment, high reliability, and full operational redundancy. The modules operate on pipeline-quality natural gas and incorporate advanced exhaust-treatment systems, including selective catalytic reduction, ensuring compliance with regulatory air-emission limits. Cooling is delivered through closed-loop, air-cooled radiators consistent with the Heartland configuration, eliminating process-water requirements.

Functionally, a 190 MW J624-based plant provides fast ramping, dispatchable power capable of supporting high-density data centre loads, forming the onsite portion of Lorneville's hybrid 190 MW onsite + 190 MW grid supply model. The system scales linearly from the Heartland architecture while maintaining the same operational characteristics, reliability profile, and emissions control approach.

The onsite power generation system is expected to operate continuously on a 24/7 basis to meet the data centre's baseload electricity requirements. Under normal operating conditions, the generators will run year-round, with increased output anticipated during the colder months when overall power demand is typically higher. Operational profiles will be aligned with facility load requirements and grid support needs; however, unlike earlier conceptual scenarios, the generating units are now assumed to operate fulltime rather than intermittently. Maintenance activities will be scheduled during lower demand periods to ensure continuous availability and minimize downtime.

Day to day operation and maintenance will be provided by a staff of approximately 8-10 maintenance and operations technicians. Inspection and maintenance will be conducted on a regular schedule consistent with industry operating experience. System maintenance will be conducted during "off-peak" periods or "shoulder" months (i.e., September-November and March-May). With proper planning of work during these periods, the Project will have a very low forced outage rate. The outage duration is expected to be approximately 48 hours per year per turbine. The Project will be designed to operate with reliability and resiliency.

2.4.2.3 Data Centre Halls

During operations, the data centre will function as a 24-hour, year-round digital infrastructure facility designed to house and operate information technology (IT) equipment, including servers, networking hardware, and data storage systems. The facility will provide continuous data processing, storage, and transmission services to support cloud computing, artificial intelligence, and high-performance computing applications. The data centre will employ an estimated 210 on-site operational and maintenance staff.. Day-to-day activities will include system monitoring, preventive maintenance, equipment replacement, and security operations. Vehicular traffic during operations will be limited and generally associated with staff access, equipment servicing, and periodic deliveries.



Heat generated by IT equipment will be managed through mechanical cooling systems designed to maintain optimal operating temperatures within the data halls. Cooling systems will be water-based closed-loop systems that circulate coolant water within the facility. Closed-loop cooling systems are designed to minimize water use. Cooling equipment will operate continuously and will be monitored and controlled through automated building management systems. Facility operations will be supported by environmental and energy management systems designed to monitor electricity use, cooling performance, and equipment status. Preventive maintenance programs will be implemented to reduce the risk of equipment failure, spills, or unplanned releases. Emergency response procedures will be in place to address power outages, equipment malfunctions, and fire prevention.

2.4.2.4 Water Use and Supply

The data centre halls will use a closed-loop water-based cooling system, significantly reducing overall water consumption compared to open-loop or evaporative cooling designs. In a closed-loop configuration, water circulates continuously within sealed piping and equipment, providing thermal exchange for server halls while minimizing withdrawals, losses, and potential environmental effects. The volume of cooling water required will be determined as part of the detailed design of the project and requirements will be negligible following the initial fill. It is estimated that the initial fill, which will be supplied from the Saint John industrial water supply, will be approximately 3,500m^3.

Domestic water use will consist of routine building needs such as washrooms, cleaning, and general occupancy, all of which require only small volumes. Fire protection will be provided through a dedicated sprinkler system supported by on-site storage and municipal connections, with water use occurring only during emergency events. Because these demands are low, intermittent, and unrelated to cooling operations, they do not contribute meaningfully to overall facility water withdrawals, ensuring the Project maintains a small footprint on local water resources.

Industrial water supply for the onsite power generator will be supplied by the City of Saint John. Drilling on site for industrial or domestic use water is not anticipated.

2.4.2.5 Power Requirements

The data centre halls will consist of a four-hall, high-performance computing campus supported by on-site natural-gas generation and a transmission connection to the NB Power grid. The facility's total electrical supply will be 390 MW, split between 190 MW of on-site VoltaGrid natural-gas generation and 200 MW supplied from the provincial grid.



2.4.3 Decommissioning and Reclamation

After the Project is no longer required, it will be decommissioned in a planned and controlled manner. Project infrastructure will be dismantled and removed from the site for reuse, recycling, or disposal at appropriate facilities, as applicable, and site reclamation will be carried out in accordance with regulatory requirements in effect at the time, with the objective of restoring the land to a self-sustaining landscape and ecosystem consistent with surrounding conditions. The Project has a minimum design life of 25 years and, through ongoing maintenance, may be extended indefinitely; however, should decommissioning be considered in the future, it will be planned in advance and subject to applicable regulatory approvals and permits. For the purposes of this EIA registration, decommissioning is assumed to be conducted under the regulations in place at the time and is not considered further in this assessment.

2.5 Project Alternatives

2.5.1 Alternatives to the Project

Alternative actions such as reducing or deferring the facility's development or not proceeding with the Project at all would limit its ability to compete in the modern digital economy and would restrict benefits to the province. Job creation tied to construction, operations, and long-term technological growth would not materialize. Local contractors, service providers, and suppliers would miss out on procurement opportunities, and the province would lose potential tax revenue and investment attraction associated with a major digital-infrastructure project.

Overall, no other reasonable alternative satisfies the combined objectives of technical feasibility, economic benefit, environmental responsibility, and long-term reliability.

2.5.2 Alternative Means of Carrying out the Project

Several alternative means of carrying out the Project were considered. Options such as only using electricity from the grid, or smaller modular deployments were evaluated. These alternatives could not meet the data centre's demand for continuous, non-interruptible baseload power and associated reliability. High-performance data centres cannot rely solely on grid-available electrical capacity, which may be constrained, intermittent, or insufficient for large computational loads. The on-site power facility is therefore a supporting measure—its role is to enable the data centre to function with required reliability and supplement electricity available from the New Brunswick electrical grid.

Therefore, dedicated on-site generation was selected as the most viable supporting solution.

2.6 Workforce

Project construction is expected to generate over 1200 local employment opportunities. Once construction is complete, the Project will generate approximately 210 operational jobs with approximately 110 additional indirect jobs.

2.7 Emissions and Wastes

2.7.1 Construction

Potential emissions and wastes during construction include:

- Noise and dust from earthworks
- The release of air contaminants and greenhouse gas (GHG) emissions from diesel equipment and from land clearing
- Liquid effluents from equipment washing and stormwater runoff
- Hazardous materials such as fuels and lubricants
- Solid waste from packaging, construction debris, and domestic refuse

Wastes will be managed in accordance with provincial regulations. Non-hazardous waste will be disposed of at approved off-site facilities. Hazardous materials will be temporarily stored in lined, bermed containment areas, and removed from site by a licenced hazardous waste contractor for disposal at an approved, existing waste disposal facility. For more information about the release of air contaminants and GHG emissions from Project construction, see Chapter 7.

2.7.2 Operations

Data centres generate air contaminant and GHG emissions primarily on an indirect basis, associated with the electricity consumed to power servers, networking equipment, and cooling systems. Where grid electricity is supplied by fossil-fuel-based generation, this electricity use results in GHG emissions, as well as associated regional air pollutants (e.g., nitrogen oxides and particulate matter) generated off-site at power plants. Direct emissions may also occur on-site from the operation of backup power systems, which will be additional natural gas emergency generation units, during testing, maintenance, or emergency power outages, contributing localized emissions of NO_x, CO, particulate matter, and trace volatile organic compounds. For more information about the release of air contaminants and GHG emissions from Project operation, see Chapter 7.

The data centre may require cooling water blowdown. Should detailed engineering determine the need for blowdown, it will be managed under site-specific permits.

Solid waste streams include routine operational wastes such as packaging materials and general refuse, as well as electronic waste (e-waste) generated through the periodic replacement of servers, storage devices, networking equipment, and batteries. E-waste may contain metals, plastics, and hazardous constituents and is generally managed through specialized recycling and disposal programs.

Sewage Treatment

The administration buildings and data hall sewage requirements are limited to standard domestic wastewater, which must be managed under the Province of New Brunswick's Land & Waste domestic wastewater treatment approval framework. No specialized industrial wastewater treatment is needed, and the design will require a provincially approved on-site domestic system.

Noise

During operations and maintenance, noise at the data centre is primarily generated by continuous operation of cooling systems, ventilation equipment, and electrical infrastructure. These sources are generally steady and predictable, with short-term increases occurring during maintenance activities or emergency generator testing. Routine operations are managed to minimize noise emissions through equipment selection, maintenance practices, and operational controls. Maintenance activities are scheduled, where feasible, during daytime hours to reduce potential disturbance, and equipment is maintained in accordance with manufacturer specifications to prevent abnormal noise levels. Noise management measures are implemented to support worker safety and to limit off-site effects in accordance with applicable regulatory requirements and local guidelines.

2.8 Future Modifications, Extensions, or Abandonment

At this preliminary stage of project planning, no specific future modifications or extensions to the Project have been formally proposed. However, the potential for future changes to the Project may arise based on evolving economic conditions, regulatory requirements, or operational considerations. Any such changes would be subject to applicable environmental review and permitting processes at that time.

2.9 Project Schedule

Subject to receipt of the necessary approvals, construction is anticipated to begin in 2026, with commercial operations targeted to commence in 2028. Project construction is anticipated to take 18-24 months, with construction of various Project components occurring concurrently. Project life will depend on contractual arrangements with end users of the data centre. The minimum operating life is anticipated to be 25-30 years.

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3 Overview of Environmental Setting

3.1 Physical Setting

3.1.1 Physiography and Geography

NB consists of seven ecoregions defined largely by their climate and further divided into ecodistricts based on their geomorphology (NBDNR 2007). The Project is in the Fundy Coastal Ecodistrict of the Fundy Coast Ecoregion. The terrain near the Project is comprised of gently rolling hills that lack sharp contrast or rugged features. Elevation of the Project ranges from ~15 metres above sea level (masl) near Marsh Brook to approximately 40-50 masl at its highest points.

3.1.2 Topography and Drainage

The Project is within the West Fundy composite watershed which drains into the Bay of Fundy. The Data Centre PDA is situated within two sub-watersheds that are drained by tributaries of Mill Creek and Marsh Brook. These watercourses, located to the north and south of the Data Centre PDA, flow into the Bay of Fundy. Mill Creek is also the sole named watercourse that occurs within the Pipeline PDA, along with smaller unnamed watercourses feeding both Mill Creek and Marsh Brook. Other watercourses associated with the Transmission Line PDA include Frenchman's Creek and Ferguson Creek and their tributaries which flow into the Musquash Estuary.

Surface water movement in the Data Centre and Pipeline PDAs is primarily controlled by regional slope from west to east, while in the Transmission Line PDA, slope is primarily from north to south or east to west, all ultimately flowing to the Bay of Fundy. There are several wetlands, swamps and coastal marshes contributing to natural water retention in the PDAs. Overall, the drainage system is well-integrated, with relatively consistent flow regimes influenced by precipitation, snowmelt, and the area's glacial till and bedrock-controlled subsurface conditions.

3.1.3 Surficial Geology

Surficial geology in the Saint John region of the Fundy Coastal Ecodistrict, where the Project is located, is predominantly Precambrian rocks comprised of marble, quartzite, and siltstone (NBDNR 2007). The Saint John area is also characterized by sedimentary rocks such as shales from the Pennsylvanian geological era, often containing fossils of insects, snails, plants. The most common soils along the coast in this ecodistrict are derived from granite, gabbro and other volcanic rocks that are typically acidic. Areas of sedimentary rocks and tidal deposits house the most arable soils in the region and consist of loam, silt, and clay.

3.2 Biophysical Setting

3.2.1 Atmospheric Environment

The atmospheric environment consists of three main components: air quality, climate/GHGs, and sound quality.

Air contamination and GHG emissions, as well as sound pressure levels (noise) in the area surrounding the Project, are expected to be predominantly influenced by vehicle traffic and nearby industrial facilities.

The Government of Canada has developed statistical summaries of climate data collected from weather stations located all over the country. The closest ECCC weather station to the Project is located at Saint John Airport, approximately 26 km northeast of the Project. This weather station meets the World Meteorological Organization Standards and has historical data going back to 1871 (ECCC 2025).

Climate normals data (1991-2020) from the Saint John Airport weather station indicate that January is typically the coldest month of the year, with a daily average temperature of -7.9ºC (ECCC 2025). July is typically the warmest month of the year, with a daily average temperature of 17.3ºC. The average annual precipitation (including snow) is 1,271 millimetre (mm) per year, with November being the month with the most precipitation (138.2 mm on average). The snowiest month of the year is typically January (59.8 centimetres (cm) per year). Average wind speeds are generally highest in the winter, with an annual average of 15.3 kilometres per hour (km/h).

3.2.2 Freshwater Fish and Fish Habitat

The Project is located within the West Fundy composite watershed, east of the Musquash River (NBDNRED 2012). This watershed is known to support brook trout (*Salvelinus fontinalis*), Atlantic salmon (*Salmo salar*), and American eel (*Anguilla rostrata*). A variety of other fish species that may occur in the watershed include blacknose dace (*Rhinichthys atratulus*), common shiner (*Notropis cornutus*), creek chub (*Semotilus atromaculatus*), lake chub (*Couesius plumbeus*), mummichog (*Fundulus heteroclitus*), amongst others (Gautreau and Curry 2020).

Several of these species are important for commercial, recreational, and Indigenous fisheries within the West Fundy composite watershed system, underscoring the ecological and socio-economic importance of maintaining healthy fish populations and habitats in the region.

3.2.3 Terrestrial Environment

The terrestrial environment of the Fundy Coastal Ecodistrict is largely characterized by coniferous forest mostly comprised of red spruce (*Picea rubens),* black spruce (*Picea mariana*), white spruce (*Picea glauca*), balsam fir (*Abies balsamea*), and tamarack (*Larix laricina*), with Eastern white cedar (*Thuja occidentalis*) also being predominant in the Saint John area (NBDNR 2007). Few tolerant hardwood stands exist in this ecodistrict, though those that do occur are largely composed of yellow birch, with some sugar maple and beech. Scattered tree-less bogs also dot the landscape in this ecodistrict, and salt marshes occur along the immediate Fundy coastline. This ecodistrict contains several rare flora species

such as glaucous meadow-grass (*Poa glauca*), livelong saxifrage (*Saxifraga paniculata*), and little curlygrass fern (*Schizaea pusilla*), though occurrences of these rare plant species are mostly confined to the eastern portion of the ecodiostrict near and within Fundy National Park (NBDNR 2007).

Salt marshes and mudflats in the ecodistrict provide important stop-over areas for migratory waterfowl and shorebirds such as the semipalmated sandpiper (*Calidris pusilla*) which congregate in the hundreds of thousands during fall migration. Offshore islands in the ecodistrict also provide nesting habitat for several seabird species such as the Atlantic Puffin (*Fratercula arctica*) and Leach's Storm-Petrel (*Hydrobates leucorhous*). Moose (*Alces alces*) and white-tailed deer (*Odocoileus virginianus*) are common in the region and make use of forested hills, wetlands, and riparian areas. Numerous other small mammals, landbirds, and amphibians typical of the Boreal forest also occur in the region.

3.3 Socio-economic Setting

3.3.1 Economic Activity and Economic Drivers

The socio-economic conditions of Lorneville are largely linked to the broader Saint John labour market owing to the community's small size and close proximity to the Saint John Metropolitan area. Key economic drivers in the region include continued investment in resource extraction, the presence of mining-related and oil and gas supply chains, shipping and transportation of goods, and stable employment in foundational sectors such as health care and social assistance, retail, education services, transportation, construction and manufacturing, and public administration amongst others (Statistics Canada 2023). The Lorneville Peninsula also houses key regional energy producing facilities, such as the Coleson Cove Generating Station and the Burchill Wind Farm.

3.3.2 Land Use

The Project is situated within the Spruce Lake Industrial Park expansion area in Lorneville within the Fundy Coastal Ecodistrict. The Fundy Coastal Ecodistrict is a largely rural landscape where forest cover (76%) remains the dominant land feature. Of the remaining 24% of the land that is not forested, 21% is used for agriculture, with wetlands and waterbodies comprising 37% and 11% of the non-forested land base, respectively (NBDNR 2007). Land cover within 1 km of the Project is 62% forested, 21.1% industrial/infrastructure, 10.6% wetlands, 3.2% cleared areas and no agricultural areas (Table 3.1), with negligible amounts of shoreline, waterbodies, and residential areas. Given its location near the Spruce Lake Industrial Park and the small rural community of Lorneville, the Project site itself is located within a zoning area characterized by a mix of forested uplands, wetlands or watercourse corridors, and scattered cleared areas, with substantial existing built infrastructure linked to the industrial park.

Table 3.1 Summary of Select Attributes Within 500 m of the Project

Attribute	Quantity
Total area (ha)	1782.7
Number of properties	154
Number of buildings	138
Number of water wells	4
Amount of forested land (ha)	1103.6
Amount of agricultural land (ha)	0
Amount of industrial areas/infrastructure (ha)	377.9
Amount of cleared areas (ha)	56.6
Amount of Crown/public land (ha)	772.3
Number of First Nations communities	0
All wetlands (NBDELG) (ha)	189.2
Mapped watercourses (km)	21.3
Natural Protected Areas (ha)	577.5

3.3.3 Transportation, Infrastructure and Services

The nearest residential community to the Project is Lorneville, though the area surrounding the Project is supported primarily by infrastructure and services based in the City of Saint John. Saint John functions as the regional service hub for surrounding rural areas, providing essential municipal, commercial, and emergency services. Many properties in Lorneville rely on private groundwater wells for potable water and utilize private septic systems for wastewater containment. Solid waste and recyclables are handled through Saint John regional waste-management facilities, with additional community composting capacity available for organic materials. The city of Saint John provides emergency services, including the Saint John Police Force for policing and the Saint John Fire Department and the Saint John Regional Hospital for health-care access. Additional services in Saint John include recreational, educational, and administrative services that support both residents and nearby rural populations.

Transportation infrastructure in and near Lorneville includes well-maintained municipal and provincial road networks that facilitate access to the Project Area. Highway Route 1 also provides connectivity to industrial areas in Saint John, as well as broader connectivity with the provincial highway network. Other transportation infrastructure in the area that provide broader connectivity to the rest of the province and further afield include the CN rail line, the Saint John Airport, and freight corridors supporting industrial operations in the Port of Saint John.

As the closest large population centre, Saint John plays an important socio-economic role relative to the Project. It is expected to serve as the primary source of labour, supplies, accommodations, and municipal services during project development and operation. Its established infrastructure further supports its capacity to accommodate increased activity associated with resource-development projects in the region.

3.4 References

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4 Summary of Indigenous Engagement

This section summarizes the Indigenous engagement undertaken in support of the Project with Indigenous communities. For the assessment of potential environmental effects of the Project on the traditional use of the PDA by Indigenous persons (including Indigenous customs, practices, and traditions on ancestral lands), the reader is referred to the Indigenous Land and Resource Use VC (Section 15).

4.1 Engagement Overview

The engagement activities for the Project began in October 2025 and will be ongoing throughout the Project.

The Project's Indigenous engagement program is designed to foster positive, long-term relationships by providing early and ongoing opportunities for Indigenous groups to receive information, share input, and identify concerns related to traditional land and resource use. Engagement activities undertaken between October 2025 and March 2026—including meetings, correspondence, newsletters, and an open house—focused on documenting Indigenous perspectives and informing project planning, mitigation, and management measures.

After identification of Indigenous groups with specific interests in the Project, engagement was initiated. In October 2025, the proponent sent letters to:

- Chief Hugh Akagi, Peskotomuhkati Nation at Skutik
- Chief Arren Sock, Elsipogtog First Nation
- Chief Bernard, Chief Atwin, Chief Perley, Chief Polchies, Chief T. Paul, and Chief S. Paul, Wolastoqey Nation in New Brunswick
- Chief LeBlanc, Chief Knockwood, Chief Ginnish, Chief Barlow, Chief George, Chief Ward, Chief Paul and Chief Richardson, Mi'gmaq Nation

The letter introduced the proponent and the proposed Project, offering to meet and discuss further, and providing their direct contact information. A public open house, publicly advertised and independently communicated to the Chiefs of the Elsipogtog, Mi'gmaq, Peskotomuhkati, and Wolastoqey First Nations of New Brunswick took place on November 5, 2025, from 5:00 – 8:00 p.m. at the Lorneville Community Centre in Lorneville, NB. Additional information regarding the open house is provided in Section 5.

The Proponent has initiated discussions with rights holders and First Nations leadership and organizations, to presentations and informal discussions over meals.

4.2 Summary of Feedback

Responses have yet to be received from Peskotomuhkati Nation at Skutik, Elsipogtog First Nation or Mi’gmaq Nation. A response was received from Mi'gmawe'l Tplut'aqnn Incorporated (MTI) notifying the proponents that the Project may affect the Mi’gmaq Aboriginal and Treaty Right, and they will be conducting a Mi’gmaq Rights Impact Assessment (MRIA). A response was received from the Wolastoqey Nation in New Brunswick who requested a meeting to discuss the impact on the communities they represent in more detail. This meeting has been scheduled for April 2, 2026, and Beacon/VoltaGrid will participate.

Following the notification from MTI to the Proponent regarding conducting a MRIA, a virtual meeting took place between the Beacon and VoltaGrid Project Team including representatives from both organizations, and MTI representatives, to discuss the process of a Mi’gmaq Rights Impact Assessment (MRIA) and as an opportunity to discuss and answer questions about the Project. MTI acknowledged the early engagement as appropriate and constructive, and provided an overview of Mi’gmaq treaty rights and the MRIA process. MTI indicated that the Project may infringe upon lands that are considered by them to be unceded Indigenous territory, not solely municipal land, and advised that MTI will not support any loss of its unceded territory.

4.3 Response and Commitments

Engagement with Indigenous communities in New Brunswick has been initiated and will continue. Beacon and VoltaGrid are committed to early engagement, community investment and local procurement, where feasible, as well as meaningful and ongoing engagement with Indigenous groups throughout the development of the Project. Beacon and VoltaGrid also committed to providing a formal detailed Project description to MTI for the purposes of the MRIA process. Voltagrid and Beacon will continue to share information regarding the Project, its potential environmental effects, and proposed mitigation measures, and will work collaboratively with affected First Nations and regulatory agencies to develop additional mitigation, as warranted. As engagement progresses and new information becomes available, it will be considered in the Project planning accordingly.

5 Summary of Public Engagement

This section summarizes the public engagement in support of the Project. For the summary of Indigenous engagement, the reader is referred to Section 4.

5.1 Engagement Overview

The involvement program initiated by Beacon and VoltaGrid, was formed to identify key stakeholders and interested members of the public and implement strategies for consulting them in a meaningful way throughout the life of the Project. It is expected that through the course of the EIA process and beyond, consultation and engagement strategies will continue to develop and evolve. Similarly, the plan outlines the understanding of the interest that members of the public and key stakeholders may express in the Project, and the methods to be used to communicate Project-related information in a timely manner and make it readily accessible.

The Project's involvement program is designed to foster positive, long-term relationships by providing early and ongoing opportunities for the public to receive information, share input, and identify concerns related to the Project.

The involvement activities for the Project began in October 2025 and are ongoing into 2026—including meetings, correspondence, and an open house—focused on documenting the public and stakeholder perspectives and informing project planning, mitigation, and management measures.

The proponents met in-person with the mayor and council of Saint John on November 4, 2025, and the New Brunswick Department of Environment and Local Government (NBDELG) on November 6, 2025, to discuss the Project. Municipal and provincial representatives were contacted via an introductory letter from Voltagrid and Beacon regarding details of the Project.

5.1.1 Open House

The open house was held on November 5, 2025, from 5:00 – 8:00 p.m. at the Lorneville Community Centre in Lorneville, NB. Public notification of the open house was through various methods including:

- three advertisements in the Telegraph Journal on October 29, 30 and November 1, 2025
- three advertisements in the Acadie Nouvelle, on October 29, 30, and 31, 2025
- letters delivered to residents within the community of Lorneville, New Brunswick
- letters sent to the Chiefs of the Elsipogtog, Mi'gmaq, Peskotomuhkati, and Wolastoqey First Nations of New Brunswick
- an emailed letter sent to the mayors and council of Saint John
- an emailed notification sent to representatives of the Department of Environment and Local Government

The November open house was led by the Co-founder of Beacon and the President and CEO of VoltaGrid, with support from company representatives and Stantec Consulting. Poster boards outlining key Project information, regulatory processes, community benefits, and environmental studies were displayed, followed by informal discussions. In response to requests from those in attendance, a question-and-answer session was held. Questions and concerns were documented, and attendees were invited to submit feedback forms at the event or via Project-specific email addresses.

5.2 Feedback and Response

5.2.1 Open House Feedback

Project information sheets were provided as members of the public entered the event; sign-in was optional. Approximately 147 people attended the November 2025 open house, and representatives from NBDELG were also present.

During the question-and-answer portion of the open house, Project team members noted the common comments and questions posed by attendees. The most frequently mentioned questions and comments from those in attendance at the open house are discussed below, providing an overview of these comments and key areas of interest. While intended as a representative summary, it does not include all questions and topics discussed.

5.2.1.1 Labour and Employment Opportunities

Concerns were raised about the number of long-term jobs that would be created at the facility, as there was concern that data centres require minimal staffing during operation.

Proponent Response

The proponents are passionate about supporting economic development in the area and encouraged those interested to use their direct contact information to submit resumes. It is currently estimated that more than 1,300 jobs will be created during the construction phase of the Project, and roughly 210 jobs will be established during regular operation.

Beacon and VoltaGrid have received significant interest from local companies wishing to become involved in supplying services to the Project, some of whose representatives attended the Open House. Beacon and VoltaGrid are maintaining a database of these companies with a view of reaching out once procurement commences, and will explore partnerships with local post-secondary institutions to provide training and employment pathways.

5.2.1.2 Distance to Residential Areas and Noise Levels During Operation

A common concern among residents is the proximity between the Project facilities and residential homes. This concern included discussions regarding noise levels, as residents worry they will be able to hear operations from their homes. There is also a desire expressed by residents to maintain the natural forest and wetlands surrounding their residential properties.

Proponent Response

The Proponent is motivated to maintain distance between their facilities and surrounding residential homes. The proponents have expressed the desire for a campus-style facility, where they plan to retain a buffer of the natural ecosystem surrounding Project facilities. This buffer would help to reduce noise levels and maintain the natural areas in proximity to residential areas, where possible. To better understand how the Project will change the acoustic environment, acoustic modelling has been conducted as part of the EIA Registration (Section 8).

5.2.1.3 Traffic Control

Members of the public have posed questions regarding increased traffic levels during construction, as well as during operation, and whether this will be problematic with the two-lane road currently leading to the Project area.

Proponent Response

The Proponent does not want increased traffic levels during construction and operation to unreasonably interfere with local communities. As Project planning progresses, so will the understanding of Project-related traffic and transportation infrastructure requirements. The Proponent will work with local officials to undertake the necessary steps to manage traffic impacts and maintain public safety.

5.2.1.4 Loss of Wetlands and Forested Areas

The loss of wetlands and old growth trees within the Project area is a concern expressed to the proponents regarding the Project.

Proponent Response

Environmental studies are required as part of the EIA process. In addition to wetland studies that are required as part of the EIA Registration process, targeted studies focused on old growth trees were completed. The results of these studies are incorporated into this EIA Registration. These concerns will continue to be taken into consideration as the engineering design of Project facilities progresses including maintaining natural buffers buffer around Project facilities.

5.2.1.5 Power Consumption

Attendees asked about the power consumption of the data centre. Specifically, there were concerns regarding the amount of power that would be pulled from the New Brunswick electrical grid system.

Proponent Response

The discussions regarding power supply are ongoing between the proponents and NB Power. It is currently planned for 190 Megawatts (MW) to be generated from the on-site natural gas plant, with another 200 MW supplied to the data centre from NB Power. The Proponent has expressed that it is ideal to be connected to the NB Power grid system and have onsite generation to maintain resiliency in power supply, and they will work with NB Power to determine an acceptable power supply agreement which does not compromise the reliability or affordability of the electricity network.

5.2.1.6 Emissions from Power Production

Residents expressed their concern regarding the emissions produced by the Project during operations, specifically from the on-site natural gas fueled power generators.

Response

The Proponent will use Selective Catalytic Reduction technology at their on-site natural gas power generators to greatly reduce emissions. At their facility in San Antonio, the same technology results in the abatement of 95% of their emissions. The Proponent has undertaken air quality studies, including dispersion modelling, to understand how the Project will interact with air quality; additional information is provided in Section 7.

5.2.1.7 Water Quality and Usage

Discussions have occurred surrounding the water usage of data centres, with members of the public wanting to know the specific amount of water that will be used at the Spruce Lake Hub. Concerns were also expressed regarding if this water usage would impact the drinking water of the surrounding community, as the surrounding community relies on residential wells.

Proponent Response

The on-site power generation facilities will not consume water. Historically, data centres consumed large volumes of water required for cooling; however, data centres are now designed to run on a closed-loop system, which limits the amount of water that is needed for cooling. The Project will include a closed-loop cooling system.

Water for the Project will be supplied by the City of Saint John industrial water system, which has determined that it has sufficient available capacity for the Project; therefore, this will not affect local water wells. The Proponent is committed to working within the environmental parameters that will be established through the EIA process.

5.2.1.8 Post-closure Economics

Members of the public asked about the lifespan of the data centre, with concerns that the modular site infrastructure would facilitate a shorter timeline for Project operations, resulting in less economic growth.

Proponent Response

The Proponent anticipates having a commercial agreement with a customer for a duration of approximately 15-20 years in length though the total duration will be determined through the commercial process. Regular maintenance and equipment replacement will be undertaken as required.

5.3 Commitments and Next Steps

The Proponent is committed to meaningful and ongoing consultation with Indigenous groups, stakeholders, and the public throughout the development of the Project. Engagement will continue using a variety of tools to share information and seek feedback on the Project's environmental, social, and economic aspects, seek feedback, and inform Project planning, with additional public-facing events planned as the EIA process progresses.

6 Assessment Scope and Methods

6.1 Overall Approach

The construction and operation of the Project will trigger requirements of the EIA Regulation under the New Brunswick *Clean Environment Act* (see Section 1.2.1). EIA is a tool for planning and decision-making that is used to predict the potential environmental effects of a project before it is constructed. This chapter describes the methods used to assess the effects of Project activities and components on the biophysical and socio-economic environments. The approach for this assessment was developed by Stantec to fulfill requirements of an EIA Registration document.

Once the scope of the Project to be assessed has been defined and Valued Components (VCs) are identified, Project-related environmental effects are assessed using a framework for each VC. Baseline conditions for each VC are characterized within the defined spatial and temporal boundaries for the assessment, using publicly available information and Project-specific field programs conducted in 2025, where completed. The assessment includes descriptions of how an environmental effect could occur (pathways), the mitigation and environmental protection measures proposed to reduce or eliminate the environmental effect, and the characterization of the residual environmental effects (i.e., the environmental effects that remain after planned mitigation has been applied) of the Project. Where data limitations or uncertainties exist regarding effect predictions or mitigation effectiveness, follow-up and monitoring activities are proposed.

All applicable phases of the Project are described in this EIA Registration, as are potential accidents, malfunctions, and unplanned events. The evaluation also considers the effects of the environment on the Project.

6.2 Scope of the Assessment

6.2.1 Scope of the Project

The scope of the Project encompasses components and activities necessary for the construction and operation and maintenance of the Project's facilities and associated infrastructure. Project components and activities are described in Chapter 2. Given the discussion in Section 2.4.3 further consideration of Project decommissioning is not considered necessary and has not been carried forward through the remainder of the assessment.

6.2.2 Selection of Valued Components

This EIA registration document focuses on VCs which are environmental or socio-economic elements of particular value or interest to First Nations communities, regulators, the public, stakeholders, and/or landowners. The VCs are selected based on ecological importance to the existing environment, the relative sensitivity of environmental components to Project influences, and their relative social, cultural, or economic importance.

The VCs for this assessment were chosen based on the following factors:

- Regulatory guidance and requirements (Section 1.2)
- Preliminary discussions with regulatory agencies prior to Registration
- Technical knowledge of the Project
- Existing conditions for the physical, biological and socio-economic environments
- Experience from previous similar EIAs
- Professional judgement of the Study Team

The following VCs were selected for a focussed assessment:

- Atmospheric Environment
- Acoustic Environment
- Water Resources
- Fish and Fish Habitat
- Vegetation and Wetlands
- Wildlife and Wildlife Habitat
- Socio-economic Environment
- Heritage Resources
- Indigenous Land and Resource Use

The assessment also considered an assessment of the potential effects of the environment on the Project (Section 16). The potential for, and consequence of, the effects of a range of potential accidents or malfunctions to occur over the life of the Project are described in Section 17.

Table 6.1 lists the biophysical and socio-economic components to be addressed, along with the rationale for inclusion, and the assigned VC for discussion.

Table 6.1 Scoping of Valued Components

Environmental Issue Identified	Scoping Considerations	Valued Component Discussed In
Air Quality	Air Quality is regulated by NBDELG under the Clean Air *Act*. The Project will emit air emissions including dust and criteria air contaminants. Dust and air emissions can affect human and ecological health.	Atmospheric Environment
Greenhouse Gas (GHG) and Climate Change	Project-related fuel combustion will result in the release of GHGs during all Project phases. The Province of New Brunswick has committed to reducing GHG emissions by 46% below 2005 emission levels by the year 2030. The Province has also committed to reaching net-zero emissions by 2050, and has developed a suite of actions to support this goal, including establishing five-year interim emission reduction targets in their Climate Change Action Plan (Government of New Brunswick 2022). Anticipated GHG emissions will be calculated for the Project and compared to provincial and federal emission levels and applicable targets for context.	Atmospheric Environment
Acoustic Environment	The Project will create noise that may travel off-site. Noise can cause annoyance and/or negative health effects to people and can adversely affect birds and other wildlife. Noise (for public nuisance) is governed by provincial noise criteria and municipal by-laws.	Acoustic Environment
Groundwater	Groundwater has potential to be a source of potable water and is important in maintaining ecological habitats by supporting surface water resources, vegetation, and wetlands. The Project will not involve groundwater extraction, although Project activities could potentially interact with groundwater resources through site excavation work and/or accidental spills and result in changes to groundwater quality.	Water Resources
Hydrology	Surface water provides habitat for fish, vegetation, and aquatic populations, and can be used as a potable water resource. Mill Creek and Marsh Brook are watercourses north and south of the Project Site respectively, with tributaries branching into the PDA. Site development may alter onsite watercourses and wetlands as well as overland drainage patterns which could affect offsite hydrology if not properly managed.	Water Resources
Fish and Fish Habitat	Fish and fish habitat provide ecological, cultural, recreational and/or economic value and are protected by the federal *Fisheries Act*. Project activities have the potential to interact with aquatic ecosystems, including fish and fish habitat, due to the presence of numerous watercourses in and/or around the PDA. These interactions with Project activities can influence the availability and suitability of habitat for various species and life stages of fish.	Fish and Fish Habitat
Vegetation	Project construction will require clearing of vegetation within the PDA. Loss of vegetation could affect plant species at risk or species of conservation concern, unique species assemblages, and/or uncommon habitats if they were present, and could affect species biodiversity and wildlife habitat.	Vegetation and Wetlands



Table 6.1 Scoping of Valued Components

Environmental Issue Identified	Scoping Considerations	Valued Component Discussed In
Wetlands	Wetlands are valued for environmental, recreational, aesthetic, and socio-economic reasons and are closely linked to water resources, vegetation, and wildlife and wildlife habitat. In New Brunswick wetlands are protected under the provincial wetland policy with policy goals enforced through the *Clean Environment Act* and *Clean Water Act*. Project development will require the permitted alteration and offsetting of wetland habitat under the Watercourse and Wetland Alteration Regulation.	Vegetation and Wetlands
Wildlife and Wildlife Habitat	Project activities will directly and/or indirectly affect wildlife and their habitat. Protection of wildlife species is administered federally through the *Species at Risk Act* (SARA) and the *Migratory Birds Convention Act, 1994* and provincially through the New Brunswick *Species at Risk Act*, and *Fish and Wildlife Act.* Project activities will change the quality and availability of habitats used by terrestrial wildlife and avifauna in the vicinity of the Project. Changes in habitat and potentially food availability may result in changes in wildlife abundance, diversity and distribution within the affected area.	Wildlife and Wildlife Habitat
Heritage Resources	Heritage resources include historical, archaeological, built heritage, and palaeontological resources. These resources are culturally significant and are protected by the *Heritage Conservation Act.* If present in the PDA, heritage resources, are highly vulnerable to loss or disturbance associated with ground disturbance activities that may occur during Project construction.	Heritage Resources
Land Use and Municipal Zoning	The Project will be located within an industrial park on previously undeveloped lands that are zoned Spruce Lake Industrial. The Project will therefore result in a change in current land use but will be compatible with land use zoning. Project components and activities may also result in air and noise emissions which could affect the use and enjoyment of surrounding lands for residential and/or recreational purposes. The Project will also require use of public utilities including power, water and natural gas and, during construction, will require transport of heavy equipment on public roads.	Socio-economic Environment
Indigenous Land and Resource Use	Project development will require alteration of natural habitat and result in changes to land use and access. The Project may therefore affect Indigenous land and resource use.	Indigenous Land and Resource Use

6.2.3 Assessment Boundaries

The scope of the assessment is defined by spatial boundaries (i.e., geographic extent of the Project and potential effects) and temporal boundaries (i.e., timing of potential effects). The spatial boundaries reflect the geographic range over which potential environmental or socio-economic effects may occur, whereas temporal boundaries identify when an environmental or socio-economic effect may occur throughout the different phases of the Project. The spatial boundaries include the following:

- The Project Development Area (PDA) represents the anticipated area of direct physical disturbance associated with the construction, operation and maintenance of the Project. For the purposes of this EIA Registration, the Project encompasses three PDAs as shown on Figure 2.1 (Project Location).
  - The Data Centre PDA encompasses the anticipated physical footprint of the data centre campus, onsite power generation facility (including a substation and switchyard), gas pipeline metering station, stormwater management features, and other ancillary features as shown on Figure 2.2 (Data Centre Layout). The Data Centre PDA is approximately 89 ha.
  - The Transmission Line PDA encompasses two 345 kV transmission lines and a substation at the interconnection with the NB Power grid. The RoW extending from the Data Centre PDA to the Coleson Cove Generating Station is approximately 3.9 km long and 92 m wide and includes both transmission lines. From this point, the lines diverge: one extends north and west towards the community of Five Fathom Hole for 6.4 km to the substation tie in within a 52 m wide RoW along an existing NB Power easement, while the other extends south for 0.7 km to the Coleson Cove Generating Station, also within a 52 m wide RoW and NB Power easement. The Transmission Line PDA is approximately 67 ha.
  - The Pipeline PDA encompasses an approximately 40-m wide, 4.5-km long RoW for up to two 8” (203 mm) diameter natural gas pipelines connecting to the existing Saint John Lateral and/or the Brunswick Pipeline. The Pipeline PDA is approximately 15 ha.
- The Local Assessment Area (LAA) encompasses the area in which Project-related environmental effects (direct or indirect) can be predicted or measured for assessment. The LAA, which is specific to each VC, encompasses the PDAs and is selected in consideration of the geographic extent of effects on the given VC.

Before the Data Centre PDA was designated, a general Project Site was selected, where field studies were conducted in 2025. Subsequently, a smaller preliminary PDA was determined within this Field Study Area, and a preliminary Project layout has been established; this layout will undergo further detailed design. The current size of the Data Centre PDA is considered conservative and may be reduced after detailed design is completed.

VC-specific LAA spatial boundaries and mapping of the boundaries for each VC are provided in the respective VC assessment sections (Sections 7 to 15).

Temporal boundaries for the assessment are based on the timeframes over which potential effects could occur as a result of Project construction, and operation and maintenance phases. The overall Project schedule is presented in Section 2.9.

The temporal boundaries for the Project consist of the following phases:

- Construction: Pending receipt of necessary approvals, construction is anticipated to begin in 2026 and last 12-18 months.
- Operation and Maintenance: Operations are anticipated to begin in 2028 with maintenance activities occurring as needed over the life of the Project (approximately 25-30 years).

6.3 Potential Project Interactions

Table 6.2 indicates where there is a potential interaction between Project activities and the VCs identified for the assessment.

Table 6.2 Potential Project Interactions with Valued Components

Project Activities	Atmospheric Environment	Acoustic Environment	Water Resources	Fish and Fish Habitat	Vegetation and Wetlands	Wildlife and Wildlife Habitat	Socio-economic Environment	Heritage Resources	Indigenous Land and Resource Use
CONSTRUCTION									
Site preparation and earthworks (e.g., clearing, grubbing, grading, excavation, trenching, topsoil management, and installation of water management and erosion and sediment control measures, temporary access road construction)	✓	✓	✓	✓	✓	✓	✓	✓	✓
Installation of Data Centre infrastructure and equipment (e.g., transport of equipment and materials to site; installation of foundations, erection of buildings, installation of ancillary facilities, substation installation)	✓	✓	-	-	-	✓	-	-	-
Pipeline installation (e.g., trenching, pipe stringing, bending, welding and coating, lowering-in, backfilling)	✓	✓	-	✓	-	✓	-	-	-
Transmission line installation (e.g., excavation, foundation design, structure assembly and erection)	✓	✓	-	✓	-	✓	-	-	-
Testing and commissioning (including Data Centre facilities, pipelines and transmission lines)	✓	✓	-	-	-	-	-	-	-

Table 6.2 Potential Project Interactions with Valued Components

Project Activities	Atmospheric Environment	Acoustic Environment	Water Resources	Fish and Fish Habitat	Vegetation and Wetlands	Wildlife and Wildlife Habitat	Socio-economic Environment	Heritage Resources	Indigenous Land and Resource Use
Clean-up and reclamation (e.g., site landscaping, RoWs restoration)	✓	✓	-	✓	✓	✓	-	-	-
Employment and Expenditures [a]	-	-	-	-	-	-	✓	-	-
OPERATION AND MAINTENACE									
Presence and operation of Data Centre (e.g., ongoing operation, fuel, power and water usage, light, noise, and air emissions, domestic sewage, stormwater management)	✓	✓	-	-	-	✓	✓	-	✓
Presence and operation of natural gas pipelines and transmission lines	-	-	-	-	✓	✓	✓	-	✓
Asset inspection and site maintenance (e.g., access and site road maintenance, vegetation management, snow clearing at Data Centre)	✓	✓	-	✓	✓	✓	✓	-	✓
Employment and Expenditures [a]	-	-	-	-	-	-	✓	-	-

Notes:
✓ = Potential interaction
– = No interaction

[A] Project employment and expenditures are generated by most Project activities and components and are the main drivers of many socio-economic effects. Rather than acknowledging this by placing a checkmark against each of these activities, "Employment and Expenditures" is an additional component under each Project phase.

6.4 Mitigation and Management Measures

Once potential effects are identified for a VC, mitigation measures are developed to avoid, reduce, or manage adverse effects, respond to public concerns, and enhance benefits where possible. These measures may encompass standard management practices, as well as VC-specific solutions addressing issues, such as habitat offsetting or compensation, along with planned environmental management and response initiatives.

6.5 Residual Environmental Effects

In consideration of potential effects and proposed mitigation, residual effects (i.e., post-mitigation) are described for each VC.

6.6 Follow-up and Monitoring

In cases where there may be uncertainty around effects predictions and/or effectiveness of mitigation, follow-up and/or monitoring programs may be proposed. Compliance monitoring may also be required in some cases to verify adherence to applicable regulatory requirements, including terms and conditions of environmental permits, approvals, or authorizations issued for the Project. Follow-up and monitoring programs are described as applicable for each VC.

6.7 References

GNB. (Government of New Brunswick) 2022. New Brunswick's Climate Change Plan 2022 – 2027. Available at: https://www2.gnb.ca/content/dam/gnb/Corporate/Promo/climate/climate-change-action-plan.pdf

7 Assessment of Environmental Effects on Atmospheric Environment

7.1 Scope of Assessment

The atmospheric environment has been selected as a valued component (VC) because activities associated with Project construction and operation can adversely affect air quality and result in release greenhouse gas (GHG) emissions.

Air quality is defined by the composition of the ambient air, including the presence and quantity of air contaminants, which may have adverse effects on human health, vegetation and wildlife. The concentrations of air contaminants in the ambient air can be compared with air quality objectives and criteria, which are established to protect environmental and human health. Air quality is highly correlated with local sources of air contaminants (e.g., industrial facilities and heavy vehicle traffic). Other more secondary influences on air quality include the long-range transport of air contaminants from distant sources (i.e., forest fires).

The release of GHGs on a global scale cumulatively increases the concentrations of GHGs in the atmosphere worldwide over time and contributes to global warming and climate change (IPCC 2024). The GHG emissions resulting from the construction and operation of any single project would have small or negligible effects on climate change. However, the releases of GHG emissions from a proposed project can be compared to provincial and national GHG releases and reduction targets to establish magnitude and potential local outcomes in relation to achieving provincial and federal GHG reduction targets.

7.1.1 Regulatory Context

7.1.1.1 Air Quality

The New Brunswick Air Quality Regulation under the New Brunswick *Clean Air Act* regulates air quality in the province. The Regulation and the Act provide measures to regulate the release of air contaminants to the atmosphere from sources (usually industrial facilities), provide emissions testing and monitoring provisions, and establish maximum permissible ground-level concentrations of specific air contaminants in the ambient air, among other requirements.

Table 7.1 presents air quality criteria for the contaminants expected to be emitted in the most substantive quantities from Project activities. These contaminants are the focus of this assessment and include those regulated under the current NB Air Quality Regulation (i.e., carbon monoxide [CO], nitrogen dioxide [NO_2], sulphur dioxide [SO_2], and total suspended particulate [TSP]). Hydrogen sulphide (H_2S) is also regulated under the NB Air Quality Regulations, but emissions from the Project are expected to be negligible. Table 7.1 also includes air quality objectives for fine particulate matter (particulate matter less than 2.5 micrometres in diameter [$PM_{2.5}$]) from the Canadian Ambient Air Quality Standards, and formaldehyde (CH_2O) and ammonia (NH_3) from the Ontario Ambient Air Quality Criteria, since these contaminants are not included in the current NB Air Quality Regulations. Fine particulate matter and CH_2O are trace products of incomplete combustion in natural gas fired engines. Ammonia is emitted from the engines due to trace losses from the selective catalytic reduction (SCR) system (an emissions control device) which uses NH_3 and is for nitrogen oxides (NO_X) control.

In September 2025, New Brunswick released proposed updates to its ambient air quality objectives (NBDELG 2025a) as part of the ongoing review and modernization of the *Clean Air Act*. The proposed objectives are also presented in Table 7.1 for comparison with the existing provincial objectives. The proposed objectives are in draft form and are not yet finalized.

The generator engines emissions are subject to Federal emission limits under Multi-Sector Air Pollutant Regulations (MSAPR). MSAPR are federal rules that set national emission limits for NO_x from key industrial equipment like stationary spark-ignition engines.

Table 7.1 Current and Proposed Air Quality Objectives – New Brunswick

Air Contaminant	Units	Air Quality Criteria				Proposed Updates to the New Brunswick Ambient Air Quality Objectives				
		1 hour	8 hours	24 hours	Annual	10 minutes	1 hour	8 hours	24 hours	Annual
CO	micrograms per cubic meter ($\mu g/m^3$)	35,000 [a]	15,000 [a]	-	-	-	30,000	10,000	-	-
NO_2	$\mu g/m^3$	400 [a]	-	200 [a]	100 [a]	-	200	-	-	-
SO_2	$\mu g/m^3$	450 [a, b]	-	150 [a, b]	30 [a, b]	178	-		-	-
$PM_{2.5}$	$\mu g/m^3$	-	-	27 [c]	8.8 [d]	-	47	-	23	8
TSP	$\mu g/m^3$	-	-	120 [a]	70 [a, e]	-	200	-	120	70 [d]
PM_{10}	$\mu g/m^3$	-	-	-	-	-	94	-	54	18
CH_4O	$\mu g/m^3$	-	-	65 [f]	-	-	-	-	34	4.3
NH_3	$\mu g/m^3$	-	-	100 [f]	-	-	-	-	30	-

[a] Source: New Brunswick Air Quality Regulations

[b] The air quality criteria SO_2 is lower for Charlotte, Kings, and Saint John counties due to historical exceedances of objectives in these areas; the Project is located in Saint John county.

[c] Source: Canadian Ambient Air Quality Standards (CAAQS) (CCME 2025); 3-year average of the annual 98th percentile of the daily 24-hour average concentration

[d] Source: CAAQS (CCME 2025); The 3-year average of the annual average concentrations

[e] Geometric mean

[f] Source: Ontario Ambient Air Quality Criteria (OMECP 2020)

The Canadian Ambient Air Quality Standards (CAAQS), developed by the Canadian Council of Ministers of the Environment (CCME), provide guidance for reducing and managing the release of air contaminants (CCME 2025). The CAAQS standards are presented in Table 7.2.

Table 7.2 Canadian Ambient Air Quality Standards

Air Contaminant	Averaging Period	parts per billion (ppb)	µg/m^3
Ozone (O_3)	8 hours	60	118
NO_2	1 hour	42	79
	1 year	12	23
SO_2	1 hour	65	170
	1 year	4	10
$PM_{2.5}$	24 hours	-	27
	1 year	-	8.8

The CAAQS includes standards for 2020, 2025, and 2030; the 2025 standards are listed above, with the exception of fine particulate matter since there is no 2025 standard available. The 2020 standard for fine particulate matter is presented above.

Metrics for each measured parameter:
$PM_{2.5}$ (24 hour) 3-year average of the annual 98th percentile of the daily 24-hour average concentrations
$PM_{2.5}$ (annual) 3-year average of the annual average concentrations
O_3 (8 hour) 3-year average of the annual 4th highest maximum 8-hour average concentrations
SO_2 (1 hour) 3-year average of the annual 99th percentile of the SO_2 daily maximum 1-hour average concentrations
SO_2 (annual) Arithmetic average over a single calendar year of all the SO_2 1-hour average concentrations during the year
NO_2 (1 hour) 3-year average of the annual 98th percentile of the NO_2 daily maximum 1-hour average concentrations
NO_2 (annual) Arithmetic average over a single calendar year of all the NO_2 1-hour average concentrations during the year
Source: CCME 2025

The New Brunswick Department of Environment and Local Government (NBDELG) participates in CCME's Air Quality Management System (AQMS), a national framework for managing and improving air quality. The AQMS consists of four management levels for defined geographical areas (air zones), each corresponding to a range of air pollutant concentrations defined under the CAAQS with associated actions and objectives. The goals of the management levels are as follows:

- Red management level, to reduce pollutant levels below the CAAQS through advanced air management actions
- Orange management level, to improve air quality through active air management and prevent exceedances of the CAAQS
- Yellow management level, to improve air quality using early and ongoing actions for continuous improvement
- Green management level, to maintain good air quality through proactive air management measures to keep clean areas clean

With respect to construction-related air contaminant emissions, diesel combustion in mobile equipment as well as fugitive dust from unpaved areas being developed, are the primary sources of air contaminants. Air contaminant emissions from mobile equipment are regulated by federal legislation. These include emission control standards in the On-Road Vehicle and Engine Emission Regulations and the Off-road Compression-Ignition (Mobile and Stationary) and Large Spark Ignition Engine Emission Regulations. The Sulphur in Diesel Fuel Regulations sets the maximum amount of sulphur in diesel as 15 milligrams per kilogram (mg/kg) to reduce emissions of SO_2.

7.1.1.2 Greenhouse Gases

The New Brunswick output-based pricing system (OBPS) requires industrial facilities emitting 50,000 tonne (t) or more of carbon dioxide equivalent (CO_2e) from direct GHG emission sources to report and verify GHG emissions under New Brunswick Regulation 2021-43 (the Reduction of Greenhouse Gas Emissions Regulation – *Climate Change Act*). The Regulation establishes GHG emissions performance standards that facilities are required to achieve, to reduce provincial GHG emissions over time. Facilities emitting between 10,000 and 50,000 t CO_2e have the option to opt in to the OBPS program.

The OBPS does not apply to construction emissions, only direct emissions released during operation of a regulated facility (such as the Project). Direct GHG emissions refer to those generated by sources or activities that are owned and/or controlled by a reporting entity (e.g., the combustion of fossil fuels, or emissions from industrial processes, flaring, venting, or fugitive emissions). Indirect GHG emissions refer to those occurring from sources or activities that are owned and/or controlled by another entity but are the result of the reporting entity's activities or project (e.g., the consumption of electricity or district heating that is generated off-site, product distribution by a third party, or employee travel).

The Province of New Brunswick has committed to reducing GHG emissions by 46% below 2005 levels by 2030. The Province has also committed to achieving net-zero GHG emissions by 2050 (Province of New Brunswick 2022).

Federally, industrial facilities that emit more than 10,000 t CO_2e per year from direct sources during operation are required to quantify and report their GHG emissions to the Environment Canada and Climate Change (ECCC) Greenhouse Gas Reporting Program (GHGRP) (ECCC 2023). Canada also has GHG reduction targets, including an Emissions Reduction Plan to reduce the country's GHG emissions 40-45% below 2005 levels by 2030, a target of reducing GHG emissions by 45-50% below 2005 levels by 2035, and a commitment to achieve net-zero GHG emissions by 2050 (ECCC 2025).

7.1.2 Assessment Boundaries

The assessment of potential environmental interactions between the Project and the atmospheric environment is focused on three PDAs and an LAA.

The PDAs represent the anticipated area of direct physical disturbance associated with the construction, operation and maintenance of the Project. For the purposes of this EIA Registration, the Project encompasses three PDAs as described in Section 6.2.3 and shown on Figure 2.1: the Data Centre PDA, the Transmission Line PDA, and the Pipeline PDA.

The LAA for changes in air quality is defined as the area within which the environmental effects of the Project can be measured or predicted and can be thought of as the theoretical “zone of influence” of the Project on the atmospheric environment. The LAA is defined as a 20 km by 20 km square, centred on the Project, shown in Figure 7.1.

The LAA for GHGs is considered to be global, since climate change impacts occur on a worldwide scale and because GHG emissions will disperse after they are released from Project activities and will remain in the atmosphere for a long time.

Temporal boundaries for the assessment are based on the timeframes over which potential effects could occur as a result of Project construction, and operation and maintenance phases as defined in Section 6.2.3.



Figure No.

7.1

Title

Atmospheric Environment Spatial Boundaries

Client/Project

121418636-011

Beacon Data Centres Inc.
Spruce Lake AI Data Centre

Project Location

Lorneville,
New Brunswick

Prepared by SC on 2026-03-05
QR by NW on 2026-03-05

N

0 2 4 km

(At original document size of 11x17)
1:100,000

Legend

- Local Assessment Area
- Project Site (Field Study Area)

Project Development Areas (PDA)

- Data Centre PDA
- Pipeline PDA
- Transmission Line PDA

Other Features

- Highway
- Collector Road
- Local Road
- Contour - 10m
- Building
- Protected Natural Area

Waterways and Wetlands

- Field-Delineated Watercourse
- Watercourse (NBHN)
- Wetland (Stantec 2025)
- Wetland (NBELG)
- Provincially Significant Wetland



Notes

1. Coordinate System: NAD 1983 CSRS New Brunswick Stereographic
2. Data Sources: Beacon Data Centres Inc.; Data License with the Government of New Brunswick (NBDEL3, NBNRED, Service NB), New Brunswick Power; Stantec
3. Background: Esr, USGS

Stantec

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C:\121418636_Beacon_Lorneville_Constraints.aprx Revised: 2026-03-27 By: schubbs
C:\121418636\7 project data\work group\12 drawing\1 environmental\2 drawings\3 draft figures\APRX1 Constraints_Open House Mapping\121418636_Beacon_Lorneville_Constraints_Open House_Mapping.aprx Revised: 2026-03-27 By: schubbs

7.2 Existing Conditions

7.2.1 Approach and Methods

The existing conditions for air quality are characterized based on a desktop review of available published data for ambient (ground-level) air contaminant concentrations and releases of air contaminants from existing sources near the Project. The ambient background data is obtained from National Air Pollution Surveillance (NAPS) station at Saint John, located approximately 10.3 km northeast of the Project site. The existing conditions for GHG emissions are based on the latest provincial and national data published by ECCC.

7.2.2 Description of Existing Conditions

7.2.2.1 Air Quality

The provincial government publishes annual air quality monitoring reports. The province has been separated into three air zones to guide management actions. The Project is located within the Southern Air Zone, which encompasses the southern boundary of New Brunswick and includes Saint John and surrounding areas. The Saint John area is home to several industrial facilities, and an industrial port, resulting in infrequent exceedances of air quality objectives.

The most recently available ambient air quality data in New Brunswick was published in 2025 (NBDELG 2025b). There were some exceedances of provincial ambient air quality objectives and CAAQS, related to odorous compounds released from industrial facilities (SO_2) in Saint John and in the Northern Air Zone (NBDELG 2025b). The AQMS management level for SO_2 is red in the Southern Air Zone due to measurements of SO_2 in Saint John, meaning advanced management actions are required to achieve CAAQS limits (NBDELG 2025b). The AQMS management level is orange for $PM_{2.5}$ and NO_2 in the Southern Air Zone because of measurements of NO_2 in Saint John, meaning improvements to air quality are required for continuous improvement. A total of four air quality advisories were issued in 2023 for New Brunswick. One advisory was due to an industrial fire in Saint John, while the other three were related to forest fires in Quebec and the long-range transport of air contaminants (NBDELG 2025b).

There is an ambient air monitoring station in Lorneville measuring SO_2 and $PM_{2.5.}$ the Saint John, West Side, NAPS station (NAPS Station ID: 40207) , located approximately 10.3 km northeast, monitors NO_2, $PM_{2.5}$, SO_2, and CO. Stantec assessed both the Lorneville and Saint John's ambient air quality data for species monitored at both (SO_2 and $PM_{2.5}$) and found that the Saint John station had higher concentrations; therefore, these were used to conservatively characterize baseline concentrations of SO_2 and $PM_{2.5}$ for the Project. The Saint John NAPS station was also used to characterize baseline concentrations of NO_2 and CO. In the absence of a detailed Ontario MECP methodology for processing background data, the approach followed the Alberta Air Quality Model Guideline (AEP 2021), which is also recommended in NSECC's guidance (NSECC 2023).).

Because TSP and PM_{10} are not monitored at nearby stations, they were estimated using ratios from a study by Brook et al. (1997) who reported that PM_{10} and $PM_{2.5}$ represent 44% and 21.6% of TSP in ambient air, respectively.



Formaldehyde and ammonia monitoring data are not available for location Lorneville. Given the rural characteristics of the surrounding area and the absence of significant nearby emission sources, background concentrations of formaldehyde and ammonia were assumed to be negligible. Therefore, the background concentration for both compounds were assumed to be zero for the purposes of this assessment.

The Saint John station is part of ECCC's NAPS network (ECCC 2025), and the resulting background concentrations and applicable air quality standards are summarized in Table 7.3.



Table 7.3 Background Concentrations, Saint John West Side NAPS Station (ECCC 2025),

Air Contaminant	Averaging Period	Background Concentration (µg/m³) [a]	Ambient Air Criteria (µg/m³) [b]	% of Ambient Air Criteria	Methodology
CO	1-hour	248	35,000	0.7%	3-year average of the annual 1-hour 90th percentile concentration (2023-2025) measured at the Saint John West Side NAPS station.
	8-hour	246	15,000	1.6%	3-year average of the maximum annual 8-hour average concentration after removal of the 90th percentile hourly data (2023-2025) measured at the Saint John West Side NAPS station.
NO_2	1-hour	14.4	400	3.6%	3-year average of the annual 1-hour 90th percentile concentration (2023-2025) measured at the Saint John West Side NAPS station.
	24-hour	11.4	200	5.7%	3-year average of the maximum annual 24-hour average concentration after removal of the 90th percentile hourly data (2023-2025) measured at the Saint John West Side NAPS station.
	Annual	4.2	100	4.2%	3-year average of the annual average concentration after removal of the 90th percentile hourly data (2023-2025) measured at the Saint John West Side NAPS station.
SO_2	10-min [c]	3.2	-	-	Converted from the 1-hour estimated background concentration.
	1-hour	1.9	450	0.4%	3-year average of the annual 1-hour 90th percentile concentration (2023-2025) measured at the Saint John West Side NAPS station.
	24-hour	1.5	125	1.2%	3-year average of the maximum annual 24-hour average concentration after removal of the 90th percentile hourly data (2023-2025) measured at the Saint John West Side NAPS station.
	Annual	0.3	60	0.5%	3-year average of the annual average concentration after removal of the 90th percentile hourly data (2023-2025) measured at the Saint John West Side NAPS station.
TSP [d]	1-hour	44.8	-	-	Derived from PM2.5 concentrations (Brook et al 1997)
	24-hour	44.3	120	36.9%	
	Annual	21.8	70	31.2%	
PM_{10} [d]	1-hour	19.7	-	-	Derived from PM2.5 concentrations (Brook et al 1997)
	24-hour	19.5	-	-	
	Annual	9.6	-	-	



Air Contaminant	Averaging Period	Background Concentration (µg/m^3) [a]	Ambient Air Criteria (µg/m^3) [b]	% of Ambient Air Criteria	Methodology
$PM_{2.5}$	1-hour	9.7	-	-	3-year average of the annual 1-hour 90th percentile concentration (2023-2025) measured at the Saint John West Side NAPS station.
	24-hour	9.6	27 [e]	35.4%	3-year average of the maximum annual 24-hour average concentration after removal of the 90th percentile hourly data (2023-2025) measured at the Saint John West Side NAPS station.
	Annual	4.7	8.8 [e]	53.4%	3-year average of the annual average concentration after removal of the 90th percentile hourly data (2023-2025) measured at the Saint John West Side NAPS station.

Notes:

[a] For 1-hour averaging period, the 90th percentile value from the cumulative frequency distribution of the background monitoring data is calculated for each year. For 24-hour and annual averaging period, the average value is calculated from the reduced dataset (after removing values greater than the 90th percentile) for each year. The background concentrations are calculated as the 3-year average.

[b] Schedule B NB Air Quality Regulation 97-133 – *Clean Air Act* (NBDELG 2018)

[c] Estimated from 1-hour background concentration (OMECC 2018)

[d] Derived from $PM_{2.5}$ concentrations (Brook et al 1997)

[e] CAAQS

7.2.2.2 GHG Emissions

The GHGs that are regulated in New Brunswick include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulphur hexafluoride (SF_6), hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs). The GHGs that are relevant for the Project are CO_2, CH_4, and N_2O. Other GHGs are expected in insubstantial amounts, or none, based on Project activities and design. Total GHG emissions are represented as tonnes (t) of carbon dioxide equivalent (CO_2e). To calculate emissions in CO_2e, emissions from each specific GHG are multiplied by their 100-year global warming potential (GWP). The GWPs of the GHGs included in this assessment are from the Intergovernmental Panel on Climate Change Fifth Assessment Report (IPCC 2014), which are used for GHG reporting provincially and nationally. They are as follows:

- CO_2 = 1.0
- CH_4 = 28
- N_2O = 265

In 2023, the quantity of GHG emissions released to the atmosphere in Canada was 694,000 kilotonnes (kt) of CO_2e (based on the most recently published data from Canada's National Inventory Report [NIR]). In New Brunswick, 11,500 kt CO_2e were released in 2023, representing approximately 1.7% of Canada's GHG emissions (ECCC 2025).

7.3 Potential Effects and Effect Pathways

A summary of the potential effects and Project effect pathways to be assessed for the atmospheric environment is provided in Table 7.3. Potential environmental effects and effects pathways were selected based on details of the Project releases to air, assessment scopes of similar projects in NB and other parts of Canada, and professional judgement.

Table 7.4 Potential Effects and Effect Pathways for Atmospheric Environment

Potential Effect	Effect Pathway(s)
Change in Air Quality	Releases of combustion gases, including sulphur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), total suspended particulate (TSP), particulate matter less than 2.5 microns ($PM_{2.5}$), and particular matter less than 10 microns (PM_{10}), and releases of formaldehyde (CH_2O) and ammonia (NH_3).
Change in GHG Emissions	Releases of GHGs, including carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O)

The Project will interact with the atmospheric environment resulting in a change in air quality and GHG emissions from the following activities:

- Site preparation activities, including clearing, grading, and construction of Project infrastructure, including the transmission line and pipeline RoWs (i.e., the combustion of diesel in heavy off-road equipment)
- Land-use changes (i.e., the decomposition of cleared vegetation following land clearing, and the loss of organic carbon in soil after earth works)
- Operation of the natural gas power generating station (i.e., the combustion of natural gas in the on-site generators and boilers)
- The consumption of electricity from the New Brunswick electrical grid (indirect GHG emissions)

Other direct and indirect sources of GHG emissions could occur, but they would be small in comparison to the sources listed above.

7.4 Mitigation Measures

The following mitigation measures specific to the atmospheric environment have been identified for the Project:

- Diesel with renewable content for construction equipment (e.g., biodiesel or renewable diesel) will be used, where feasible.
- Natural gas, which is considered the cleanest burning fuel of the available options and reduces air contaminant and GHG emissions as compared to other fossil fuels, will be used for power generation during operation.
- Equipment will be maintained in good working order to optimize energy efficiency.
- Idling of engines will be reduce or eliminated, where practical.
- Only vegetation and wetland that is within the Project's footprint and necessary for Project development will be removed.
- Disturbed areas that do not need to remain cleared will be revegetated as soon as possible to reduce dust.
- Transportation routes will be planned to reduce transportation distances and the consumption of fossil fuels, where feasible during construction.
- Dust control measures, such as the use of dust suppressants or water on unpaved roads, will be used as required during construction, especially during dry and windy conditions, to mitigate the generation and distribution of particulate matter (dust) from construction activities.
- The Jenbacher J624 engines are equipped with high efficiency emission control systems including selective catalytic reduction (SCR) and oxidation catalysts that substantially reduce NO_X, CO, and CH_2O emissions.



7.5 Residual Environmental Effects

Potential environmental effects on the atmospheric environment were identified in Section 7.3. For the atmospheric environment, two effects were identified: change in air quality and change in GHG emissions. Residual effects (i.e., those remaining following implementation of mitigation in Section 7.4) for each Project phase are evaluated below.

7.5.1 Change in Air Quality

7.5.1.1 Construction

During construction of the Project, the release of air contaminants is expected to occur from the combustion of fossil fuels (mainly diesel) in off-road heavy equipment, and stationary equipment. Equipment used for Project activities will be maintained in good working, according to manufacturer's recommended schedules, to optimize energy efficiency. Idling of engines will be avoided where practical, and transportation routes will be managed to reduce transportation distances and the consumption of fossil fuels.

Dust is expected to be generated from earth moving activities, loading and dumping of materials, and unpaved access roads during construction activities. Dust control measures will be used as required, such as the use of dust suppressants or water on unpaved roads, to mitigate the generation and distribution of dust during construction. Disturbed areas that do not need to remain cleared will be revegetated as soon as possible to reduce dust. During especially dry and windy conditions, construction activities may be reduced to reduce emissions of dust.

Exceedances of ambient air quality standards during construction are not expected. As construction is temporary and short-term, a detailed emissions inventory or modelling was not completed, since construction air contaminant emissions can generally be managed by applying best practices.

7.5.1.2 Operation

During operation of the Project, the release of air contaminants is expected to occur from the combustion of natural gas in the generator engines and boilers. The Project has 50 Jenbacher J624 engines and eight Clearfire CFLC-500 condensing boilers . Although Beacon only requires 42 engines to generate the power typically required by the data centre (190 megawatt (MW)), the dispersion modelling assessment was conservatively based on all 50 engines operating continuously at their maximum rated capacity. Each Jenbacher J624 engines is equipped with high efficiency emission control systems including selective catalytic reduction (SCR) and oxidation catalysts that substantially reduce NO_X, CO, and CH_2O emissions.

Project operations will result in the release of air contaminants including NO_X, CO, SO_2, TSP, PM_{10}, $PM_{2.5}$, CH_2O, and NH_3. The emissions inventory for the sources associated with Project activities was developed using engineering estimates provided by the Proponent. An estimate of operation phase air contaminant emissions for each engine and boiler is provided in Table 7.5. Table 7.6 provides total annual emissions for the Project. The detailed emissions inventory can be found in Appendix B.



The NO_X emissions from the engines are subject to Multi-Sector Air Pollutant Regulations (MSAPR) emission limit of 2.7 g/kWh (ECCC 2016). The NO_X emissions for each engine are calculated to be 0.06 gram per kilowatt hour (g/kWh). Project emissions are well below this federal emission standard.

Table 7.5 Point Source Emission Rates (per unit)

Source		Generator Engine (per unit)	Condensing Boiler (per unit)
Make/Model		**Jenbacher J624**	**Clearfire CFLC-5000**
Period of Operation		Continuous	Continuous
Emission Rate			
NO_X	grams/second (g/s)	0.0737	0.0219
CO	g/s	0.141	0.0519
$PM_{2.5}/PM_{10}/TSP$	g/s	0.0189	0.000933
SO_2	g/s	0.0101	0.000397
CH_4O	g/s	0.0378	0.0000463
NH_3	g/s	0.0241	-

Note:
Emission rates are provided per unit. There are total of 50 engines and eight boilers.

Table 7.6 Total Annual Project Emissions

Source	Unit	Total Project Emissions
NO_X	tonnes/year(t/y)	122
CO	t/y	236
$PM_{2.5}/PM_{10}/TSP$	t/y	30.0
SO_2	t/y	16.0
CH_4O	t/y	59.6
NH_3	t/y	38.0

An Air Dispersion Modelling (ADM) Study, using the United States Environmental Protection Agency (US EPA) plume dispersion model, AERMOD, was undertaken to assess the potential environmental effects of Project operations on air quality (Appendix B). The ADM study area, which is also the LAA for the assessment of atmospheric environment, consists of a 20 km by 20 km area, centred on the Data Centre PDA (Figure 7.1).

Predicted concentrations from the dispersion modelling are compared against the ambient air quality criteria in Schedule B of the New Brunswick Air Quality Regulation – *Clean Air Act* as well as standards from other jurisdictions for air contaminants of concern that are not included in the NB criteria. Representative background concentrations were added, where applicable, to the model predicted values to account for influences from other existing regional emission sources not included in the modeling.

The results of the dispersion modelling show that the maximum predicted ground-level concentrations of air contaminants modelled (including background) are well below the applied ambient criteria (as summarized in Table 7.1 and 7.2). The maximum predicted concentrations (excluding background) in the modelling domain were predicted to be on the Project property boundary, and all were 28.8% or lower of the applicable criteria, indicating that air quality will not be substantially influenced by the Project.

A more detailed discussion of maximum predicted ground level concentrations and their comparison to the ambient air objectives can be found in Appendix B.

7.5.2 Change in GHG Emissions

7.5.2.1 Construction

The main sources of direct GHG emissions during Project construction includes the combustion of fossil fuels in off-road mobile and stationary construction equipment during site preparation activities and construction of Project infrastructure, the decomposition of cleared vegetation following land clearing, and loss of organic carbon in soil after earth works. Grid electricity will not be used during construction of the Project. The GHG emissions from construction activities are anticipated to be negligible in comparison to the annually reported emissions in New Brunswick.

7.5.2.2 Operation

The main source of direct GHGs during Project operation is the combustion of natural gas in the on-site generators and boilers to produce energy for the Project. Electricity from the New Brunswick electrical grid is required to supplement on-site generation and is the main source of indirect GHG emissions. Other direct and indirect sources of GHG emissions were not calculated because they are expected to be small in comparison to the sources that were quantified.

The estimated natural gas consumption rate of the onsite power systems (1,813 GJ per hour) was calculated from fuel input information obtained from the generator manufacturer. Emissions of CH_4 and N_2O from the combustion of natural gas were estimated using emission factors published in Canada's NIR (ECCC 2025). For CO_2 emissions, an emission factor from the generator manufacturer was used (110 pounds per million British Thermal Units [lb/MMBTU]). Although the Project only requires 42 engines to generate the power that would typically be required by the data centre (190 MW), the GHG calculations were conservatively based on all 50 engines operating continuously at their maximum capacity.

The NIR includes the consumption intensity of electricity in New Brunswick (ECCC 2025). The emissions intensity and the estimated electricity consumption rate at 190 MW per year (for 8,760 hours per year) were used to estimate indirect GHG emissions from the Project electricity consumption.



The GHG emissions from Project activities during operation are presented in Table 7.7

Table 7.7 Annual GHG Emissions During Operation

Source	CO_2 (t/yr)	CH_4 (t/yr)	N_2O (t/yr)	CO_2e (t/yr)
Direct190 MW Generators – Natural Gas	750,878	15.46	14.63	755,187
Indirect Electricity Consumption	-	-	-	**389,470**

Approximately 755,187 t CO_2e per year of direct GHG emissions are expected to be released annually during operation of the Project from the combustion of natural gas in the generators and boilers. This represents approximately 6.6% of New Brunswick's 2023 GHG emissions (ECCC 2025). It is expected the Project will be required to report GHG emissions both provincially and federally during operation and comply with the GHG performance standards for electricity generation. The Project will have an impact on New Brunswick's achievement of 2030 and 2050 GHG reduction targets that will need to be managed. A net zero by 2050 plan will be required for the Project to comply with provincial and federal GHG targets.

The provincial *Reduction of Greenhouse Gas Emissions Regulation – Climate Change Act* requires industrial facilities releasing 50,000 tCO_2e or more per year from direct GHG sources during operation to quantify and report their direct GHG emissions and comply with performance standards annually. These emissions must be third-party verified. Federally, industrial facilities that emit more than 10,000 t CO_2e per year from direct sources during operation are required to report their GHG emissions to the ECCC Greenhouse Gas Reporting Program (ECCC 2023).

7.6 Follow-up and Monitoring

No follow-up is planned, based on the low contributions to existing air contaminant concentrations predicted from modelling and the existing ambient air quality network near the Project. The Project will apply for an Approval to Operate under the New Brunswick Air Quality Regulation and may be subject to monitoring requirements under the Approval.

The Project will likely be subject to GHG emissions reporting both federally and provincially. The Project will likely participate in the New Brunswick OBPS and therefore would be subject to emissions performance standards. Participants in the OBPS are required to have their GHG emissions verified by a third-party on an annual basis.

7.7 References

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8 Assessment of Environmental Effects on Acoustic Environment

8.1 Scope of Assessment

Acoustic Environment was selected as a VC due to the potential for Project-related noise to cause sensory disturbance affecting land and resource use, and wildlife and wildlife habitat. The acoustic environment is characterized by the type, frequency, and duration of sound. Noise is unwanted sound that can adversely affect humans and wildlife. Sound pressure levels (Leq) are measured in decibels (dB). An A-weighted decibel scale (dBA) is used to report sound pressure levels that relate more closely to the sensitivities of the human ear.

8.1.1 Regulatory Context

The New Brunswick Noise Complaint Response Guidelines (NBDELG 2023) provide a procedure to address noise complaints from industrial facilities where noise impacts off-site noise receptors. The guidelines only apply to sites regulated by an Approval to Operate issued under the *Clear Air Act* or the *Clean Environment Act*. The guidelines do not supersede existing approval conditions or apply to impulse noise such as blasting. If a regulated facility exceeds the noise levels in the guidelines during a one-hour survey, the facility must self-rectify the noise issue or will be required to conduct a noise impact assessment (NBDELG 2023). The guidelines apply to the cumulative noise level, or the combination of baseline noise conditions and noise emissions from Project-related activities.

The New Brunswick noise guidelines are shown in Table 8.1.

Table 8.1 New Brunswick Noise Complaint Response Guidelines

Time of Day	Guideline 1-hour Equivalent Sound Pressure Level (dBA)
Daytime (7 AM to 7 PM)	60
Evening (7 PM to 11 PM)	55
Nighttime (11 PM to 7 AM)	50

The City of Saint John Noise By-Law (By-law Number M-22: A By-law Respecting the Prevention of Excessive Noise in the City of Saint John) provides guidance for acceptable noise levels within city limits, including in the Spruce Lake Industrial Park. The Noise By-law does not include quantitative limits but prohibits excessive or disturbing noise that unreasonably interferes with residents' enjoyment of property or constitutes a public nuisance, regardless of land use. It restricts specific noise-generating activities (such as vehicle noise, amplified sound, and unnecessary idling), provides limited exemptions (e.g., emergencies), and authorizes enforcement actions, fines, and other remedies for non-compliance, based primarily on a complaint-driven basis.

8.1.2 Assessment Boundaries

The assessment of potential environmental interactions between the Project and the acoustic environment is focused on three PDAs and an LAA.

The PDAs represent the anticipated area of direct physical disturbance associated with the construction, operation and maintenance of the Project. For the purposes of this EIA Registration, the Project encompasses three PDAs as described in Section 6.2.3 and shown on Figure 2.1: the Data Centre PDA, the Transmission Line PDA, and the Pipeline PDA.

The LAA for this VC is defined as a buffer of 1.5 km around the PDAs to encompass nearby receptors that may encounter Project noise.

Temporal boundaries for the assessment are based on the timeframes over which potential effects could occur as a result of Project construction, and operation and maintenance phases as defined in Section 6.2.3.

8.2 Existing Conditions

8.2.1 Approach and Methods

8.2.2 Description of Existing Conditions

Existing conditions of the acoustic environment were established through sound monitoring completed on February 4, 2026. The baseline sound monitoring survey was conducted in accordance with ISO 1996-2:2007 using Type 1 sound meters that logged one-minute equivalent sound pressure level values over a period of 24 hours. The noise monitoring location is shown in Figure 8.1 and was selected due to its location relative to nearby receptors.

The 1-minute sound levels were then used to calculate daytime (L_d), evening (L_e), and nighttime (L_n) sound levels occurring for nearby receptor locations. A summary of the daytime, evening, and nighttime average sound levels is provided in Table 8.2. Noise near the Data Centre PDA is characterized predominantly by roadway traffic that occurs along Lorneville Road.

Table 8.2 Average Baseline Sound Pressure Level (dBA) by Time Period

Time period	L_{eq} (dBA)
Daytime (7 AM to 7 PM)	45.1
Evening (7 PM to 11 PM)	40.6
Nighttime (11 PM to 7 AM)	38.5

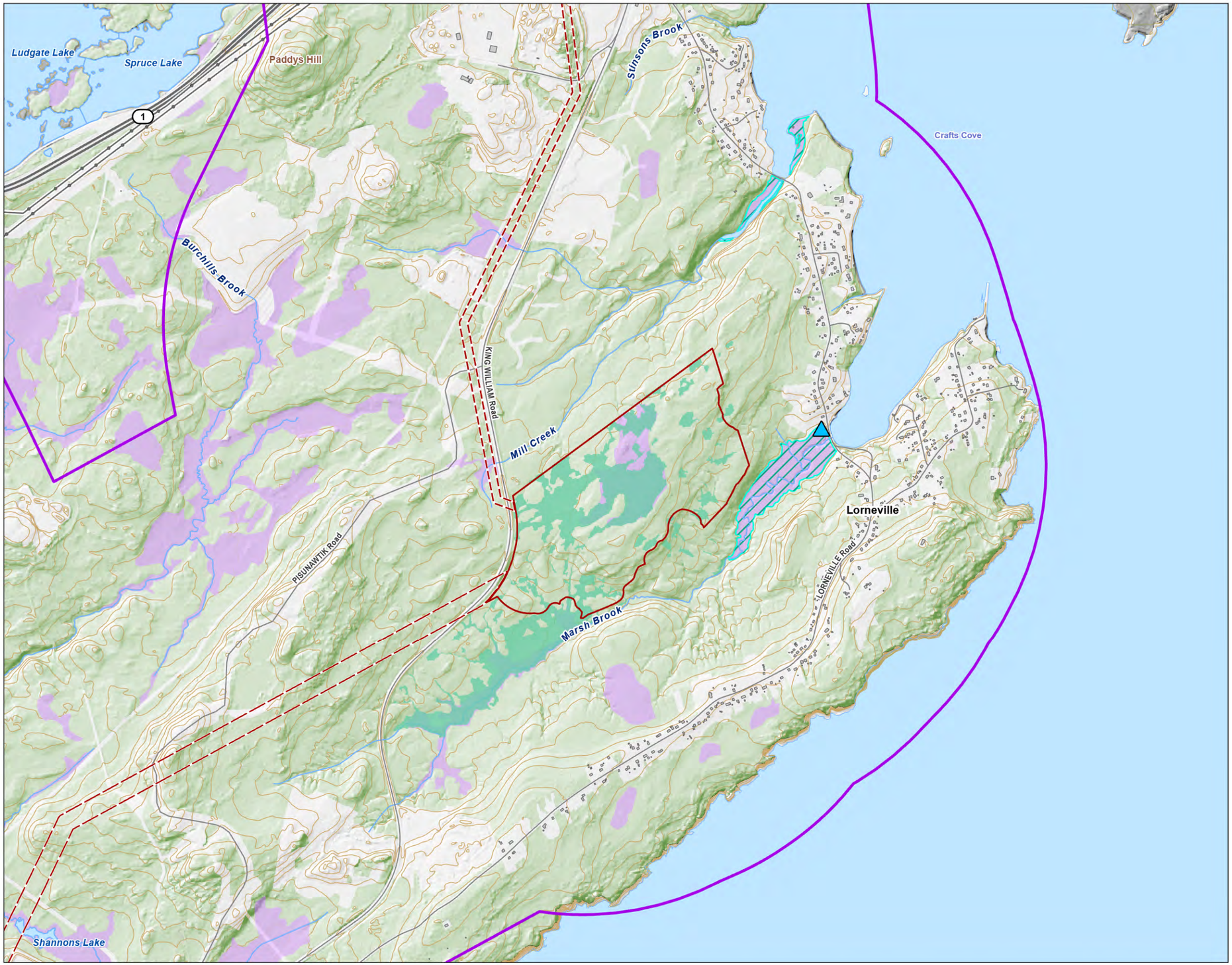


Figure No.
8.1

Title
Baseline Sound Monitoring Location

Client/Project
Beacon Data Centres Inc.
Spruce Lake AI Data Centre

121418636-802

Project Location
Lorneville,
New Brunswick

Prepared by SC on 2026-03-13
Revised by SC on 2026-03-24

N

0 0.5 1 km

(At original document size of 11x17)
1:20,000

Legend

- Local Assessment Area

Project Development Areas (PDA)

- Data Centre PDA
- Pipeline PDA
- Transmission Line PDA

Site Plan

- Baseline Sound Monitoring Location

Other Features

- Transmission Line (Existing)
- Highway
- Local Road
- Contour - 5m (Stantec)
- Building

Waterways and Wetlands

- Watercourse (NBHN)
- Waterbody (NBHN)
- Field-Delineated Wetland (Stantec 2025)
- Wetland (NBELG)
- Provincially Significant Wetland
- Forested Area



Notes
1. Coordinate System: NAD 1983 CSRS New Brunswick Stereographic
2. Data Sources: Beacon Data Centres Inc.; Data License with the Government of New Brunswick (NBDELG, NBNRED, Service NB); New Brunswick Power; Stantec
3. Background: Esri, USGS

Stantec

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8.3 Potential Effects and Effect Pathways

A summary of the potential effects and Project effect pathways to be assessed for Acoustic Environment is provided in Table 8.3.

The key noise emissions during construction will occur from the operation of mobile equipment, such as loaders, bulldozer, heavy duty trucks, and excavators. These emissions are expected to be intermittent and occur during daytime hours.

The key noise emissions during Project operations are expected to occur through the operation of the power generation facility, data halls, and substation in the Data Centre PDA. Noise emissions may also be generated during asset inspection and maintenance of the transmission lines and pipelines.

The power generation facility will consist of 50 Jenbacher J624 lean-burn natural gas engines. Jenbacher's QPAC is a modular power generation platform which consists of five subunits each housing a Jenbacher J624 gas genset and supporting equipment. Each subunit includes the genset module, engine exhaust system equipped with Selective Catalytic Reduction (SCR), genset module ventilation exhaust outlet, radiator and air filtration module, and other auxiliary modules. In accordance with the manufacturer's specifications, each QPAC noise emission will achieve 65 dBA measured at 10 m from the modular. The power facility will consist of 10 QPAC modules.

The data centre consists of four data hall buildings housing AI HPC processing equipment. Each data hall also encloses one Clearfire CFLC-5000 condensing boiler with outdoor boiler exhaust outlets. Acoustical paneling will be used on the interior walls to reduce noise emissions from the operation of the data halls. Each data hall is equipped with 100 air-cooled chiller units with 50 associated pump enclosures and water tanks. The air-cooled chiller units will include louvres for the air inlets and silencers for the air discharge to reduce noise emissions.

The substation is in the southwestern corner of the PDA and will include a power transformer for tying into the existing power grid.

Table 8.3 Potential Effects and Effect Pathways for Acoustic Environment

Potential Effect	Effect Pathway(s)
Change in Acoustic Environment	• During construction, operation of heavy mobile equipment and vehicles within the PDAs will generate noise and result in a change in ambient sound levels • During operation and maintenance, noise emissions will be generally limited to operation of the data centre, power generation facility, and substation • Periodic noise emissions will be generated with the use of vehicles and equipment used during asset inspection and RoW maintenance for the transmission line and pipelines

8.4 Mitigation Measures

The following mitigation measures will be implemented to reduce potential effects on the acoustic environment:

- Equipment will be maintained in good working order, in adherence to manufacturer's recommended schedules.
- Idling of vehicle engines, equipment, and machinery will be avoided where practicable.
- Construction activities that have the potential to generate noise disturbance will be limited to daytime hours as feasible to limit nuisance noise to off-site receptors at night.
- If blasting is required, residents will be notified in advance of blasting activity.
- Air cooled chillers used for cooling air for the data halls include inlet air louvres and exhaust silencers to reduce noise emissions.
- Wall paneling will be used within the data halls to reduce breakout noise.
- The Project will implement a Complaint Resolution Procedure to address concerns raised by community members, land users, or other stakeholders over the course of construction and operations.

8.5 Residual Environmental Effects

8.5.1 Change in Acoustic Environment

8.5.1.1 Construction

Construction-related noise will occur through the use of earth-moving and other construction equipment throughout the construction phase of the Project. Construction is anticipated to occur during daytime hours and will be intermittent. Construction occurring along the pipeline and transmission line RoW will follow the RoW as components are added to the pipeline and transmission line so that will limit changes to noise levels for each nearby individual receptor as the construction work progresses along the line (i.e., Point of Reception; POI). In the event that blasting is required, blasting activities will be carefully controlled by qualified personnel and the extent of blasting activity will be localized and short term. Residents will be notified in advance of blasting activity.

8.5.1.2 Operation and Maintenance

A quantitative assessment (Appendix C) was conducted to predict noise emissions from the operation of the Data Centre (including the power generation facility). The locations of the predominant noise sources from Project operations in the Data Centre PDA and nearby receptors are shown in Figure 8.2.

Noise predictions were conducted using Cadna/A acoustic modeling software (DataKustik 2025), which uses the internationally accepted sound propagation algorithms (ISO 9613-1: 1993, ISO 9613-2: 2024).



A detailed description of the model, including inputs and results are described in Appendix C. The predicted sound levels at nearby receptors are shown in Table 8.4 and predicted sound level isopleth contours from Project operations are shown in Figure 8.3. The model assumes all operation equipment will run continuously during both the daytime and nighttime periods.

As shown in Table 8.4, Project-related noise emissions from the operation of the Data Centre are predicted to comply with applicable noise guidelines in New Brunswick at the nearby receptor locations.

Noise generated during asset inspection and maintenance for the transmission lines and natural gas pipelines will be infrequent and sporadic over the life of the Project and temporary in any one location.



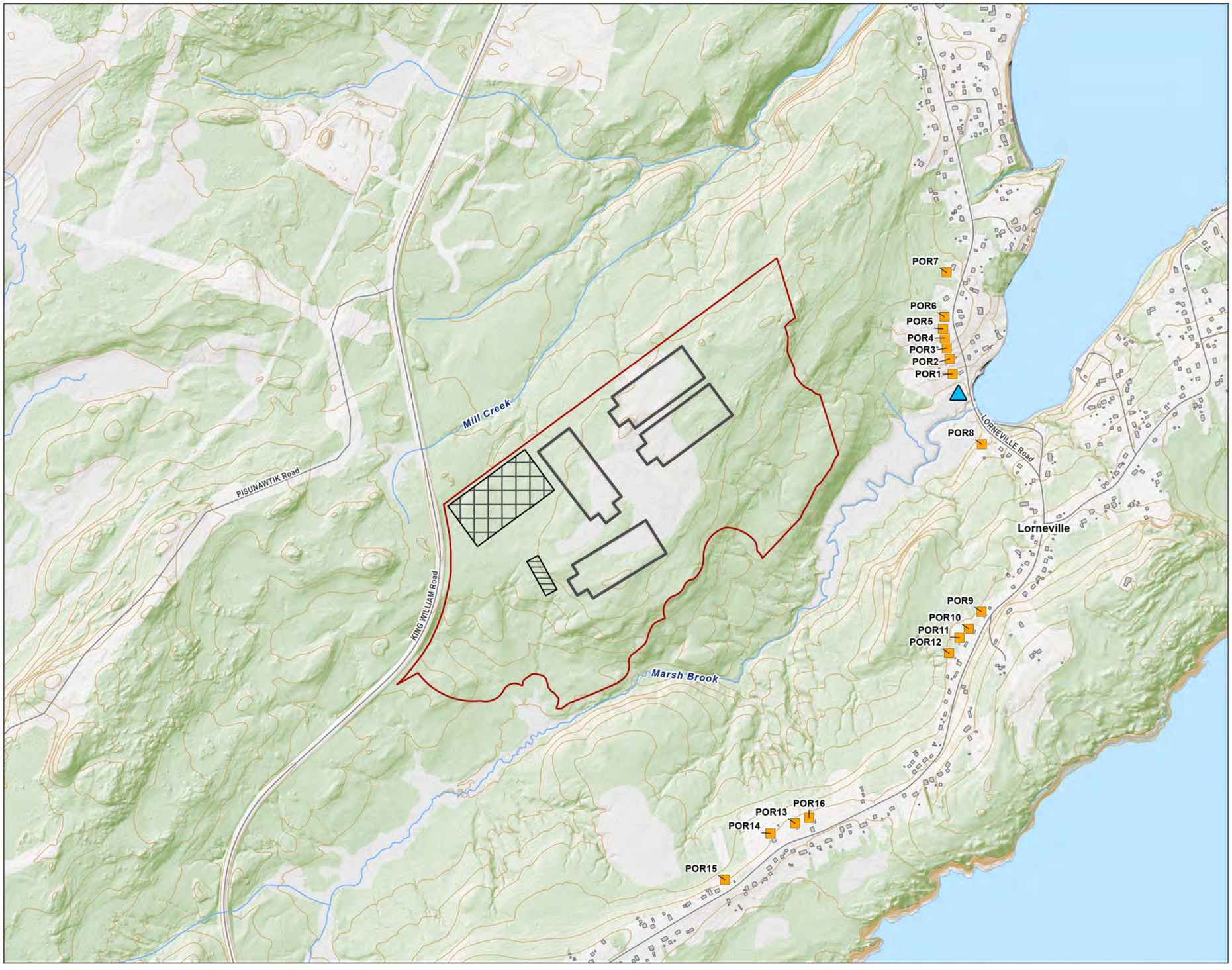


Figure No.

8.2

Title

Location of Key Data Centre Components Relative to Nearby Receptor Locations

Client/Project 121418636-803

Beacon Data Centres Inc.
Spruce Lake AI Data Centre

Project Location
Lorneville,
New Brunswick

Prepared by SC on 2026-03-13
Revised by SC on 2026-03-24

N

0 200 400 metres

(At original document size of 11x17)
1:12,000

Legend

- Data Centre Project Development Area
- Baseline Sound Monitoring Location
- Receptor

Site Plan

- Data Hall
- Substation
- Power Generation

Other Features

- Local Road
- Contour - 5m (Stantec)
- Building

Waterways and Wetlands

- Watercourse (NBHN)
- Waterbody (NBHN)
- Forested Area



Notes

1. Coordinate System: NAD 1983 CSRS New Brunswick Stereographic
2. Data Sources: Beacon Data Centres Inc.; Data License with the Government of New Brunswick (NBDELG, NBNRED, Service NB); New Brunswick Power; Stantec
3. Background: Esri, USGS

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Table 8.4 Comparison of the Cumulative Sound Pressure Level during Project Operation to the NB Noise Guidelines at Nearby Receptors

Receptor	Daytime (dBA)		Evening (dBA)		Nighttime (dBA)	
	Cumulative SPL [a]	NB Noise Guideline	Cumulative SPL [a]	NB Noise Guideline	Cumulative SPL [a]	NB Noise Guideline
POR1	45.8	60	42.3	55	40.8	50
POR2	45.9		42.5		41	
POR3	45.9		42.5		41.1	
POR4	45.9		42.5		41.1	
POR5	45.9		42.5		41.1	
POR6	45.8		42.4		41.0	
POR7	45.7		42.2		40.6	
POR8	45.7		42.2		40.6	
POR9	45.6		41.9		40.1	
POR10	45.6		41.9		40.3	
POR11	45.6		42.0		40.3	
POR12	45.6		42.0		40.3	
POR13	45.8		42.3		40.7	
POR14	45.8		42.3		40.7	
POR15	45.6		42.0		40.3	
POR16	45.8		42.2		40.7	

[a] Cumulative SPL refers to the combination of the baseline noise level and noise emissions from Project operations.

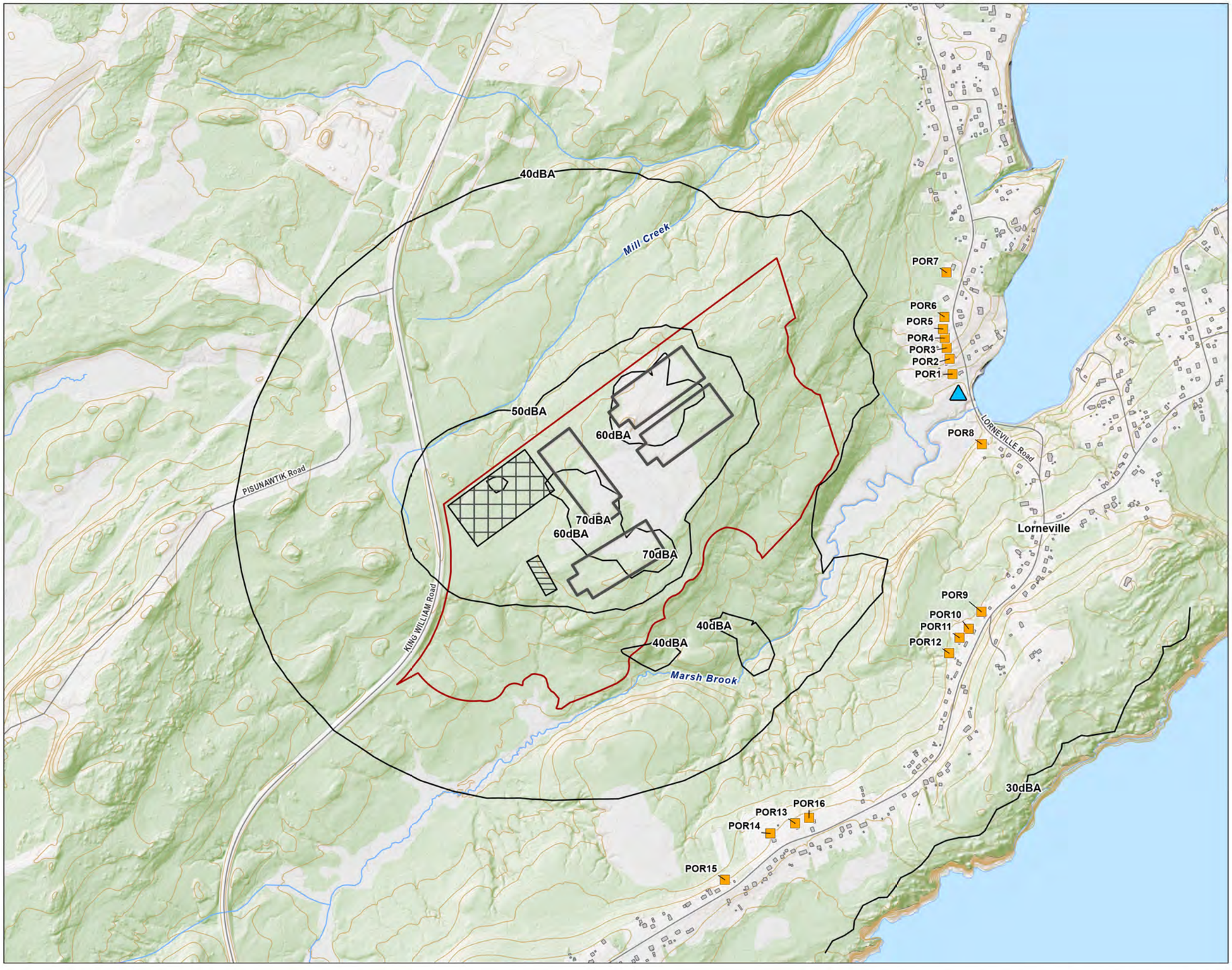


Figure No.

8.3

Title

Modelled Sound Pressure Level (dBA) Contours from Data Centre Operations

Client/Project 121418636-804

Beacon Data Centres Inc.
Spruce Lake AI Data Centre

Project Location
Lorneville,
New Brunswick

Prepared by SC on 2026-03-13
Revised by SC on 2026-03-24

N

0 200 400 metres

(At original document size of 11x17)
1:12,000

Legend

- Data Centre Project Development Area
- Baseline Sound Monitoring Location
- Receptor
- Sound Pressure Level (dBA) Contour

Site Plan

- Data Hall
- Substation
- Power Generation

Other Features

- Local Road
- Contour - 5m (Stantec)
- Building

Waterways and Wetlands

- Watercourse (NBHN)
- Waterbody (NBHN)
- Forested Area



Notes

1. Coordinate System: NAD 1983 CSRS New Brunswick Stereographic
2. Data Sources: Beacon Data Centres Inc.; Data License with the Government of New Brunswick (NBDELG, NBNRED, Service NB); New Brunswick Power; Stantec
3. Background: Esri, USGS

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8.6 Follow-up and Monitoring

A dedicated follow-up and monitoring program is not proposed for the acoustic environment. However, the Project will implement a Complaint Resolution Procedure to address concerns raised by community members, land users, or other stakeholders over the course of construction and operations. If noise complaints are received through this procedure, the investigation of the complaint may involve noise monitoring and/or adaptive mitigation to resolve the complaint.

8.7 References

DataKustik. 2025. DataKustik GmbH Cadna/A Computer Aided Noise Abatement (CadnaA) Model, Version 2025 (build:209.5501), Munich, Germany.

ISO (International Organization for Standardization). 1993. International Standard ISO 9613-1, ISO 9613-2, Acoustics – Attenuation of Sound During Propagation Outdoors. Part 1: Calculation of Absorption of Sound by the Atmosphere. Geneva, Switzerland.

ISO. 1996. International Standard ISO 9613-1, ISO 9613-2, Acoustics – Attenuation of sound during propagation outdoors. Part 2: General Method of Calculation. Geneva, Switzerland.

NBDELG (New Brunswick Department of Environment and Local Government). 2023. New Brunswick Noise Complaint Response Guidelines.

9 Assessment of Environmental Effects on Water Resources

9.1 Scope of Assessment

Water Resources was selected as a valued component (VC) because of its importance to ecosystem function and potential Project-related interactions with human uses. Water resources are critical in maintaining baseflow to streams for ecological habitat, and in supplying fresh water for human and industrial/commercial uses. Quantity and quality of water resources could be affected by the construction, operation and maintenance of the Project, which may in turn affect human consumption, ecological processes and fish and fish habitat. For this assessment, the Water Resources VC is defined as the value and function of surface water and groundwater resources in maintaining flow to streams for ecological habitat, and in supplying fresh water for human and industrial/commercial uses.

The scope of assessment includes Project infrastructure including the data centre, transmission line and pipeline.

9.1.1 Regulatory Context

The Province of New Brunswick has legislation in place to manage and protect water resources (both surface water and groundwater), including the *Clean Water Act* and the *Clean Environment Act*. Specific regulations under these acts that relate to the protection of water resources include the Watercourse and Wetland Alteration Regulation, the Wellfield Protected Areas Designation Order, the Water Well Regulation, and the Potable Water Regulation, all under the *Clean Water Act*.

The Watercourse and Wetland Alteration Regulation requires a watercourse and wetland alteration (WAWA) permit to be issued for activities, including ground disturbance, carried out within 30 metres of a watercourse or wetland.

The Wellfield Protected Areas Designation Order defines restrictions in areas around production wells that are used for public water supply systems. The Designation Order restricts the types of activities that can be carried out within the Wellfield Protected Area, thereby reducing the risk of contaminants (e.g., bacteria and viruses, petroleum products, and chlorinated solvents) possibly reaching the wells.

The Water Well Regulation defines how water wells are to be constructed in New Brunswick so that water quality is not compromised by local runoff or land use activities. The Potable Water Regulation requires water quality testing for all new water wells installed in the province, and for regulated water supply systems. The Water Well Regulation applies to all water wells in the LAA, including future water wells.

The Canadian Water Quality Guidelines for Protection of Freshwater Aquatic Life (CWQG-PAL) are established by the Canadian Council of Ministers of the Environment (CCME various). These guidelines are developed collaboratively among provincial, territorial, and federal jurisdictions and regularly updated to reflect current toxicology information and guideline derivation approaches.



The Guidelines for Canadian Drinking Water Quality (GCDWQ) are established by Health Canada (2025). These guidelines are developed with the Federal-Provincial-Territorial Committee on Drinking Water. GCDWQ are applicable as an aesthetic and health-based guideline for a variety of chemical and physical parameters for potable water sources.

9.1.2 Assessment Boundaries

The assessment of potential environmental interactions between the Project and water resources is focused on three PDAs and an LAA.

The PDAs represent the anticipated area of direct physical disturbance associated with the construction, operation and maintenance of the Project. For the purposes of this EIA Registration, the Project encompasses three PDAs as described in Section 6.2.3 and shown on Figure 2.1: the Data Centre PDA, the Transmission Line PDA, and the Pipeline PDA.

The LAA for water resources is defined as the area within which the environmental effects of the Project can be measured or predicted and can be thought of as the theoretical “zone of influence” of the Project on the water resources. For considering a potential change in surface water, the LAA associated with the Data Center is defined as the catchments which flow into Marsh Brook from the Data Centre and the catchments which follow into the headwaters of Mill Creek (Figure 9.1), which ultimately discharge into the Bay of Fundy. The surface water LAA for the Transmission Line and Natural Gas Pipeline is a 150 m buffer applied to the centreline of the respective corridors. The LAA for groundwater is a 500 m radius around the PDAs (Figure 9.1).

Temporal boundaries for the assessment are based on the timeframes over which potential effects could occur as a result of Project construction, and operation and maintenance phases as defined in Section 6.2.3.

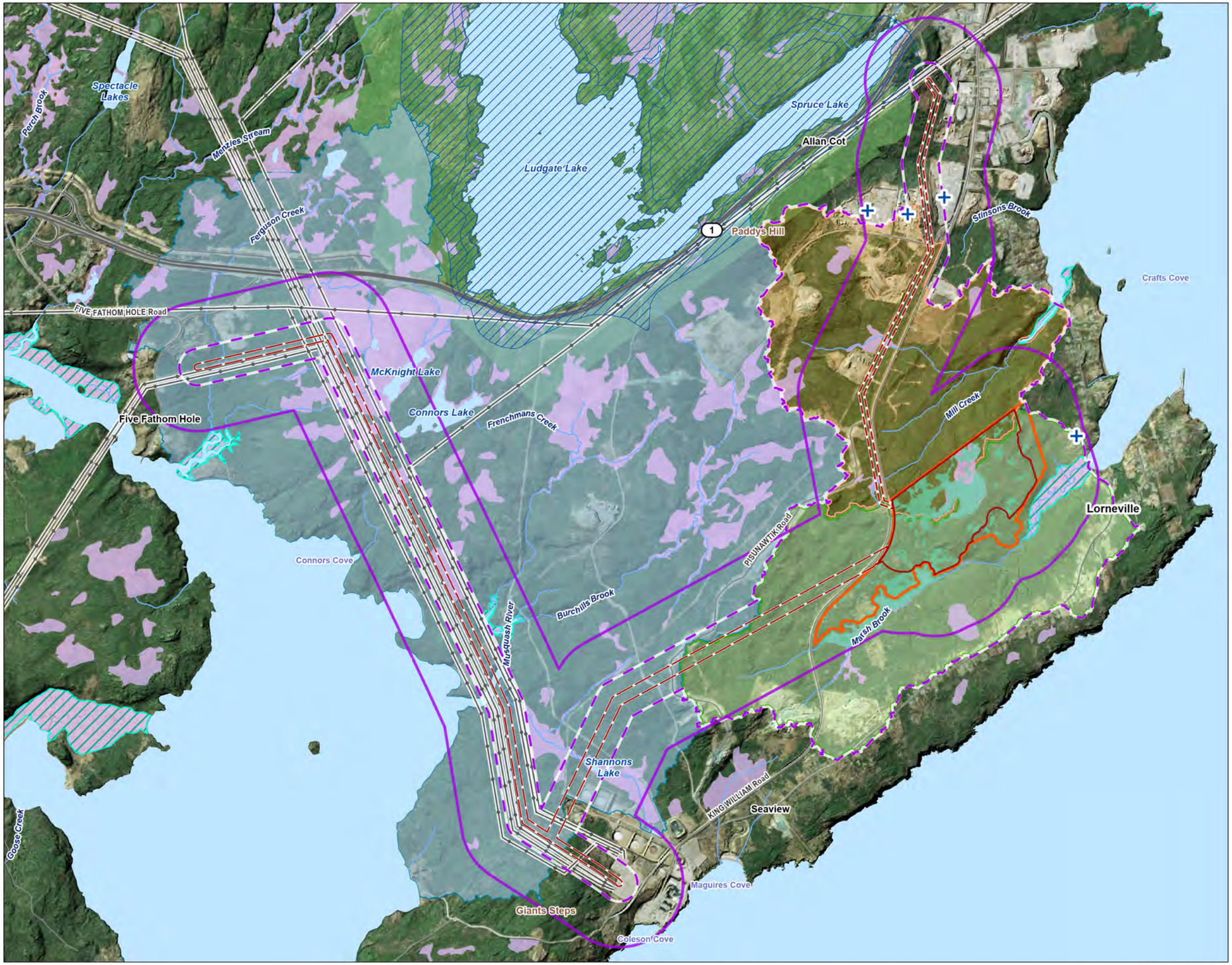


Figure No.

9.1

Title

Water Resources Spatial Boundaries

Client/Project

Beacon Data Centres Inc.
Spruce Lake AI Data Centre

121418636-601

Project Location

Lorneville,
New Brunswick

Prepared by SC on 2026-03-05
QR by NW on 2026-03-05

N

0 0.5 1 1.5 km

(At original document size of 11x17)
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Legend

- Groundwater - Local Assessment Area
- Surface Water - Local Assessment Area
- Project Site (Field Study Area)

Project Development Areas (PDA)

- Data Centre PDA
- Pipeline PDA
- Transmission Line PDA

Water Wells

- Drinking Water

Other Features

- Transmission Line (Existing)
- Highway
- Collector Road
- Local Road

Waterways and Wetlands

- Watercourse (NBHN)
- Waterbody (NBHN)
- Field-Delineated Wetland (Stantec 2025)
- Provincially Significant Wetland
- Wetland (NBELG)
- Marsh Brook Watershed - Craft Cove Catchment (Stantec 2026)
- Mill Creek Watershed - Craft Cove Catchment (Stantec 2026)
- East Musquash Harbour Catchment (Stantec 2026)
- Protected Watershed



Notes

1. Coordinate System: NAD 1983 CSRS New Brunswick Stereographic
2. Data Sources: Beacon Data Centres Inc.; Data License with the Government of New Brunswick (NBDELG, NBNRED, Service NB); New Brunswick Power; Stantec
3. Background: Vantor, Esri, USGS

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9.2 Existing Conditions

A characterization of the existing conditions within the surface water and groundwater LAAs are provided in the following sections.

9.2.1 Approach and Methods

Information regarding existing conditions of water resources in the LAAs are derived from publicly available regional hydrologic and hydrogeologic data sources. To support the characterization of existing water resource conditions for the Project, the following datasets and technical reports were reviewed:

- ECCC Canadian Climate Normals, 1991 – 2020 (ECCC 2026a)
- Ecological Land Classification, NB Department of Natural Resources and Energy Development (NBDNR 2007)
- ECCC Water Level and Flow – Water Survey of Canada (WSC; ECCC 2026b)
- New Brunswick Online Well Log System (NB OWLS) water well database containing records of wells drilled since 1995, maintained by the NBDELG (NBDELG 2026)
- Natural Resources Canada Atlas of Canada - Toporama (NRCan 2019)
- New Brunswick Hydrographic Network geographic dataset (NBDNR 2015)

9.2.2 Description of Existing Conditions

9.2.2.1 Topography and Drainage

The Project is located within the Fundy Coastal Ecoregion District 4-1 (NBDNR 2007). It has an area of 2,265 km^2 and is characterized by a variety of landscapes: gently rolling hills, flat-lying saltmarshes and rocky cliffs. Average elevation within the ecodistrict is 84 metres, with maximum values reaching 300 m.

9.2.2.1.1 Data Centre

The Data Centre lies within the West Fundy composite watershed, east of the Musquash River (NBDNRED 2012), ultimately flowing to the Bay of Fundy at Crafts Cove. Two named watercourses are identified: Mill Creek and Marsh Brook to the north and south of the Data Centre and discharging into the Bay of Fundy. Several unnamed tributaries were identified as flowing to the named watercourses. The Data Centre is fully contained within the Mill Creek catchment (4.12 km^2), and the Marsh Brook catchment (5.04 km^2). There are several wetlands contributing to non riverine storage in the LAA between both the Mill Creek and Marsh Brook watersheds, with total classified wetlands, swamps, coastal marsh, and bogs comprising 10% of the Marsh Brook watershed, and 7% of the Mill Creek watershed. Any change in drainage to or from wetlands and non riverine storage within the surface water LAA will be addressed in the surface water management plan to maintain pre-disturbance flow capacity and surface contribution.

9.2.2.1.2 Transmission Lines

Two 345 Kv transmission lines will run for 9.5 km from the PDA substation westward where they will branch near Coleson Cove Generating Station and will parallel existing RoWs heading north before being interconnected near Five Fathom Hole. Twenty-seven watercourses/waterbodies were identified within two catchment areas, the Marsh Brook and East Musquash Harbour catchments, which are within the proposed transmission line RoW. Of the 27 watercourses/ waterbodies, six are mapped watercourses (including Frenchman's Creek and Ferguson Creek) and one is a small pond. The remaining 20 watercourses were identified through existing satellite imagery and publicly available LiDAR. As some of the watercourses were crossed multiple times by the transmission line, there was a total of 37 watercourse crossings identified. Four watercourse crossings were previously surveyed in the Data Centre PDA (Appendix D) or to support the Saint John 138 kV Corridor Project (Stantec 2025).

9.2.2.1.3 Natural Gas Pipeline

A 4.5 km natural gas pipeline is proposed to connect to the Gas Power plant and run northward. A total of 15 tributary watercourses from the Mill Creek and Marsh Brook catchment areas will enter the pipeline RoW, with the primary pathway crossing the Mill Creek catchment and only interacting with the Marsh Brook catchment at the terminus location in the Data Centre PDA. Two of the watercourses, Mill Creek and a Tributary to Mill Creek, are mapped while the remaining 13 watercourses are unmapped.

9.2.2.2 Areas of Special Significance

The Data Centre PDA is adjacent to a saltmarsh at the mouth of Marsh Brook which is designated a Provincially Significant Wetland (PSW; Figure 9.1), with an area of 10.7 ha. There is a second PSW at the mouth of Mill Creek into the Bay of Fundy with an area of 1.15 ha, outside of the LAA but downstream of potential project interactions. PSWs are subject to the Watercourse and Wetland Alteration Regulation - *Clean Water Act.* These PSWs are discussed in further detail in the Vegetation and Wetlands VC (Section 11.2).

The Spruce Lake Protected Watershed (A27, zone C) is located approximately 3 km from the PDA and is protected under the Watershed Protected Area Designation Order – *Clean Water Act* (NB DELG 2001).

9.2.2.3 Local Climate

The nearest ECCC Climate station with recent data (within the last 10 years) is Saint John Airport (ID: 8104901) shown in Table 9.1 (ECCC 2025). The 1991-2020 climate normals have been composed using two stations at this location, with Station ID: 8104900 active between 1991 and 2012, and the current Station ID: 8104901 active since 2012. The active Saint John Airport climate station is located approximately 27 km northeast of the Project (45°18'58.000" N 65°53'24.000" W) at an elevation of 108.8 m. Climate normals from 1991 to 2020 show a temperature range from a low of -7.9°C in January to a high of 17.3°C in July. The climate normal annual precipitation is 1,271.3 mm, with a mean annual snowfall of 214.8 centimetres. Snow cover is expected between October through May, with peak snowfall occurring in January. The wettest month observed is November with an average of 138.2 mm of precipitation, and the driest is August with 73.0 mm of precipitation.

Table 9.1 Climate Normal Data, Saint John Airport (1991-2020) Climate ID: 8104901

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Total
Daily Average Temperature (°C)	-7.9	-7.1	-2.6	3.7	9.4	14.1	17.3	17.1	13.1	7.9	2.4	-3.5	5.3
Monthly Rainfall (mm)	65.6	52.7	74.2	82.0	93.1	85.1	86.4	71.3	112.2	137.1	126.4	87.5	1,073.5
Snowfall (cm)	59.8	45.5	36.8	16.3	0.8	0.0	0.0	0.0	0.0	0.9	12.5	42.2	214.8
Total Precipitation (mm)	116.1	91.9	107.3	100.2	93.9	86.8	89.5	73.0	108.8	138.0	138.2	127.6	1,271.3

Source: ECCC 2026a

9.2.2.4 Surficial Geology

Available surficial geology mapping indicates that overburden within the majority of the PDAs primarily consists of glacially deposited sandy or stony diamicton till veneer (NBDEM 2016).

Areas within the south portion of the Data Centre PDA (in the vicinity of Marsh Brook) and within north portion of the Pipeline PDA overburden likely consists of silt, clay, and fine-sand glaciomarine deposited offshore sediments greater than 1 m thick (NBDEM 2016).

Sections of the west portion of the Transmission Line PDA may encounter overburden consisting of glaciomarine deposits or fen deposits (decaying organic debris), or potential bedrock outcrops. The overburden within the south portion of the Transmission Line PDA likely consists of fill or other anthropogenic materials (NBDEM 2016).

The surficial geology of the three PDAs is shown on Figure 9.2.

Figure No.

9.2

Title

Detailed Surficial Geology

Client/Project

121418636-602

Beacon Data Centres Inc.
Spruce Lake AI Data Centre

Project Location

Lorneville,
New Brunswick

Prepared by SC on 2026-03-05
QR by NW on 2026-03-05

N

0 0.5 1 1.5 km

(At original document size of 11x17)
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Legend

- Project Site (Field Study Area)

Project Development Areas (PDA)

- Data Centre PDA
- Pipeline PDA
- Transmission Line PDA

Other Features

- Highway
- Collector Road
- Local Road

Waterways and Wetlands

- Watercourse (NBHN)

Holocene Earth Materials and Landforms

- H - Anthropogenic Deposits

Organic Deposits

- Owb - Bog Deposits
- Owf - Fen Deposits
- Ows - Coastal Marsh Deposits
- Owm - Freshwater Marsh Deposits
- Owv - Organic Veneer

Marine Sediments

- Mr - Beach Sediments
- Mi - Intertidal Sediments

Pleistocene Earth Materials and Landforms

Glaciomarine Sediments

- GMd - Deltaic Sediments
- GMm - Submarine Moraine Sediments
- GMf - Submarine Outwash Fan Sediments
- GMn - Littoral and Nearshore Sediments
- GMb - Offshore Sediments
- GM - Undifferentiated Sediments

Glaciofluvial Sediments

- GFp - Outwash Plain Sediments
- GFc - Ice-Contact Sediments
- GFv - Sediment Veneer

Till Deposits

- Tv - Till Veneer

Pre-Quaternary

- R - Bedrock

Complex Patterns[4]

- Er - Eolian Sediments
- Lr - Lacustrine Sediments: Beach
- Mr - Marine Sediments: Beach
- GMv - Glaciomarine Sediments: Beach



Notes

1. Coordinate System: NAD 1983 CSRS New Brunswick Stereographic
2. Data Sources: Allard, S. and Dickinson, P.J. 2013. Surficial Geology of the Musquash Area (NTS 21G/01), revised by DNRED in 2016; Beacon Data Centres Inc.; Data License with the Government of New Brunswick (NBDELG, NBNRED, Service NB); New Brunswick Power; Stantec
3. Background: Earthstar Geographics, Esri, CGIAR, USGS
4. The detailed surficial geology for this area has identified complex surficial geological units that are symbolized by the dominant unit.

Stantec

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9.2.2.5 Bedrock Geology

The bedrock geology of the PDA is shown on Figure 9.3 and consists of the following:

- **Data Centre PDA**: bedrock consists of the Late Devonian-Early Carboniferous age greyish green and red siltstone, sandstone and shale with massive and amygdaloidal basalt, peperitic basalt, and basaltic breccia of the Lorneville Group, Taylors Island Formation (NBDNR 2008)
- **Transmission Line PDA**: bedrock varies from the Taylors Island Formation and Saint John Group (clastic sedimentary rocks) on the east portion of the PDA, while the west portion of the PDA crosses the Ashburn Formation (marble, pelite, hornfelds, and quartzite), and Golden Grove plutonic suites: Spruce Lake Tonalite (diorite and granodiorite), Prince of Wales Granite, and Ludgate Lake Granodiorite (NBDNR 2008)
- **Pipeline PDA**: bedrock varies from the Taylors Island Formation in the south, to the Ashburn Formation (marble, pelite, hornfelds, and quartzite) centrally, and the plutonic Spruce Lake Tonalite (diorite and granodiorite) in the north (NBDNR 2008)

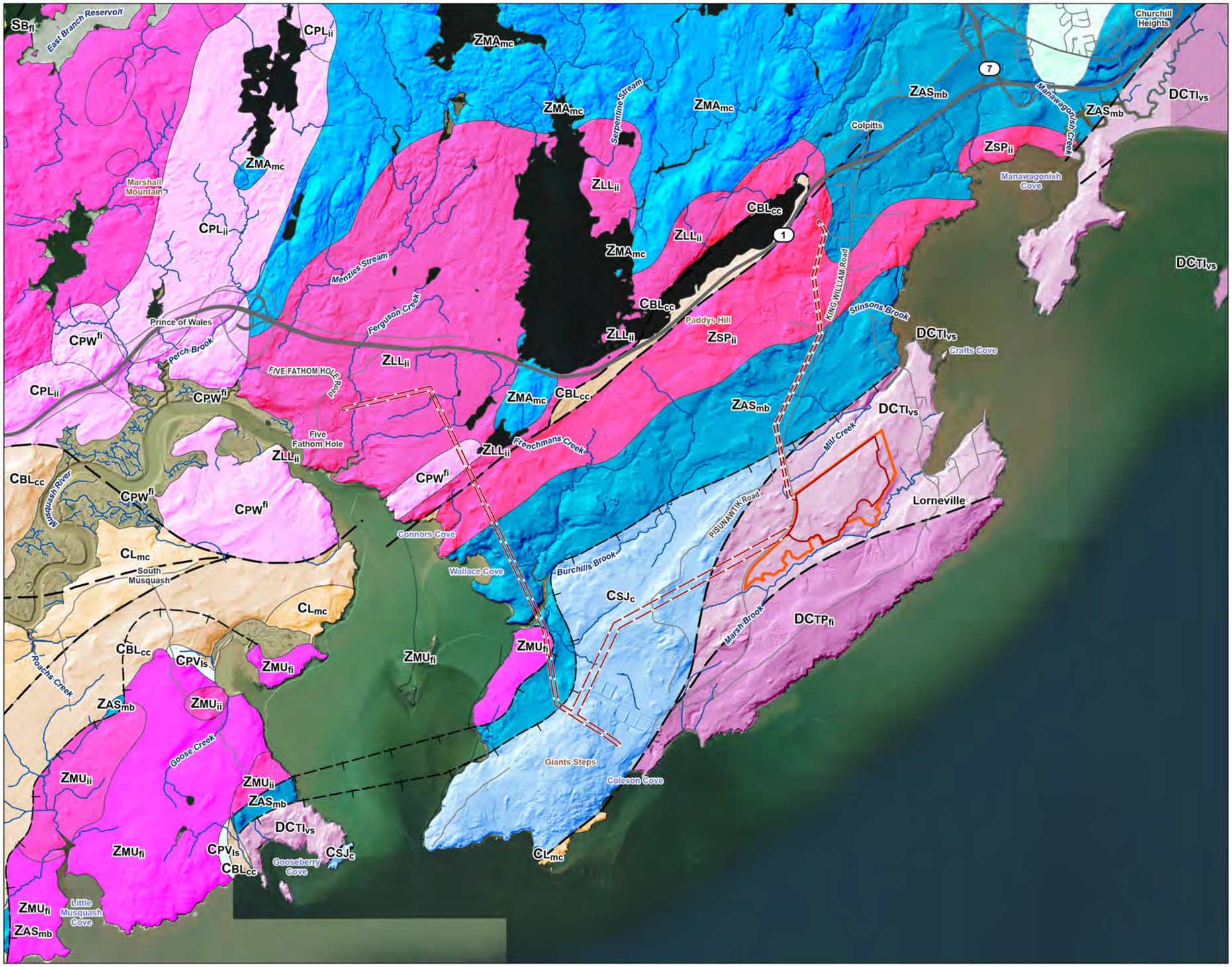


Figure No.
9.3

Title
Bedrock Geology

Client/Project
121418636-603
Beacon Data Centres Inc.
Spruce Lake AI Data Centre

Project Location
Lorneville,
New Brunswick

Prepared by SC on 2026-03-05
QR by NW on 2026-03-05

N

0 0.5 1 1.5 km
(At original document size of 11x17)
1:50,000

Legend

Project Site (Field Study Area)

Project Development Areas (PDA)
- Data Centre PDA
- Pipeline PDA
- Transmission Line PDA

Other Features
- Highway
- Collector Road
- Local Road

Waterways and Wetlands
- Watercourse (NBHN)

Bedrock Geology

Carboniferous
- Cumberland Group
  - Lancaster Formation (C_{Lmc}) medium-grained clastic sedimentary rocks
- Mabou Group
  - Balls Lake Formation ($C_{Bl_{cc}}$) coarse-grained clastic sedimentary rocks
- Windsor Group
  - Parleeville Formation ($C_{PV_{ls}}$) limestone

Late Devonian to Early Carboniferous
- Tiner Point Complex
  - $DCTP_{fi}$ - Intensely deformed leucotonalite, quartz-monzodiorite, and alkalifeldspar granite.
- Lorneville Group
  - Taylors Island Formation ($DCTl_{vs}$) Greyish green and red siltstone, sandstone, and shale

Early Silurian
- Kingston Group
  - Bayswater Formation (S_{Be}) felsic lithic tuff

Early Cambrian
- Saint John Group
  - Saint John Group (B_{SJ_c}) clastic sedimentary rocks

Late Neoproterozoic to Early Cambrian
- Golden Grove Granitoid Suite
  - Prince of Wales Granite ($C_{PW^{fi}}$) felsic intrusive rocks
  - Perch Lake Granodiorite ($C_{PL_{ii}}$) intermediate intrusive rocks
  - Spruce Lake Tonalite ($Z_{SP_{ii}}$) intermediate intrusive rocks
  - Ludgate Lake Granodiorite ($Z_{LL_{ii}}$) intermediate intrusive rocks
  - Shadow Lake Granitoids ($Z_{SL_{gd}}$) intermediate intrusive rocks
  - Musquash Harbour Granite ($Z_{MU_{fi}}$) felsic intrusive rocks
  - Musquash Harbour Granite ($Z_{MU_{ii}}$) intermediate intrusive rocks
  - Fairville Granite (Z_{Fi}) felsic intrusive rocks

Middle to Late Neoproterozoic
- Green Head Group
  - Martinon Formation ($Z_{MA_{mc}}$) medium-grained clastic sedimentary rocks
  - Ashburn Formation ($Z_{AS_{mb}}$) marble



Notes
1. Coordinate System: NAD 1983 CSRS New Brunswick Stereographic
2. Data Sources: Bedrock Geology of the Musquash Area (NTS 21G/01), revised by DNRED in 2015; Beacon Data Centres Inc.; Data License with the Government of New Brunswick (NBDELG, NBNRED, Service NB); New Brunswick Power; Stantec
3. Background: Vantor, Esri, USGS

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9.2.2.6 Groundwater Quantity

Groundwater is recharged by rainfall and snowmelt in topographically high areas and discharges to rivers and lakes in topographically low areas. Groundwater flow occurs through the pore spaces in unconsolidated surficial materials but is constrained to fractures developed in consolidated materials, such as bedrock. The upper surface of the saturated zone is called the water table. The position of the water table is typically a subdued reflection of the topography of the land surface above. Groundwater can flow between unconfined surficial and bedrock systems based on the presence of a vertical hydraulic gradient and open and connected fractures. An aquifer is a saturated formation or group of formations that can store or yield useable volumes of groundwater to wells or springs. Natural groundwater quality is directly influenced by the geochemical composition of the geological material that forms the aquifer, and the time the water resides within that material.

In the absence of site-specific data, shallow groundwater moving through and around the PDA is likely recharged via infiltration in surficial materials. Shallow groundwater flow direction along the Transmission Line and Natural Gas Pipeline PDAs is expected to vary with changes in topography.

Within the Data Centre PDA, shallow groundwater on the north portion is expected to flow with the topography north-northwest, towards Mill Creek. Shallow groundwater on the south portion of the Data Centre PDA is expected to flow with topography to the south-southeast, towards Marsh Brook. Deeper, more regional groundwater regimes may be influenced by upgradient recharge beyond Ludgate Lake and would expect to be discharging to the Bay of Fundy south and/or east of the Data Centre PDA.

To gain an understanding of the local groundwater usage and quality, a query of the georeferenced New Brunswick Online Well Log System (NB OWLS) was completed. Data available from NB OWLS was screened to a 500 m radius of the Data Centre, Transmission Line, and Natural Gas Pipeline PDAs (the groundwater LAA, as seen on Figure 9.1).

It should be noted that residences in the vicinity of the groundwater LAA are expected to source water from groundwater wells; however, most of these residences are further than 500 m from the PDAs. There are four private groundwater wells identified within the groundwater LAA; a summary of the records from these wells are presented in Table 9.2, and the locations of these wells are presented in Figure 9.1.

Table 9.2 Summary of Water Well Records within the Groundwater LAA

Record	Depth (mbgs)	Casing Length (m)	Depth to Bedrock (mbgs)	Yield (L/min)	Static Water Level (mbtoc)	Drill Date	Bedrock Groundwater Region
24	48.77	12.19	10.67	13.65	7.62	11/15/2001	-
15887	60.96	6.1	3.05	45.5	12.19	04/22/2008	Granite
24548	91.44	7.01	6.10	45.5	1.52	08/20/2010	Granite
25977	129.54	12.19	4.57	13.65	3.05	03/21/2011	Granite

Notes: "-" – data not available

Source: NBDELG 2025

Records for existing private water wells indicate depths ranging from 48.77 to 129.54 m below ground surface (mbgs) and depth to bedrock between 3.05 mbgs and 10.67 mbgs. The static water level was reported to be between 1.52 and 12.19 m below top of casing.

The four well records indicate that domestic wells in the area are advanced into bedrock, with reported yields ranging from 13.65 to 45.50 litres per minute (L/min), with an average yield of 29.56 L/min.

9.2.2.7 Groundwater Quality

Groundwater quality data from the New Brunswick OWLS database are available for 18 private groundwater wells within and beyond the Groundwater LAA. Groundwater quality data are not georeferenced; therefore, the data summarized below includes areas both inside and outside of the Groundwater LAA. Parameters of interest to drinking water from the identified groundwater wells are presented in Table 9.3.

Table 9.3 Summary of Groundwater Quality Data

Parameter	Units	Maximum Allowable Concentration[1]	Mean	Min	Max	Number of Exceedances	Number of Samples
Alkalinity	mg/L	-	141.7	25.9	309	0	18
Arsenic	µg/L	10[B]	3.79	1.0	28.2	1	18
Hardness	mg/L	-	170.4	0.67	512	0	18
TDS	mg/L	500[A]	426.1	58.1	**1819.4**	5	16
Calcium	mg/L	-	42.0	0.1	122	0	18
Iron	µg/L	100[A]	0.24	0.01	2.38	0	18
Manganese	µg/L	20[A] / 120[B]	0.28	0.005	4.5	0	18
Magnesium	mg/L	-	15.9	0.1	78.9	0	18
Potassium	mg/L	-	2.68	0.3	14	0	18
Sodium	mg/L	200[A]	92.4	5.56	**488**	2	18
pH	pH units	7.0 – 10.5[A]	7.86	7.03	8.51	0	18
Chloride	mg/L	250[A]	135.0	8.06	**894**	2	18
Fluoride	mg/L	1.5[B]	0.29	0.1	1.11	0	18
Nitrate/Nitrite	mg/L	-	0.98	0.06	3.4	0	18
Sulphate	mg/L	500[A]	43.1	8.22	245	0	18
Uranium	µg/L	20[B]	2.8	0.5	11	0	16

Notes:

Bold – Value exceeds the Guideline for Canadian Drinking Water Quality (GCDWQ) aesthetic objective

Underlined – Value exceeds the GCDWQ maximum acceptable concentration

"-" – No guideline available

[A] – GCDWQ aesthetic objective

[B] – GCDWQ maximum acceptable concentration

Source: NBDELG 2025

Drinking water quality in the vicinity of the Project is generally good, with water quality largely meeting the Guidelines for Canadian Drinking Water Quality (Health Canada 2025) in the wells reviewed. Groundwater quality varied widely with respect to alkalinity (moderate to high), hardness (low to very high), and total dissolved solids (low to very high). Naturally occurring trace metals including iron, manganese, fluoride and uranium were identified.

Groundwater quality data from the NB OWLS database was compared to the GCDWQ. Exceedances of arsenic, sodium, chloride, and total dissolved solids were identified:

- Arsenic concentrations above the GCDWQ MAC guideline of 10 µg/L.
- TDS concentrations above the GCDWQ AO guideline of 500 mg/L
- Sodium concentrations above the GCDWQ AO guideline of 200 mg/L
- Chloride concentrations above the GCDWQ AO guideline (250 mg/L)

9.2.2.7.1 Acid Rock Drainage

Acid rock drainage (ARD) is the result of the exposure of sulphide-rich rocks to oxidizing environments, including precipitation. Earthwork activities around these sulphide-rich rocks can increase the rock exposure and thus the acid-generating potential. Not all sulphide-containing rocks produce ARD. In many cases, rocks contain enough carbonate minerals to buffer the sulphide effect. In these instances, ARD is not produced.

As shown on Figure 9.3, various bedrock formations underly the Data Centre, Transmission Line and Pipeline PDAs. There are no studies of acid-generating potential available for these bedrock formations.

9.2.2.8 Surface Water Quantity

As there are no gauged watercourses within the LAA, flow scenarios are estimated through a prorated data set from a proximate gauged and unregulated watercourse. The historical Water Survey of Canada (WSC) hydrometric station at Black River at Garnett Settlement (01BV004) was selected based on these criteria, as well as having a similar catchment area, the same ecological classification, land cover, and similar riverine vs waterbody storage percentage (WSC 2025, NBDNR 2007).

Black River at Garnett Settlement has a catchment area of 28.7 km^2 which is within the same order of magnitude as the catchment area of the ungauged watercourses (Mill Creek, Marsh Brook) within the LAA with areas of 4.12 and 5.03 km^2, respectively. The ratio of the gauged (drainage area gauged, DAG) and ungauged (DAU) watercourse catchments (DAU/DAG) is calculated as 0.14 at Mill Creek and 0.18 at Marsh Brook. Using these ratios of catchment areas a prorated data set of daily average flow was developed for the LAA at both watercourses from WSC station Black River at Garnett Settlement with a robust period of record ranging from 1991 to 2026. This station was selected because the station provides a strong fit for the study area due to comparable characteristics such as gross drainage area and ecological land class to the LAA watercourses (NBDNR 2007). Both catchments contain mixed forested and cleared land, with the LAA being cleared primarily for domestic use, while the catchment surrounding Black River at Garnett Settlement contains large industrially cleared areas for mixed industrial and domestic usage.

The mean annual flow (MAF) and 25% MAF from the data set at Mill Creek is estimated at 0.137 m^3/s and 0.034 m^3/s, and 0.167 m^3/s and 0.042 m^3/s at Marsh Brook. The mean monthly flow (MMF), monthly median flow (Q50), and monthly 75% Q50 data for both watercourses are shown in Table 9.4 and Table 9.5. MMF and 70%Q50 thresholds are presented in Figure 9.4. The MMF ranges from a peak of 0.291 m^3/s in April to a low of 0.042 m^3/s in August at Mill Creek and 0.365 m^3/s to 0.052 m^3/s in the same months at Marsh Brook. The 70% Q50 and 25% MAF are typically referenced by NBDELG as a threshold for environmental flows (e-flows) which support aquatic life (NBDELG 2026). These thresholds recommend variation with season, namely January through March and July through September referencing 70% Q50 values, and April through June and October through December referencing 25% MAF values.

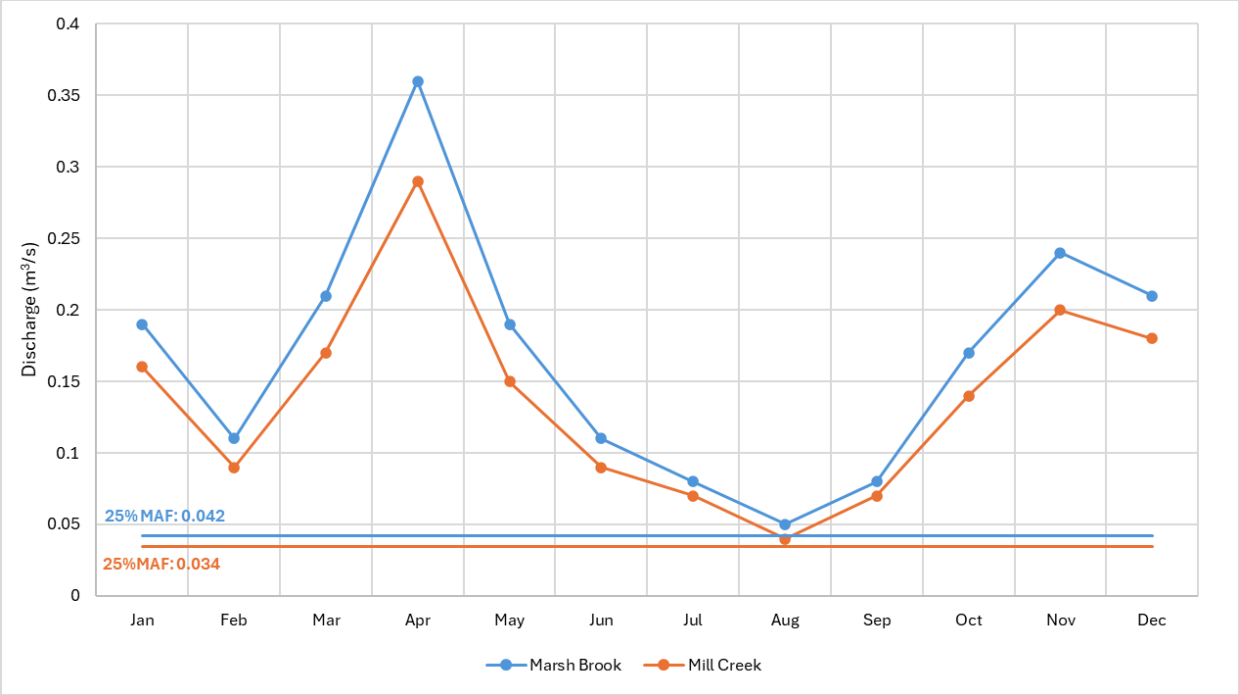


Figure 9.4 Prorated Riverine Flow Conditions (MMF and MAF) for Mill Creek and Marsh Brook

Table 9.4 LAA Prorated Riverine Flow Conditions for Mill Creek (MMF, Q50, 70% Q50)

Flow (m3/s)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MMF	0.156	0.091	0.173	0.291	0.154	0.093	0.070	0.042	0.066	0.138	0.196	0.176
Q50	0.079	0.053	0.089	0.209	0.097	0.053	0.034	0.019	0.022	0.074	0.122	0.116
70% Q50	0.056	0.037	0.062	0.146	0.068	0.037	0.023	0.013	0.016	0.052	0.085	0.081

Table 9.5 LAA Prorated Riverine Flow Conditions for Marsh Brook (MMF, Q50, 70% Q50)

Flow (m3/s)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MMF	0.190	0.112	0.211	0.355	0.187	0.113	0.085	0.052	0.080	0.168	0.239	0.215
Q50	0.097	0.065	0.108	0.255	0.119	0.064	0.041	0.023	0.027	0.090	0.149	0.142
70% Q50	0.068	0.045	0.076	0.178	0.083	0.045	0.029	0.016	0.019	0.063	0.104	0.099

9.2.2.9 Surface Water Quality

There are no Provincial surface water quality monitoring stations within 10 km of the Project.

In situ water quality measurements were collected at 13 locations within the Study Area during the baseline fish habitat surveys in 2025 (Appendix D). Water temperatures ranged from 8.4°C to 18.0°C, dissolved oxygen concentrations ranged from 3.30 to 10.32 mg/L (30-103%) and pH ranged from 5.65 to 8.48 (Appendix D).

Seven surface water grab samples were collected within the PDA during the 2025 baseline fish habitat surveys: two from Marsh Brook (freshwater and tidal), four from freshwater tributaries of Marsh Brook and one from Mill Creek. The six freshwater samples were compared to the Canadian Water Quality Guidelines for the Protection of Aquatic Life (Freshwater) (CWQG-PAL; CCME 1999) and the Guidelines for Canadian Drinking Water Quality (GCDWQ; Heath Canada 2025).

Analytical water quality results for many parameters were found to be below the reporting limit. Freshwater samples generally had low concentrations of dissolved minerals and nutrients. There were exceedances of the CWQG-PAL for cadmium in Marsh Brook and aluminum and iron in both Marsh Brook and Mill Creek. There were reported exceedances of the GCDWQ in Marsh Brook for manganese and for aluminium and iron in both Marsh Brook and Mill Creek.

In situ water quality and water chemistry results are further discussed in the Fish and Fish Habitat VC (Section 10.2) as well as in the Fish and Fish Habitat Technical Data Report (Appendix D).

9.3 Potential Effects and Effect Pathways

A summary of the potential effects and Project effect pathways to be assessed for water resources is provided in Table 9.6.

Table 9.6 Potential Effects and Effect Pathways for Water Resources

Potential Effect	Effect Pathway(s)
Change in groundwater quantity	• Changes in groundwater levels due to construction dewatering activities • Changes in groundwater flow conditions in construction areas where overburden removal exposes impervious bedrock and results in increased runoff and decreased recharge to the aquifer
Change in groundwater quality	• Changes in groundwater chemistry related to the acid rock drainage potential in some bedrock units and construction aggregate stockpiles • Degradation of groundwater quality in potable water supplies, where present, compared to applicable guidelines from on site septic – subsurface effluent discharge, and from potential blasting activity
Change in surface water quantity	• Land clearing, paving, site grading, and permanent structure placements will change land cover and contributing watershed area which may affect surface water quantity to receiving waterbodies or wetlands. • Changes to drainage pathways, such as through attenuating or rerouting, may result in altered flow rates to receiving waterbodies, wetlands or provincial infrastructure (highway drainage features). • Installation of watercourse crossings (culverts/bridges) associated with infrastructure access roads may result in localized changes to water quantity, including flooding, at crossing locations.
Change in surface water quality	• Increase in erosion rates and sedimentation from land cover changes may cause increases to in-stream suspended sediment concentrations from discharge of sediment-laden runoff. • Use of explosives in support of open trench construction of the natural gas pipeline or transmission structures may have deleterious effects on local surface water quality if blasting residues are in contact or hydrologically connected to watercourses and waterbodies • Exposed rock and bedrock may affect surface water quality if it contains sulphide rich rocks, indicating potential for ARD and acidic runoff and metal leaching into watercourses • Sanitary system discharges may have deleterious effects on surface water quality if the industrial or domestic water interacts with or discharges to watercourses or waterbodies • Vegetation Management may result in the need for herbicide application and/or manual cutting after initial RoW clearing which could result in changes in surface water quality. • Horizontal directional drilling (HDD), temporary and permanent structure placement, and operation of machinery on or near watercourses and waterbodies may result in changes to surface water quality.

Pathways that affect water resources are related to potential surface runoff from areas of disturbance or stockpiles, discharge of overland runoff to watercourses, and dewatering activities.



In the absence of mitigation, the Project may interact with water resources in the following ways:

- Construction dewatering activities may lower groundwater levels, alter groundwater flow direction, reduce discharge to surface water, and reduce water availability to other groundwater users, where present.
- Site preparation and earthworks, including overburden removal, may expose impervious bedrock, increasing surface runoff and decreasing aquifer recharge.
- Exposure of sulphide-bearing bedrock or construction aggregate stockpiles with ARD potential may alter groundwater and surface water chemistry.
- Blasting activities may introduce residues that affect groundwater and surface water quality.
- On-site septic systems or subsurface effluent discharge may degrade groundwater quality and potentially affect nearby surface waterbodies.
- Land clearing, grading, paving, and permanent infrastructure may alter land cover, contributing watershed areas, drainage pathways, and flow regimes to receiving waterbodies.
- Installation of watercourse crossings (e.g., culverts or bridges) may result in localized changes to water quantity, including flooding at crossing locations.
- Land disturbance, site preparation, and construction activities (including HDD or pipeline boring) may increase erosion, sedimentation, and suspended sediment concentrations in watercourses.
- Industrial or domestic effluent discharges interacting with adjacent surface waterbodies may degrade surface water quality.
- Vegetation removal and herbicide use near watercourses and waterbodies may affect surface water quality.
- Surface runoff from disturbed areas or stockpiles and overland runoff discharge to watercourses may transport sediment or deleterious substances and affect water resources.

9.4 Mitigation Measures

The following mitigation measure will be implemented to avoid or reduce potential effects on water resources:

- Wastewater sources including industrial wastewater, cooling system blowdown, and natural gas power will be routed to approved disposal pathways, consisting of industrial water pathways and municipal servicing. Domestic wastewater will be managed through the design and installation of a provincially approved septic disposal system.

- Changes in received surface flow due to change in land cover will be managed through approved design of roads, pathways, culvert sizing, and the site-specific Stormwater Management Plan. The Data Centre site shall be graded to drain stormwater away from buildings and equipment, and to prevent localized ponding. Site grading will be designed to direct surface runoff to conveyance channels and sediment ponds. Discharges will be designed to mimic natural drainage patterns to the extent practicable to maintain hydrology to downstream wetlands and receiving water bodies.
- Stormwater at the site will be managed through a stormwater management system designed to collect runoff from building roofs, paved areas, and landscaped surfaces and convey it to appropriately sized control measures prior to release as described in the Stormwater Management Plan. Stormwater infrastructure will be isolated from sanitary systems and may include features such as swales, catch basins, and retention or detention facilities to control flow rates and maintain water quality. Stormwater discharges will be designed to mimic natural drainage patterns to the extent practicable. Design of attenuation features will be used to control post-development runoff rates to pre-development thresholds.
- Watercourse crossings for infrastructure access roads will be designed to convey a 1:10 year design storm event at non-critical crossing locations and a 1:100 year design storm event at critical crossing locations. Appropriate sizing of conveyance structures will be completed to mitigate flood risk from the installation of inappropriately sized structures.
- On-site erosion and sediment control measures will be constructed, maintained and monitored to confirm they are working as expected. Inspections will take place before and after heavy precipitation events to identify if modifications are required, or whether erosion and sedimentation control measures have failed; if failure occurs, repairs will be immediately undertaken.
- Frequent inspection of stormwater management structures will be made to determine that they function efficiently and determine if routine maintenance is required.
- Blasting may be required during construction. Use of explosives in or near water will be avoided, however, if required, will follow applicable permit conditions.
- Removal of bedrock by means of hydraulic hammering, blasting and/or breaking of bedrock may be required during construction along sections of the pipeline and transmission line, or during foundation preparations at the data centre. An ARD Management Plan, including identification of ARD potential, sampling procedures, and mitigation options (if required), will be developed prior to significant construction that may interact with bedrock in the PDA.
- Industrial water will be supplied by municipal infrastructure. Some domestic water usage is expected but no drilling will be required within the PDA for drinking water or industrial usage. Wastewater including blowdown required for system cooling will be disposed of locally in a closed loop system. Discharges to surface water systems are not expected.

- Vegetation clearing within RoWs will generally be completed using mechanical methods, except within 30 m of watercourses or wetlands, where manual clearing will be used to protect soils and understory vegetation. Only tower locations and pull sites will be grubbed. Trees that pose a safety risk (“danger trees”) will also be removed. Felled vegetation will be mulched or piled in low windrows with breaks at trails and watercourses to allow wildlife movement, and material may be used for erosion control. Slash will be left to decompose naturally.
- Vegetation management of the linear corridors will be ongoing, determined by regular ground and aerial patrols to assess condition of transmission line and natural gas pipeline conditions. Integrated vegetation management may employ the use of herbicides and a permit will be obtained from NBDELG prior to application. This permit will dictate the required timing of application, setback distances, and limitations near waterbodies and watercourses.
- Transmission line structure locations will be selected to maintain a minimum 30 m setback from watercourses, where practicable. 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.
- It is assumed HDD will be used for watercourse crossings during the installation of the natural gas pipeline. Pull through trenches and drill mobilization will be located outside the required watercourse buffer. Drill mud management techniques will be employed to reduce turbidity in watercourses during horizontal drilling operations and any construction process which requires crossing or passing underneath a watercourse. A mud management plan will be required to be submitted by the HDD contractor for approval prior to construction.
- A baseline groundwater monitoring program will be implemented for private potable wells within the LAA. The program will include identification of active wells within the LAA and an assessment of expected interactions between the individual well and the Project prior to baseline and/or active monitoring. Sampling water quality pre- and post construction may be appropriate for wells in close proximity to Project activities such as blasting.

9.5 Residual Environmental Effects

9.5.1 Construction

Construction will require clearing and grubbing of forested areas within the PDAs and excavation of overburden material, which will expose site soils. In areas of shallow overburden, Project construction may require hydraulic hammering or blasting through rock. This can cause adverse effect to water quality in receiving waters downstream of construction areas if runoff laden with sediment or blast residuals is permitted to be discharged. Usage of explosives near waterbodies and watercourses will be limited, but of required will follow applicable permit conditions and guidelines. If site rock is found to have ARD potential, there is additional potential for water quality impacts from metal leaching and/or pH change. Changes to surface water quantity may be observed as contributing watershed area land cover is altered through land clearing, grubbing, construction and paving. Groundwater withdrawal, if any, will be limited to construction dewatering of shallow excavations. Erosion and sediment control measures will be implemented and monitored to support water management during construction and to prevent sediment releases to receiving waterbodies.

9.5.2 Operation and Maintenance

There are no planned industrial water withdrawals or effluent discharges to the environment during the operations and maintenance phase. On-site disposal of domestic wastewater may be required but will be designed and installed per provincial requirements. Land use changes are required to accommodate site development; however, land use changes represent a change of 7%, 12% to the Mill Creek and Marsh Brook watersheds, respectively, and are assumed to be negligible within the LAA for the transmission line and natural gas pipeline. Given the commitment to maintain current watershed flow regimes through site grading, permanent diversions within watersheds are not anticipated. The uncontrolled release of stormwater could have adverse effects to surface water quality and quantity for water bodies within the immediate vicinity of the PDA. A site-specific stormwater management plan will be implemented to attenuate stormwater to pre-development flow rates and release in a controlled manner, while providing water quality improvements through physical settling. Site grading and stormwater management design will be completed to maintain existing flow regimes to watercourses and wetlands, including PSWs identified within the LAA. Based on current Project design and planned mitigation measures, residual effects to surface water quantity or quality are predicted to be largely associated with construction, irregular in occurrence and limited to the immediate area outside the PDA. Residual effects to surface water quality and quantity are anticipated to be largely mitigated by the management of site grading, design, installation and maintenance of a stormwater management system.

Permanent site infrastructure may modify surface runoff patterns and peak flows. There is also potential for herbicides, explosive residue, and industrial substances to discharge to an adjacent watercourse which may alter nutrient concentrations, biochemical oxygen demand, and other water quality parameters, particularly under low-flow conditions. These potential interactions will be managed through implementation of water management, containment, treatment, and monitoring programs designed to protect water quantity and quality and maintain compliance with applicable regulatory and environmental objectives throughout the life of the Project. The stormwater management plan will work to attenuate increases in peak flow and discharge storm flow back to the original receivers. The Surface Water Monitoring Plan will work in conjunction with the stormwater management plan to indicate any required water quality sample locations, frequency of sampling, and the parameters being tested and collected.

The operation and maintenance phase of the Project does not include industrial groundwater withdrawal or discharge to the subsurface beyond an on-site septic system. The maintenance of surface water flow regimes as described above will prevent significant changes in groundwater quantity and quality within the PDA and LAA. In the unlikely event that groundwater wells are required for the Project (not currently planned), the necessary authorizations will be sought from NBDELG and the wells will be operated in accordance with accepted best management practices and applicable regulations to reduce or avoid adverse residual effects to groundwater quantity and quality.

During operation of the new transmission line and pipeline, vegetation will need to be maintained. The frequency of vegetation management during operation varies depending on vegetation growth rates. Herbicide application for the transmission line will follow appropriate set back distances, with riparian vegetation within 30 m of watercourses cut manually. Herbicides will be applied in a manner consistent with NB Power's existing Integrated Vegetation Management Program and associated permits issued by NBDELG. It is anticipated that vegetation within the pipeline RoW will be mowed, and herbicides will not be used. Given the infrequent occurrence and adherence to the management practices described above, effects on surface water quality are not anticipated.

9.6 Follow-up and Monitoring

Monitoring of installed erosion and sediment control measures will occur during construction to confirm measures are properly located and installed and allow for adaptive management planning as site construction progresses. Ongoing monitoring and maintenance of stormwater management infrastructure, including periodic sediment removal, will be carried out through the operational period of the Project.

The Surface Water Monitoring Plan will work in conjunction with the stormwater management plan to indicate any required water quality sample locations, frequency of sampling, and the parameters being tested and collected.

A baseline groundwater monitoring program will be implemented for private potable wells within the LAA. The program will include identification of active wells within the LAA and an assessment of expected interactions between the individual well and the Project prior to baseline and/or active monitoring. Sampling water quality pre- and post construction may be appropriate for wells in close proximity to Project activities such as blasting.

An ARD Management Plan will be developed for the Project to include protocols for monitoring to manage risks associated with ARD.

9.7 References

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10 Assessment of Environmental Effects on Fish and Fish Habitat

10.1 Scope of Assessment

Fish and fish habitat have been assessed as a valued component (VC) because they provide ecological, cultural, recreational and economic value to the public, Indigenous groups, local businesses, and government agencies. Fish are valued by resource users for commercial, recreational or Aboriginal fisheries and therefore it is important to maintain populations within the region. Project activities can interact with fish and fish habitat, because numerous watercourses are in and around the Study Area. These interactions with Project activities can influence the availability and suitability of habitat for various species and life stages of fish.

The Fish and Fish Habitat VC includes freshwater and diadromous fish, and fish habitat, as defined under the federal *Fisheries Act* as follows:

- Fish, which include: (i) parts of fish; (ii) shellfish, crustaceans, marine animals and any parts of shellfish, crustaceans or marine animals; and (iii) the eggs, sperm, spawn, larvae, spat and juvenile stages of fish, shellfish, crustaceans, and marine animals.
- Fish habitat, which includes waters frequented by fish and any other areas on which fish depend directly or indirectly to carry out their life processes, including spawning grounds and nursery, rearing, food supply, and migration areas.

The assessment also includes aquatic species at risk (SAR) and aquatic species of conservation concern (SOCC) which are defined as follows:

- SAR are species listed as *extirpated*, *endangered*, *threatened*, or *special concern* under Schedule 1 of the federal *Species at Risk Act* (SARA) or the New Brunswick *Species at Risk Ac*t (NB SARA) List of Species at Risk Regulation.
- SOCC are species that do not meet the above definition of SAR, but are ranked S1 (Critically Imperiled), S2 (Imperiled), or S3 (Vulnerable) in New Brunswick by the Atlantic Canada Conservation Data Centre or assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as being either Endangered, Threatened, or Special Concern.

The fish and fish habitat VC is also linked to the Water Resources VC (Chapter 9) as changes in water quantity and water quality can affect fish and fish habitat.

10.1.1 Regulatory Context

Fish and fish habitat is protected by federal and provincial legislation. The *Fisheries Act* protects fish and fish habitat and addresses national interests in marine and fresh waters with the goal of protecting the long-term sustainability of aquatic resources. The *Fisheries Act* includes prohibitions against works, undertakings or activities that result in the harmful alteration, disruption or destruction (HADD) of fish habitat or the death of fish by means other than fishing. After avoidance and mitigation measures have been taken, an authorization with appropriate offsetting is required to counterbalance the residual adverse effects. The *Fisheries Act* also prohibits the deposition of deleterious substances into waters frequented by fish in Canada unless authorized by regulation.

While the primary legislation protecting fish and fish habitat is the federal *Fisheries Ac*t, provincial legislation such as the New Brunswick *Clean Water Act* and associated Watercourse and Wetland Alteration Guidelines, New Brunswick *Clean Environment Act* and the NB SARA, is also considered in the assessment of effects on fish and fish habitat.

10.1.2 Assessment Boundaries

The assessment of potential environmental interactions between the Project and fish and fish habitat is focused on three PDAs and an LAA.

The PDAs represent the anticipated area of direct physical disturbance associated with the construction, operation and maintenance of the Project. For the purposes of this EIA Registration, the Project encompasses three PDAs as described in Section 6.2.3 and shown on Figure 10.1: the Data Centre PDA, the Transmission Line PDA, and the Pipeline PDA.

The LAA for the Fish and Fish Habitat VC is defined as the area within which the environmental effects of the Project can be measured or predicted and can be thought of as the theoretical “zone of influence” of the Project on fish and fish habitat. The LAA for fish and fish habitat is defined as the catchments which flow into Marsh Brook from the PDA and the catchments which flow into the headwaters of Mill Creek (Figure 2.1). A 150 m LAA has also been applied on either side of centreline of the pipeline and transmission line corridor to capture potential upstream and downstream effects related to the construction and operation of these components.

Temporal boundaries for the assessment are based on the timeframes over which potential effects could occur as a result of Project construction, and operation and maintenance phases as defined in Section 6.2.3.

Figure No.
10.1

Title
Fish and Fish Habitat Spatial Boundaries

Client/Project
Beacon Data Centres Inc.
Spruce Lake AI Data Centre

121418636-204

Project Location
Lorneville,
New Brunswick

Prepared by SC on 2026-03-05
QR by JR on 2026-03-05

N

0 0.5 1 km
(At original document size of 11x17)
1:30,000

Legend

- Local Assessment Area

Project Development Areas (PDA)

- Data Centre PDA
- Pipeline PDA
- Transmission Line PDA

Other Features

- Highway
- Collector Road
- Local Road
- Transmission Line (Existing)

Water Features

- Watercourse Flow Direction
- Watercourse
- Marsh Brook Watershed - Craft Cove Catchment (Stantec 2026)
- Mill Creek Watershed - Craft Cove Catchment (Stantec 2026)
- East Musquash Harbour Catchment (Stantec 2026)

Project Location:



Notes
1. Coordinate System: NAD 1983 CSRS New Brunswick Stereographic
2. Data Sources: Beacon Data Centres Inc., Service NB; GeoNB; New Brunswick Power; Stantec
3. Background: Esr , USGS, GeoNB, NB ELG, NB NRED, NS ECC, NS NRR, NRCan CanVec, Service NB

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10.2 Existing Conditions

A characterization of the existing conditions for fish and fish habitat within the spatial boundaries of the Field Study Area (for field surveys) and LAA is provided in the following sections.

10.2.1 Approach and Methods

To characterize the existing conditions for the Fish and Fish Habitat VC in the LAA, existing literature and information was reviewed, and field data were collected in potentially affected aquatic environments.

10.2.1.1 Existing Information Sources

The review of existing literature and information included:

- Other field programs carried out in the area (Dillon 2024, Stantec 2025)
- Publicly available scientific information (COSEWIC 2010, 2012)
- Species at Risk Registries (AC CDC 2026; DFO 2026, COSEWIC)
- Atlantic Canada Conservation Data Centre Data Report (AC CDC 2025; Appendix A)
- Publicly available satellite imagery, Light Detection and Ranging (LiDAR; GNB 2019)

10.2.1.2 Field Studies

Fish habitat characterization (including water quality) and fish community and presence/absence surveys were completed in the vicinity of the Study Area between September 25 and November 27, 2025. The Field Study Area shown in Figure 10.2 encompasses the survey areas for the field programs.

10.2.1.2.1 Fish Habitat Characterization

Data were collected in the vicinity of the Field Study Area to identify and delineate watercourses and to support the determination of fish habitat within watercourses to inform existing conditions in the vicinity of the Data Centre. The methods associated with each survey component are described below. Detailed methods and results of this study are contained in the baseline fish and fish habitat report (Appendix D).

Potential watercourses in the Field Study Area were identified using the 1:10,000 topographic mapping (NBDNRED 2024), existing satellite imagery, and publicly available LiDAR (Appendix D). Fish habitat surveys were conducted in thirteen watercourses in 2025 (Figure 10.2). Watercourses in the vicinity of the Field Study Area were delineated and characterized. Unmapped watercourses were fully characterized and three approximately 100 m long reaches of Marsh Brook were also characterized for fish habitat.

Fish habitat information, including habitat unit (HU; i.e., riffle, run, pool), substrate composition, bank stability, riparian vegetation, overhead and instream cover, wetted and channel width and depth, and velocity at ¼, ½, and ¾ of the watercourse width, was collected to inform whether watercourses were considered fish habitat. Potential barriers to fish migration were noted, photographed and georeferenced.

In situ water quality data were also collected in each watercourse surveyed, with the exception of WC-09 as there was no water present and WC-10 as no channel was visible. Data were collected with a water quality meter and included measurements of water temperature, dissolved oxygen, conductivity, and pH.

In addition to in situ water quality measurements, seven surface water grab samples were collected. Four of these samples were collected in freshwater watercourses draining the Project, one sample was collected in the freshwater reaches of Marsh Brook, and one sample was collected in the tidal portion of Marsh Brook. One additional sample was collected in Mill Creek on November 27, 2025, following public consultation (Appendix D). Surface water samples were analyzed for general chemistry, trace metals (total), total mercury, and turbidity at the Research and Productivity Council (RPC) laboratory in Fredericton, NB. In situ measurements and surface water quality sample results were compared to the Canadian Council of Ministers of the Environment (CCME) Canadian Water Quality Guidelines for the Protection of Aquatic Life (Freshwater) (CWQG-PAL; CCME 1999), except for the sample collected in the tidal portion of Marsh Brook and the sample collected in Mill Creek.

Watercourses within the proposed transmission line and pipeline RoWs were not surveyed, but were identified using the 1:10,000 topographic mapping and publicly available LiDAR as the RoW for those Project components had been determined when field surveys took place.

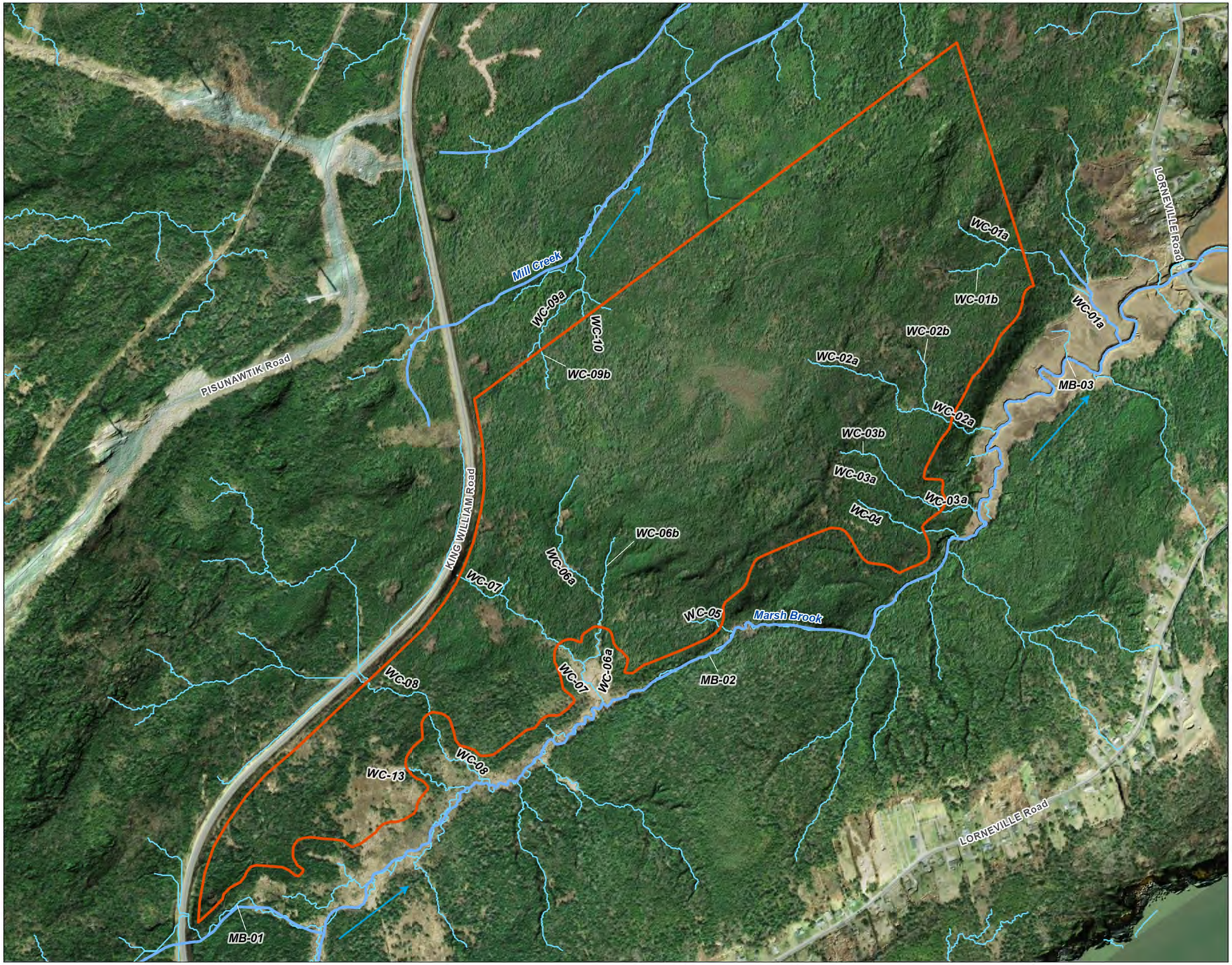


Figure No.

10.2

Title

Watercourses Identified in the Vicinity of the Field Study Area

Client/Project

121418636-205

Beacon Data Centres Inc.
Spruce Lake AI Data Centre

Project Location
Lorneville,
New Brunswick

Prepared by SC on 2026-03-05
QR by JR on 2026-03-05

N

0 200 400 metres

(At original document size of 11x17)
1:9,000

Legend

- Field Study Area

Water Features

- LiDAR-Derived Watercourse (Stantec 2025)[4]
- Watercourse Flow Direction
- Watercourse (NBHN)

Other Features

- Local Road

Project Location:



Notes

1. Coordinate System: NAD 1983 CSRS New Brunswick Stereographic
2. Data Sources: Beacon Data Centres Inc.; Service NB; GeoNB; New Brunswick Power; Stantec
3. Background: Vantor, Esri, CGIAR, LSGS, Esri, USGS; GeoNB; NB ELG; NB NRED; NS ECC; NS NRR; NRCan CanVec; Service NB
4. LiDAR-Derived watercourses produced from GIS desktop analysis to support aquatic fieldwork. Service New Brunswick 1m digital elevation model (DEM) used for analysis.

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10.2.1.2.2 Fish Community

To further the understanding of the fish communities within the LAA, a literature review of existing information was completed, and qualitative electrofishing was conducted in ten watercourses. As Marsh Brook flowed along the southern edge of the Field Study Area, three reaches were sampled. Two reaches were sampled by electrofishing, and one was sampled using minnow traps.

Fish sampling was conducted primarily using a backpack electrofishing unit (Smith Root LR-24). Fishing stations were sampled for a minimum fishing effort of 500 seconds unless sufficient habitat was lacking (i.e., channel ended, intermittent stream). Additional effort was expended to determine if watercourses or portions of watercourse deemed to not be fish habitat were indeed fishless (e.g., overland drainage channels). The time fished for each watercourse section was recorded and captured fish were measured, weighed, identified to species, and released alive.

In the tidal portion of Marsh Brook, baited minnow traps were set below the low tide mark to fish overnight and checked the following morning.

10.2.1.2.3 Aquatic Species at Risk

To assess the potential for the occurrence of SAR or SOCC, fish community studies were undertaken within watercourses in the LAA and literature was reviewed for catchments which drain into the LAA. Additionally, data from the AC CDC (AC CDC 2025; Appendix A), which includes managed areas and observations of SAR and SOCC, was reviewed to assess the potential for the occurrence of SAR or SOCC species within watercourses in the LAA.

10.2.2 Description of Existing Conditions

There are two catchments that are potentially affected by the Project. The first catchment is the Craft Cove catchment which drains the Marsh Brook and Mill Creek watersheds and several other nearby small tributaries (Figure 10.1). The second catchment area is the Musquash Harbour catchment which drains Ferguson Creek, Shannon's Lake, Frenchman's Creek, Burchill's Brook and many other small tributaries (Figure 10.1).

10.2.2.1 Fish Habitat Characterization

10.2.2.1.1 Data Centre Watercourses

Thirteen watercourses in proximity to the Field Study Area were surveyed in 2025 (Appendix D). The majority of watercourses surveyed are small unmapped headwater tributaries which were generally narrow (<1.5 m wide), shallow (<0.21 m), and had no flow or were slow flowing (<0.2 m/s). Many of the watercourses sampled contained reaches that were ephemeral and/or intermittent (Appendix D). The reaches of Marsh Brook that were surveyed were wider (0.05 to 6.0 m), deeper (0.08 to 0.54 m), and faster flowing (0.001 m/s to 1 m/s). A summary of habitat characteristics for watercourses in proximity to the Field Study Area is provided in Table 10.1. The complete habitat classification dataset is included in the baseline fish and fish habitat report (Appendix D).

The three reaches sampled in Marsh Brook contained fish habitat and seven other watercourses were determined to potentially contain fish habitat throughout the watercourse or within their lower reaches. The remaining six watercourses were determined not to contain fish habitat because they were overland drainage, had no visible channel, no connectivity to fish-bearing water, or a combination of these characteristics.

Table 10.1 Summary of Habitat Characteristics for Data Centre Watercourses Surveyed by Tributary

Stream	Wetted Stream Width (m)	Channel Stream Width	Mean Depth (m)	Mean Velocity (m/s)	Dominant Habitat Type	Dominant Substate Type	Dominant Riparian Vegetation	Average Overhead Cover	Dominant Instream Cover	Comments
MB-01	1.8	2.3	0.37	0.12	Riffle	Sand (31%)	Grass (40%) and Shrubs (40%)	25%	Large Woody Debris (5%)	Mapped second order watercourse with confirmed fish habitat
MB-02	4.2	4.6	1.07	0.45	Riffle	Small Boulder (43%)	Grass (45%)	18%	Large Woody Debris (5%)	Mapped second order watercourse with confirmed fish habitat
MB-03	1.2	6.0	0.65	0.1	Run	Fines (95%)	Grass (100%)	5%	None	Mapped second order watercourse which is tidally influenced. Confirmed fish habitat
WC-01a	0.4	1.0	0.07	N/A*	Run	Cobble (32%)	Grass (54%)	9%	Small Woody Debris (11%)	Unmapped watercourse with connectivity to Marsh Brook. Potentially fish habitat.
WC-01b	Dry overland drainage channel that drains into WC-01a. Not fish habitat									
WC-02a	0.2	0.7	0.04	N/A*	Glide	Fines (31%)	Trees (53%)	29%	Small Woody Debris (1%)	Unmapped watercourse with connectivity to Marsh Brook. Potentially fish habitat in downstream reaches (0 to 105 m) until a very steep slope (~40%) poses a barrier to fish passage. Upstream reaches are overland drainage or no visible channel and are not considered fish habitat.
WC-02b	0.4	0.5	0.1	N/A*	Glide	Fines (70%)	Trees (60%)	14%	Small Woody Debris (4%)	Unmapped watercourse with no connectivity to fish-bearing waters. Not fish habitat.
WC-03a	0.5	0.8	0.05	N/A*	Run	Fines (61%)	Grass (55%)	15%	Small and Large Woody Debris (4% each)	Unmapped watercourse with connectivity to Marsh Brook. Potentially fish habitat in downstream reaches (0 to 353 m). Upstream reaches have no visible channel or are overland drainage and are not considered fish habitat (353 to 426 m).
WC-03b	0.2	0.4	0.05	N/A*	Run	Fines (70%)	Trees (55%)	8%	Small Woody Debris (3%)	Unmapped branch of WC-03a. Potentially fish habitat in downstream reach (0 to 76 m). Upstream reaches are either overland drainage or have no visible channel (76 to 144 m).
WC-04	0.4	0.8	0.09	N/A*	Run	Fines (64%)	Grass (60%)	16%	Small and Large Woody Debris (5% each)	Unmapped watercourse with connectivity to Marsh Brook. Potentially fish habitat in lower reaches (0 to 164 m). Upstream reaches (164 to 356 m) are overland drainage and are not considered fish habitat.
WC-05	0.6	0.9	0.08	N/A*	Riffle	Fines (41%)	Grass (57%)	15%	Small and Large Woody Debris (5% each)	Unmapped watercourse with connectivity to Marsh Brook. Potentially fish habitat.
WC-06a	0.1	0.1	0.03	N/A*	Glide	Fines (24%)	Grass (40%) and Trees (40%)	1%	Small Woody Debris (2%)	No connectivity to fish-bearing waters. No defined channel is visible in downstream reaches within a wetland (0 to 115 m). Upstream reaches are an overland drainage channel and are not considered fish habitat (125 to 612 m).
WC-06b	Dry overland drainage channel that drains into WC-06a. Not fish habitat									
WC-07	0.4	0.9	0.18	N/A*	Intermittent -Pool	Fines (48%)	Grass (51%)	13%	Small Woody Debris (7%)	Unmapped watercourse with no connectivity to fish-bearing waters. Downstream reach is an overland drainage channel (0 to 50 m) and then dissipates into a wetland and no defined channel is visible (50 to 130 m). Upstream reaches are an overland drainage channel and are not considered fish habitat.
WC-08	0.6	0.7	0.13	N/A*	Run	Fines (23%)	Grass (40%)	13%	Small Woody Debris (3%)	Unmapped watercourse with connectivity to Marsh Brook. Potentially fish habitat, further assessment is required.
WC-09a	Dry overland drainage channel. Not fish habitat									
WC-09b	The downstream reach is a dry overland drainage channel (0 to 27 m) that dissipates into a wetland and no channel is visible (27 to 71 m). A dry overland drainage channel re-emerges (71 to 106 m) before dissipating into a wetland again.									
WC-10	No visible channel - not fish habitat.									
WC-11	0.4	0.5	0.09	0.09	Run	Fines (48%	Trees (65%)	4%	Small Woody Debris (8%)	Unmapped watercourse. Downstream reaches may potentially be fish habitat as there is connectivity to fish-bearing water during periods of high flow (0 to 65 m). Upstream reaches (65 to 136 m) lack connectivity and are overland drainage and not fish habitat.
WC-12a	0.7	1.1	0.16	0.13	Run	Fines (37%)	Trees (43%)	9%	Small Woody Debris (5%)	Unmapped watercourse with no connectivity to fish-bearing waters. Downstream reaches dissipate into a wetland. Overland drainage channel that does not contain fish habitat.
WC-12b	0.5	1.4	0.06	0.001	Run	Cobble (40%)	Trees (50%)	0%	Small Woody Debris and Boulders (5% each)	Unmapped branch of WC-12a. Watercourse dissipates into a wetland downstream and is not considered fish habitat.
WC-13	No visible channel in downstream reaches. Overland drainage channel present upstream that drains from one wetland into another. Not fish habitat.									

*No measurable flow
Source: Appendix D

Figure No.
10.3

Title
Fish Bearing Status of Mapped and Unmapped Watercourses in the Field Study Area

Client/Project
121418636-206
Beacon Data Centres Inc.
Spruce Lake AI Data Centre

Project Location
Lorneville,
New Brunswick

Prepared by SC on 2026-03-05
QR by JR on 2026-03-05

N

0 200 400 metres
(At original document size of 11x17)
1:9,000

Legend

- Field Study Area

Project Development Areas (PDA)

- Data Centre PDA
- Pipeline PDA
- Transmission Line PDA

Water Features

Fish Bearing Status

- Potentially Fish Bearing
- Channel Not Present - Not Fish Bearing
- Channel Present - Not Fish Bearing
- Confirmed Fish Bearing
- Potential Watercourse - Not Surveyed (LiDAR-Derived)[4]
- Watercourse Flow Direction
- Watercourse - Not Surveyed (NBHN)

Other Features

- Local Road

Project Location:



Notes
1. Coordinate System: NAD 1983 CSRS New Brunswick Stereographic
2. Data Sources: Beacon Data Centres Inc.; Service NB; GeoNB; New Brunswick Power; Stantec
3. Background: Vantor, Esri, CGIAR, LSGS, Esri, USGS; GeoNB; NB ELG; NB NRED; NS ECC; NS NRR; NRCan CanVec; Service NB
4. LiDAR-Derived watercourses produced from GIS desktop analysis to support aquatic fieldwork. Service New Brunswick 1m digital elevation model (DEM) used for analysis.

Stantec

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In situ water quality measurements were collected at 13 locations within the Field Study Area (Appendix D). Water temperatures ranged from 8.4°C to 18.0°C and dissolved oxygen concentrations ranged from 3.30 to 10.32 mg/L (30 to 103%; Appendix D). Dissolved oxygen concentrations were below the CWQG PAL recommended value of 6.5 mg/L for other life stages (e.g., juvenile and adult) of coldwater fish species for five of 13 measurements collected. Five out of 13 dissolved oxygen measurements were above the minimum value for other life stages but below the value for early life stages of coldwater fish (e.g., egg, embryo, larvae; 9.5 mg/L). Three out of 13 dissolved oxygen measurements collected were above the value for early life stages of coldwater fish. The pH ranged from 5.65 to 8.48 and was below the CWQG PAL recommended range (6.5 to 9.0) for four of thirteen measurements collected.

Analytical water quality results for many parameters were found to be below the reporting limit. The reporting limits of the water sample taken in the tidal environment of Marsh Brook (MB-03) were above the CWQG-PAL (marine), thus the results could not be compared to the guidelines.

In general, the surface waters flowing into and within Marsh Brook contained low concentrations of dissolved minerals (i.e., hardness). Alkalinity (as $CaCO_3$) was considered low (range: 13 to 110 mg/L) and hardness (as $CaCO_3$) ranged from low to moderate (range: 45.3 to 97.7 mg/L). Laboratory measured conductivity was considered high for freshwater environments (range: 170 to 439 µS/cm). These values overall indicate soft water conditions in freshwater watercourses sampled (Appendix D).

Nutrient concentrations in surface waters were generally low, reflective of the relatively undeveloped nature of the surrounding land. Ortho-phosphate (as P) was less than the detection limit in all five samples and nitrogen (ammonia nitrogen) was below the detection limit at three of five sampling locations. Nitrate + nitrite ranged from 0.19 to 0.45 mg/L at four sampling locations and was below the detection limit at two locations (Appendix D).

Total aluminum exceeded the CWQG PAL at three of five sampling locations flowing into and within Marsh Brook, total cadmium exceeded the guideline at one sampling location, and total iron exceeded the guideline at three of five sampling locations (Appendix D).

The water quality parameters in the single sample from Mill Creek (MC-01) was similar to samples collected from streams flowing into and within Marsh Brook. Like Marsh Brook, concentrations of aluminum, iron and lead in surface waters of Mill Creek were also above the CWQG PAL. The concentration of zinc was also found to be above the CWQG PAL in Mill Creek, but not in Marsh Brook.

10.2.2.1.2 Transmission Line Watercourses

Twenty-seven potential watercourses/ waterbodies were identified within the proposed transmission line RoW through the review of existing information. Six mapped watercourses and one pond were identified within the proposed transmission line RoW through 1:10,000 topographic mapping and 20 watercourses were identified through existing satellite imagery and publicly available LiDAR. Of the 27 watercourses/waterbodies identified, one is a pond, 24 are considered small (unmapped, first or second order headwater streams) and the remaining two are considered medium to large watercourses (third order or larger streams), which drain into the Bay of Fundy.

As some of the watercourses were crossed multiple times by the transmission line, there was a total of 37 watercourse crossings identified. Four were surveyed previously to support the Data Centre watercourse characterization (Appendix D), all of which were confirmed present and located on two watercourses (WC-06 and WC-07). Four crossings were surveyed previously during fish and fish habitat surveys to support the Saint John 138 kV Corridor Project (WC-02, WC-04, WC-07, and WC-71) and all four watercourses were determined to be present (Stantec 2025). A summary of habitat characteristics for previously surveyed crossings is provided in Table 10.2. Twenty-eight additional crossings were identified and will require field surveys to determine if they are present.

In situ water quality measurements were collected at six locations in downstream reaches of watercourses crossed by the proposed transmission line (Stantec 2025; Appendix D). Water temperatures ranged from 8.3°C to 12.1°C and dissolved oxygen concentrations ranged from 2.8 to 9.2 mg/L (24 to 84%; Stantec 2025; Appendix D). Dissolved oxygen concentrations were below the CWQG PAL recommended value of 6.5 mg/L for other life stages of coldwater fish species for two of six measurements collected. The remaining four out of six measurements were above the guideline for other life stages but below the guideline for early life stages of coldwater fish (9.5 mg/L). The pH ranged from 7.5 to 8.5 and was within the CWQG PAL recommended range (6.5 to 9.0) for all six measurements collected.

Table 10.2 Summary of Habitat Characteristics for Transmission Line Watercourses Surveyed

Crossing ID	Wetted Stream Width (m)	Channel Stream Width	Mean Depth (m)	Mean Velocity (m/s)	Dominant Habitat Type	Dominant Substate Type	Dominant Riparian Vegetation	Average Overhead Cover	Dominant Instream Cover	Comments
WC-06	0.1	0.1	0.03	N/A*	Glide	Fines (24%)	Grass (40%) and Trees (40%)	1%	Small Woody Debris (2%)	No connectivity to fish-bearing waters. No defined channel is visible in downstream reaches within a wetland (0 to 115 m). Upstream reaches are an overland drainage channel and are not considered fish habitat (125 to 612 m).
WC-07	0.4	0.9	0.18	N/A*	Intermittent-Pool	Fines (48%)	Grass (51%)	13%	Small Woody Debris (7%)	Unmapped watercourse with no connectivity to fish-bearing waters. Downstream reach is an overland drainage channel (0 to 50m) and then dissipates into a wetland and no defined channel is visible (50 to 130 m). Upstream reaches are an overland drainage channel and are not considered fish habitat.
WC-02**	34.5	39.4	1.89	-	Run	Small Gravel/Large Gravel	Trees	-	-	Watercourse is tidal.
WC-04**	20.0	24	1.95	-	Glide	Organics	Grass			Watercourse has a well-defined channel, is located in a wetland, and has many small side channels.
WC-07**	0.8	1.0	0.12	-	Glide	Organics	Grass			Drainage channel connected to small pond. Further field characterization of the pond will be required.
WC-71**	-	1.3	0.14	-	Riffle/Run	Sand/ Large Gravel	Grass	-	-	-

Notes:
*No measurable flow
** Downstream reaches of these watercourse crossings were surveyed to support the Saint John 138 kV Corridor Project (Stantec 2025)

Sources (Stantec 2025, Appendix D)

10.2.2.1.3 Pipeline Watercourses

In total, 15 potential watercourses were identified in the proposed pipeline RoW through the review of existing information. Two mapped watercourses were identified within the proposed transmission line RoW through 1:10,000 topographic mapping and 13 were identified through existing satellite imagery and publicly available LiDAR. These crossings will require field surveys to determine presence and potential for fish habitat. Of the watercourses identified, all 15 are considered small (unmapped, first or second order headwater streams).

Water quality is anticipated to be similar to the TL crossings.

10.2.2.2 Fish Community

The Project is located in the West Fundy composite watershed, east of the Musquash River (NBDNRED 2012). This watershed is known to support a variety of fish species including Atlantic salmon (*Salmo salar*), American eel (*Anguilla rostrata*), and brook trout (*Salvelinus fontinalis*). Other species that may occur include blacknose dace (*Rhinichthys atratulus*), common shiner (*Notropis cornutus*), creek chub (*Semotilus atromaculatus*), lake chub (*Couesius plumbeus*), mummichog (*Fundulus heteroclitus*), ninespine stickleback (*Pungitius pungitius*), threespine stickleback (*Gasterosteus aculeatus*), slimy sculpin (*Cottus cognatus*), and white sucker (*Catostomus commersonii*; Gautreau and Curry 2020).

American eel and brook trout were captured in Mill Creek and its tributaries during electrofishing surveys conducted in 2024 (Dillon 2024). Brook trout were also captured in Stinson's Brook which is located approximately 1.5 km to the north of the current Study Area (Dillon 2024).

No fish were captured in any of the watercourses sampled within the Data Centre PDA (WC-01 to WC-08, WC-10; Appendix D). Brook trout and mummichog were captured in Marsh Brook in 2025 (Appendix D). Various life stages of brook trout (e.g., young of year, juvenile and adult) were captured in the freshwater reaches of Marsh Brook and juvenile and adult mummichog were captured in the tidal portion of Marsh Brook. A summary of the catch from Marsh Brook is provided in Table 4.1.

Watercourses crossed by the proposed transmission line RoW have the potential to support American eel, Atlantic salmon, brook trout, blacknose dace, creek chub, lake chub, threespine stickleback, and white sucker (Stantec 2025), as suitable habitat exists.

Watercourses crossed by the proposed pipeline RoW have the potential to support fish communities that are similar to the West Fundy composite watershed as suitable habitat exists.

Table 10.3 Fish Captured from Study Area

Site	Number of Fish Captured		
	Brook trout (*Salvelinus fontinalis*)	**Mummichog (*Fundulus heteroclitus*)**	**Total**
MB-01	15	0	**15**
MB-02	3	0	**3**
MB-03	0	13	**13**
Total	**18**	**13**	**31**

10.2.2.3 Aquatic Species at Risk

American eel are considered SAR/SOCC in New Brunswick and are considered Threatened under the COSEWIC (COSEWIC 2012) and NB SARA (NBDNRED 2013) but have no status under SARA (Table 10.4). American eel was not captured in the Field Study Area, Marsh Brook, or its inflowing watercourses in 2025 during field studies (Appendix D); however, it has been captured in Mill Creek (Dillon 2024) and is assumed to be present in the fish-bearing reaches of watercourses within the LAA.

Atlantic salmon that occur within the West Fundy watershed belong to the Outer Bay of Fundy population (DFO 2014). This population is considered SAR/SOCC in New Brunswick and are considered Endangered under COSEWIC (COSEWIC 2010) and NB SARA (NBDNRED 2013) but have no status under SARA. Atlantic salmon was not captured within the Data Centre PDA, Marsh Brook, or its inflowing tributaries in 2025 (Appendix D) or in the adjacent Mill Creek watershed (Dillon 2024). Atlantic salmon have the potential to be present in the fish-bearing reaches of watercourses within the LAA.

Table 10.4 Aquatic Species at Risk and/or Species of Conservation Concern That May Occur in the LAA

Species	Local Distribution, Key Life History Traits, and Anthropogenic Interactions	Conservation Status			
		SARA[1]	COSEWIC[1]	NB *SARA*[2]	SRank[3]
Fishes					
American eel (*Anguilla rostrata*)	A long-lived, bottom-dwelling predator, it spends most of its life in freshwater and estuarine environments and then migrates to sea to spawn and die. Spawning migration occurs in the fall; elvers arrive in estuaries in spring and early summer (Scott and Crossman 1998; COSEWIC 2012). Existing population pressures include habitat degradation and barriers to migration (Chaput *et al.* 2014).	No status	Threatened (2012)	Threatened	S4N (Apparently secure nonbreeding)
Atlantic salmon (*Salmo salar*) Outer Bay of Fundy population	An anadromous species that spawns and rears in clean, gravel-bottomed freshwater environments. In the spring of the year smolts migrate to the sea to feed and mature for 1-2 years before returning back to their natal streams and rivers (COSEWIC 2010). The Outer Bay of Fundy population of Atlantic salmon inhabit rivers that flow into the Bay of Fundy from the New Brunswick side between the U.S.A – Canada border and the city of Saint John (DFO 2014).	No status (under consideration)	Endangered (2010)	Endangered	SNR

Notes:

1. Source: Government of Canada
2. Source: New Brunswick Department of Natural Resources and Energy Development (no date)
3. Source: Atlantic Canada Conservation Data Centre (AC CDC 2026)

10.3 Potential Effects and Effect Pathways

A summary of the potential effects and Project effect pathways to be assessed for Fish and Fish Habitat is provided in Table 10.5. Potential environmental effects and effects pathways were selected based on the review of similar projects in Atlantic Canada and professional judgement.

Table 10.5 Potential Effects and Effect Pathways for Fish and Fish Habitat

Potential Effect	Effect Pathway(s)
Change in Fish Habitat Quantity	• Placement of infrastructure (e.g., watercourse crossings) in watercourses may result in a reduction of available habitat for fish to carry out their life processes (i.e., direct loss) • Stormwater management may also result in an indirect loss of fish habitat due changes in drainage area and associated reductions in flows and water management infrastructure. • Watercourse crossings can result in an obstruction to fish passage if not properly designed, which could limit access to upstream habitats that are required to carry out life processes (Khan and Colbo 2008; Dunham et al. 1997)
Change in Fish Habitat Quality	• The use of industrial equipment in or near water could introduce deleterious substances, result in sedimentation and alteration of fish habitat such that habitat quality is reduced (Sweka and Hartman 2001; Herbert and Merkens 1961; Robertson et al. 2006) • Transfer of aquatic invasive species from construction and maintenance equipment could result in a change in fish habitats (e.g., aquatic vegetation, algae, mussels) • Site clearing, preparation, and earth works could increase the potential for changes in runoff, sedimentation, and the introduction of deleterious substances into fish habitat, thus reducing habitat quality (e.g., siltation of spawning beds) (Greig et al. 2007; Wood and Armitage 1999; Curry and MacNeill 2004) • Removal of riparian vegetation may reduce shade and/or increase nutrient and energy inputs, which could affect water quality, in turn affecting the quality of fish habitat through changes in temperature and food availability (i.e., primary and secondary productivity) (Zalewski et al. 2001) • Instream work during high flow or increased rainfall events can increase the potential for runoff and the amount of sediment entering fish habitat. These effects may be compounded if sedimentation occurs during the spawning, incubation or hatching period of a fish species (DFO 2025a). • Discharges from the wastewater system into streams could affect fish habitat quality if suspended sediments and/or contaminants are released, which could affect the suitability of habitat for fish (Sweka and Hartman 2001; Herbert and Merkens 1961; Robertson et al. 2006) • Exposing and disturbing sulphide-bearing rocks can result in acid rock drainage which can result in acidic runoff and metal leaching into watercourses • Changes in stream flow due to wastewater management can affect habitat suitability or quality • Vegetation Management may result in the need for herbicide application (excluding within 30 m of watercourses) and/or manual cutting after initial RoW clearing which could result in changes in fish habitat through instream or riparian disturbances (i.e., bank erosion and sedimentation)

Table 10.5 Potential Effects and Effect Pathways for Fish and Fish Habitat

Potential Effect	Effect Pathway(s)
Change in Fish Health and Survival	• Fish health and survival could be affected directly or indirectly through injury due to industrial equipment working in or near watercourses • Introduction of sediments and contaminants into fish habitat could affect fish health and survival. Siltation events could inhibit the ability of fish to forage and cause behavioural or physiological changes in fish and smothering of eggs (Sweka and Hartman 2001; Herbert and Merkens 1961; Kjelland et al. 2015) • Introduction of deleterious substances (e.g., grease, fuel) from machinery operating in or near waterbodies could also affect fish health and survival • Removal of riparian vegetation near watercourses could affect fish health due to changes in shade, protective cover, and/or external nutrient/energy inputs (Zalewski et al. 2001) • The use of explosives in or near water could result in instantaneous changes in pressure, and changes to fish health and survival through injury or instantaneous death (if required) • Fish survival could be affected by stranding in streams with reduced flows (i.e., indirect loss; DeBoer et al. 2016; Irvine et al. 2009) • Stormwater discharges could affect fish habitat quality if contaminants or nutrients are released, which could affect the habitat suitability • Exposing and disturbing sulphide-bearing rocks can result in acid rock drainage which can result in acidic runoff and metal leaching watercourses • Transfer of aquatic invasive species from equipment could result in a change in fish health and survival, because of changes in fish habitat or competition from invasive species • Timing of in-water works could affect fish health and survival if early life stages (e.g., eggs or larvae) are present when in-water work occurs

The Project will interact with fish and fish habitat resulting in a change in fish habitat quantity, fish habitat quality and fish health and survival from the following activities:

- Site Preparation
- Foundations and Earthworks
- Site Clean-up and Restoration
- Pipeline Installation
- Transmission Line Installation and Operations (including vegetation management)

10.4 Mitigation Measures

The Project has been designed to avoid loss of fish habitat through careful planning and placement of infrastructure and shifting locations of activities away from fish-bearing watercourses to the extent feasible. During Project planning and design, efforts were made to relocate or design Project infrastructure to avoid the loss of fish habitat. Where avoidance is not feasible, the mitigation measures described below will be employed to reduce the potential for effects. The mitigation measures have been selected in consideration of the environmental effects pathways and include standard mitigation measures for sediment and erosion control, incorporate standards and best management practices, and consider regulations and guidelines that govern fish and fish habitat protection.

The following mitigation measures specific to the Fish and Fish Habitat VC have been identified for the Project:

- Project footprint and disturbed areas will be limited to the extent practicable. The Project will adhere to a maximum RoW width of 92 m for the transmission line and 52 m for the pipeline
- Movement of equipment/vehicles will be restricted to defined work areas and roads and specified corridors between work areas
- Where existing roads are insufficient, temporary matting, bridges or corduroy may be used to provide access for machinery and equipment to cross watercourses.
- A 30 m buffer will be clearly marked around watercourses. Within 30 m manual clearing will be used to protect soils and understory vegetation
- Standard erosion and sedimentation control structures will be used (e.g., silt curtains, sediment control fences, settling basins), inspected regularly, and maintained throughout construction activities. Sediment control fences will be removed following stabilization or revegetation
- Weather advisories will be followed, and work will be scheduled to avoid high precipitation and runoff events or periods to the extent practicable, to reduce potential for erosion/sedimentation
- Equipment will be inspected and cleaned prior to use onsite to prevent the transfer of non-native species
- Exposed topsoil, brush and woody debris will be placed away from watercourses

- Fuels and lubricants used during construction will be stored according to regulated containment methods in designated areas. Storage areas will be located at least 30 m from watercourses
- Refueling of machinery will not occur within 30 m of watercourses to reduce the likelihood that deleterious substances will enter watercourses. Where stationary equipment is situated, special precautions will be implemented to prevent spills during refueling. Spill response kits will be located at the refueling site
- Disposal and handling of waste oils, fuels, and hazardous waste will be as recommended by the suppliers and/or manufacturers in compliance with federal, provincial, and municipal regulations
- Reasonable measures will be undertaken to prevent the release of deleterious substances (e.g., fuels, lubricants, hydraulic oil) into watercourses
- The duration of in-water works will be reduced to the extent practicable and machinery will be operated above the high-water mark or inside of isolated areas, where practicable
- In-water work will be planned to respect DFO timing windows to protect fish in New Brunswick (DFO 2025a)
- In-water work areas will be isolated from fish bearing waters (e.g., coffer dams, sediment and erosion control)
- Precast concrete will be used for in-water works (e.g., culverts) as practically feasible. If poured concrete is required, in-water work areas will be isolated. Concrete or wastewater contacting concrete will be disposed of appropriately so that it does not enter watercourses
- Use of explosives in or near water will be avoided, however, if required, will follow applicable permit conditions
- Excavated or exposed rock that is potentially acid generating (PAG) will be managed to prevent acid rock drainage into watercourses
- HDD will be preferentially used for pipeline crossings through perennial fish-bearing watercourses, and confirmed following field surveys
- Wastewater will be treated as needed to meet applicable discharge limits
- Fish rescues will be conducted to safely redistribute fish outside of areas requiring in-water work

The practices used to mitigate risks to freshwater fish and freshwater and estuarine fish habitats will be applied to all phases and activities of the Project.

10.5 Residual Environmental Effects

Potential environmental effects on the Fish and Fish Habitat were identified in Section 10.3: change in fish habitat quantity, change in fish habitat quality and change in fish health and survival.

Residual effects (i.e., those remaining following implementation of mitigation [Section 10.4]) for each Project phase are evaluated below. The assessment of residual effects considers the following key factors:

- Most affected watercourses within the Project Area of the data centre provide overland drainage that convey flow into fish-bearing streams. There are periods of the year when these watercourses are ephemeral or intermittent and dissipate into wetlands.
- Some of the watercourses associated with the proposed transmission line and pipeline have been disturbed by an existing transmission line and pipeline corridor previously. Existing linear corridors will be used to the extent practically feasible.
- Receiving fish-bearing watercourses are generally small and support brook trout, American eel, mummichog and a variety of other species.
- American eel and Outer Bay of Fundy Atlantic salmon are potential aquatic SAR/SOCC within watercourses in the Project Area (transmission line and pipeline RoW) and LAA. American eel is assumed to be present and Atlantic salmon have the potential to occur in the fish-bearing reaches within the Project Area and LAA.
- The Project has been designed to avoid loss of fish habitat through careful planning of the placement of infrastructure and shifting locations of activities away from fish-bearing streams, as practically feasible. Where avoidance is not feasible, mitigation measures will be employed to reduce the potential for effects. Where residual effects cannot be avoided or mitigated, offsetting measures will be used to counterbalance harmful impacts to provide a net gain of fish habitat.

10.5.1 Change in Fish Habitat Quantity

The residual effects on fish habitat quantity are closely related to the assessment of Project effects on the Surface Water Resources VC (Chapter 9) in this document.

10.5.1.1 Construction

Pathways that affect fish habitat quantity as outlined in Section 10.3 are related to placement of Project infrastructure, stormwater management and associated changes in watershed areas.

The Project has been designed to avoid loss of fish habitat through careful planning of the placement of infrastructure and shifting locations of activities away from watercourses, as practically feasible. Where avoidance is not feasible, mitigation measures will be employed to reduce the potential for effects as described below. Where residual effects cannot be avoided or mitigated, offsetting measures will be used to counterbalance harmful impacts to provide a net gain of fish habitat.

Within the Data Centre PDA, there are portions of unmapped non-fish bearing watercourses that cannot be practically avoided and will be overprinted (e.g., WC-02a, WC-06ab, WC-09ab, WC-10, WC-11). These alterations will be authorized through Watercourse and Wetland Alteration (WAWA) permits.

Work in fish-bearing watercourses may be required if watercourse crossings (e.g., culverts) are required to provide access within the transmission line or pipeline RoW, or if there is a failure of the borehole while completing an HDD under watercourses. While not anticipated, residual losses in fish habitat quantity will be counterbalanced through a *Fisheries Act* Authorization if required.

Residual Project-related effects to fish habitat quantity are reduced through the application of standard mitigation and best practices in accordance with New Brunswicks' Watercourse and Wetland Alteration Guidelines (NBDE 2012), DFO's "Measures to Protect Fish and Fish Habitat" (DFO 2025b) and standards and codes of practice (DFO 2025c). Trenching across fish-bearing watercourses during construction of the pipeline has the potential to result in alterations to fish habitat as a result of in-water work. To avoid effects to fish HDD will be preferentially used for pipeline crossings through perennial fish-bearing watercourses and confirmed following field surveys and design. If required, watercourse crossings (e.g., road and pipeline) have the potential to result in an obstruction to fish passage if not properly designed or installed, which could limit access to upstream habitats that are required to carry out life processes (Khan and Colbo 2008; Dunham et al. 1997). Watercourse crossings will be designed and constructed to be consistent with best practices and relevant guidance, allowing fish to access the necessary habitat required for life processes.

Stormwater management may also result in an indirect loss of fish habitat due to changes in drainage area from stormwater management and potential reductions in flows. Water management infrastructure will be designed to maintain existing catchments to the extent practicable. A reduction of 10% of mean annual flow (MAF) in watercourses has the potential to result in adverse effects to fish habitat (e.g., loss in productivity, wetted width). The changes in land use, and overprinted area within non-fish bearing watercourses within the data centre footprint is relatively small and these watercourses are often ephemeral or intermittent as a baseline condition. As a result, the indirect loss of fish habitat from stormwater management is not anticipated.

10.5.1.2 Operation

Stormwater management will continue from construction throughout operation. The relatively small land use changes associated with the Project in relation to the watersheds, are not anticipated to alter existing downstream flow regimes in the LAA and result in effects to fish habitat quantity.

10.5.1.3 Summary

The Project has been designed to avoid loss of fish habitat through careful planning of the placement of infrastructure and shifting locations of activities away from watercourses, as practically feasible.

Within the data centre footprint, portions of unmapped non-fish bearing watercourses will be overprinted and authorized through Watercourse and Wetland Alteration (WAWA) permits. Work in fish-bearing watercourses may be required during construction of watercourse crossings (e.g., culverts or pipelines). While not anticipated, residual losses in fish habitat quantity will be counterbalanced through a *Fisheries Act* Authorization if required, and associated Offsetting Plan.

10.5.2 Change in Fish Habitat Quality

The residual effects on fish habitat quality are closely related to the results of the assessment of Project effects on Surface Water Resources (Chapter 9).

10.5.2.1 Construction

During the construction phase of the Project, site preparation, foundations and earthworks, site clean-up and restoration, pipeline installation and transmission line installation will require access, clearing of vegetation, grubbing or grading and use of heavy equipment near or in watercourses. The pathways that affect fish habitat quality during construction are outlined in Section 10.3 and are related work in or near water, surface runoff or sedimentation, introduction of deleterious substances (including acid rock drainage or concrete), removal of riparian vegetation, and transfer of aquatic invasive species.

The Project has been designed to avoid these pathways to the extent practicable through shifting the placement of infrastructure and locations of activities away from watercourses. Where avoidance is not feasible, mitigation (Section 10.4) will be used to reduce the potential for effects. Interactions for fish and fish habitat are well known and documented, and standards and codes of practice will be followed when working in or near water to prevent sedimentation, introduce deleterious substances and aquatic invasive species, and maintain riparian vegetation to the extent practicable.

10.5.2.2 Operation

During the operation phase of the Project, surface water runoff from the data centre and associated parking lots will be conveyed to stormwater management ponds to manage excess water and suspended sediments during heavy rainfall. Water will be released gradually from stormwater ponds to nearby wetlands or watercourses on the Property. Water will be treated to meet authorized limits (as applicable) and is not anticipated to affect fish habitat quality in downstream receiving watercourses that are fish-bearing.

During operation of the new transmission line and pipeline, vegetation will need to be maintained. The frequency of vegetation management during operation varies depending on vegetation growth rates. Herbicide application for the transmission line will follow appropriate set back distances, with riparian vegetation within 30 m of watercourses cut manually. Herbicides will be applied in a manner consistent with NB Power’s existing Integrated Vegetation Management Program and associated permits issued by NBDELG. It is anticipated that vegetation within the pipeline RoW will be mowed, and herbicides will not be used. Given the infrequent occurrence and adherence to the management practices described above, effects on fish habitat quality are not anticipated.

10.5.2.3 Summary

The Project has been designed to avoid the pathways affecting fish habitat quality to the extent practicable through shifting the placement of infrastructure and locations of activities away from watercourses. Where avoidance is not feasible, mitigation will be used to reduce the potential for effects. Interactions for fish and fish habitat are well known and documented, and standards and codes of practice will be followed when working in or near water to prevent sedimentation, introduce deleterious substances and aquatic invasive species, and maintain riparian vegetation to the extent practicable. Consequently, with the application of best practices in accordance with DFO's Measures to Protect Fish and Fish Habitat (DFO 2025b), adverse effects on fish habitat quality are not anticipated.

10.5.3 Change in Fish Health and Survival

Several Project-related activities could affect fish health and survival. In general, effects to fish habitat quality can also affect fish health and survival. Standard mitigation will be applied to manage potential effects on fish health and survival.

10.5.3.1 Construction

The timing of construction could influence the environmental effects of the Project on fish health and survival, hence work in or near water should be conducted during the summer low flow period (June 1 to September 30) to protect fish within downstream receiving watercourses (NBDE 2012; DFO 2025a), unless Authorized by applicable permits.

During the construction phase of the Project, site preparation, foundations and earthworks, site clean-up and restoration, pipeline installation and transmission line installation will require access, clearing of vegetation, grubbing or grading and use of heavy equipment near or in watercourses. The pathways that affect fish health and survival during construction are outlined in Section 10.3 and are related work in or near water, surface runoff or sedimentation, introduction of deleterious substances (including acid rock drainage), removal of riparian vegetation, and transfer of aquatic invasive species.

The Project has been designed to avoid these pathways to the extent practicable through shifting the placement of infrastructure and locations of activities away from fish-bearing watercourses and directional drilling pipeline crossings. Where avoidance is not feasible, mitigation (Section 10.4) will be used to reduce the potential for effects as outlined below. Interactions for fish and fish habitat are well known and documented, and standards and codes of practice will be followed when working in or near water to prevent sedimentation, introduce deleterious substances and aquatic invasive species, and maintain riparian vegetation to the extent practicable.

Removal of riparian vegetation during construction could affect fish health due to changes in shade, protective cover, and/or external nutrient/energy inputs (Zalewski et al. 2001). Changes in riparian vegetation may affect predation rates; however, are unlikely to substantially alter water temperature or affect primary and secondary productivity upon which fish rely as food sources given the limited area of disturbance (Zalewski et al. 2001).



Watercourse crossing structures will be designed and constructed to allow fish passage maintain access to the necessary habitat required for fish life processes. If pumping is required to dewater in-water work areas, such as watercourse crossings, the Freshwater Intake End-of-Pipe Fish Screen Guideline (DFO 2025d).

During construction, blasting has the potential to produce compressive shock waves or vibrations which could result in injury or mortality to fish The effects of blasting on fish depends on the size and location of the blast, the timing of the blast in relation to the fishes life history, the density of substrates bounding the water (e.g., bedrock stream beds reflect the shockwave while organic stream beds would absorb some of the impact), the detonation method, and the species, size, and life history stage of the fish (Wright and Hopky 1998). Use of explosives in or near water will be avoided and, if required, will follow the Guidelines for the "*Use of Explosives In or Near Canadian Fisheries Waters*" (Wright and Hopky 1998) or other applicable permit conditions, to mitigate effects.

Exposing and disturbing sulphide-bearing rocks has the potential to result in acid rock drainage which can result in acidic runoff and metal leaching into watercourses. If excavated or exposed PAG rock is identified during construction, the material will be segregated and managed appropriately to prevent acid rock drainage into nearby watercourses.

10.5.3.2 Operation

During the operation phase of the Project, surface water runoff from the data centre and associated parking lots will be released gradually from stormwater ponds to nearby wetlands or watercourses on the Property. Surface water runoff will be treated to meet authorized limits and is not anticipated to contain parameters at concentrations which could comprise fish health. A Water Management Plan will be developed and modified if required using an adaptive management process.

During operation of the new transmission line and pipeline, vegetation will need to be maintained within the RoW. Herbicide application will follow appropriate set back distances from watercourses, NB Power's existing Integrated Vegetation Management Program and associated permit conditions to reduce effects to fish health and survival. Given the infrequent occurrence and adherence to the management practices described above, effects on fish health and survival are not anticipated.

10.5.3.3 Summary

The Project has been designed to avoid the pathways affecting fish health and survival to the extent practicable through shifting the placement of infrastructure and locations of activities away from watercourses. Where avoidance is not feasible, mitigation will be used to reduce the potential for effects. Interactions for fish and fish habitat are well known and documented, and standards and codes of practice will be followed when working in or near water, when designing and constructing water-crossing structures so fish can maintain access to necessary habitats and will maintain riparian vegetation to the extent practically feasible. Consequently, with the application of best practices in accordance with DFO's Measures to Protect Fish and Fish Habitat (DFO 2025b) and WAWA Technical Guidelines (NBDE 2012), adverse effects on fish health and survival are not anticipated.



10.6 Follow-up and Monitoring

Follow-up and monitoring are intended to verify the accuracy of predictions made during the EA, to assess the implementation and effectiveness of mitigation and the nature of the residual effects, and to manage adaptively, if required. Compliance monitoring will be conducted to confirm that mitigation measures are properly implemented. Should an unexpected deterioration of the environment be observed as part of follow-up and/or monitoring, intervention mechanisms will include the adaptive management process. This may include an investigation of the cause of the deterioration and identification of existing and/or new mitigation measures to be implemented to address it. Follow-up and monitoring plans pertaining to fish habitat include:

- Fish and fish habitat surveys within the proposed transmission line and pipeline RoW, for watercourses which have not yet been surveyed
- Development of Project-Specific EMP, which will include erosion and sediment control measures
- Stormwater Management Plan
- Surface Water Monitoring Plan

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11 Assessment of Environmental Effects on Vegetation and Wetlands

11.1 Scope of Assessment

Vegetation and wetlands have been identified as a valued component (VC) because of their intrinsic value and because these features are valued by the people of New Brunswick for environmental, recreational, aesthetic, and socio-economic reasons. They are also valued for their relationship with water resources, wildlife and wildlife habitat, and other biological and physical components addressed as VCs in this EIA Registration. Vegetation and wetlands are protected by federal and provincial legislation and/or are addressed by federal and provincial policies.

This VC focuses on vascular plant species at risk (SAR) and species of conservation concern (SOCC), as well as wetlands.

11.1.1 Regulatory Context

This section identifies the primary regulatory requirements and policies which influence the scope of the assessment on vegetation and wetlands and govern the management and protection of vegetation and wetlands in Canada and New Brunswick.

11.1.1.1 Species at Risk and Species of Conservation Concern

The federal *Species at Risk Act* (SARA) provides a framework across Canada to prevent the extinction of wildlife species, including vegetation, and to support actions for their recovery. Schedule 1 of the SARA lists species classified as Extirpated, Endangered, Threatened, or Special Concern, which are afforded special measures to protect them and assist in their recovery. These special measures include prohibitions against killing, harming, or harassment of these species; damage or destruction of their residences; and destruction of any part of their critical habitat.

SAR in New Brunswick are protected under the NB *Species at Risk Act* (NB SARA). Schedule A of the NB SARA List of Species at Risk Regulation lists species in New Brunswick that are classified as being Extirpated, Endangered, Threatened, or 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 of the Prohibitions Regulations. NB SARA is administered by the NB Department of Natural Resources (NBDNR).

In this assessment, SAR include those listed as Extirpated, Endangered, Threatened, or Special Concern in Schedule 1 of the federal SARA, or NB SARA's List of Species at Risk Regulation.

SOCC are those species that do not meet the above definition of SAR, but are ranked S1 (Critically Imperiled), S2 (Imperiled), or S3 (Vulnerable) in New Brunswick by the Atlantic Canada Conservation Data Centre (AC CDC 2026), or assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as being either Endangered, Threatened, or Special Concern.



11.1.1.2 Wetlands

Wetlands are defined as lands that are saturated with water for a sufficient time for wetland and aquatic processes to occur, supporting hydrophytic vegetation, demonstrating hydric soils, and supporting biological activity adapted to wet environments (Government of Canada 1991; NBDNRE and NBDELG 2002).

In New Brunswick, regulation and conservation of wetlands are under the jurisdiction of NBDELG. The NB Wetlands Conservation Policy focuses on protecting wetlands in New Brunswick through securement, increasing education and awareness, and maintaining wetland function. The policy aims to prevent the loss of Provincially Significant Wetlands (PSWs), which includes all coastal wetlands, wetlands along the lower Saint John River, and other notable wetlands within the Province; and for no net loss of wetland function in other wetlands (NBDNRE and NBDELG 2002). These policy goals are enforced through the NB *Clean Environment Act* and associated Environmental Impact Assessment (EIA) Regulation and the *Clean Water Act* and associated Watercourse and Wetland Alteration (WAWA) Regulation. A WAWA permit is required prior to any alteration in or within 30 metres of a watercourse or wetland, and compensation is required for permanent loss of wetland area and/or function (NBDELG 2024). Wetlands <1 ha (and not connected to a watercourse) are exempt from the provincial wetland policy (i.e., do not require a WAWA permit) and any wetlands <100 m^2 do not require compensation.

11.1.1.3 Old Forest

Old forest stands contain large-diameter trees, large woody debris, and openings in the canopy that allow for natural regeneration in the understory (NBDERD 2017b).

While there is currently no regulatory framework in New Brunswick to directly protect old growth forests, the NBDELG *Guide to Environmental Impact Assessment in New Brunswick* (NBDELG 2023) indicates that the description of existing conditions in an EIA registration document should include any known presence of critical or sensitive habitat (e.g., old growth forest).

A process used to establish thresholds for old forest on Crown Land in New Brunswick is described by NBDERD (2017a, b). Old Forest Communities (OFC) are considered the building blocks of the provincial strategy to foster old forest conditions on Crown Land and a total of 18 OFCs have been described for the province based on composition and structure (Table 1 in NBDERD 2017b). The OFC layer is available from the Government of New Brunswick (GNB) and the NBDNRED (2023) which identifies OFCs on Crown Land. Forests on private land are not evaluated by NBDNR for classification as OFC.

A prescribed field methodology to evaluate forest stands according to the thresholds described by NBDERD is not currently publicly available.

11.1.1.4 Special Areas

Provincially designated ecologically important areas are protected by the NB *Protected Natural Areas Act*.

11.1.2 Assessment Boundaries

The assessment of potential environmental interactions between the Project and vegetation and wetlands is focused on three PDAs and an LAA.

The PDAs represent the anticipated area of direct physical disturbance associated with the construction, operation and maintenance of the Project. For the purposes of this EIA Registration, the Project encompasses three PDAs as described in Section 6.2.3 and shown on Figure 11.1: the Data Centre PDA, the Transmission Line PDA, and the Pipeline PDA.

As discussed in Section 6, a general Project Site was selected before the Data Centre PDA was designated (which is where field studies were conducted in 2025, referred to as the Field Study Area). Subsequently, a smaller preliminary Data Centre PDA was determined within this Field Study Area with a final facility footprint to be developed upon further design and engineering.

The LAA for the vegetation and wetlands VC is defined as the area within which the environmental effects of the Project can be measured or predicted and can be thought of as the theoretical “zone of influence” of the Project on vegetation and wetlands. For considering a potential change in vegetation and wetlands, the LAA is defined a 500 m buffer surrounding the PDAs (Figure 11.1).

Temporal boundaries for the assessment are based on the timeframes over which potential effects could occur as a result of Project construction, and operation and maintenance phases as defined in Section 6.2.3.

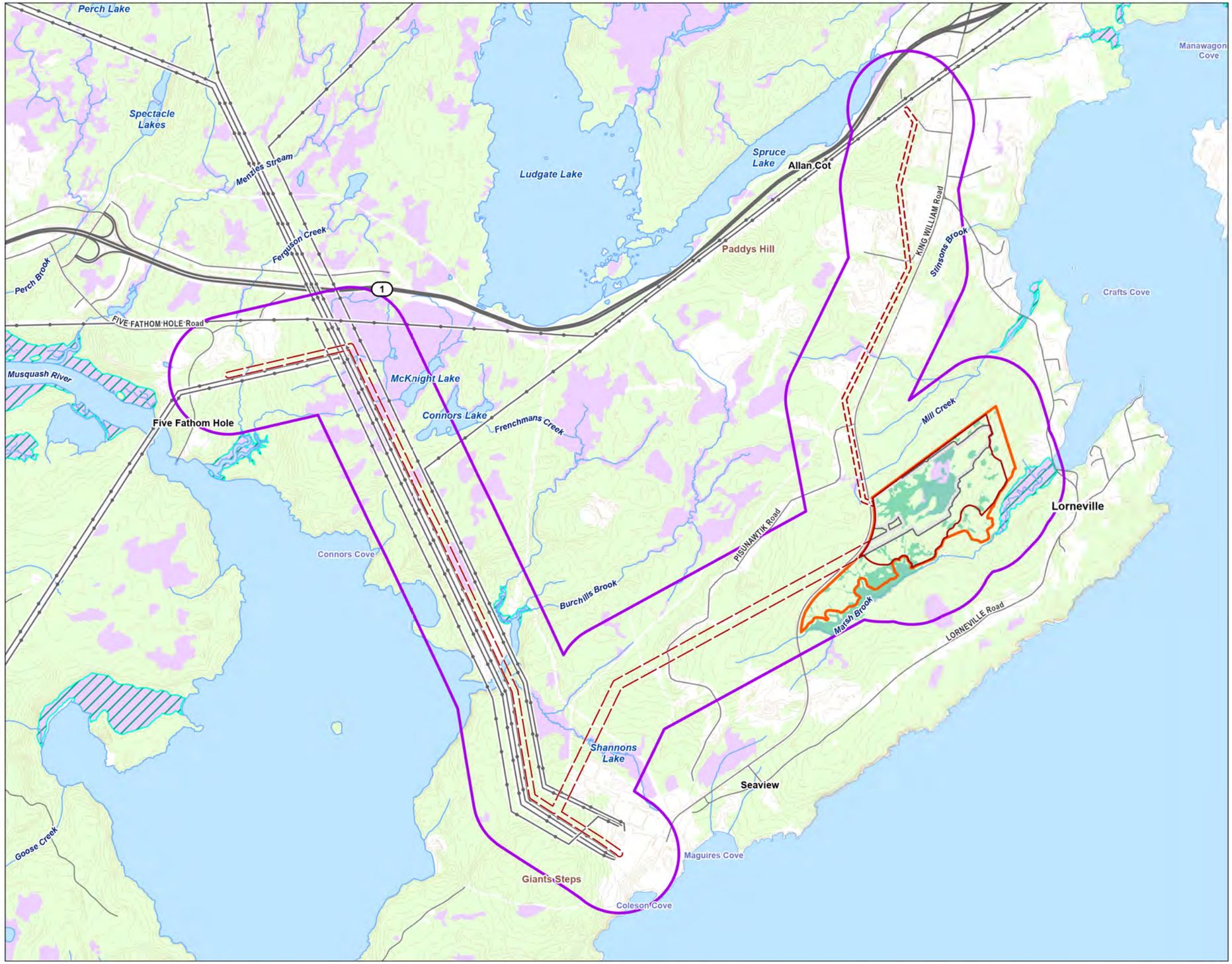


Figure No.
11.1

Title
Vegetation and Wetland Spatial Boundaries

Client/Project 121418636-411
Beacon Data Centres Inc.
Spruce Lake AI Data Centre

Project Location
Lorneville,
New Brunswick

Prepared / Revised by SC on 2026-03-12

N

0 0.5 1 1.5 km
(At original document size of 11x17)
1:35,000

Legend

- Local Assessment Area
- Project Site (Field Study Area)

Project Development Areas (PDA)

- Data Centre PDA
- Pipeline PDA
- Transmission Line PDA

Site Plan

- Estimated Project Footprint

Other Features

- Transmission Line (Existing)
- Highway
- Collector Road
- Local Road

Waterways and Wetlands

- Watercourse (NBHN)
- Waterbody (NBHN)
- Field-Delineated Wetland (Stantec 2025)
- Wetland (NBELG)
- Provincially Significant Wetland
- Forested Area



Notes
1. Coordinate System: NAD 1983 CSRS New Brunswick Stereographic
2. Data Sources: Beacon Data Centres Inc.; Data License with the Government of New Brunswick (NBDELG, NBNRED, Service NB); New Brunswick Power; Stantec
3. Background: Esri, USGS

Stantec

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11.2 Existing Conditions

This section describes the existing conditions in the PDAs and the LAA.

11.2.1 Approach and Methods

11.2.1.1 Data Centre Site

11.2.1.1.1 Desktop Sources

Desktop information regarding previous observations of rare species within a 5 km radius from a point within the Field Study Area was requested from the Atlantic Canada Conservation Data Centre (AC CDC 2025; Appendix A).

In addition to the AC CDC data, a variety of publicly available data sources were reviewed including:

- GeoNB-mapped wetlands
- Provincially Significant Wetlands (PSW)
- NB Department of Natural Resources and Energy (NBDNRE) forest development inventory and the non-forest inventory
- Various imagery sources

11.2.1.1.2 Vascular Plant Survey

A vascular plant survey was conducted within the Field Study Area in September 2025 (i.e., during the growing season). This survey was carried out concurrently with the vegetation community assessment (described below). During the survey, a botanist walked throughout the Field Study Area and recorded the first occurrence of each vascular plant species encountered (including a GPS location). Special attention was paid to areas with potential to host plant SAR/SOCC (e.g., wetlands and mature forest stands). If plant SAR/SOCC were encountered during the surveys, the abundance of those species was recorded either as the number of plants present at a particular site or in instances where plants occurred in dense patches, the size of each patch was estimated.

11.2.1.1.3 Vegetation Community Assessment

Based on desktop information, a preliminary habitat map was created prior to field surveys using forest polygons from the forest inventory. During field surveys, each forest polygon within the Field Study Area was visited and the plant community found there was described by estimating the cover of dominant species in the tree, shrub, and ground vegetation layers. The tree layer was defined as any woody plant cover having a diameter at breast height (DBH) greater than 5 cm. The shrub layer was defined as any upright woody plant having a height greater than 20 cm and a DBH less than 5 cm. Ground vegetation species included all non-woody plants including vascular plants, bryophytes and lichens as well as trailing woody plants or woody plants with a height of less than 20 cm.

The estimated age of forest polygons was recorded. The development stage of each forest polygon is available in the forest inventory data; however, the forest inventory data for the Field Study Area is approximately 10 years old and derived from air photo interpretation. Therefore, the forest development stage was determined for each stand based on observations made during the field survey. Drainage was determined using the categories outlined in the Canada Soil Information System (CanSIS) Manual for describing soils in the field (Day 1975) which are:

- VR – Very rapidly drained
- R – Rapidly drained
- W – Well drained
- MW – Moderately well drained
- I – Imperfectly drained
- P – Poorly drained
- VP – Very poorly drained

Field verification of vegetation communities within each forest polygon are important because the provincial forest inventory is based primarily on air photo interpretation which has limited capability and accuracy. The NB forest inventory is focused on merchantable species and does not address understory vegetation.

The preliminary habitat map created prior to field surveys was refined based on results of field observations (including wetland delineations, described below) and subsequent classification. The vegetation cover data from the tree, shrub and ground vegetation layers were entered into a species-by-site matrix which also included information about site drainage and estimated age of dominant trees (when present). Sites supporting similar vegetation species composition were clustered together and factors such as drainage and age were used to further refine the clusters of sites with similar vegetation into vegetation communities. Vegetation communities were initially grouped into generic classifications used in the New Brunswick forest inventory (e.g., softwood forest, mixedwood forest). In instances where these generic classifications contained more than one vegetation community, each of the constituent vegetation communities were named based on the dominant tree species.

In some instances during the field survey, forest polygons were subdivided due to the presence of multiple vegetation types within the original forest polygon. Forest polygons were most frequently subdivided because of the presence of both upland and wetland vegetation types within the same forest polygon. Less frequently, forest polygons were subdivided due to the presence of more than one forest development stage in a forest polygon.

11.2.1.1.4 Wetland Delineation and Functional Assessment

Methods for Wetland Delineation and Functional Assessment are described in the Wetland Delineation and Functional Assessment Report (Appendix F); a summary is provided below.

Wetlands within the Field Study Area were field delineated between September 10 and October 21, 2025, in accordance with the Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (U.S. Army Corps of Engineers 2012). Following the *Protocol for Wetland Delineation in New Brunswick* (NBDELG 2024), representative paired three parameter data plots were completed for each of the wetland types that was encountered. Wetland function was evaluated using the Wetland Ecosystem Services Protocol – Atlantic Canada (WESP-AC) method (NBDELG 2018).

11.2.1.1.5 Old Forest

Large Trees

Whenever large trees (i.e., >40 cm DBH, approximately) were encountered within the Field Study Area, they were identified to species, their DBH was measured, and their location was recorded. Data from the old forest assessment (described below) were used to prepare DBH versus age plots which were used to estimate the age of large trees using their DBH.

Old Forest Assessment

NBDELG (2023) indicates that the description of existing conditions in an EIA registration document should include any known presence of critical or sensitive habitat (e.g., old growth forest). However, there is currently no regulatory framework in New Brunswick to directly protect old growth forest. The NBDERB describes 18 OFCs in New Brunswick (2017a, b). The OFC layer (GNB and NBDNRED 2023), which identifies OFCs on Crown Land, was reviewed to see if any OFCs have been identified in the PDAs.

Currently there is no publicly available, prescribed field assessment method to evaluate stands for old forest conditions in New Brunswick. However, Nova Scotia has an Old-growth Forest Policy that came into effect on August 15, 2022, and includes an old forest assessment protocol (the Nova Scotia protocol) developed by NSDNRR (2025a). New Brunswick and Nova Scotia are both part of the Acadian Forest Region and share similar plant species composition, climate conditions and soils (Mosseler et al. 2003). Because New Brunswick does not currently have an old forest assessment protocol to evaluate stands in the field, the Nova Scotia protocol was used to evaluate forest polygons in the Field Study Area.

Forest inventory data along with field observations from September 2025 surveys were reviewed to identify polygons for further evaluation in October 2025. Generally, forest polygons within the Field Study Area listed as ‘mature’ (using the layer 1 development stage (L1DS) column in the forest inventory data) were selected for evaluation, unless September 2025 field observations indicated a different age class. Old forest sampling plots were established in each of the selected forest polygons prior to going in the field in October 2025. Sampling plots were only established within the Field Study Area. As per the Nova Scotia protocol, plot selection was based on randomly selected points in stands greater than 1 ha. The number of plots per stand was determined based on area (forest polygons >1 ha and <5 ha = three plots; >5 ha and <10 ha = 5 plots; >10 ha = one plot for every 2 ha, up to a maximum of 10 plots).



In the field, a 2 Basal Area Factor (BAF) angle gauge was used to determine which trees would be included in the plot. Each live tree was tallied, and the DBH was measured using Haglof tree calipers and recorded in 2 cm intervals. The 80th percentile tree was identified by counting the total number of tallied trees in the plot and multiplying the count by 0.20; the product of these numbers was used to count back from the largest tree to reach the 80th percentile tree (i.e., a large tree representing most of the trees that comprise the canopy). A single tree representing the 80th percentile in size was cored using a 12" Haglof increment borer. Cores were placed in plastic straws for protection and labelled. In the lab, cores were glued into boards with grooves and sanded to obtain a flat surface to count annual growth rings using a dissecting microscope. Each core was counted by two people experienced in aging cores. If the first two counts differed by 10 years or more, a third person counted the core. The age used in the analysis was the average of the counts.

According to the Nova Scotia protocol, age-based old growth is based on reference ages attributed to late successional forest types (Table 1 in NSDNRR 2025b). Old growth reference ages are between 100-140 years based on how a plot is classified using the Forest Ecosystem Classification (FEC) for Nova Scotia (Neily et al. 2023). The vegetation type at each plot where a core was taken was determined using the Nova Scotia FEC and the associated old growth reference age was used.

According to the Nova Scotia protocol, a forest polygon is considered old growth if at least 30% of the plots within the polygon are vegetation types capable of becoming old growth and the average age of all plots within the stand is greater than the minimum old growth reference age for that stand.

11.2.1.2 Transmission Line and Pipeline Rights-of-Way

Desktop information regarding previous observations of rare species within a 5 km radius from a point in the Field Study Area was requested from the Atlantic Canada Conservation Data Centre (AC CDC 2025; Appendix A). This request covers the pipeline PDA and most of the transmission line PDA. In addition to the AC CDC data, a variety of publicly available data sources were reviewed including:

- GeoNB-mapped wetlands
- Provincially Significant Wetlands
- NBDNRE forest development inventory and the non-forest inventory
- Various imagery sources

Field studies will be completed in 2026 along the Transmission Line and Pipeline PDAs, which were identified after the 2025 field season.



11.2.2 Overview of Habitat Types in the PDAs and LAA

Habitats in the PDAs and LAA are presented on Figures 11.2, 11.3, 11.4 and in Table 11.1.

The Project is located within the Fundy Coastal Ecoregion, characterized by a maritime climate, moderated by proximity to the Bay of Fundy, and forests dominated primarily by coniferous species. Variation in geology, soils, and coastal exposure are important ecological gradients driving diversity in forest and wetland types within the ecoregion (NBDNR 2007).

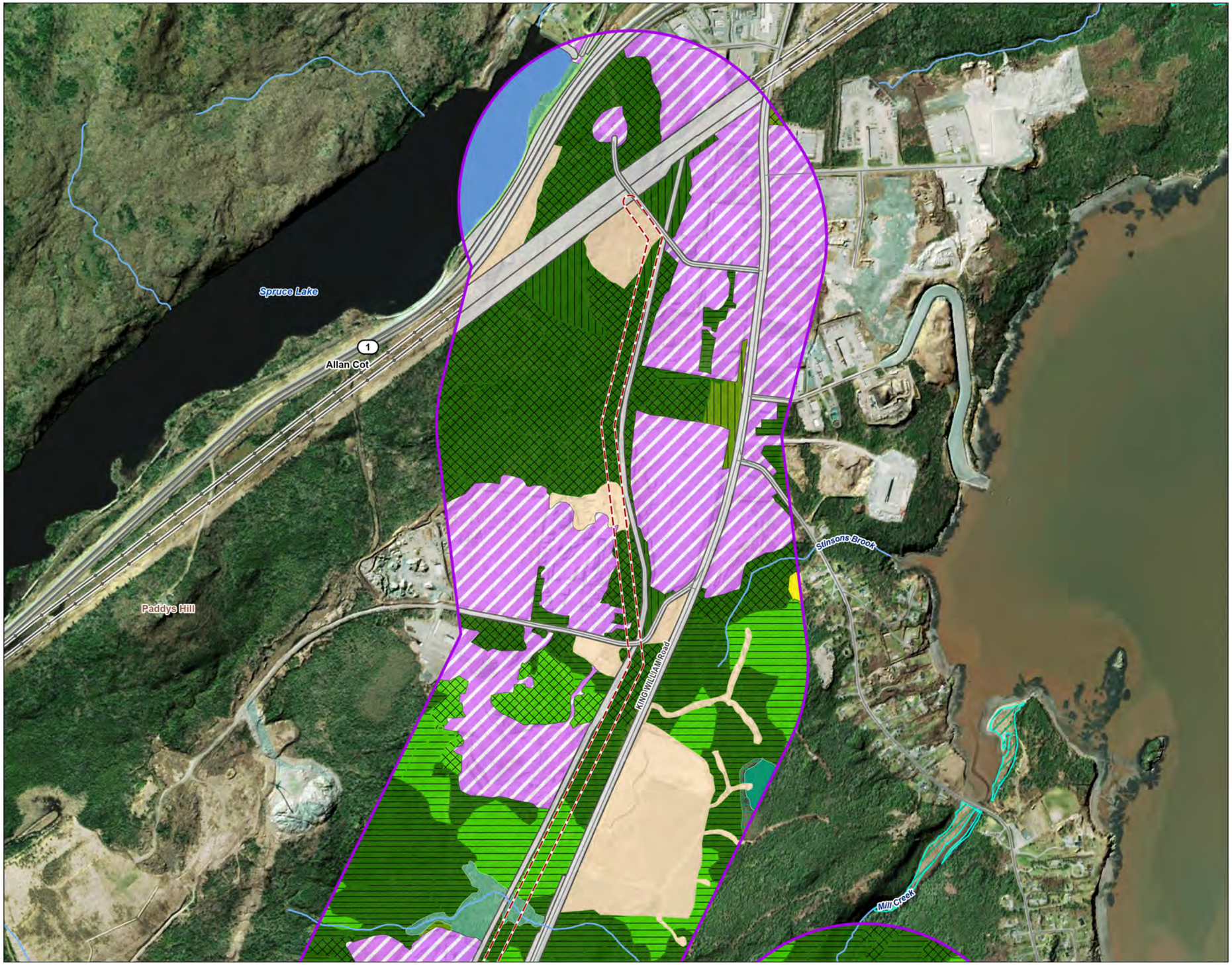


Figure No.
11.2

Title
Habitat Types in the Project Development Areas and Local Assessment Area

Client/Project
121418636-502
Beacon Data Centres Inc.
Spruce Lake AI Data Centre

Project Location
Lorneville,
New Brunswick

Prepared / Revised by SC on 2026-03-12

N

0 250 500 metres
(At original document size of 11x17)
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Legend

- Local Assessment Area
- Project Development Areas (PDA)
  - Pipeline PDA
- Other Features
  - Transmission Line (Existing)
  - Highway
  - Collector Road
  - Local Road
- Natural Features
  - Watercourse (NBHN)
  - Provincially Significant Wetland
- Habitat
  - Regeneration / Sapling Mixedwood
  - Regeneration / Sapling Softwood
  - Young / Immature Hardwood
  - Young / Immature Mixedwood
  - Young / Immature Softwood
  - Mature / Overmature Hardwood
  - Mature / Overmature Mixedwood
  - Mature / Overmature Softwood
- Wetland
  - Bog
  - Coniferous Treed Swamp
  - Wetland - Unclassified
- Non-Forest
  - Cleared / Partially Cleared Area
  - Industrial
  - Park / Recreational
  - Infrastructure
  - Urban or Rural Residential
  - Waterbody



Notes
1. Coordinate System: NAD 1983 CSRS New Brunswick Stereographic
2. Data Sources: Beacon Data Centres Inc.; Data License with the Government of New Brunswick (NBDELG, NBNRED, Service NB); New Brunswick Power; Stantec
3. Background: Vantor, Esri, CGIAR, USGS

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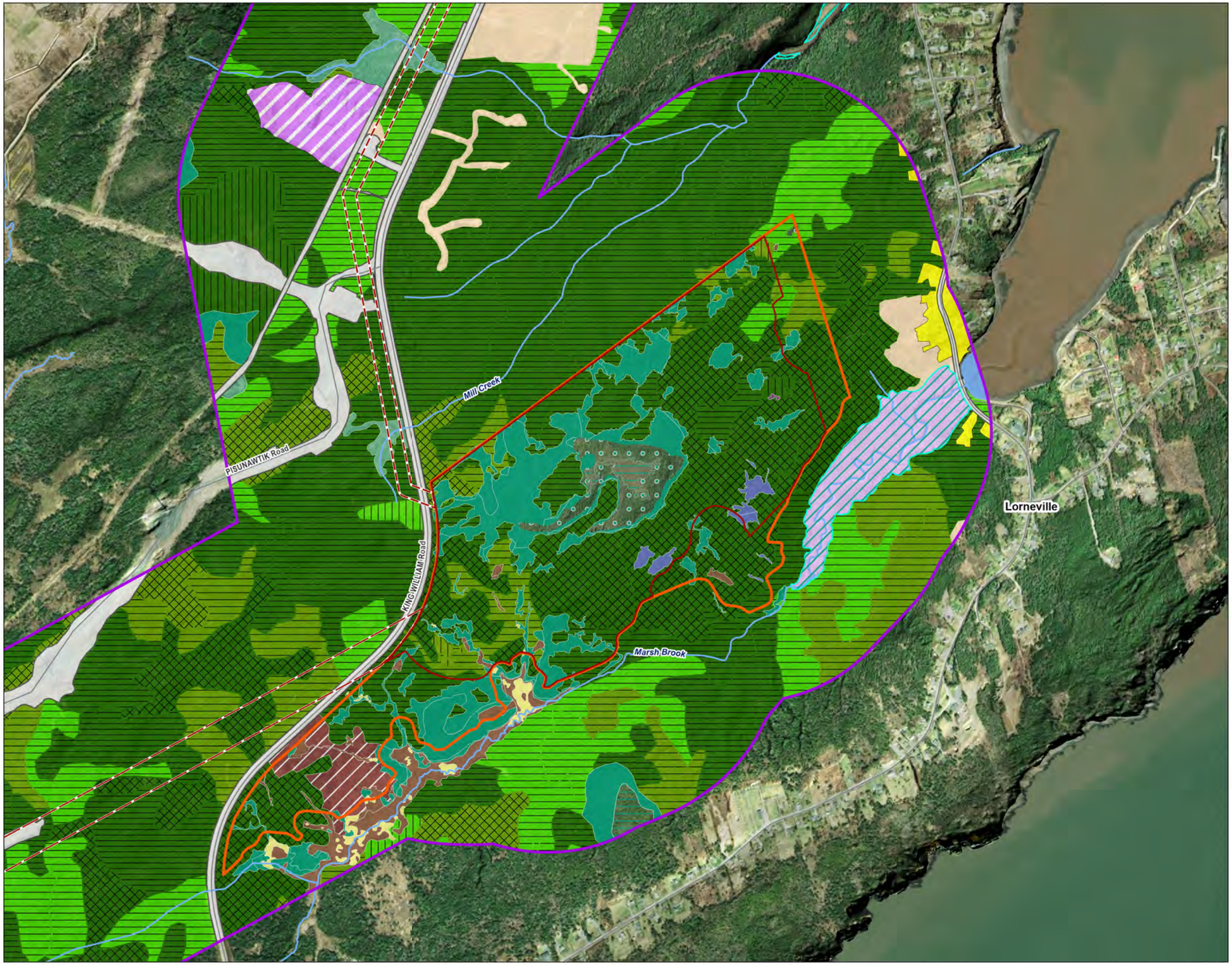


Figure No.
11.3

Title
Habitat Types in the Project Development Areas and Local Assessment Area

Client/Project
Beacon Data Centres Inc.
Spruce Lake AI Data Centre

121418636-502

Project Location
Lorneville,
New Brunswick

Prepared / Revised by SC on 2026-03-12

N

0 250 500 metres

(At original document size of 11x17)
1:12,000

Legend

- Local Assessment Area
- Project Site (Field Study Area)

Project Development Areas (PDA)
- Data Centre PDA
- Pipeline PDA
- Transmission Line PDA

Other Features
- Local Road

Natural Features
- Watercourse (NBHN)
- Provincially Significant Wetland

Habitat
- Regeneration / Sapling Hardwood
- Regeneration / Sapling Softwood
- Young / Immature Hardwood
- Young / Immature Mixedwood
- Young / Immature Softwood
- Mature / Overmature Hardwood
- Mature / Overmature Mixedwood
- Mature / Overmature Softwood
- Tall Shrub Thicket

Wetland
- Bog
- Coniferous Treed Swamp
- Deciduous Treed Swamp
- Coastal Marsh
- Marsh
- Mixedwood Treed Swamp
- Tall Shrub Swamp
- Treed Bog
- Wetland - Unclassified

Non-Forest
- Cleared / Partially Cleared Area
- Industrial
- Infrastructure
- Urban or Rural Residential
- Waterbody



Notes
1. Coordinate System: NAD 1983 CSRS New Brunswick Stereographic
2. Data Sources: Beacon Data Centres Inc.; Data License with the Government of New Brunswick (NBDELG, NBNRED, Service NB); New Brunswick Power; Stantec
3. Background: Vantor, Esri, USGS

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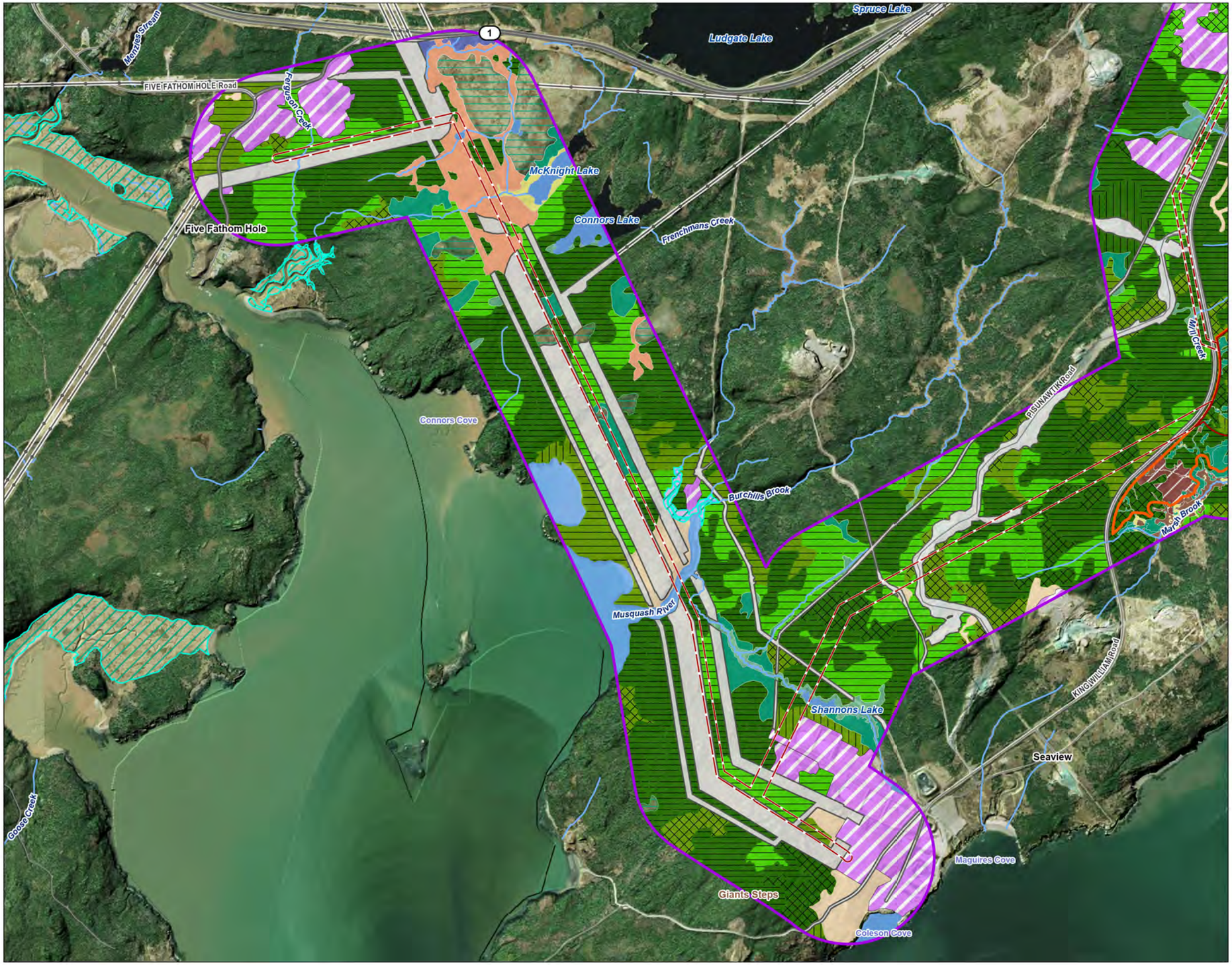


Figure No.
11.4

Title
Habitat Types in the Project Development Areas and Local Assessment Area

Client/Project
121418636-502
Beacon Data Centres Inc.
Spruce Lake AI Data Centre

Project Location
Lorneville,
New Brunswick

Prepared / Revised by SC on 2026-03-12

N

0 250 500 metres
(At original document size of 11x17)
1:24,000

Legend

- Local Assessment Area
- Project Site (Field Study Area)

Project Development Areas (PDA)
- Data Centre PDA
- Pipeline PDA
- Transmission Line PDA

Other Features
- Transmission Line (Existing)
- Highway
- Collector Road
- Local Road

Natural Features
- Watercourse (NBHN)
- Provincially Significant Wetland

Habitat
- Regeneration / Sapling Hardwood
- Regeneration / Sapling Mixedwood
- Regeneration / Sapling Softwood
- Young / Immature Hardwood
- Young / Immature Mixedwood
- Young / Immature Softwood
- Mature / Overmature Hardwood
- Mature / Overmature Mixedwood
- Mature / Overmature Softwood
- Tall Shrub Thicket

Wetland
- Bog
- Coniferous Treed Swamp
- Fen
- Coastal Marsh
- Marsh
- Mixedwood Treed Swamp
- Tall Shrub Swamp
- Wetland - Unclassified

Non-Forest
- Cleared / Partially Cleared Area
- Industrial
- Infrastructure
- Urban or Rural Residential
- Waterbody



Notes
1. Coordinate System: NAD 1983 CSRS New Brunswick Stereographic
2. Data Sources: Beacon Data Centres Inc.; Data License with the Government of New Brunswick (NBDELG, NBNRED, Service NB); New Brunswick Power; Stantec
3. Background: Vantor, Esri, USGS

Stantec

Revised: 2026-03-27 By: schubbs
\\ca0181-cpfs01\workgroup1214\active\121418636\1 environmental\2 drawings\3 draft figures\APRX\5 Wildlife\121418636 Beacon Terrestrial Wildlife.aprx Revised: 2026-03-27 By: schubbs

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Table 11.1 Habitat Types Within the PDAs and the LAA

Habitat[1]	Data Centre PDA		Transmission Line PDA		Pipeline PDA		LAA	
	ha	%	ha	%	ha	%	ha	%
Non-Forest								
Industrial			1.44	2.13	0.07	0.44	168.01	9.42
Infrastructure			12.11	17.96	0.93	6.19	209.88	11.77
Park / Recreational							0.62	0.03
Residential							3.75	0.21
Rock / Barren							1.39	0.08
Cleared / Partially Cleared Area			1.37	2.03	1.30	8.63	56.57	3.17
Non-Forest Totals			14.92	22.12	2.30	15.26	440.22	24.68
Forest[2]								
Hardwood - Sapling					0.01	0.05	3.71	0.21
Hardwood - Young	0.68	0.76	1.79	2.66			9.15	0.51
Hardwood - Immature							2.26	0.13
Hardwood - Mature	0.51	0.57			0.49	3.23	16.47	0.92
Hardwood - Overmature							0.97	0.05
Mixedwood - Regenerating							5.83	0.33
Mixedwood - Young	0.75	0.85	0.01	0.01	0.07	0.47	10.27	0.58
Mixedwood - Immature			1.70	2.52	0.09	0.61	32.20	1.81
Mixedwood - Mature	30.59	34.53	4.69	6.96	4.63	30.72	133.99	7.52
Mixedwood - Overmature	5.46	6.16	0.81	1.20			32.96	1.85
Softwood - Sapling	0.04	0.05					8.77	0.49
Softwood - Young	5.86	6.62	1.93	2.87			87.69	4.92
Softwood - Immature	1.77	2.00	19.83	29.42	3.11	20.63	233.48	13.10
Softwood - Mature	10.52	11.88	12.97	19.24	2.41	16.00	419.57	23.54

Table 11.1 Habitat Types Within the PDAs and the LAA

Habitat[1]	Data Centre PDA		Transmission Line PDA		Pipeline PDA		LAA	
	ha	%	ha	%	ha	%	ha	%
Softwood - Overmature	5.67	6.39	1.63	2.41	1.39	9.21	100.96	5.66
Tall Shrub Thicket							5.32	0.30
Forest Totals	61.85	69.80	45.36	67.29	12.21	80.92	1103.60	61.92
Wetlands[3]								
Bog	1.02	1.15	0.41	0.60			36.29	2.04
Treed Bog	4.66	5.25					4.74	0.27
Tall Shrub Swamp	0.34	0.39					6.97	0.39
Coniferous Treed Swamp	19.45	21.95	2.13	3.16	0.01	0.04	63.86	3.58
Deciduous Treed Swamp	0.03	0.04					0.03	0.002
Mixedwood Treed Swamp	1.25	1.41					3.77	0.21
Marsh	0.03	0.03	0.05	0.08			5.03	0.28
Coastal Marsh							13.14	0.74
Fen			3.40	5.05			38.66	2.17
Shrub Wetland			0.45	0.67	0.57	3.78	16.67	0.93
Wetlands Total	26.75	30.22	6.44	9.56	0.58	3.82	189.16	10.61
Water[4]			0.69	1.03			49.15	2.76
Total (Non-Forest, Forest, Wetlands, Water)[5]	**89**	**100**	**67**	**100**	**15**	**100**	**1782**	**100**

Notes:
[1]Habitats are classified according to NBDNRED forest and non-forest inventory data (SNB no date) combined with field data, where available.
[2]Forest polygons (or portions thereof) within the Field Study Area were reclassified based on field data. Refer to Section 11.2.1.1.3 for more details. The extent and type of forest habitat in the transmission line and pipeline PDAs and the LAA was determined using NBDNRE data.
[3]Wetlands within the Field Study Area were field delineated and classified. The extent of wetland habitat in the transmission line and pipeline PDAs and the LAA was determined using NBDNRED data.
[4]Water includes the following NBDNRED categories: lake, surface water, coastal/tidal water.
[5]Totals have been rounded

A portion of the Project will pass through the Musquash Estuary Nature Reserve. This natural area supports extensive wetland and upland habitat of mixed age classes, including mature and potential old forests. The area is included within the provincial Protected Natural Areas database and is described as “Private Land Component” as it is land owned by the Nature Conservancy of Canada (NCC 2023).

The Data Centre PDA (89 ha) is largely forested (70%) and has abundant wetland habitat (30%) (Table 11.1). The transmission line PDA comprises 67 ha and is also mostly forested (67%) but has a significant portion of infrastructure (18%). Wetland habitat makes up 10% of this PDA, with small amounts of industrial land use, cleared area, and waterbodies (1-2% each). Forest makes up 81% of the pipeline PDA (15 ha total). This PDA has some cleared area (9%) and infrastructure (6%) with smaller amounts of wetland (4%) and industrial land use (<1%).

The LAA is approximately 1,782 ha and comprises a 500 m buffer around the PDAs. The LAA is primarily forested (62%), with infrastructure (12%), wetland (11%), and industrial areas (9%). There are smaller amounts of cleared area, waterbodies, residential, shoreline, and parks (6% total). The LAA contains two PSWs (Figure 11.5). There is a 10.7-ha coastal marsh at the mouth of Marsh Brook (south of the Data Centre PDA), and a 2.4-ha coastal marsh associated with the Musquash River.

11.2.3 Data Centre

11.2.3.1 Vascular Plant, Lichen, and Bryophyte SAR/SOCC

A total of 184 vascular plant species were observed during field surveys completed in the Field Study Area (Table E.1, Appendix E). None of the vascular plant species recorded are considered SAR or SOCC.

One lichen SOCC was incidentally recorded in the Field Study Area. Powder-tipped antler lichen (*Hypotrachyna catawbiensis*), which is ranked as S3 by the AC CDC, is an epiphytic lichen that grows mostly on the branches and wood of conifers (Consortium of Lichen Herbaria. n.d.). This lichen was observed at seven locations in the Field Study Area, all associated with wetlands (WLs); three observations were associated with WL-12 while the other four were in or near WL-21 (Figure 11.5).

According to the AC CDC data, no vascular plant, bryophyte or lichen SAR have been recorded in or within 5 km of the Field Study Area; however, ten vascular plant SOCC have been recorded (Table 11.2; Figure 11.5). None of these records are within the Field Study Area.

Table 11.2 Vascular Plant and Bryophyte Species of Conservation Concern Recorded within 5 km of the Field Study Area

Common Name	Scientific Name	AC CDC S Rank[1]	Observed in Field Study Area or LAA?	Potential to be found in the Data Centre PDA?
Vascular Plant				
Alaska alkaligrass	*Puccinellia nutkaensis*	S2	No	No
branched bartonia	*Bartonia paniculata ssp. iodandra*	S3	No	Yes
cursed buttercup	*Ranunculus sceleratus*	S2S3	No	Yes
golden hedge-hyssop	*Gratiola lutea*	S1	No	No
least moonwort	*Botrychium simplex*	S3	No	Yes
little curlygrass fern	*Schizaea pusilla*	S2	No	Yes
low water milfoil	*Myriophyllum humile*	S3	No	No
roseroot	*Rhodiola rosea*	S3	No	No
small-flowered purple false foxglove	*Agalinis purpurea var. parviflora*	S3	No	Yes
Tuckerman's quillwort	*Isoetes tuckermanii ssp. tuckermanii*	S3	No	No
Bryophyte				
sphagnum	*Sphagnum macrophyllum*	S1	No	No

Notes:

[1]Provincial Conservation Status Rank Assigned by Atlantic Canada Conservation Data Centre (AC CDC 2025a): S1 = critically imperiled, S2 = imperiled, S3 = vulnerable, S#S# = range of uncertainty about the status

Source: AC CDC (2025)

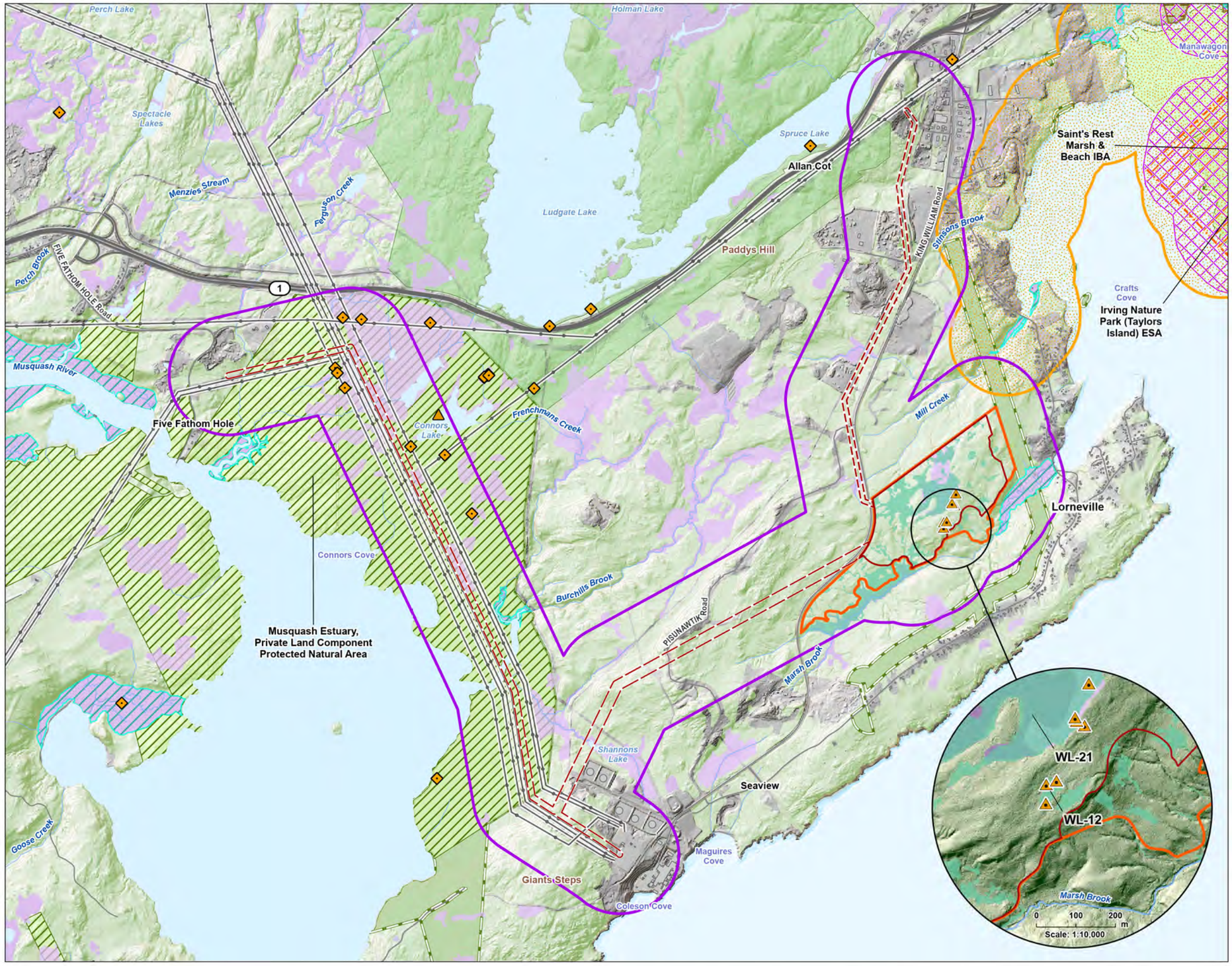


Figure No.
11.5

Title
Species of Conservation Concern and Special Areas in the Vicinity of the Local Assessment Area

Client/Project
121418636-410
Beacon Data Centres Inc.
Spruce Lake AI Data Centre

Project Location
Lorneville,
New Brunswick

Prepared / Revised by SC on 2026-03-12

N

0 0.5 1 1.5 km
(At original document size of 11x17)
1:35,000

Legend

- Local Assessment Area
- Project Site (Field Study Area)

Project Development Areas (PDA)
- Data Centre PDA
- Pipeline PDA
- Transmission Line PDA

Environmental Features

Species of Conservation Concern (SOCC)
- Non-Vascular Plant SOCC (ACCDC)
- Vascular Plant SOCC (ACCDC)
- Lichen SOCC (Stantec 2025)
- Critical Habitat Area
- Important Bird Area (IBA)
- Nature Preserve
- Irving Nature Park
- Protected Natural Area
- Environmentally Sensitive Area

City of Saint John Zoning
- Environmental Protection
- Park

Other Features
- Transmission Line
- Highway
- Collector Road
- Local Road
- Contour - 5m
- Building

Waterways and Wetlands
- Watercourse
- Waterbody
- Wetland (NBELG)
- Wetland (Stantec)
- Provincially Significant Wetland



Notes
1. Coordinate System: NAD 1983 CSRS New Brunswick Stereographic
2. Data Sources: Beacon Data Centres Inc.; Data License with the Government of New Brunswick (NBDELG, NBNRED, Service NB); New Brunswick Power; Stantec
3. Background: Esri, USGS

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Alaska alkaligrass (*Puccinellia nutkaensis*) is listed as S2 by AC CDC. This species is typically found on coastal sandy beaches and saltmarshes although it can also be found near inland salt springs (Hinds 2000). Alaska alkaligrass was recorded 4.5 km northeast of the Field Study Area in Manawagonish Cove. No habitat suitable for Alaska alkaligrass is present in the PDA.

Branched bartonia (*Bartonia paniculata* ssp. *iodandra*) is listed as S3 by the AC CDC and has been recorded 4.6 km west of the PDA. This species typically grows in wet peat (Hinds 2000). The open bog habitat present in WL-21 could potentially provide suitable habitat for this species. Surveys conducted in the Field Study Area did not reveal the presence of this species.

Cursed crowfoot (*Ranunculus sceleratus*), ranked as S2S3 by the AC CDC, has been recorded 4.8 km to the northeast of the Field Study Area in Manawagonish Cove. Cursed crowfoot grows in ditches and damp ground and along the upper edges of saltmarshes (Hinds 2000). Seepy areas along permanent and intermittent streams in the PDA could potentially provide suitable habitat for this species. Surveys conducted in the Field Study Area did not reveal the presence of this species.

Golden hedge-hyssop (*Gratiola lutea*) is listed by the AC CDC as S1. In New Brunswick, this species is typically found growing on gravelly or muddy shores of lakes and reservoirs (Hinds 2000). It has been recorded along the shores of Spruce Lake, 3.6 km to the northwest of the Field Study Area. Habitat suitable for golden hedge-hyssop is not present in the PDA.

Least moonwort (*Botrychium simplex*) has an AC CDC rank of S3. In New Brunswick, this species is generally found on rocky slopes, clearings, rich hardwoods, the shores of lakes and the mossy banks of streams (Hinds 2000). It has been recorded 4.0 km north of the PDA. Suitable habitat in the form of stream banks and clearings is present in the PDA. Surveys conducted in the Field Study Area did not reveal the presence of this species.

Little curlygrass fern (*Schizaea pusilla*) is typically found in open bogs often at the edge of wet areas (Hinds 2000). This species is listed by AC CDC as S2 and has been recorded 4.0 km to the west of the PDA. The open bog in the centre of WL-21 could potentially provide habitat for little curlygrass fern. Surveys conducted in the Field Study Area did not reveal the presence of this species.

Low water milfoil (*Myriophyllum humile*) typically grows in shallow acid waters and along shores (Hinds 2000). It is listed as S3 by the AC CDC and has been reported 3.3 km northwest of the Field Study Area on the shores of the Spruce Lake reservoir. Suitable habitat for low water milfoil is not present in the PDA.

Roseroot (*Rhodiola rosea*) is found on moist ledges on coastal cliffs (Hinds 2000). It is listed by AC CDC as S3 and has been recorded on coastal cliffs 2.7 km south of the Field Study Area. No suitable habitat for roseroot is present in the PDA.

Small-flowered purple false foxglove (*Agalinis purpurea var. parviflora*) occurs on boggy swales and on seepy stream banks (Hinds 2000). It is listed as S3 by the AC CDC and has been recorded 3.6 km to the west of the Field Study Area. Stream banks in the PDA could potentially provide suitable habitat for small-flowered purple false foxglove. Surveys conducted in the Field Study Area did not reveal the presence of this species although a closely related species, Nova Scotia agalinis (*Agalinis neoscotica*) (S3S4) was found growing on a shaded ATV trail.



Tuckerman's quillwort (*Isoetes tuckermanii ssp. Tuckermanii*) is listed as S3 by the AC CDC and grows in shallow water in shallow rocky or sandy pond or lake shores (Hinds 2000). It has been recorded along the shore of the Spruce Lake reservoir 2.9 km north of the Field Study Area. No suitable habitat for Tuckerman's quillwort is present in the PDA.

According to the AC CDC data, one bryophyte SOCC has been documented within 5 km of the Project. *Sphagnum macrophyllum* (which is ranked as S1 by the AC CDC) has been recorded in the Musquash Estuary Protected Natural Area 4.4 km west of the PDA. This species typically grows in shallow water in coastal bogs. There are no open water areas in the bog in the PDA, so this species is not expected to be present.

Exotic plant species are those that have been introduced to a region outside of their natural range, with approximately one-third of plant species in New Brunswick, Nova Scotia, and Prince Edward Island classified as exotic (Hill and Blaney 2009). Invasive plant species are exotics that negatively impact the natural environment, economy, or human health, by altering natural ecosystems and competing with native plants and crops (CFIA 2008). The only species recorded during field surveys that is considered potentially invasive is creeping buttercup (*Ranunculus repens*) (Table E.1, Appendix E). Although not currently listed by the NB Invasive Species Council as invasive in New Brunswick, neighbouring jurisdictions consider this species invasive (e.g., Maine Department of Agriculture, Conservation & Forestry 2021). Creeping buttercup can be found in damp meadows, ditches and can also be found growing on saturated mineral soils in swamps and along seepy stream banks that are not heavily shaded (Hinds 2000). During the vascular plant survey, creeping buttercup was observed at the southern end of the Field Study Area, outside the Data Centre PDA in a tall shrub swamp situated along a small stream.

11.2.3.2 Vegetation Communities

Vegetation plots were completed in each of the forest polygons in the Field Study Area (Figure 11.6). The vegetation plot numbers correspond to the forest polygon number. Results of the vegetation community assessment are included in Table E.2 (Appendix E) and are summarized in Table 11.3.



Figure No.
11.6

Title
Forest Polygons and Vegetation Plots in the Field Study Area

Client/Project
Beacon Data Centres Inc.
Spruce Lake AI Data Centre

121418636-407

Project Location
Lorneville,
New Brunswick

Prepared by SC on 2026-03-17

N

0 100 200 metres
(At original document size of 11x17)
1:9,000

Legend

- Project Site (Field Study Area)

Project Development Areas (PDA)

- Data Centre PDA
- Pipeline PDA
- Transmission Line PDA
- Vegetation Plot
- Provincial Forest Stand

Other Features

- Road

Wetlands and Waterways

- Watercourse (NBHN)
- Provincially Significant Wetland



Notes
1. Coordinate System: NAD 1983 CSRS New Brunswick Stereographic
2. Data Sources: Beacon Data Centres Inc.; Data License with the Government of New Brunswick (NBDELG, NBNRED, Service NB); New Brunswick Power; Stantec
3. Background: Vantor, Esri, USGS

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Table 11.3 Summary of Vegetation Community Assessment

Vegetation Plot #	Stantec Stand Description[1]	Approximate Age	Vegetation Community[2]	Drainage
1	Mixedwood - Mature	70	Balsam Fir / Heart-leaved Birch	Imperfectly drained
2	Tall Shrub Thicket	Unknown	Tall Shrub Thicket	Imperfectly drained
3	Softwood - Mature	50	Balsam Fir / Red Spruce / Heart-leaved Birch	Imperfectly drained
4	Wetland - Young	20	Balsam Fir / Red Spruce / Heart-leaved Birch	Imperfectly drained
5	Hardwood - Young	20	Heart-leaved Birch / Paper Birch	Moderately well drained
6	Mixedwood - Mature	70	Balsam Fir / Heart-leaved Birch	Moderately well drained
7	Mixedwood - Mature	60	Balsam Fir / Heart-leaved Birch	Moderately well drained
8	Softwood - Young	25	Balsam Fir / Red Spruce / Heart-leaved Birch	Moderately well drained
9	Softwood - Overmature	100	Balsam Fir / Red Spruce / Heart-leaved Birch	Moderately well drained
10	Mixedwood - Mature	50	Balsam Fir / Heart-leaved Birch	Moderately well drained
11	Mixedwood - Overmature	100	Balsam Fir / Heart-leaved Birch	Moderately well drained
12	Mixedwood - Mature	50	Balsam Fir / Heart-leaved Birch	Moderately well drained
13	Softwood - Mature	100	Eastern White Cedar / Heart-leaved Birch	Imperfectly drained
14	Mixedwood - Young	30	Balsam Fir / Heart-leaved Birch	Moderately well drained
15a	Softwood - Young	25	Balsam Fir / Red Spruce / Heart-leaved Birch	Moderately well drained
15b	Softwood - Mature	100	Eastern White Cedar / Heart-leaved Birch	Moderately well drained
15c	Wetland - Mature	100	Coniferous Treed Swamp	Poorly drained
16a	Wetland - Mature	80	Coniferous Treed Swamp	Poorly drained
16b	Softwood - Mature	50	Balsam Fir / Red Spruce / Heart-leaved Birch	Moderately well drained
17	Wetland - Mature	Unknown	Bog	Very poorly drained
18	Softwood - Mature	60	Balsam Fir / Red Spruce / Heart-leaved Birch	Moderately well drained
19a	Softwood - Overmature	100	Balsam Fir / Red Spruce / Heart-leaved Birch	Moderately well drained
19b	Wetland - Mature	100	Coniferous Treed Swamp	Poorly drained
20	Softwood - Immature	60	Balsam Fir / Red Spruce / Heart-leaved Birch	Well drained

Table 11.3 Summary of Vegetation Community Assessment

Vegetation Plot #	Stantec Stand Description[1]	Approximate Age	Vegetation Community[2]	Drainage
21	Softwood - Young	30	Eastern White Cedar / Heart-leaved Birch	Imperfectly drained
22	Softwood - Mature	70	Eastern White Cedar / Heart-leaved Birch	Imperfectly drained
23a	Softwood - Sapling	20	Balsam Fir / Red Spruce / Heart-leaved Birch	Well drained
23b	Hardwood - Young	20	Heart-leaved Birch / Paper Birch	Well drained
24a	Softwood - Mature	100	Eastern White Cedar / Heart-leaved Birch	Moderately well drained
24b	Softwood - Immature	40	Balsam Fir / Red Spruce / Heart-leaved Birch	Moderately well drained
25	Mixedwood - Overmature	100	Balsam Fir / Heart-leaved Birch	Well drained

Notes

[1]Based on field data results, forest polygons were reclassified according to NBDERD 2017c

[2]Vegetation communities were developed based on field data for the Field Study Area

11.2.3.2.1 Upland Plant Communities

Softwood Forest

Most of the upland forest in the Field Study Area is composed of mature softwood forest which can be subdivided into two main stand types, Balsam Fir / Red Spruce / Heart-leaved Birch and Eastern White Cedar / Heart-leaved Birch.

Balsam Fir / Red Spruce / Heart-leaved Birch

Well drained and moderately well drained sites often support softwood stands that are dominated by a mixture of balsam fir, red spruce, and heart-leaved birch (*Betula cordifolia*). The shrub understory of these stands contains little shrub cover other than advanced regeneration of balsam fir. The ground vegetation layer is moderately dense and is composed largely of mosses, the most abundant of which are red-stemmed feathermoss (*Pleurozium schreberi*), bazzania (*Bazzania* spp.), and broom moss (*Dicranum* sp.) along with lesser amounts of stair-step moss (*Hylocomium splendens*) and Sphagnum moss (*Sphagnum* spp.). The only vascular plant that is common in the ground vegetation layer are balsam fir seedlings. The estimated ages of Balsam Fir / Red Spruce / Heart-leaved Birch stands in the Field Study Area range from 40 to 100 years.

Young Balsam Fir / Red Spruce / Heart-leaved Birch stands (estimated ages less than 30 years) have tree and shrub layers that are similar to the mature stands. They differ mainly in the ground vegetation layer which is relatively sparse and is dominated by stair-step moss and bazzania along with lesser amounts of broom moss and red-stemmed feathermoss.

Eastern White Cedar / Heart-leaved Birch

This softwood stand type is found on moderately well drained to imperfectly drained sites. On moderately well drained sites, the dominant tree species are eastern white cedar, red spruce and heart-leaved birch. On imperfectly drained sites the dominant tree species are eastern white cedar, balsam fir and heart-leaved birch. The shrub understory is relatively sparse and only advanced regeneration of balsam fir is encountered regularly. On the mesic sites, small amounts of sheep laurel (*Kalmia angustifolia*) and mountain holly (*Ilex mucronata*) are also present in the shrub layer. The ground vegetation layer is generally well developed and is dominated by a mixture of bunchberry (*Cornus canadensis*), bazzania and wild sarsaparilla (*Aralia nudicaulis*). Other less abundant ground vegetation species present in these stands include broom moss, hairy flat-top white aster (*Doellingeria umbellata*) and big shaggy-moss (*Rhytidiadelphus triquetris*). Northern star flower (*Lysimachia borealis*) is typically found on the moderately well drained sites and sphagnum moss is present on the imperfectly drained sites. The estimated age of Eastern White Cedar / Heart-leaved Birch stands in the Field Study Area ranges from 30 to 100 years.

Mixedwood Forest

Mixedwood forest is relatively common in the Field Study Area. All the mixedwood stands encountered in the Field Study Area have estimated stand ages greater than 30 years and are listed as mature and overmature. The Balsam Fir / Heart-leaved Birch stand type is the only mixedwood forest stand type noted in the Field Study Area.

Balsam Fir / Heart-leaved Birch

This mature mixedwood forest type is typically found on moderately well drained sites but is occasionally found on well drained and imperfectly drained sites. The species composition of the tree layer is very similar to the Balsam Fir / Red Spruce / Heart-leaved Birch stand type except that the abundance of heart-leaved birch is much higher and red spruce is present less frequently. Like most other forest stands in the Field Study Area, the shrub layer is sparse and is composed almost entirely of advanced regeneration of balsam fir. The ground vegetation layer is well developed and is dominated by mosses, the most abundant of which are red-stemmed feathermoss, knight's-plume moss (*Ptilium crista-castrensis*), and sphagnum moss, along with lesser amounts of broom moss, stair-step moss, and bazzania. The only vascular plant species that occurs regularly in the ground vegetation layer are bunchberry and seedlings of balsam fir.

Hardwood Forest

Only three hardwood forest stands are present in the Field Study Area. Two of the stands are immature with an estimated age of 20 years while the third stand is mature and approximately 50 years old. All these stands are characterized by a tree canopy dominated by birch.

Heart-leaved Birch / Paper Birch

The Heart-leaved Birch / Paper Birch stand type is found on sites where drainage ranges from well drained to moderately well drained. In the immature stands, the tree canopy is dominated by a mixture of heart-leaved birch and paper birch (*Betula papyrifera*). The stand located on the well drained stony site also has red maple (*Acer rubrum*), balsam fir, and white spruce (*Picea glauca*) in the tree layer. The shrub layer is relatively sparse and is dominated by American mountain ash (*Sorbus americana*). The well drained site also has small amounts of mountain holly and sheep laurel. The dominant ground vegetation species in both stands is bunchberry. However, plant species richness is much higher on the moderately well drained site where mountain wood fern (*Dryopteris campyloptera*), evergreen wood fern (*Dryopteris intermedia*), rough-stemmed goldenrod (*Solidago rugosa*), interrupted fern (*Claytosmunda claytoniana*), and New England sedge (*Carex novae-angliae*) are also common.

The mature stand type is found on a moderately well drained site. The tree layer is dominated by a mixture of heart-leaved birch and paper birch along with yellow birch (*Betula allegheniensis*). Other common tree species include balsam fir and red spruce. The shrub layer is relatively sparse and consists mostly of advance regeneration of balsam fir and some American mountain ash. The ground vegetation layer is similar to the ground vegetation layer species composition in the young stand on the moderately well drained site.



Tall Shrub Thicket

Tall shrub thicket is only found at two locations near the southern end of the Field Study Area. Both locations are on imperfectly drained sites upslope of a large wetland complex. It is unclear why the shrub thicket is present, but it may be the result of past agricultural activity. Tree cover is sparse and consists largely of scattered balsam fir and tamarack as well as a few white spruce. The shrub layer is heavy and is composed of a mixture of speckled alder (*Alnus incana*) and white meadowsweet (*Spiraea alba*). The ground vegetation layer is dominated by bristly dewberry (*Rubus hispidus*), hairy flat-top white aster, and rough-stemmed goldenrod. Other common ground vegetation species include haircap moss (*Polytrichum* sp.) and spinulose woodfern (*Dryopteris carthusiana*).

11.2.3.2.2 Wetland Plant Communities

Wetland data for the Field Study Area, including a description of wetland types and associated plant communities, is presented in the Wetland Delineation and Functional Assessment Report (Appendix F).

A total of 35 wetlands were identified within the Field Study Area; 24 of these wetlands are within the Data Centre PDA (Figure 11.7). A summary of wetlands in the Field Study Area is provided in Table 11.4. None of the wetlands within the Data Centre PDA are classified as PSW.

Table 11.4 Summary of Wetlands in the Field Study Area

Wetland Class and Type	Wetland IDs[1]	Area in the Field Study Area (ha)	Area in the Data Centre PDA (ha)
Bog	WL-21	1.02	1.02
Treed Bog	WL-21, WL-35	4.72	4.66
Coniferous Treed Swamp	WL-1, WL-4, WL-5, WL-6, WL-9, WL-10, WL-11, WL-14, WL-15, WL-17, WL-20, WL-21, WL-24, WL-25, WL-26, WL-28, WL-29, WL-30, WL-31, WL-32, WL-33	24.37	19.45
Mixedwood Treed Swamp	WL-1, WL-12, WL-13, WL-18, WL-19, WL-21, WL-22, WL-23	1.36	1.25
Deciduous Treed Swamp	WL-27	0.03	0.03
Tall Shrub Swamp	WL-1, WL-2, WL-3, WL-7, WL-8, WL-16, WL-34	1.33	0.34
Marsh	WL-1	0.11	0.03
	Totals	**32.94**	**26.78**

Notes: [1]WL-1 and WL-21 are wetland complexes (i.e., they contain more than one wetland type).

Throughout the Field Study Area, small, isolated patches of wetland habitat (i.e., <100 m^2) were identified. Where a patch of wetland habitat was <100 m^2, it was noted but not delineated (Figure 11.7). These patches were typically small, coniferous treed swamps surrounded by coniferous upland forest with similar overstory.

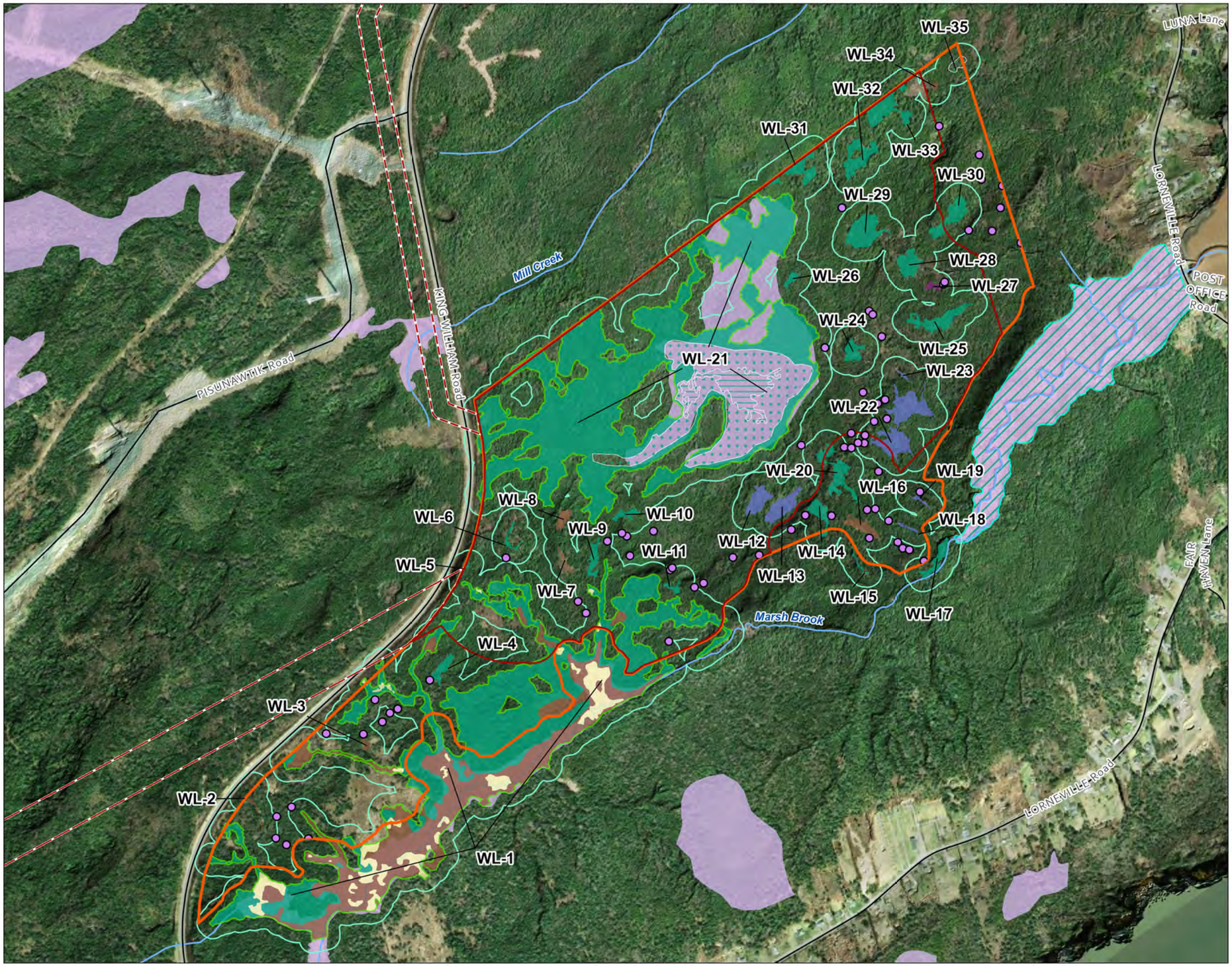


Figure No.
11.7

Title
Wetlands in the Field Study Area

Client/Project
Beacon Data Centres Inc.
Spruce Lake AI Data Centre

121418636-404

Project Location
Lorneville,
New Brunswick

Prepared/Revised by SC on 2026-03-12

N

0 100 200 metres
(At original document size of 11x17)
1:9,000

Legend

Project Site (Field Study Area)

Project Development Areas (PDA)
- Data Centre PDA
- Pipeline PDA
- Transmission Line PDA

Wetland Survey Results
- Wetland Less Than 100m^2
- Wetland Complex Cutline

Wetland Type (Stantec)[4]
- Bog
- Treed Bog
- Marsh
- Coniferous Treed Swamp
- Deciduous Treed Swamp
- Mixedwood Treed Swamp
- Tall Shrub Swamp

Other Features
- Road

Wetlands and Waterways
- Wetland Buffer (30 m)
- Watercourse (NBHN)
- Provincially Significant Wetland
- Wetland (NBELG)



Notes
1. Coordinate System: NAD 1983 CSRS New Brunswick Stereographic
2. Data Sources: Beacon Data Centres Inc.; Data License with the Government of New Brunswick (NBDELG, NBNRED, Service NB); New Brunswick Power; Stantec
3. Background: Vantor, Esri, USGS
4. Field notes and photos from the field delineation of the wetlands were used with satellite imagery to identify the wetland types of the field-delineated wetland.

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11.2.3.3 Old Forest

11.2.3.3.1 Large Trees

During field surveys, it was noted that large trees were scattered throughout the Field Study Area. However, the surrounding forest matrix was composed of much smaller trees with a uniform age structure. Whenever these large trees (i.e., >40 cm DBH, approximately) were encountered, they were identified to species, their DBH was measured, and their location was recorded.

A total of 102 large trees were measured in the Field Study Area at the 67 locations where large trees were encountered (Figure 11.8, Table E.3, Appendix E). A summary of the results is presented in Table 11.5. The highest concentrations of old trees occurred in a broad band extending east to west through the middle of the Field Study Area. Forest polygons that had the largest numbers of recorded old trees recorded included forest polygon 11 (16 locations), polygon 10 (12 locations), polygon 6 (8 locations), and polygon 24 (6 locations).

Results of the old forest assessment (Section 11.2.3.3.2) provided a collection of DBH measurements and associated ages for five tree species cored as part of the assessment. These included red spruce (*Picea rubens*), eastern white cedar, balsam fir (*Abies balsamea*), black spruce (*Picea mariana*), and tamarack (*Larix laricina*). These data were used to prepare DBH versus age plots for four of these species to estimate the ages of the large trees. Only one tamarack was cored during the old forest assessment, so it was not possible to determine the relationship between DBH and age for this species. However, it was noted that the DBH/age relationship for the cored tamarack was similar to that of the cored black spruce, so the black spruce DBH/age plot was used to estimate the ages of tamarack.

Seventy-five of the large trees recorded are within the Data Centre PDA. Red spruce accounted for 77% of the large trees, followed by eastern white cedar (15%), tamarack (6%), and balsam fir (1%). Although the largest tree was a 75.4 cm DBH red spruce with an estimated age of 240 years, it was not the oldest tree due to the faster growth rate of red spruce in the Field Study Area. The trees with the oldest estimated ages were a 50.9 cm DBH tamarack with an estimated age of 285 years, and a 55.6 cm DBH eastern white cedar with an estimated age of 280 years.

Table 11.5 Summary of Tree Measurements in the Field Study Area

Species	Number of Trees Measured	DBH (cm)			Estimated Age (years)		
		Min	Max	Average	Min	Max	Average
Balsam Fir	1	37.5	37.5	37.5	175	175	175.0
Cedar	15	41.3	55.6	48.0	175	280	227.7
Red Spruce	79	36.8	75.4	49.9	100	240	149.4
Tamarack	6	43.0	66.9	50.9	175	285	210.8
Unknown[1]	1	50.0	50.0	50.0	-	-	-

Notes
[1]Species was not recorded

The presence of large trees does not necessarily indicate that a forest is an old forest. Mosseler et al. (2003) have identified six structural features that characterize old growth Acadian forest:

- Uneven or multi-aged stand structure, or several identifiable age cohorts.
- Average age of dominant species approaching half the maximum longevity for species (approximately 150 + years for most shade-tolerant trees).
- Some old trees at close to their maximum longevity (ages of 300 + years).
- Presence of standing dead and dying trees in various stages of decay.
- Fallen, coarse woody debris.
- Natural regeneration of dominant tree species within canopy gaps or on decaying logs.

The structure of most of the forest polygons where large trees were encountered was not indicative of old forest. In most instances, the large trees occurred as single trees or small clusters of two or three trees protruding from a forest matrix composed of trees of relatively uniform size that were substantially smaller than the large trees. The tree canopies were typically dense with few small canopy gaps to provide opportunities for tolerant tree species to establish. Some large patches of wind throw were found at the eastern end of the Field Study Area, likely blown down during Hurricane Fiona which occurred in September 2022. These large-scale disturbances do not provide conditions conducive to the establishment of shade tolerant trees unlike the small canopy gaps left by small-scale disturbances created by fallen individual trees or small groups of trees. There was little regeneration of shade tolerant canopy trees in the forest understory, and fallen, coarse woody debris was uncommon in most of the Field Study Area.

Over most of the Field Study Area, the presence of scattered large trees is probably an artifact of past forest harvesting activities. Many of the large trees have defects such as broken tops or multiple leaders that may have made them less marketable. It is possible that these trees were not harvested during past harvesting events allowing them to survive and achieve large sizes.



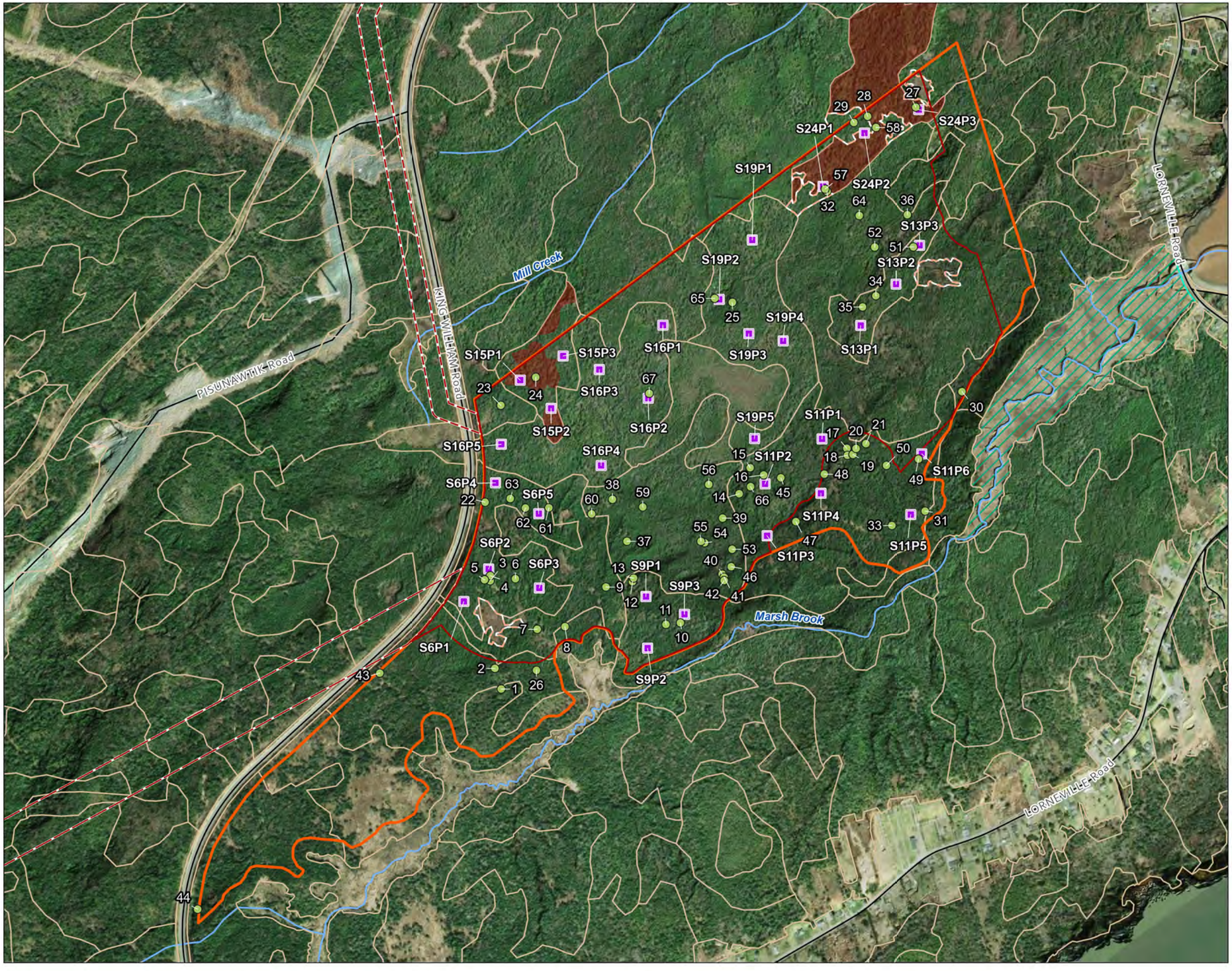


Figure No.
11.8

Title
Large Trees and Old Forest in the Field Study Area

Client/Project
Beacon Data Centres Inc.
Spruce Lake AI Data Centre

121418636-402

Project Location
Lorneville,
New Brunswick

Prepared by SC on 2026-03-12

N

0 100 200 metres
(At original document size of 11x17)
1:9,000

Legend

- Project Site (Field Study Area)

Project Development Areas (PDA)

- Data Centre PDA
- Pipeline PDA
- Transmission Line PDA

Old Forest Survey Results

- Large Tree(s) Location
- Old Forest Plot
- Altered Stand (Stantec)
- Confirmed Old Forest Stand (Stantec)
- Provincial Forest Stand

Other Features

- Road

Wetlands and Waterways

- Watercourse (NBHN)
- Provincially Significant Wetland



Notes
1. Coordinate System: NAD 1983 CSRS New Brunswick Stereographic
2. Data Sources: Beacon Data Centres Inc.; Data License with the Government of New Brunswick (NBDELG, NBNRED, Service NB); New Brunswick Power; Stantec
3. Background: Vantor, Esri, CGIAR, USGS

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11.2.3.3.2 Old Forest Assessment

Eight forest inventory polygons were evaluated for old forest conditions (Table 11.6). Only the portions of the polygons found within the Field Study Area were evaluated. Generally, forest polygons within the Field Study Area listed as ‘mature’ (using the layer 1 development stage (L1DS) column in the forest inventory data) were selected for evaluation, unless field observations indicated a different age class. During September 2025 surveys, two polygons listed as ‘mature’ in the forest inventory were found to be immature (estimated ages of 20 and 30 years), so these polygons were not evaluated for old forest conditions. These polygons are also located outside the Data Centre PDA. One polygon listed as ‘young’ in the forest inventory was selected for evaluation because field observations indicated that this polygon had pockets of mature forest. Forest structure indicative of old forest was noted in polygons 15 and 24, where concentrations of large trees greater than two or three individuals were present, including cedars having an estimated age of 265 years. The canopy was multi-layered and composed of trees of a variety of sizes and ages. Coarse woody debris was common on the forest floor. Forty-one of the 67 locations (61%) where large trees (Section 11.2.3.3.1) were recorded were found within the eight polygons evaluated for old forest conditions.

According to the Nova Scotia protocol, a forest polygon is considered old growth if at least 30% of the plots are vegetation types capable of becoming old growth and the average age of all plots is greater than the minimum old growth reference age for the vegetation type (Table 11.6). All eight polygons had more than 30% of the plots containing vegetation types that are Old Growth Eligible. In two polygons (15 and 24) the average age of the cored trees exceeded the lowest old growth reference age of the vegetation types found in those polygons and therefore met the criteria for old growth (Table 11.6, Figure 11.8). The average ages of the cored trees in the remaining six polygons were below the lowest old growth reference age in those polygons. Two polygons (16 and 19) had average ages that were less than 10 years below the lowest old growth reference age of the vegetation types found in those polygons.

Data from the old forest assessment plots (Table 11.6) indicates that the ages of trees within the forest polygons were variable, suggesting that small patches of old forest may be interspersed in a matrix of younger forest. The Nova Scotia protocol has a provision for the subdivision of forest polygons containing both old and young forest; however, it is permitted only if the resultant polygons are at least one ha in size. Polygon 15 is 3.20 ha total, and 2.09 ha of that is in the PDA. Polygon 24 is 7.86 ha total with 3.43 ha in the PDA. Data were combined to delineate patches of old forest within polygons 15 and 24, including the locations of old forest plots and large trees, and the locations of vegetation community descriptions. These data sources along with analysis of satellite imagery suggest that approximately 1.03 ha of polygon 15 is occupied by old forest while the rest is covered in younger forest. Most of the old forest is within the PDA. There is a small amount of old forest in polygon 15 that is outside the PDA and would not be affected by the Project. Similarly, approximately 2.58 ha of old forest associated with polygon 24 is within the PDA, while a relatively large area of old forest is located north of the PDA.

In two polygons (16 and 19), the average age of the cored trees (91 and 93, respectively) was less than 10 years from the lowest old growth reference age of 100. If left undisturbed, it is anticipated that forest within these polygons would mature into old forest within 10 years.

Based on the OFC layer, which identifies OFCs on Crown Land, there are no OFCs within the PDAs.



Table 11.6 Old Forest Assessment Results

Polygon ID	Plot	Species Cored	Nova Scotia FEC[1]	Old Growth Eligible?[2]	DBH (cm)	Approx. Age	Average Age[3]	Old Growth Reference Age[2]
6	1	Red Spruce	SH8/CA1	N/Y	24.1	58	85	125
	2	Red Spruce	MW13	Y	42.2	105		125
	3	Red Spruce	CA1	Y	30.6	76		125
	4	Red Spruce	SH8	N	20.9	35		-
	5	Red Spruce	CA1	Y	35.7	101		125
9	1	Cedar	MW13	Y	39.1	125	75	125
	2	Balsam Fir	CB3	Y	19.2	43		100
	3	Red Spruce	SH5b	Y	33.9	57		125
11	1	Balsam Fir	CA1	Y	28.5	63	85	125
	2	**Red Spruce**	**CA1/WC5**	**Y/Y**	**35.1**	**103**		**100**
	3	Red Spruce	CA1	Y	30.0	67		125
	4	Red Spruce	CA1	Y	38.7	109		125
	5	Balsam Fir	MW8	N	20.1	77		-
	6	Balsam Fir	MW8	N	16.5	72		-
13	1	Cedar	MW13	Y	29.1	84	95	125
	2	Red Spruce	CA1	Y	28.9	76		125
	3	**Cedar**	**MW13**	**Y**	**28.0**	**126**		**125**
15	1	Cedar	CA1	Y	30.2	154	116	125
	2	Tamarack	WC2	Y	19.5	107		100
	3	Black Spruce	WC1	Y	25.9	87		100
16	1	Black Spruce	WC2	Y	20.3	98	91	100
	2	Balsam Fir	MW8	N	22.2	85		-
	3	Black Spruce	WC2	Y	30.8	96		100
	4	**Black Spruce**	**WC2**	**Y**	**26.9**	**106**		**100**
	5	Black Spruce	WC2	Y	22.5	66		100
19	**1**	**Cedar**	**WC10**	**Y**	**38.4**	**142**	93	**100**
	2	Balsam Fir	CA1	Y	20.5	43		125
	3	Red Spruce	CA1	Y	15.5	57		125
	4	**Cedar**	**WC10**	**Y**	**29.9**	**122**		**100**
	5	**Black Spruce**	**WC2**	**Y**	**15.3**	**101**		**100**
24	1	Red Spruce	MW13	Y	54.3	165	130	125
	2	Red Spruce	MW13	Y	39.8	110		125
	3	Red Spruce	CA1	Y	38.8	115		125

Notes
[1]Neily et al. 2023
[2]As per Table 1 in NSDNRR 2025b
[3]The average for the stand is calculated using trees within FEC types that are Old Growth Eligible
Shaded rows indicate plots meeting the Nova Scotia Old Growth Assessment Protocol definition for old growth
Bold text indicates individual trees that were older than the reference age

11.2.4 Transmission Line and Pipeline

Field surveys have not yet been completed within the transmission line and pipeline PDAs, so the existing environment for these PDAs was characterized using available desktop information. Field surveys in these PDAs will be completed prior to construction.

The transmission line PDA comprises 67.4 ha and is mostly forested (67%) but has a significant portion of infrastructure (18%). Wetland habitat makes up 10% of this PDA, with small amounts of industrial land use, cleared area, and waterbodies (1-2% each).

The transmission line PDA contains two main portions; one that extends from the Data Centre PDA toward Coleson Cove (a 92 m wide RoW generally oriented SW-NE) and one that extends from Coleson Cove to Five Fathom Hole (a 52 m wide RoW, generally oriented NW-SE).

Based on available desktop information, the 92 m wide RoW is comprised primarily of forest habitat; mostly softwood and mixedwood stands of varying ages (Table 11.1). This RoW crosses one mapped wetland associated with Shannons Lake, near the Coleson Cove Generating Station. The RoW also crosses infrastructure associated with the Burchill Windfarm. There are no vascular plant or lichen SAR or SOCC records within this portion of the transmission line PDA (AC CDC 2025).

The 52 m wide RoW portion will parallel existing transmission line infrastructure. This portion of the transmission line PDA passes through the Musquash Estuary Nature Reserve and crosses several mapped wetlands, including a large fen in the north. While there are no vascular plant or lichen SAR or SOCC records throughout most of this portion of the PSA, the AC CDC dataset for the Project does not cover the transmission line PDA in its entirety (due to Project design changes). Prior to future field surveys, AC CDC data for the remaining portion will be requested and reviewed.

The pipeline PDA (15.1 ha) will extend from the Data Centre PDA to the Saint John Lateral and/or Brunswick Pipeline located approximately 4.5 km north of the PDA. Forest makes up 81% of the pipeline PDA, but there is cleared area (9%) and infrastructure (6%) within the PDA and some wetland habitat (4%) and industrial land use (<1%). The PDA crosses two provincially mapped wetlands. There are no vascular plant or lichen SAR or SOCC records within the pipeline PDA (AC CDC 2025).

According to GeoNB-mapped wetlands, there are no PSWs within the transmission line or pipeline PDAs.

11.3 Potential Effects and Effect Pathways

A summary of the potential effects and Project effect pathways to be assessed for vegetation and wetlands is provided in Table 11.7. Potential environmental effects and effects pathways were selected based on a review of similar projects in New Brunswick and other parts of Canada, and professional judgement.

Table 11.7 Potential Effects and Effect Pathways for Vegetation and Wetlands

Potential Effect	Effect Pathway(s)
Change in species diversity	• Loss of vegetation (which could include SAR or SOCC) through direct disturbance or indirect loss of individuals and populations through changes in habitat parameters
Change in vegetation community diversity	• Loss of vegetation communities through direct disturbance or a change to vegetation communities through changes in abiotic factors and introduction and spread of non-native invasive plants
Change in wetland function	• Change in wetland function through direct disturbance or indirectly due to changes in hydrology

The Project will interact with vegetation and wetlands resulting in a change in vegetation species and community diversity and/or changes in wetland function from the following activities.

- Project construction will require vegetation clearing and grubbing which will result in direct loss of vegetation.
- Vegetation clearing activities during site preparation can directly damage or disturb understory and ground vegetation layers during canopy removal. Vegetation clearing can also have indirect effects on the LAA through edge effects.
- Site preparation within the Data Centre PDA will require excavation and infilling of wetland habitat, resulting in changes to wetland habitat and function.
- Excavation during construction could affect hydrology and/or require dewatering which could also affect vegetation and wetlands.
- Direct disturbance to soils and vegetation associated with access routes within wetlands can cause loss of wetland function. Vehicles or machinery can result in soil compaction, erosion, and alteration of hydrology.
- Construction activities, including onsite transportation, could generate dust which could reduce vegetation health and productivity.
- Construction activities can lead to the introduction of or increase in abundance of non-native and potentially invasive plant species as construction equipment and/or borrow material is brought on site and open linear habitats conducive to the spread of non-native species are created.
- Site maintenance during operations may include the application of road salt or other de-icing agents to onsite roads and parking lots which could potentially affect adjacent wetlands and vegetation. Vegetation maintenance will also result in direct loss of vegetation.

11.4 Mitigation Measures

In addition to environmental management plans associated with the transmission line and pipeline, a Project-specific Environmental Management Plan (EMP) will be developed.

The following general mitigation measures specific to vegetation and wetlands have been identified. Mitigation measures specific to the transmission line and pipeline are included following this list.

General Mitigation Measures:

- To reduce the adverse effects of clearing on vegetation communities and wetlands, clearing and grubbing activities will be restricted to only what is required within the PDAs.
- The location of important environmental features (i.e., wetlands, old forest, and large trees) in the Data Centre PDA will be considered during final site planning.
- The limits for approved clearing, grubbing and topsoil overburden removal will be clearly identified (flagging/survey stakes) in the field prior to the commencement of work.
- Vegetation clearing will generally be completed using mechanical methods, except within 30 m of watercourses or wetlands, where manual clearing will be used to protect soils and understory vegetation.
- Sensitive areas (e.g., wetlands, rare plant occurrences) identified prior to Project activities will be flagged and appropriate buffers maintained around these areas, where feasible.
- An application for a WAWA Permit will be submitted to NBDELG prior to the commencement of work in and within 30 m of a watercourse or wetland, and the conditions of any permits received will be followed.
- Permanent alterations to wetlands will be compensated for at a 2:1 ratio, in accordance with provincial legislation and the Wetland Compensation General Guidance document (NBDELG 2020b).
- When travelling through wetlands, swamp mats will be used to reduce soil disturbance through rutting. The areas where vehicles are permitted to operate in wetlands will be restricted to the minimum area required.
- Vehicles and equipment will be operated in previously disturbed areas, wherever feasible.
- Standard erosion and sedimentation control measures (including stormwater management) will be employed to reduce erosion and sedimentation in wetlands and areas adjacent to wetlands. Erosion and sediment controls installed during construction will be maintained until vegetation is fully established.
- Stormwater will be managed through a stormwater management system (refer to Table 2.2 in Section 2.3)
- The wetland organic layer will be salvaged and stored separately from upland topsoil.

- Material stockpiles will be kept a minimum of 30 m from a watercourse or waterbody with the appropriate erosion control mitigation in place to prevent sediment from entering a watercourse, waterbody or wetland. Any potentially dust-generating materials will be kept covered, where practical, and used as soon as practical, or will be appropriately temporarily vegetated.
- Equipment and materials arriving on site will be clean and free of soil or vegetative debris before it enters the Project RoW to begin work to reduce the potential for the spread of invasive plant species. Equipment which arrives in a dirty condition will not be allowed on the site until it has been cleaned.
- Quarried, crushed material will be used for road building and foundations if needed, to reduce the risk of introducing or spreading exotic and/or invasive vascular plant species.
- Merchantable timber within the PDAs will be harvested and used.
- Construction areas will be kept clear of rubbish and debris. Rubbish and debris will be appropriately stored and managed.
- Where feasible, natural regeneration will be allowed to occur to re-establish native plant communities. This can be encouraged by reducing soil disturbance and leaving the root mat and seed bank in place.
- If natural regeneration is not possible, a seed mix that contains native species will be used. The vegetation in the undisturbed surrounding area will be considered prior to selecting an appropriate seed mix for the site. Re-seeding of areas will follow standard methods in compliance with permit conditions.
- Native plants will be used for landscaping, where practical.
- The sizes of temporary workspaces will be kept to the smallest size feasible to reduce adverse effects of clearing in these areas and will avoid wetlands and mature forested habitat. Where practical, developed areas will be used for staging.
- Wetlands will not be used as temporary workspaces, unless required for site-specific purposes.
- Work will be performed so that materials such as sediment, fuel or other hazardous materials do not enter watercourses and waterbodies through implementation of erosion and sediment control measures and hazardous materials management practices.
- Fuelling/servicing will be conducted using appropriate containment equipment, including spill kits.
- Spill response kits will be available on-site. Project vehicles will be equipped with appropriately sized spill kits.
- Vehicles, heavy equipment, and machinery will be properly maintained to reduce the risk of leakage. Routine preventative maintenance and inspection of hydraulic equipment and machinery will be undertaken to avoid a hazardous material release.
- Fuelling and servicing areas will be sited more than 100 m away from watercourses, waterbodies, and wetlands.



In addition to the general mitigation measures listed above, the following mitigation measures will apply to the transmission line:

- Pre-construction surveys for wetlands and rare plants will be conducted within the transmission line PDA, particularly in areas where there are known occurrences of plant SAR and SOCC within the AC CDC database.
- Wherever possible, structures for the transmission line will be situated outside of wetlands and conductors will span the wetland. Conductors will be drawn though the wetland by hand using progressively larger cables. Where it is not feasible to span a wetland, foundations and other infrastructure will be established as close to the edges of the wetland as feasible to reduce traffic on wetland soils.
- Construction of the transmission line will aim to avoid sensitive areas where possible, and where crossings of watercourses or wetlands are unavoidable, temporary matting, bridging, or corduroy will be used. Tracked equipment will be preferred near sensitive areas to reduce rutting.
- Where feasible, infrastructure required to be installed in wetlands will be installed during the winter months when the ground is frozen to reduce disturbance to wetland soils and vegetation.
- The locations of foundations and other infrastructure in wetlands will be planned to reduce the distance that heavy equipment must travel through wetlands.
- To reduce the adverse effects of clearing on wetlands, clearing and grubbing activities will be restricted to the minimum amount required within the transmission line PDA. Only as much wetland vegetation as is required to safely install necessary equipment and provide adequate clearance between conductors and vegetation will be removed.
- Clearing activities for the transmission line will follow best practices according to NB Power's Transmission Vegetation Management Program (TVMP) Manual for the Maintenance of Transmission Lines (2024).
- NB Power will work with landowners to control unauthorized access to RoW and will continue to discourage ATV and snowmobile traffic in RoW.
- Use of existing access points will prevent additional indirect disturbance to wetlands by recreational ATV users, including to wetlands within sensitive areas that intersect the PDA and LAA, such as the Musquash Estuary Nature Reserve. If the construction of new access roads is required, quarried, crushed material will be used, to reduce the risk of introducing or spreading exotic and/or invasive vascular plant species.

In addition to the general mitigation measures listed above, the following mitigation measures will apply to the pipeline:

- Pre-construction surveys for wetlands and rare plants will be conducted within the pipeline PDA, particularly in areas where there are known occurrences of plant SAR and SOCC within the AC CDC database.
- Where feasible, work will be completed in winter months when the ground is frozen to reduce disturbance to wetland soils and vegetation.



- Cross ditches and berms will be installed on moderately steep and steep slopes in non-agricultural areas to prevent runoff along the RoW and subsequent erosion.
- Progressive rehabilitation practices will focus on restoring topography, hydrology and vegetation in disturbed wetland areas where practicable, to reduce permanent loss of habitat.
- Ditch plugs or similar water control structures will be used in the trench at either end of wetland crossings where there is the potential of water migration along the trench.
- Trench material will be replaced as soon as practicable, and preconstruction contours will be re-established within wetland boundaries to maintain drainage patterns.

11.5 Residual Environmental Effects

Potential environmental effects on vegetation and wetlands were identified in Section 11.3. For vegetation and wetlands, three effects were identified: change in species diversity, change in vegetation community diversity, and change in wetland function.

Residual effects (i.e., those remaining following implementation of mitigation) for each Project phase are evaluated in Sections 11.5.1, 11.5.2 and 11.5.3. The assessment of residual effects considers the following key factors:

- In addition to environmental management plans associated with the transmission line and pipeline, a Project-specific EMP will be developed.
- Access to the Data Centre PDA will be via existing roads and road upgrades are not anticipated. Access to the transmission line and pipeline RoWs will rely primarily on existing roads and trails, though some may require improvements such as brush clearing, grading and gravel placement, or the installation of drainage and culverts. If new access roads are needed, they will meet provincial and municipal standards, and landowner permissions will be obtained where required.
- An application for a WAWA Permit will be submitted to NBDELG prior to the commencement of work in and within 30 m of a watercourse or wetland, and the conditions of any permits received will be followed. Permanent alterations to wetlands will be compensated for at a 2:1 ratio, in accordance with provincial legislation and the Wetland Compensation General Guidance document (NBDELG 2020b). Avoidance and mitigation will be completed to the extent feasible; however, effects on vegetation and wetlands may still occur because of the uncertainty of success of reclamation techniques, and unforeseen natural events or processes.
- The Transmission Line PDA is situated adjacent, in large part, to an existing transmission line corridor, and thus expands the footprint of a pre-existing disturbance within an existing RoW. To the extent feasible, work associated with the transmission line will avoid alterations to wetlands and other sensitive habitats, and vascular plant SAR and SOCC. Mitigation will reduce the loss of biodiversity features and the ecosystem services and functions provided by wetland and upland habitats.



- While field surveys have not yet been completed within the transmission line and pipeline PDAs, they will be completed prior to construction. Information from the completed surveys will be used to determine the location of SAR and/or SOCC, and if additional mitigation measures are warranted.

11.5.1 Change in Species Diversity

Project development can result in a change to species diversity, including SAR/SOCC.

During the construction phase, clearing, grubbing, and levelling within the Data Centre PDA will result in the direct loss of vegetation and disturbance to soil. For the transmission line and pipeline PDAs, clearing will remove trees and shrubs and damage understory vegetation. Any grubbing will completely remove vegetation and cause soil disturbance. To reduce the adverse effects of clearing on vegetation communities and wetlands, clearing and grubbing activities will be restricted to only what is required within the PDAs.

During operation and maintenance, vegetation management activities will be ongoing, particularly for the transmission line and pipeline RoWs. These activities will largely occur within previously disturbed areas and will follow BMPs and other established protocols. However, any SAR/SOCC not lost due to construction activities could be affected by vegetation maintenance activities.

A total of 184 vascular plants were recorded within the Field Study Area during field surveys. None of the observed species are considered SAR or SOCC. One lichen SOCC was incidentally recorded in the Field Study Area. Powder-tipped antler lichen is ranked as S3 by the AC CDC and was observed at 10 locations in the Data Centre PDA (Figure 11.5), so will be affected by the Project. It is unlikely that the provincial population of these species will be irreversibly affected with the loss of these occurrences in the Data Centre PDA.

According to the AC CDC data for the Project, no vascular plant, bryophyte or lichen SAR have been recorded in or within 5 km of the Field Study Area, but ten vascular plant SOCC have been recorded within 5 km (Table 11.2). Of these ten, only five have potential to be found within the Data Centre PDA, including:

- branched bartonia (*Bartonia paniculata* ssp. *iodandra*) – S3
- cursed buttercup (*Ranunculus sceleratus*) – S2S3
- least moonwort (*Botrychium simplex*) – S3
- little curlygrass fern (*Schizaea pusilla*) – S2
- small-flowered purple false foxglove (*Agalinis purpurea var. parviflora*) – S3

These species are ranked between S2 (imperiled) and S3 (vulnerable) by the AC CDC. While there is potential for these species to be found in the Data Centre PDA, they were not recorded during vascular plant surveys, and it is unlikely that the populations of these species will be irreversibly affected if individuals do happen to be present in the Data Centre PDA.



Pre-construction surveys within the transmission line and pipeline PDAs will be completed to determine whether SAR/SOCC are present within those PDAs.

Many invasive plant species are strong competitors and can thrive in disturbed habitats. Subsequently, invasive plant species may spread into adjacent areas through edge effects, and the impacts can be irreversible, depending on the species. Only one species observed during field surveys in the Field Study Area is considered potentially invasive (creeping buttercup). It is expected that other invasives will be observed during subsequent field surveys within the transmission line and pipeline PDAs, as they are adjacent to previously disturbed areas. Adherence to mitigation measures, BMPs, and the implementation of post-construction monitoring will be key in preventing and managing any effects related to invasive plants.

Based on the information presented above, and with the implementation of mitigation and management measures listed in Section 11.4, direct effects to vegetation within the PDAs and indirect effects to adjacent plants through edge effects and changes in hydrology are expected. Project-related effects are expected to be restricted to the PDAs and the LAA (minimally, through edge effects). A measurable change in species diversity is not expected outside the PDAs. The population status and viability of plant and lichen SAR and SOCC occurring within the PDA and LAA are not expected to be affected by the Project. Project effects will occur primarily during the construction phase, but some may extend through to the completion of post-construction reclamation and ongoing vegetation maintenance activities within Transmission Line and Pipeline PDAs, which will occur approximately once every 10 years.

11.5.2 Change in Vegetation Community Diversity

Development of the Project has the potential to result in a change in community diversity through direct effects (the removal of vegetation and disturbance of soils) and alteration of abiotic factors in the PDAs that could result in indirect change in adjacent vegetation communities. As with a change in species diversity, these interactions will primarily occur during vegetation clearing and disturbances to soil associated with site preparation and construction.

Removal of the canopy during vegetation clearing activities can result damage or disturb the understory and ground vegetation layers. Canopy removal will alter important abiotic factors that contribute to the species composition of forest communities, including the amount of light that reaches the understory, humidity, and temperature. For wetlands and woody upland habitats, vegetation clearing will alter factors that contribute to ecological functions, such as the diversity of vegetation height and form and height class interspersion, woody diameter classes, and overall species composition. Removing vegetation from wetlands affects sediment retention, nutrient cycling, water cooling, and influences habitat. These changes will result in the loss or transition of vegetation communities.

Depending on the technique used, site preparation could remove topsoil and the associated seedbank that remains after vegetation clearing activities, and heavy machinery can compact any remaining soil. This can influence the plant communities that re-establish on the disturbed area.



Vegetation clearing can have indirect effects on the LAA through edge effects. With the removal of vegetation, changes in abiotic factors (i.e., light, wind penetration, humidity, temperature) can influence adjacent vegetation communities. Invasive plant species often thrive in disturbed habitats and may spread into adjacent areas through edge effects.

The Data Centre PDA covers approximately 89 ha. Habitat within the Data Centre PDA is primarily forested (70% of the PDA or approximately 62 ha) with an abundance of wetlands (30% or approximately 27 ha). The upland forest in the PDA consists mostly of mixedwood stands (36 ha) with softwood stands totalling approximately 25 ha, and a small amount (just over 1 ha) of hardwood (Table 11.1).

During construction activities there will be direct loss and fragmentation of habitat to allow for construction of the Data Centre. While this effects assessment considers the effects within the currently defined Data Centre PDA (i.e., 62 ha of forest and 27 ha of wetland habitat lost) the current PDA is considered conservative (i.e., likely overstates rather than understates effects) and may be reduced after detailed design is completed.

A total of 102 large trees (i.e., trees with a DBH >40 cm, approximately) were measured at 67 locations where large trees were encountered in the Field Study Area (Figure 11.8, Table E.3, Appendix E). Seventy-five of these large trees were found within the Data Centre PDA.

The Data Center PDA overlaps two forest polygons (15 and 24) that were classed as old growth forest. Both polygons are located along the northern boundary of the PDA. Approximately 2.09 ha of polygon 15 and 3.43 ha of polygon 24 are within the PDA. Field observations combined with analysis of satellite imagery suggest that approximately 1.03 ha of polygon 15 is occupied by old forest while the rest is covered in younger forest, most of which is within the PDA. Similarly, approximately 2.58 ha of old forest associated with polygon 24 is within the PDA, while a relatively large area of old forest is located north of the PDA. It is expected that most of the old forest found within the PDA could be affected by the Project with the exact amount depending on the final footprint. The location of old forest and large trees in the Data Centre PDA will be considered during final site planning.

The transmission line PDA is mostly forested with some wetland habitat and smaller amounts of other land uses (Table 11.1). Permanent loss of habitat within the transmission line PDA will be localized (i.e., at structure sites) and wetlands will be avoided where possible. Vegetation clearing and subsequent changes in abiotic factors will influence the type of upland forest and wetland habitats that remain following construction, which will be further influenced by ongoing vegetation maintenance. It is expected that forested areas (including forested wetlands) will transition to shrub habitat. Most wetland areas in this PDA will continue to function as wetlands, although the type of wetland habitat may change due to a change in the vegetation community.

The pipeline PDA is mostly forest habitat, with some cleared area, infrastructure, wetland, and industrial land use. It is anticipated that the forested areas in this PDA will be harvested and vegetation in these areas will be maintained at a low height to prevent the re-establishment of forest. Any forested wetland habitat within this PDA will transition over time to wetlands dominated by shrub communities.



Based on the information presented above, and with the implementation of mitigation and management measures listed in Section 11.4, direct effects to vegetation communities within the PDAs and indirect effects to adjacent vegetation communities through edge effects and changes in hydrology are expected. Project related effects are expected to be restricted to the PDAs and the LAA (through edge effects) and a measurable change in vegetation community diversity is not expected outside the PDAs. The loss of old forest associated with polygons 15 and 24 will be a long-term, irreversible, adverse effect of the Project.

Project effects will occur primarily during the construction phase, but some may extend through to the completion of post-construction reclamation and ongoing vegetation maintenance activities, which will occur approximately once every 10 years within the Transmission Line and Pipeline PDAs.

11.5.3 Change in Wetland Function

Project construction could result in a change in wetland function through direct disturbance or through changes in hydrology. These interactions are expected to occur primarily during site preparation and construction, when wetland habitat will be lost or changed by vegetation clearing and soil disturbance. During the operations and maintenance phase of the Project, effects on wetlands will be limited and primarily associated with vegetation maintenance.

For any wetlands within the PDAs, the mitigative sequence (avoidance, minimization, compensation) will be followed. Any alteration in or within 30 m of a wetland will require a WAWA approval prior to disturbance and compensation will be implemented for loss of wetland habitat. None of the wetlands within the PDAs are considered a PSW. Direct and indirect effects to wetland habitat will be reduced through mitigation techniques described in Section 11.4.

For forested wetlands, vegetation clearing will alter factors that contribute to ecological functions, such as the diversity of vegetation height and form and height class interspersion, woody diameter classes, and overall species composition. Removing vegetation from wetlands effects sediment retention, nutrient cycling, water cooling, and influences habitat. Clearing of forested wetlands will result in loss or conversion of vegetation communities through the removal of canopy and loss of species through both direct and indirect disturbance.

Field delineation and functional assessment of wetlands within the Field Study Area were completed in 2025. Prior to construction within the transmission line and pipeline PDAs, field delineation and functional assessment of wetlands will be completed.

Based on 2025 field surveys, the Data Centre PDA (89 ha) contains approximately 27 ha of wetland habitat, most of which is coniferous treed swamp (19 ha), and bog (6 ha). The current size of the Data Centre PDA is considered conservative and may be reduced after detailed design is completed. It is expected that wetland habitat within the final Data Centre PDA will be directly affected by the Project.

The largest area of wetland habitat within the Data Centre PDA, WL-21, occurs along the northern boundary. This wetland consists of treed bog with shallow peat deposits and in the centre of this lies open bog with deeper peat deposits. According to the results of the functional assessment, WL-21 has high function ratings for phosphorous retention and wildlife habitat (refer to Section 3.5 of the Wetland Delineation and Functional Assessment Report in Appendix F).

Powder-tipped reindeer lichen (an SOCC) was found in WL-12 and WL-21, both which will be altered for the Project. It is unlikely that the provincial population of these species will be irreversibly affected with the loss of these occurrences in the Data Centre PDA.

According to GeoNB-mapped wetlands, the 15-ha pipeline PDA has 0.6 ha of wetland habitat and the transmission line PDA (67 ha) has 6 ha of wetland habitat (Table 11.1).

Wherever possible, transmission line structures will be situated outside wetlands and conductors will span wetlands. Where it is not feasible to span a wetland, foundations and other infrastructure will be established in such a way to reduce traffic on wetland soils. Where wetland crossings are unavoidable, temporary matting, or corduroy will be used. Construction of the transmission line and pipeline will be timed to occur during the winter months, where possible, to reduce disturbance to vascular plants and wetlands. Progressive rehabilitation practices will focus on restoring topography, hydrology and vegetation in disturbed wetland areas where practicable, to reduce permanent loss. Following construction, natural regeneration will be allowed to occur to re-establish native plant communities.

Within the transmission line and pipeline RoWs, wetland vegetation cover will transition for years following restoration, and the success of restoration efforts will be evaluated through follow-up monitoring. Pre-disturbance wetland data will be used to quantify any residual changes in wetland area or function (i.e., after mitigation and onsite restoration).

A PSW (coastal saltmarsh) is located south of the Data Centre PDA. As indicated on Figure 9.1 (Section 9), most of the Data Centre PDA (and a portion of the Transmission Line PDA) lies within the Marsh Brook Watershed, which drains into the Bay of Fundy through this PSW. Stormwater management along with erosion and sediment controls are key mitigation measures to prevent unwanted substances being discharged to adjacent watercourses and, ultimately, the PSW. A surface water monitoring plan will outline any required water quality sample locations, frequency of sampling, and the parameters being tested and collected. Stormwater management, containment, treatment, and monitoring programs will be designed to protect water quantity and quality and maintain compliance with applicable regulatory and environmental objectives throughout the life of the Project.



Based on the information presented above, and with the implementation of mitigation and management measures listed in Section 11.4, direct effects on wetlands within the PDAs and indirect effects through changes in hydrology are expected. Indirect effects on wetlands may also occur as a result of releases of sediment and contaminants such as herbicides, hydrocarbons and metals in surface water and groundwater from the PDA. Project related effects are expected to be restricted to the PDAs and edges of the LAA that abut the PDAs. There is potential for indirect effects on the PSW located south of the Data Centre PDA. With the application of mitigation (i.e., stormwater management and erosion and sediment controls) it is expected that residual effects on the PSW will be negligible. A surface water monitoring program will be implemented to evaluate surface water chemistry downstream of the Data Centre PDA.

Within the implementation of compensation for lost wetland habitat, there should be a net increase in wetland area (when applying the 2:1 ratio) and no net loss of wetland function. Project effects will occur primarily during the construction phase but will extend through to the completion of post-construction reclamation and ongoing vegetation maintenance activities, which will occur approximately once every 10 years within the Transmission Line and Pipeline PDAs.

11.6 Follow-up and Monitoring

Prior to construction of the transmission line and pipeline, further work will be completed to characterize the existing environment of these PDAs, including:

- Field delineation and functional assessment of wetlands within the Transmission Line and Pipeline PDAs
- Vascular plant surveys within the Transmission Line and Pipeline PDAs

Prior to vegetation clearing at any of the Project PDAs, lichen surveys will be completed in habitats where there is potential for lichen SAR and/or SOCC.

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12 Assessment of Environmental Effects on Wildlife and Wildlife Habitat

12.1 Scope of Assessment

Wildlife and wildlife habitat were selected as a valued component (VC) due to their environmental, recreational, cultural, and socio-economic value, and because activities associated with construction, operation, and maintenance of the Project can interact with wildlife and their habitats. This VC assesses the potential interactions between construction, operation, and maintenance of the Project and wildlife and wildlife habitat.

12.1.1 Regulatory Context

Species at Risk (SAR) include those species designated as Extirpated, Endangered, Threatened, or Special Concern under Schedule 1 of the federal *Species at Risk Act* (SARA) and/or listed under the New Brunswick *Species at Risk Act* (NB SARA) List of Species at Risk Regulation. The protection of SAR is a legal requirement for those species listed as Extirpated, Endangered, or Threatened under Schedule 1 of SARA or Schedule A of NB SARA Prohibitions Regulation.

Species of Conservation Concern (SOCC) are defined as those species that do not meet the definition of SAR, but are ranked S1 (Critically Imperiled), S2 (Imperiled), or S3 (Vulnerable) in New Brunswick by the Atlantic Canada Conservation Data Centre (AC CDC) (AC CDC 2025a, AC CDC 2025b), or those assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as Endangered, Threatened, or Special Concern, but not yet listed under SARA.

12.1.2 Assessment Boundaries

The assessment of potential environmental interactions between the Project and wildlife and wildlife habitat is focused on three PDAs and an LAA. Spatial boundaries are shown in Figure 12.1.

The PDAs represent the anticipated area of direct physical disturbance associated with the construction, operation and maintenance of the Project. For the purposes of this EIA Registration, the Project encompasses three PDAs as described in Section 6.2.3 and shown on Figure 2.1: the Data Centre PDA, the Transmission Line PDA, and the Pipeline PDA.

The LAA for Wildlife and Wildlife Habitat is defined as a 500 m buffer surrounding the PDAs, within which the environmental effects of the Project may extend.

Temporal boundaries for the assessment are based on the timeframes over which potential effects could occur as a result of Project construction, and operation and maintenance phases as defined in Section 6.2.3.

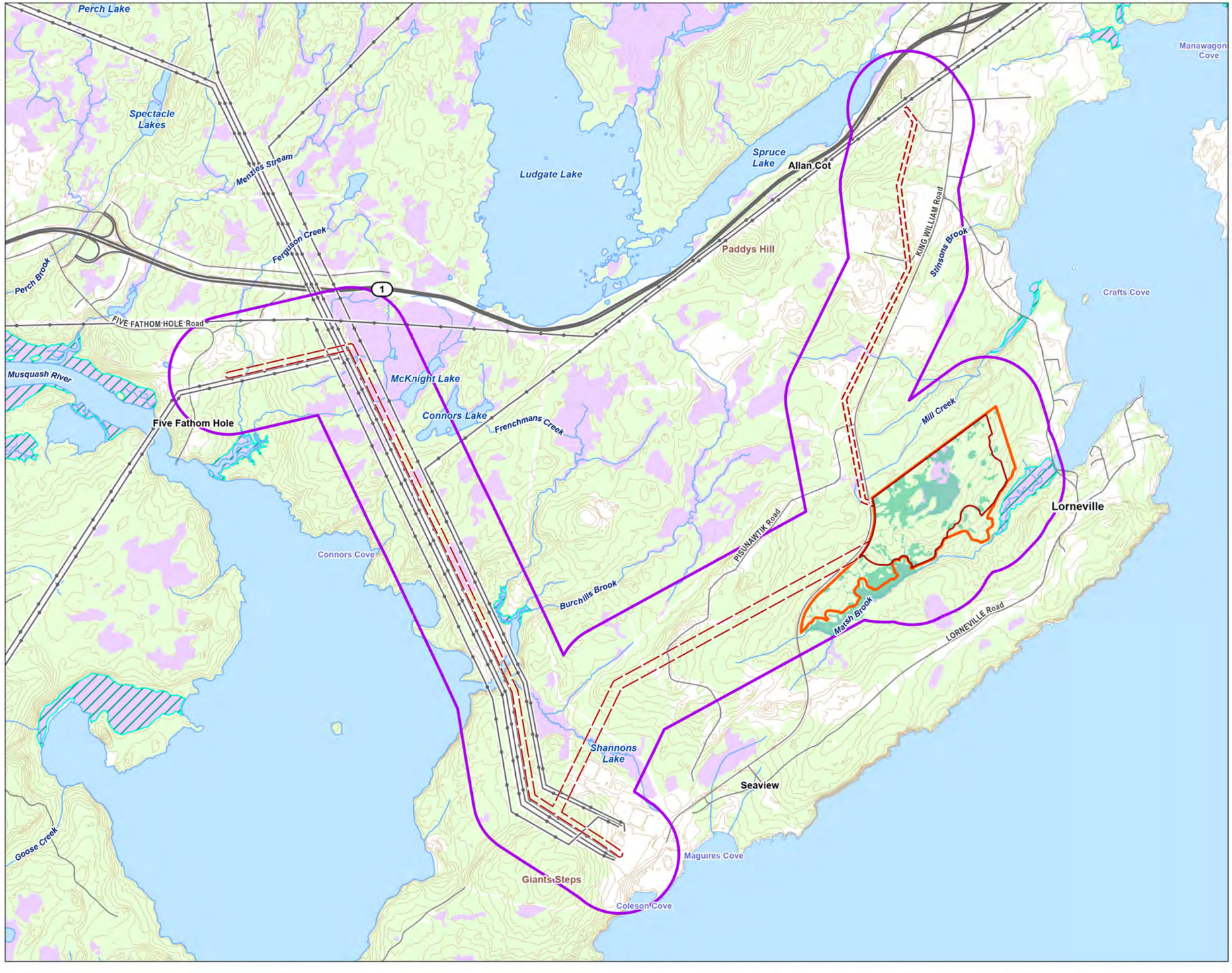


Figure No.
12.1

Title
Wildlife and Wildlife Habitat Spatial Boundaries

Client/Project 121418636-501
Beacon Data Centres Inc.
Spruce Lake AI Data Centre

Project Location
Lorneville,
New Brunswick

Prepared / Revised by SC on 2026-03-12

N

0 0.5 1 1.5 km
(At original document size of 11x17)
1:35,000

Legend

- Local Assessment Area
- Project Site (Field Study Area)

Project Development Areas (PDA)

- Data Centre PDA
- Pipeline PDA
- Transmission Line PDA

Other Features

- Transmission Line (Existing)
- Highway
- Collector Road
- Local Road

Waterways and Wetlands

- Watercourse (NBHN)
- Waterbody (NBHN)
- Field-Delineated Wetland (Stantec 2025)
- Wetland (NBELG)
- Provincially Significant Wetland
- Forested Area



Notes
1. Coordinate System: NAD 1983 CSRS New Brunswick Stereographic
2. Data Sources: Beacon Data Centres Inc.; Data License with the Government of New Brunswick (NBDELG, NBNRED, Service NB); New Brunswick Power; Stantec
3. Background: Esri, USGS

Stantec

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\\Cal01ei-pdfs01\work\group\121\active\121418636\01 environmental\2 drawings\3 draft figures\APRX\5 Wildlife\121418636 Beacon Terrestrial Wildlife.aprx Revised: 2026-03-27 By: schubbs

12.2 Existing Conditions

12.2.1 Approach and Methods

12.2.1.1 Information Sources

A desktop review was performed for spatial information on Protected Natural Areas (PNAs) (GNB n.d.), Environmentally Significant Areas (ESAs) (Tims, J. and Craig, N. 1995), Important Birds Areas (IBAs) (IBA Canada n.d.), and Critical Habitat for Species at Risk (ECCC 2015).

To assess the wildlife and wildlife habitat within the LAA, data from the AC CDC, including managed areas and observations of SAR and SOCC, were obtained for the area within 5 km of the Data Centre (AC CDC 2025). Observations from the Cornell Lab of Ornithology's online database, eBird, recorded within 5 km of the LAA were also included (eBird 2026).

To inform the assessment of the Data Centre PDA and its surroundings, data collected between 2006 and 2010 for the second Maritimes Breeding Bird Atlas (MBBA) (Bird Studies Canada 2012) and from the Spruce Lake Industrial Park Expansion EIA (EIA #1635) (Dillon 2024a, Dillon 2024b) were reviewed.

To inform the assessment of the Transmission Line PDA and its surroundings, data were reviewed from previously submitted Environmental Impact Assessments (EIAs) in the vicinity: the Burchill Wind Project (EIA #1635) (Boreal 2019, Boreal 2020, Natural Forces 2020a, Natural Forces 2020b), and Saint John 138kV Corridor Project (EIA #1649) (Stantec 2025).

No Atlantic Canada Nocturnal Owl Surveys (ACNOS) routes are located near the LAA (Birds Canada 2022). No Atlantic Canada Bank Swallow Monitoring data are available in the vicinity of the Project (Birds Canada 2026).

12.2.1.2 Habitat Assessment

Habitat types within the LAA were identified using a combination of desktop and field methods. Field methods included a vascular plant survey, vegetation community assessment, wetland delineation and function assessment, and an old growth forest assessment. A detailed explanation of methodology can be found in Section 11.

12.2.1.3 Field Methods

To further assess available habitat for wildlife within the Data Centre PDA, Pileated Woodpecker habitat surveys were conducted, and incidental observations were recorded during other field surveys completed in the area.

12.2.1.3.1 Pileated Woodpecker Habitat Surveys

Pileated Woodpecker (*Drycopus pileatus*) habitat surveys were carried out on October 21 and 23, 2025. To assess nesting activity, surveys are typically completed between April 10 and July 15, during the early stages of nesting when activity is highest, and before leaf-out to facilitate visibility of possible nest cavities. As surveys were completed outside of the nesting season, the objective was to evaluate the presence of candidate nest cavities in the area, rather than determine nesting occupancy.

Forest inventory data and field data collected during vegetation and wetland surveys were reviewed prior to the field survey to identify mature and overmature forest stands within the Data Centre PDA that could provide suitable nesting habitat for Pileated Woodpeckers. Surveyors assessed the area using a transect area search approach to provide coverage of each identified habitat type, with a focus on mature and overmature forest stands that could provide suitable nesting habitat for Pileated Woodpeckers. Transect spacing was adjusted during surveys according to forest stand density and habitat cover to allow for visibility of cavities. Suitable nest trees were identified using the Pileated Woodpecker Cavity Identification Guide (ECCC 2023a) and evidence of Pileated Woodpecker foraging, roosting, or nesting activities as indicated by their workings were documented. Attributes such as number of holes in a tree, shape and edge texture of a hole, and tree condition were used to make a determination of whether an observed cavity was a candidate nest cavity that was likely excavated by Pileated Woodpecker.

12.2.1.3.2 Other Wildlife

Incidental wildlife observations were recorded during field surveys conducted during the 2025 field season, including during vegetation, old growth forest, and wetland surveys.

12.2.2 Description of Existing Conditions

12.2.2.1 Information from Existing Data Sources

Results from the desktop review indicate that there are two IBAs in proximity to the Project: Saint's Rest Marsh & Beach (2.04 km from nearest PDA) and Manawagonish Island (3.62 km from nearest PDA) (IBA Canada n.d.). The nearest ESA is the Irving Nature Park (Taylors Island), 2.07 km from the nearest PDA, which is located within the Irving Nature Park (AC CDC 2025). The Saints Rest Marsh- F. Gordon Carvell Nature Preserve is approximately 2.40 km from the Data Centre PDA and the Musquash Estuary PNA, which overlaps with the Transmission Line PDA. The nature of the Project and the distance from the Data Centre PDA to these areas suggests there would not be an interaction with the Project.

Wildlife Habitat

The Data Centre PDA (89 ha) is largely forested (70%) and has abundant wetland habitat (30%). The Transmission Line PDA comprises 67 ha and is also mostly forested (67%) but has a significant portion of infrastructure (18%). Wetland habitat makes up 10% of this PDA, with small amounts of industrial land use, cleared area, and waterbodies (1-2% each). Forest makes up 81% of the Pipeline PDA (15 ha total). This PDA has some cleared area (9%) and infrastructure (6%) with smaller amounts of wetland (4%) and industrial land use (<1%).

The LAA is approximately 1,782 ha and is primarily forested (62%), with infrastructure (12%), wetland (11%), and industrial areas (9%). There are smaller amounts of cleared area, waterbodies, residential, shoreline, and parks (6% total). Detailed information on habitat coverage can be found in Section 11, Table 11.2; Figures 11.2, 11.3, 11.4.

SAR Critical Habitat

A portion of the LAA overlaps with federally identified critical habitat for an avian SAR, Bank Swallow (*Riparia riparia*). Critical Habitat polygons were identified using confirmed breeding occurrences made in a natural setting between 2001 and 2017, with a spatial accuracy of 702 m or less (ECCC 2022a). Shorelines were selected from within a 5 km radius of confirmed breeding locations, with a 500 m buffer placed around selected shorelines to create the Critical Habitat polygons. Within the identified polygons, critical habitat for Bank Swallow is defined as areas that are able to support the species during nesting and foraging activities. Suitable nesting habitat includes vertical faces composed of erodible material, with a slope greater than 70 degrees and minimum height of 0.5 m, while foraging habitat is typically composed of open areas that produce insects (COSEWIC 2013a, ECCC 2022a). Within the Critical Habitat polygon overlapping the LAA, suitable nesting habitat may be found along steep banks along streams and rivers, with nearby wetlands and marshes providing foraging habitat (Garrison 1999). Bank Swallows typically avoid the use of densely forested areas (NB DNRED 2021). The overlap between the LAA and Bank Swallow Critical Habitat polygons does not contain the required biophysical attributes to qualify as critical habitat for Bank Swallow due to the lack of steep banks along streams and rivers for nesting habitat and lack of open areas that produce insects for foraging habitat.

AC CDC Report

The AC CDC report (AC CDC 2025; Appendix A) produced records of 85 rare and/ or endangered species of fauna within 5 km of the Data Centre, since 1960, consisting of 77 bird,1 marine mammal, 1 fish, and 6 invertebrate species. Two location sensitive SAR were noted in the AC CDC report as present in the area: Bald Eagle (*Haliaeetus leucocephalus*) and Peregrine Falcon (*Falco peregrinus*).

For the purpose of this assessment, only records from the past 20 years will be evaluated. Species that do not have the potential to occur within the Project area or those assessed in another VC will not be carried forward. Additionally, only species from the AC CDC report that meet the definitions of wildlife SAR and SOCC within this report will be evaluated as such in this VC. This results in a total of 64 bird and 2 invertebrate SAR and SOCC species recorded within 5 km of the Data Centre since 2006 (Table 12.2; Section 12.2.2.3).

eBird

Data reviewed from eBird included observations of three SAR (Bald Eagle, Canada Warbler (*Cardellina canadensis*), and Eastern Wood-Pewee (*Contopus virens*)) and 20 SOCC (eBird 2026) (Table 12.2; Section 12.2.2.3).

Maritimes Breeding Bird Atlas

The Data Centre PDA falls within survey square 19GL20 of the MBBA (Bird Studies Canada 2012) which covers the Lorneville, NB region. The results from the second MBBA surveys (2006-2010) suggest the potential for at least 86 breeding species in this survey square. During point-count surveys, the most frequently observed species were Black-capped Chickadee (*Poecile atricapillus*), American Robin (*Turdus migratorius*), Common Yellowthroat (*Geothlypis trichas*), Nashville Warbler (*Leiothlypis ruficapilla*), and Black-throated Green Warbler (*Setophaga virens*). SAR reported from MBBA surveys include Bald Eagle, Barn Swallow (*Hirundo rustica*), Canada Warbler, and Eastern Wood-Pewee (*Contopus virens*) (Table 12.2; Section 12.2.2.3).

Spruce Lake Industrial Park

Breeding bird surveys (BBS) were completed in proximity to the Data Centre PDA for the SLIP Expansion Project (EIA #1635) in July of 2024 (Dillon 2024b). Dillon reported that 27 species were observed during point-count surveys, with the most abundant species being Black-throated Green Warbler, Winter Wren (*Troglodytes hiemalis*), Swainson's Thrush (*Catharus ustulatus*), and Hermit Thrush (*Catharus guttatus*). Ten additional bird species were recorded through incidental observations, including one SOCC, Killdeer (*Charadrius vociferus*) (Table 12.2; Section 12.2.2.3). No SAR were observed.

Saint John Corridor EIA

Data were reviewed from the Saint John 138kV Corridor (SJC) Project EIA (EIA #1649), as a portion of the proposed transmission line for this Project will run parallel to the section from Coleson Cove to Five Fathom Hole with the intertie location near Five Fathom Hole. Breeding bird surveys were completed in support of the SJC EIA in June and July 2024. Ten of the completed BBS surveys were located within the assessment boundaries of the proposed transmission line for this Project. Data from these ten surveys were reviewed to inform this assessment (Stantec 2025). Stantec (2025) reported 90 observations of 30 bird species during surveys at the select ten BBS locations. One of the reported species at these locations was a SAR, the Eastern Wood-Pewee (Table 12.2; Section 12.2.2.3; Figure 12.2). All other recorded species have AC CDC S-ranks ranging from S3S4 to S5 and are therefore not considered SOCC in this report.

Figure No.
12.2

Title
Wildlife Species At Risk and Special Areas in the Vicinity of the Local Assessment Area

Client/Project
Beacon Data Centres Inc.
Spruce Lake AI Data Centre

121418636-504

Project Location
Lorneville,
New Brunswick

Prepared / Revised by SC on 2026-03-12

N

0 0.5 1 1.5 km

(At original document size of 11x17)
1:35,000

Legend

- Local Assessment Area
- Project Site (Field Study Area)

Project Development Areas (PDA)

- Data Centre PDA
- Pipeline PDA
- Transmission Line PDA

Environmental Features

Species At Risk (SAR)

- Avian SAR (ACCDC)
- Eastern Wood-Pewee (Stantec 2024)
- Common Nighthawk Survey Location (Stantec 2024)
- Critical Habitat Area
- Important Bird Area (IBA)
- Nature Preserve
- Irving Nature Park
- Protected Natural Area
- Environmentally Sensitive Area

City of Saint John Zoning

- Environmental Protection
- Park

Other Features

- Transmission Line
- Highway
- Collector Road
- Local Road
- Contour - 5m

Waterways and Wetlands

- Watercourse
- Waterbody
- Wetland (NBELG)
- Wetland (Stantec)
- Provincially Significant Wetland
- Non-Forest Area



Notes
1. Coordinate System: NAD 1983 CSRS New Brunswick Stereographic
2. Data Sources: Beacon Data Centres Inc.; Data License with the Government of New Brunswick (NBDELG, NBNRED, Service NB); New Brunswick Power; Stantec
3. Background: Esri, USGS

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Revised: 2026-03-27 By: schubbs
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Burchill Wind Park EIA

To inform the assessment of the Transmission Line PDA and surroundings, data was reviewed from the EIA submitted for the nearby Burchill Wind Project (BWP) (EIA #1538) (Natural Forces 2020a). In support of the BWP EIA, spring migration, breeding bird, fall migration, and winter bird surveys were completed from 2019 – 2020. Targeted owl and Common Nighthawk (*Chordeiles minor*) surveys were also conducted in the spring and summer of 2019. A radar and acoustic monitoring study was conducted for the project, during fall migration of 2019 and 2020, to monitor nocturnal bird movements during these periods (Boreal 2020).

Boreal (2019) reported a total of 101 avian species recorded within or near the BWP study area. With the study area being situated along the coast of the Bay of Fundy, many species were observed flying over the water during spring migration, but their flight path did not intersect the study area. Eight SAR and SOCC were specifically recorded within the BWP study area during surveys: Bald Eagle, Common Nighthawk, Evening Grosbeak (*Coccothraustes vespertinus*), Greater Yellowlegs (*Tringa melanoleuca*), Horned Lark (*Eremophila alpestris*), Killdeer, Olive-sided Flycatcher (*Contopus cooperi*), and Peregrine Falcon. Only one of these species, the Common Nighthawk, was suspected to be breeding within the BWP study area. An additional SOCC, Pine Siskin (*Spinus pinus*), was recorded during winter bird surveys (Natural Forces 2020b).

Through the radar and acoustic monitoring program, a species list was reported for 12 nights during the fall migration period in 2020 selected for analysis. A total of 54 species were identified including three SAR and seven SOCC (Table 12.2 in Section 12.2.2.3) (Taylor et al. 2020). Reported SAR include Bobolink (*Dolichonyx oryzivorus*), Canada Warbler, and Wood Thrush (*Hylocichla mustelina*).

Six bat detectors were deployed from June to October 2019 within the BWP study area, near proposed turbine locations, to determine the use of the area by resident and migratory bat species (Boreal 2020). Two resident bats were recorded during the study: Myotis sp. and Big Brown Bat (*Eptesicus fuscus*); the Myotis sp. calls were suspected to belong to Little Brown Myotis (*Myotis lucifugus*), rather than Northern Myotis (*Myotis septentrionalis*). Two migratory species were also recorded: Eastern Red Bat (*Lasiurus borealis*) and Hoary Bat (*Lasiurus cinereus*). Both Little Brown Myotis and Northern Myotis are SAR (COSEWIC 2013b, COSEWIC 2023) (Table 12.2 in Section 12.2.2.3). Most recordings were identified as Myotis sp. and Big Brown Bat, and just two recordings were classified as Eastern Red Bat.

The number of recorded bat calls peaked during late summer into early fall, coinciding with the fall migration period for migratory species; however, overall activity levels at the site were considered low (Boreal 2020). The low level of activity detected during the breeding season, and the lack of detections in an area with suitable cavity trees for roosting, supports the absence of active bat breeding on-site. Due to the overall low levels of activity, it was not suspected that a winter hibernaculum was present within the study area or that the area served as a key migratory corridor (Boreal 2020). Rather it was suggested that the resident bat species detected in the fall may have been travelling through the area towards known hibernacula locations in Saint John or foraging on insects.



12.2.2.2 Field Studies

12.2.2.2.1 Pileated Woodpecker Habitat Surveys

Seventeen observations of trees with Pileated Woodpecker foraging activity were made during the habitat surveys, and three incidental observations of trees with foraging activity were noted during other surveys. Two of the incidental observations were revisited during the habitat surveys. Only one of the eighteen total forage tree observations had fresh wood chips at the base of the tree.

Five trees with one or more cavities were observed during the habitat surveys, but none of these cavities met the criteria to be considered candidate nesting cavities for Pileated Woodpecker (e.g., hole size, hole shape, number of holes in tree, edge texture, or tree type) (ECCC 2023a).

Two incidental observations of Pileated Woodpecker individuals were heard calling while completing wetland surveys in the Field Study Area on September 9 and 16, 2025. One of the observations was recorded outside the Data Centre PDA, in the southwestern portion of the Field Study Area by Marsh Brook. The other was in the southeastern portion of the Data Centre PDA.

12.2.2.2.2 Other Wildlife Observations

A variety of wildlife observations were recorded during other field surveys conducted in 2025, reported in EIAs completed in the area (Dillon 2024a, Natural Forces 2020a), or indicated as present in the vicinity of the Project by AC CDC (AC CDC 2025). Table 12.1 presents wildlife species either observed directly, or indirectly (e.g., scat, footprints); these species are ranked as secure in the province of New Brunswick (AC CDC 2026)

Table 12.1 Other Wildlife Observed Near the Project Area

Common Name	Scientific Name	Data Source
Mammals		
American black bear	*Ursus americanus*	BWP EIA, Stantec Incidentals
American mink	*Neogale vison*	BWP EIA
Eastern chipmunk	*Tamias striatus*	BWP EIA, SLIP EIA
Eastern coyote	*Canis latrans*	BWP EIA, SLIP EIA
Meadow vole	*Microtus pennsylvanicus*	BWP EIA
Moose	*Alces alces*	BWP EIA, SLIP EIA, Stantec Incidentals
North American porcupine	*Erethizon dorsatum*	BWP EIA
North American river otter	*Lontra canadensis*	BWP EIA
Raccoon	*Procyon lotor*	BWP EIA, SLIP EIA
Red fox	*Vulpes vulpes*	BWP EIA
Red squirrel	*Tamiasciurus hudsonicus*	BWP EIA, SLIP EIA, Stantec Incidentals
Snowshoe hare	*Lepus americanus*	BWP EIA
Striped skunk	*Mephitis mephitis*	BWP EIA
White-tailed deer	*Odocoileus virginianus*	BWP EIA, SLIP EIA
Herptiles		
Common gartersnake	*Thamnophis sirtalis*	Stantec Incidentals
Spotted salamander	*Ambystoma maculatum*	Stantec Incidentals
Spring peeper	*Pseudacris crucifer*	Stantec Incidentals
Wood frog	*Lithobates sylvaticus*	Stantec Incidentals

Notes:
BWP EIA = Burchill Wind Project Environmental Impact Assessment (Natural Forces 2020a)
SLIP EIA = Spruce Lake Industrial Park Environmental Impact Assessment (Dillon 2024a)
Stantec Incidentals = Incidental observations from Stantec field surveys conducted in 2025

A full list of avian species from all data sources (desktop and field studies) recorded within or near the LAA is provided in Appendix G.

12.2.2.3 Species at Risk and Species of Conservation Concern

The desktop review of information sources near the LAA identified 17 SAR (15 bird species, 1 invertebrate species, and 1 mammal genus), and 64 SOCC (61 birds, 1 invertebrate, and 2 mammals). A summary of SAR and SOCC recorded in or near the LAA are presented below in Table 12.2. SAR identified during field surveys and desktop review are discussed in Section 12.2.2.3.1.

Table 12.2 Wildlife SAR and SOCC Reported or Recorded Within or Near the LAA

Common Name	Scientific Name	SARA	NB SARA	COSEWIC	AC CDC Rank	Data Source
Birds						
American Coot	*Fulica americana*	-	-	NAR	S1B	AC CDC
American Golden-Plover	*Pluvialis dominica*	-	-	-	S2S3M	AC CDC
American Scoter	*Melanitta americana*	-	-	-	S1S2N,S5M	AC CDC, BWP EIA, eBird
Arctic Tern	*Sterna paradisaea*	-	-	-	S1B,SUM	AC CDC
Baird's Sandpiper	*Calidris bairdii*	-	-	-	S1S2M	AC CDC
*Bald Eagle	*Haliaeetus leucocephalus*	-	EN	NAR	S4	AC CDC, BWP EIA, eBird, MBBA, Stantec Incidentals
*Bank Swallow	*Riparia riparia*	TH	EN	TH	S2B	AC CDC
*Barn Swallow	*Hirundo rustica*	TH	TH	SC	S2B	AC CDC, MBBA
Black Guillemot	*Cepphus grylle*	-	-	-	S3B	AC CDC, BWP EIA
Black-backed Woodpecker	*Picoides arcticus*	-	-	-	S3	Stantec Incidentals
Black-billed Cuckoo	*Coccyzus erythropthalmus*	-	-	-	S3B	AC CDC, MBBA
Black-crowned Night Heron	*Nycticorax nycticorax*	-	-	-	S1S2B	AC CDC
Black-headed Gull	*Chroicocephalus ridibundus*	-	-	-	S1N,S2M	AC CDC
*Bobolink	*Dolichonyx oryzivorus*	TH	TH	SC	S3B	AC CDC, BWP EIA
Brant	*Branta bernicla*	-	-	-	S1N,S2S3M	AC CDC, BWP EIA
Brown Thrasher	*Toxostoma rufum*	-	-	-	S2S3B	AC CDC, MBBA
Brown-headed Cowbird	*Molothrus ater*	-	-	-	S3B	AC CDC
*Buff-breasted Sandpiper	*Calidris subruficollis*	SC	-	SC	SNA	AC CDC
Bufflehead	*Bucephala albeola*	-	-	-	S3N	AC CDC, eBird
*Canada Warbler	*Cardellina canadensis*	TH	TH	SC	S3S4B	AC CDC, BWP EIA, eBird, MBBA
Cape May Warbler	*Setophaga tigrina*	-	-	-	S3B,S4S5M	BWP EIA, eBird
Common Eider	*Somateria mollissima*	-	-	-	S2B,S2N,S4M	AC CDC, BWP EIA, eBird, MBBA

Table 12.2 Wildlife SAR and SOCC Reported or Recorded Within or Near the LAA

Common Name	Scientific Name	SARA	NB SARA	COSEWIC	AC CDC Rank	Data Source
Common Murre	*Uria aalge*	-	-	-	S1B	AC CDC
*Common Nighthawk	*Chordeiles minor*	SC	TH	SC	S3B,S4M	BWP EIA
Cooper's Hawk	*Accipiter cooperii*	-	-	NAR	S1S2B	AC CDC
*Eastern Wood-Pewee	*Contopus virens*	SC	SC	SC	S3B	AC CDC, eBird, MBBA, SJC EIA
*Evening Grosbeak	*Coccothraustes vespertinus*	SC	-	SC	S3B,S3S4N,SUM	BWP EIA
Gadwall	*Mareca strepera*	-	-	-	S2B,S3M	AC CDC
Glaucous Gull	*Larus hyperboreus*	-	-	-	S2N	AC CDC
Great Black-backed Gull	*Larus marinus*	-	-	-	S3	AC CDC, BWP EIA, eBird, MBBA
Great Cormorant	*Phalacrocorax carbo*	-	-	-	S2N	AC CDC
Greater Scaup	*Aythya marila*	-	-	-	S1B,S2N,S4M	AC CDC
Greater Yellowlegs	*Tringa melanoleuca*	-	-	-	S1?B,S4S5M	AC CDC, BWP EIA, eBird
*Horned Grebe - Western population	*Podiceps auritus pop. 2*	SC	SC	-	S3N	AC CDC
Horned lark	*Eremophila alpestris*	-	-	-	S1B,S4N,S5M	BWP EIA
Hudsonian Godwit	*Numenius phaeopus hudsonicus*	-	-	-	S3M	eBird
Indigo Bunting	*Passerina cyanea*	-	-	-	S3B	AC CDC, MBBA
Killdeer	*Charadrius vociferus*	-	-	-	S3B	AC CDC, BWP EIA, eBird, MBBA, SLIP EIA
Lapland Longspur	*Calcarius lapponicus*	-	-	-	S2S3N,SUM	AC CDC
Laughing Gull	*Leucophaeus atricilla*	-	-	-	S1B	AC CDC
Lesser Scaup	*Aythya affinis*	-	-	-	S1B,S4M	AC CDC
Lesser Yellowlegs	*Tringa flavipes*	-	-	TH	S3M	AC CDC, eBird
Lincoln's Sparrow	*Melospiza lincolnii*	-	-	-	S3S4B,S4M	BWP EIA, SJC EIA
Northern Mockingbird	*Mimus polyglottos*	-	-	-	S2B	AC CDC, MBBA

Table 12.2 Wildlife SAR and SOCC Reported or Recorded Within or Near the LAA

Common Name	Scientific Name	SARA	NB SARA	COSEWIC	AC CDC Rank	Data Source
Northern Pintail	*Anas acuta*	-	-	-	S3B,S5M	AC CDC
Northern Shoveler	*Spatula clypeata*	-	-	-	S3B	AC CDC
*Olive-sided Flycatcher	*Contopus cooperi*	SC	EN	SC	S3B	BWP EIA
Pectoral Sandpiper	*Calidris melanotos*	-	-	-	S3M	AC CDC
Peregrine Falcon	*Falco peregrinus*	-	-	-	S1B,S3M	BWP EIA, eBird, MBBA
*Peregrine Falcon - anatum/tundrius	*Falco peregrinus pop. 1*	-	EN	NAR	S1B,S3M	AC CDC, BWP EIA
Pine Grosbeak	*Pinicola enucleator*	-	-	-	S2B,S4S5N,S4S5M	Stantec Incidentals
Pine Siskin	*Spinus pinus*	-	-	-	S3	AC CDC, BWP EIA, eBird, MBBA
*Piping Plover - melodus subspecies	*Charadrius melodus melodus*	EN	EN	EN	S1B	AC CDC
Purple Sandpiper	*Calidris maritima*	-	-	-	S3N	AC CDC
Razorbill	*Alca torda*	-	-	-	S1B	AC CDC
Red Crossbill	*Loxia curvirostra*	-	-	-	S3	AC CDC, eBird, Stantec Incidentals
Red Knot	*Calidris canutus*	-	-	-	S2M	eBird
*Red Knot - rufa subspecies	*Calidris canutus rufa*	EN	EN	EN,SC	S2M	AC CDC
Red-breasted Merganser	*Mergus serrator*	-	-	-	S3B,S4S5N,S5M	AC CDC, BWP EIA
Red-necked Grebe	*Podiceps grisegena*	-	-	NAR	S2N,S3M	AC CDC
Ring-billed Gull	*Larus delawarensis*	-	-	-	S2S3B,S4N,S5M	AC CDC, BWP EIA, eBird
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	-	-	-	S3B	AC CDC, BWP EIA, MBBA
Ruby-crowned Kinglet	*Corthylio calendula*	-	-	-	S3M	BWP EIA, eBird, MBBA
Ruddy Duck	*Oxyura jamaicensis*	-	-	-	S1B,S2S3M	AC CDC
Ruddy Turnstone	*Arenaria interpres*	-	-	-	S3M	AC CDC, eBird
*Rusty Blackbird	*Euphagus carolinus*	SC	SC	SC	S2S3B,S3M	AC CDC

Table 12.2 Wildlife SAR and SOCC Reported or Recorded Within or Near the LAA

Common Name	Scientific Name	SARA	NB SARA	COSEWIC	AC CDC Rank	Data Source
Sanderling	*Calidris alba*	-	-	-	S1N,S3S4M	AC CDC, eBird
Semipalmated Sandpiper	*Calidris pusilla*	-	-	-	S3M	AC CDC, BWP EIA, eBird
Short-billed Dowitcher	*Limnodromus griseus*	-	-	-	S3M	BWP EIA, eBird
Short-billed Dowitcher hendersoni/griseus	*Limnodromus griseus ssp. 1*	-	-	TH	S3M	AC CDC
Solitary Sandpiper	*Tringa solitaria*	-	-	-	S2B,S4S5M	AC CDC
Surf Scoter	*Melanitta perspicillata*	-	-	-	S2N,S4M	AC CDC, BWP EIA, eBird
Upland Sandpiper	*Bartramia longicauda*	-	-	-	S1B	BWP EIA
Whimbrel	*Numenius phaeopus*	-	-	-	S3M	AC CDC, BWP EIA, eBird
White-winged Scoter	*Melanitta deglandi*	-	-	-	S2N,S4M	AC CDC
*Wood Thrush	*Hylocichla mustelina*	TH	TH	TH	S1S2B	AC CDC, BWP EIA
Yellow-throated Vireo	*Vireo flavifrons*	-	-	-	S1?B	AC CDC, MBBA
Invertebrates						
Crowberry Blue	*Plebejus idas empetri*	-	-	-	S3	AC CDC
*Monarch	*Danaus plexippus*	EN	EN	EN	S2S3?B	AC CDC
Mammals						
Eastern Red Bat	*Lasiurus borealis*	-	-	EN	SUB,S2?M	BWP EIA
Hoary Bat	*Lasiurus cinereus*	-	-	EN	SUB,S2?M	BWP EIA
*Little Brown Myotis / Northern Myotis	*Myotis lucifugus / Myotis septentrionalis*	EN	EN	EN	S1	BWP EIA

Table 12.2 Wildlife SAR and SOCC Reported or Recorded Within or Near the LAA

Common Name	Scientific Name	SARA	NB SARA	COSEWIC	AC CDC Rank	Data Source

Notes:
SAR are indicated with an asterisk (*).
Data source acronyms used:
AC CDC = Atlantic Canda Conservation Data Centre (AC CDC 2025a)
eBird = eBird online database (eBird 2026)
BWP EIA = Burchill Wind Energy Project Environmental Impact Assessment (Boreal 2019, Boreal 2020, Natural Forces 2020a, Natural Forces 2020b)
MBBA = Maritime Breeding Bird Atlas (Bird Studies Canada 2012)
SJC EIA = Saint John 138 kV Corridor Project Environmental Impact Assessment (Stantec 2025)
SLIP EIA = Spruce Lake Industrial Park Environmental Impact Assessment (Dillon 2024a, Dillon 2024b)
Stantec Incidentals = Incidental observations from Stantec field surveys conducted in 2025

SAR / COSEWIC / NB SARA codes used:
SC = Special Concern; TH = Threatened; VU = Vulnerable; EN = Endangered; NAR = Not at Risk
S-Rank definitions (AC CDC 2025b):
S1 = Critically Imperiled: Critically imperiled in the province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.
S2 = Imperiled: Imperiled in the province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.
S3 = Vulnerable: Vulnerable in the province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
S4 = Apparently Secure: Uncommon but not rare; some cause for long-term concern due to declines or other factors.
S5 = Secure: Common, widespread, and abundant in the province.
SNR = Unranked: Nation or state/province conservation status not yet assessed.
SNA = A conservation status rank is not applicable because the species is not a suitable target for conservation activities
SU = Unrankable: Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.

12.2.2.3.1 Species at Risk Descriptions

Bald Eagle

Bald Eagle (*Haliaeetus leucocephalus*) is listed as Endangered by NB SARA and Not at Risk by COSEWIC. It is not listed under Schedule 1 of the federal SARA. This raptor has undergone dramatic population fluctuations over the past two centuries, and its population recovery from drastic declines prior to the banning of the use of DDT is considered among the most successful conservation stories in North America. Bald Eagles are associated with aquatic habitats during all times of year, and breeding habitat generally consists of forests near water but may also include cliff faces. Nests are typically built in one of the largest trees in an area, near the top, with branches capable of holding the large nest built by this species. Both coniferous and deciduous trees are used for nesting across the Bald Eagle's range, depending on what is dominant in the region (Buehler 2000).

Observations of Bald Eagles around the LAA were reported by AC CDC, eBird, and MBBA surveys. They were also recorded during 2025 field surveys and reported in targeted surveys conducted for the BWP EIA.

There is no evidence of large stick nests within the Data Centre PDA, though many large trees are present (mainly red spruce, tamarack, and eastern white cedar). These tree species typically do not provide adequate nest sites for the Bald Eagle; however, many of these trees had broken tops with multiple large branches that could support nests. Thus, there is potential for nesting in the Data Centre PDA, though the probability is low. The Transmission Line and Pipeline PDAs may also have potential nesting habitat owing to the presence of mature and overmature forest; however, no Bald Eagle nesting has been noted in studies conducted nearby (Stantec 2025; Boreal 2019). Bald Eagle breeding evidence from the MBBA survey indicates that at least one nest was observed in 2009; however, no location within the survey square was provided.

Bank Swallow

Bank Swallow (*Riparia riparia*) is listed as Threatened under the federal SARA and COSEWIC and Endangered under NB SARA. Critical habitat polygons, areas necessary for the survival or recovery of a species, have been identified in New Brunswick (ECCC 2022a). Critical habitat for this species consists of suitable nesting habitat, as well as foraging habitat within a 500 m radius. Bank Swallows excavate burrows in steeps banks and bluffs to use for nesting. Nests may be constructed in a variety of habitat types including along lake and ocean bluffs; stream and riverbanks; sand and gravel pits; roadcuts; piles of sand, topsoil, sawdust, coal ash, and other materials (COSEWIC 2013a). Nest burrows are excavated in vertical or near vertical slopes, with a slope greater than 70 degrees and minimum height of 0.5 m. Bank Swallows forage in open habitats that produce insects such as wetlands, salt marshes, grasslands and hay fields, with seasonally flooded wetlands or ponds also acting as important sources of insect prey.

The LAA northeast of the Data Centre PDA overlaps with a federally identified critical habitat polygon for Bank Swallows, however, as the overlap contains only forested habitat, there is no suitable habitat for Bank Swallow breeding or foraging. The AC CDC report indicated that there are 14 records of Bank Swallow within approximately 5 km of the LAA, all observed within the Saint's Rest Marsh & Beach IBA or the Irving Nature Park (Taylors Island) ESA, approximately 4 km away from the Data Centre PDA. No Bank Swallows were observed during 2025 field surveys or recorded in other desktop data sources. No natural potential nesting sites were observed within the Data Centre PDA. The LAA overlaps Mill Creek and its estuary, which has been included within the mapped Critical Habitat polygon. The banks of Mill Creek may provide suitable nesting habitat, with the estuary producing insects for foraging. The Transmission Line PDA transects Frenchman's Creek, and its banks may have the potential to provide suitable nesting habitat. No suitable nesting habitat is present within the Pipeline PDA.

Barn Swallow

Barn Swallow (*Hirundo rustica*) is listed as Threatened on Schedule 1 of SARA and under NB SARA, and as Special Concern by COSEWIC. This species is a medium-sized songbird that has become increasingly associated with human settlements. Barn Swallows previously constructed nests in caves, as well as in crevices and on rock ledges on cliff faces. Following European colonization, they shifted to using artificial structures for nesting locations. Barn Swallows may construct their nests along the eaves of barns, garages, and houses, or under bridges and within road culverts (Brown and Brown 2020), presenting risks of vehicular collisions or disturbance by construction and maintenance activities (COSEWIC 2021). In Canada, Barn Swallows occur in nearly all provinces and territories and use a variety of open habitats while feeding on insects, including grassy fields, agricultural fields, shorelines, woodland clearings, wetlands, and subarctic tundra (COSEWIC 2021).

Nine observations of Barn Swallows were reported within 5 km of the Data Centre PDA, observed within the Saint's Rest Marsh & Beach IBA and the Irving Nature Park (Taylors Island) ESA (AC CDC 2025). One observation of a Barn Swallow was also recorded during MBBA surveys (Bird Studies Canada 2012). As there are currently no anthropogenic structures in the any of the PDAs, there is no suitable nesting habitat for Barn Swallow present.

Bobolink

Bobolink (*Dolichonyx oryzivorus*) is listed as Threatened on Schedule 1 of SARA and under NB SARA, and as Special Concern by COSEWIC. This species is a medium-sized passerine whose breeding range extends across southern areas of Canada and includes the entirety of New Brunswick. Previously nesting in grass prairies, the Bobolink now uses forage crops (e.g., hayfields and pastures) as well as various grassland habitats during the breeding season (Government of Canada 2023). The greatest threats to Bobolinks include the loss of natural habitats and conversion of agricultural lands (e.g., conversion of forage crops to row crops), mortality from agricultural activities during the nesting season, and pesticide use (COSEWIC 2022).

Two observations of Bobolinks were reported in the Irving Nature Park (Taylors Island) ESA approximately 4 km away from the Data Centre PDA (AC CDC 2025). Two Bobolink were also recorded during the radar and acoustic monitoring program completed near the BWP study area, flying overhead during fall migration in 2020 (Taylor et al. 2020). There is no suitable nesting habitat for Bobolink in the LAA, as there is a lack of tall and relatively dense upland grasslands.

Buff-breasted Sandpiper

The Buff-breasted Sandpiper is a medium shorebird with buff-coloured face and underparts and speckled brown/black upperparts. The species breeds in the Arctic within tundra habitats. During winter and migration, the species occurs primarily within grasslands and other anthropogenic influenced habitats such as crop fields, golf courses, airport runways, and pastures (COSEWIC 2012a). Buff-breasted Sandpiper is listed as Special Concern federally by SARA and COSEWIC, with no provincial designation.

Buff-breasted Sandpiper is ranked SNA by the AC CDC, as a conservation status rank is not applicable because the species is not a suitable target for conservation activities. These are typically accidental and/or transient species, and/or species that are largely outside their normal breeding range or migratory pathways and includes Buff-breasted Sandpiper.

As there are no short grassy areas present in the PDA, there is no suitable foraging habitat present, and the species is not expected to occur. Buff-breasted Sandpiper is not a regularly occurring species within the province of New Brunswick.

Canada Warbler

The Canada Warbler (*Cardellina canadensis*) is listed as Threatened under the federal SARA and the NB SARA; however, the species was re-assessed as Special Concern in 2020 (COSEWIC 2020) making it eligible for a status change under the federal SARA. Close to 80% of the Canada Warbler population breeds in Canada (COSEWIC 2020). Many key threats identified by COSEWIC (2020) are present on the wintering grounds outside of Canada, though habitat loss in Canada is recognized as a contributing factor. Canada Warblers are found in a variety of forest types, but are most abundant in wet, mixed deciduous-coniferous forest with a well-developed understory. It is also found in shrub swamps, red maple (*Acer rubrum*) stands, eastern white cedar (*Thuja occidentalis*) stands, conifer swamps, and riparian woodlands along rivers and lakes.

One observation of Canada Warbler was reported in the MBBA square (19GL20), approximately 700 m from the Data Centre PDA, and an additional individual was observed in the Irving Nature Park, approximately 4 km from the Data Centre PDA (AC CDC 2025) (Figure 12.2). Two individuals were also reported within the LAA on eBird (eBird 2026). There were 43 observations of Canada Warbler flying overhead during fall migration detected by the radar and acoustic monitoring program completed near the BWP study area in 2020 (Taylor et al. 2020). Suitable nesting habitat may be present in treed bog and scrubby coniferous treed swamp surrounding the open bog in the centre of the Data Centre PDA. Otherwise, most forested swamps in the Data Centre PDA lack the dense shrub understory typical of breeding habitat for the species. The section of the LAA bordering Marsh Brook may have patches of suitable breeding habitat. The Pipeline PDA is unlikely to support Canada Warbler nesting, as there is

very little forested wetland or shrub wetland habitat present (0.57 ha total). The Transmission Line PDA is also unlikely to support breeding Canada Warblers, because of small amounts of forested wetland and shrub wetland being present (2.58 ha total).

Common Nighthawk

Common Nighthawk (*Chordeiles minor*) is listed as Special Concern under the federal SARA, by COSEWIC, and the NB SARA. The AC CDC ranks the species as S3B, S4M, which indicates that in New Brunswick breeding populations are vulnerable while migratory populations are apparently secure. The Common Nighthawk is an aerial insectivorous nightjar which breeds throughout much of North and Central America and winters in South America. Nesting habitat in the breeding range includes open areas such as logged or open forest clearings, rocky outcrops, and even gravel rooftops. The species typically forages for insect prey under low light conditions, most commonly at dawn and dusk (Brigham et al. 2020). Factors influencing the population decline of Common Nighthawk are not well understood, but as an aerial insectivore, insect decline due to habitat alterations, pesticide use, and climate change is the leading hypothesis (COSEWIC 2018a).

Common Nighthawks were observed in the BWP study area during designated surveys, as well as during fall watch counts and incidentally during other surveys (Boreal 2019). There is no suitable breeding habitat for Common Nighthawks in the Data Centre PDA. Targeted surveys for Common Nighthawk were performed as part of the Saint John 138 kV Corridor Project EIA (Stantec 2025) and one of these survey points was located within the LAA near the Transmission Line PDA (Figure 12.2). No Common Nighthawk were observed during the survey; however, disturbed area along the transmission line corridor consisting of gravel roads, rocky outcroppings, and low vegetation may provide suitable habitat for Common Nighthawk nesting.

Eastern Wood-Pewee

Eastern Wood-Pewee (*Contopus virens*) is listed as Special Concern under Schedule 1 of SARA, by COSEWIC, and the NB SARA. The provincial AC CDC ranking for the Eastern Wood-Pewee is S4B, S4M indicating that the breeding and migratory populations are considered to be apparently secure in New Brunswick. The Eastern Wood-Pewee is a medium-sized flycatcher that nests in virtually every type of wooded community including deciduous and coniferous habitat and prefers mature deciduous and mixedwood forest stands. They typically occupy the mid to upper layers of the canopy and favor areas where canopy openings are present where they can catch flying insects (COSEWIC 2012b). Threats to the Eastern Wood-pewee are poorly understood, but like most aerial insectivores, a decline in insect populations is thought to be a key contributor (COSEWIC 2012b).

There is one confirmed breeding record of Eastern Wood-Pewee approximately 4 km away from the Data Centre PDA in the 19GL20 MBBA square (AC CDC 2025). There is also a record of one individual within the LAA on eBird (eBird 2026), and one record of an individual from the SJC EIA during breeding bird surveys (Stantec 2025) (Figure 12.2).

Potentially suitable habitat for Eastern Wood-Pewee is present in all three PDAs, because of the presence of mature mixedwood forest. Within the Data Centre PDA, few areas of forest gaps/open clearings adjacent to mixedwood or deciduous forest were noted, suggesting a low probability of Eastern Wood-Pewee to occur. Breeding habitat may be present within the LAA near Marsh Brook, because of the presence of hardwood stands with adjacent forest gaps.

Evening Grosbeak

Evening Grosbeak (*Coccothraustes vespertinus*) is a large finch that favors coniferous habitat. The species is listed as Special Concern by COSEWIC and under Schedule 1 of SARA. AC CDC ranks the species as S3B, S3S4N, SUM, suggesting that the breeding and non-breeding populations of this species are vulnerable in New Brunswick. Evening Grosbeak depend largely on seed crops from fir and spruce trees within boreal forest habitat, and their optimal breeding habitat is generally characterized by open, mature mixedwood forests dominated by fir and white spruce (Gillihan and Byers 2025).

One observation of 12 Evening Grosbeaks calling was recorded during spring migration surveys in the BWP study area (Boreal 2019). Suitable habitat for Evening Grosbeak exists within the Data Centre PDA, as there are areas of mature conifer stands containing ample balsam fir. However, another preferred conifer species, the white spruce, is sparse within the Data Centre PDA, suggesting that nesting and foraging habitat may not be ideal.

Horned Grebe – Western Population

Horned Grebe (*Podiceps auritus*) is a small waterbird with a long neck, short bill. The species is designated as Special Concern both federally under COSEWIC, and provincially under the New Brunswick SARA. The species overwinters in New Brunswick, primarily at inshore saltwater sites, though may also use medium to large freshwater lakes and ponds when free of ice (COSEWIC 2023a).

There are multiple records of Horned Grebes near Irving Nature Park, Lorneville Wharf, Island View Heights, and Gorge Rocks (AC CDC 2025) (Figure 12.2). As the Horned Grebe is restricted to larger waterbodies such as bays, inlets, ponds, and lakes, the species is not expected to occur within the PDAs due to an absence of these habitat types.

Monarch

Monarch (*Danaus plexippus*) is a large, showy butterfly, and one of the most well studied in the world. This species is listed as endangered by SARA, COSEWIC, and under the NB SARA. The species is ranked S2S3?B by AC CDC, meaning that the breeding population of the species within the province is considered imperiled to vulnerable. Monarch adults migrate into New Brunswick in summer and seek out milkweed (*Asclepias spp*.) plants on which to deposit their eggs. The larvae feed exclusively on milkweed, which are found predominantly in open and periodically disturbed habitat such as roadsides, fields, wetlands, and open forests (COSEWIC 2016). There is a management plan (ECCC 2016) in place for monarch; however, there is no critical habitat identified at this time.

The AC CDC report identified nine records of monarch within 5 km of the Data Centre PDA, with five in Seaview ~4.5 km to the southwest, two in Five Fathom Hole ~5 km to the northwest, one at Island View Heights ~ 5 km to the northeast, and one at the Irving Nature Park ~4 km to the northeast (AC CDC 2025).

No milkweed species were recorded in the Data Centre PDA ; therefore, no breeding is expected. No milkweed species were observed during field surveys for the SJC EIA (Stantec 2025) located adjacent the Transmission Line PDA. Thus, no breeding is expected in the adjacent Transmission Line PDA. Few wildflowers were found in the Data Centre PDA, making it unlikely to be used as feeding habitat for migrating adult monarchs. There is potential for milkweed to grow in disturbed areas such as along newly created roadsides.

Little Brown Myotis/Northern Myotis

Little Brown Myotis (*Myotis lucifugus*) and Northern Myotis (*Myotis septentrionalis*) are two small, brown, insectivorous bats with a broad range across Canada. Both species are listed as Endangered federally by SARA, and provincially by the New Brunswick SARA. Both species also have an AC CDC rank of S1, meaning they are considered to be critically imperiled provincially. Both species overwinter in cold and humid hibernacula, typically in caves and mines. Both species establish maternity colonies in the summer months, often in large-diameter trees with peeling bark and tree cavities, though Little Brown Myotis also shows preference for creating maternity colonies in buildings. Foraging habitat consists of waterways, forest edges, and gaps in forest cover, with large open areas such as fields or clearcuts typically being avoided. The largest threat to both species is White-nose Syndrome, a fungal disease that has caused precipitous population declines of greater than 90%. Other threats include collisions with wind turbines, and colony eradication stemming from public concerns of disease transmission (COSEWIC 2013b).

During the acoustic monitoring program in the BWP study area from June 1 to October 15, 2019, 91 detections of calls produced by either Little Brown Myotis or Northern Myotis were confirmed (Boreal 2020). Within the Data Centre PDA, there is potential for maternity colonies for both species due to the presence of large trees in forested areas with peeling bark and tree cavities.

Olive-sided Flycatcher

Olive-sided Flycatcher (*Contopus cooperi*) is a medium-sized flycatcher which belongs to the guild of birds known as aerial insectivores which forage for insects while in flight. It is listed as Special Concern by COSEWIC and SARA and Endangered under the NB SARA. The AC CDC ranks the species as S3B, which indicates that breeding populations are vulnerable in New Brunswick. COSEWIC and the federal SARA downlisted the species from Threatened to Special Concern in 2018 and 2023 respectively, as the rates of population decline have slowed; however, the NB SARA upgraded the species to Endangered in 2022 as the species has shown some of the highest declines across their breeding range in the province. Threats faced by the Olive-sided Flycatcher include loss of wintering habitat, reductions in the abundance and availability of insect prey, and altered fire regimes and changing climates on nesting habitat quality (COSEWIC 2018b). In Atlantic Canada, breeding habitat consists of forest openings and edges with the presence of snags for foraging and singing perches (Altman and Sallabanks 2020).



One incidental observation of Olive-sided Flycatcher was recorded during surveys in the BWP study area and was not recorded within the Spruce Lake Industrial Park Expansion Project. There is no suitable nesting habitat for Olive-sided Flycatcher within the PDAs, because of a lack of a combination of dense spruce forest and open areas with snags. However, suitable nesting habitat may exist within the portion of the LAA near Marsh Brook.

Peregrine Falcon – *anatum/tundrius* population

Peregrine Falcon (*Falco peregrinus*) has several subspecies, each of which has been evaluated individually by COSEWIC. The population found in New Brunswick is considered as a single entity as *anatum* and *tundrius* subspecies cannot be distinguished genetically. This population is not on Schedule 1 of the federal SARA and has a COSEWIC ranking of Not at Risk. Provincially, Peregrine Falcon is listed as Endangered, and has an AC CDC assessment of S1B, S3M indicating that the breeding population is critically imperilled (S1B) and the migratory population is vulnerable (S3M). Peregrine Falcon are medium-sized raptors most commonly identified by their greyish-blue upperparts. Individuals can be found throughout New Brunswick and are associated with a broad range of habitats where suitable biophysical features are present. Breeding primarily occurs on high ledges and cliffs, as well as on the tops of tall anthropogenic structures such as high-rise buildings.

There are no high ledges or cliff sites, nor are there any tall anthropogenic structures within or near any of the PDAs; therefore, no suitable breeding habitat is present.

Piping Plover – *melodus* subspecies

Piping Plover – *melodus* subspecies (*Charadrius melodus melodus*) is a small shorebird listed as Endangered on Schedule 1 of the federal SARA, by COSEWIC, and on the NB SARA. The species has an AC CDC rank of S1B, S3M meaning that the breeding population in New Brunswick is critically imperiled, and the migratory population which stages in the province is vulnerable. In Canada, the *melodus* subspecies breeds in New Brunswick, Nova Scotia, Prince Edward Island, Newfoundland, and on the Magdalen Islands of Quebec. Piping Plovers nest above the normal high-water mark on exposed sandy or gravelly beaches. Along the Atlantic coast, they often nest in association with small cobble and other small beach debris on ocean beaches, sand spits, or barrier beaches (COSEWIC 2013c). They also forage for food on these beaches. The most important limiting factor for piping plovers of the *melodus* subspecies is loss of habitat, mostly caused by human use of beaches, and the consequent human disturbance around nesting sites.

There is one record of Piping Plover approximately 1.5 km to the north of the PDA (AC CDC 2025) (Figure 12.2). As there are no beaches or mudflats within the PDAs, there is no suitable nesting or foraging habitat present.

Red Knot – *rufa* subspecies

Red Knot – *rufa* subspecies (*Calidris canutus rufa*), which contains three different populations, is listed as Endangered on Schedule 1 of SARA and as Endangered (pop. 4 and pop.5) and Special Concern (pop. 3) by COSEWIC. The *rufa* subspecies is listed as Endangered under the NB SARA and is ranked by the AC CDC as S2M, meaning the migratory population of this species that regularly passes through and stages within the province is considered imperiled. This shorebird breeds in the Arctic tundra, and travels thousands of kilometres during migration and may use the shores of Prince Edward Island as staging areas. Preferred migration stop-overs include sandflats and sometimes mudflats in coastal zones where they can feed on intertidal invertebrates. The species also frequents saltmarshes, brackish lagoons and mussel beds. Threats to the red knot include decreased wetland habitats, human disturbance, and the effects of climate change such as increased storm activity during migration and rising sea levels (COSEWIC 2020b).

As there are no beaches, mudflats or saltmarshes in the PDAs, there is no suitable nesting or foraging habitat present.

Rusty Blackbird

Rusty Blackbird (*Euphagus carolinus*) is a medium-sized blackbird associated with wetlands throughout the year. It is listed as Special Concern under the federal SARA and the provincial NB SARA, and by COSEWIC. The AC CDC rank for this species is S2S3B, S3M meaning the breeding population of the species within New Brunswick is considered imperiled to vulnerable, while the migratory population that passes through the province is considered vulnerable. In Canada, this species breeds in coniferous-dominated forests near wetlands, with areas of shallow, slow-moving water providing ideal foraging habitat (COSEWIC 2017). This species typically constructs its nest in small shrubs or trees within or near wetlands, with a preference for dense vegetation (Avery 2020).

One record of a Rusty Blackbird was reported in the Irving Nature Park (Taylors Island) ESA, approximately 4 km away from the Data Centre PDA (AC CDC 20205).

There is no suitable nesting habitat (e.g., coniferous forest adjacent to an open water source) present within the PDAs. However, there may be suitable nesting habitat present along Marsh Brook, within the LAA.

Wood Thrush

Wood Thrush (*Hylocichla mustelina*) is a medium-sized thrush listed as Threatened under the federal and provincial SARA, and by COSEWIC. The species has an AC CDC rank of S1S2B, meaning that the breeding population of this species is considered imperiled to critically imperiled provincially. Breeding habitat preferences for the Wood Thrush consist of moist, deciduous hardwood or mixed stands, oftentimes previously disturbed either anthropogenically (e.g., small-scale logging) or environmentally (e.g., winter storms), and a dense deciduous undergrowth (COSEWIC 2012c).

One observation of Wood Thrush was recorded at the Irving Nature Park, approximately 4 km away from the Data Centre PDA (AC CDC 2025). Two individuals were also recorded flying overhead during fall migration in 2020 by the radar and acoustic monitoring program completed near the BWP study area (Taylor et al. 2020).

No large, mature hardwood forest stands are present in the PDAs that would provide suitable nesting habitat for Wood Thrush.

12.3 Potential Effects and Effect Pathways

A summary of the potential effects and Project effect pathways to be assessed for Wildlife and Wildlife Habitat is provided in Table 12.3. Potential environmental effects and effects pathways were selected based on the review of similar projects in NB and other parts of Canada, and professional judgement.

Table 12.3 Potential Effects and Effect Pathways for Wildlife and Wildlife Habitat

Potential Effect	Effect Pathway(s)
Change in wildlife habitat	• Site preparation could result in the direct loss of suitable habitat and important habitat features such as nests, denning sites, or maternity roosts • Vegetation clearing can result in habitat fragmentation, which can have adverse effects on species with large ranges, and those that require large patches of interior forest or other types of homogeneous habitat • Vegetation clearing can indirectly affect adjacent habitats through edge effects, including changes in microclimate and vegetation structure, that in turn may influence wildlife presence and/or abundance • Construction and operational activities can result in indirect effects on habitat through sensory disturbance (e.g., noise, light, pollution, dust, vibrations, odors, and human presence). These disturbances may lead to avoidance behaviours or changes in movement patterns of animals. Sensory disturbance from odors can also attract or repel wildlife.
Change in wildlife mortality risk	• Direct change in mortality risk could occur due to vegetation clearing and site preparation activities, vehicular collisions, and human-wildlife conflicts. • Indirect change in mortality risk could occur due to changes in wildlife health and survival, including increased stress and/or reduced body condition (e.g., increased physiological stress in wildlife may increase their susceptibility to disease (e.g., Hing et al. 2016). • Indirect change in mortality risk could occur due to increased predation, hunting, and/or poaching because of improved access or other habitat changes. • Wildlife mortality risk could increase from the accidental release of toxic substances or wastes.

The Project will interact with wildlife and wildlife habitat resulting in a change in habitat and mortality risk through the following activities:

- Site preparation (clearing, grading, excavation trenching, topsoil management, installation of water management and erosion and sediment control measures, temporary access road construction)
- Site development (installation of Data Centre infrastructure, pipeline, and transmission line, construction of additional site infrastructure including roads and laydown areas)
- Clean-up and reclamation (e.g., site landscaping, RoWs restoration)
- Operation (vegetation management along roadsides and RoWs, sensory disturbance including noise and lighting, presence of transmission lines)

12.4 Mitigation Measures

The Project has been designed to limit interactions with wildlife and wildlife habitat to the extent practicable through planning of the placement of infrastructure and timing of vegetation clearing outside of sensitive periods. Where interactions with wildlife habitat cannot be avoided, the application of mitigation measures will be used to reduce the adverse effects to wildlife and wildlife habitat. The mitigation measures have been selected in consideration of the environmental effects pathways, include standard mitigation measures, and consider regulations and guidelines that govern wildlife and wildlife habitat protection.

The following mitigation measures specific to wildlife and wildlife habitat have been identified for the Project:

- Vegetation clearing will be completed outside the migratory bird nesting period of mid-April to late August (Zone C3; ECCC 2023b). Where activities may result in risk of harm to migratory bird nests during this period (e.g., limited vegetation clearing, nesting on Project infrastructure) or during the nesting period for other species (i.e., raptors), a qualified biologist will complete a pre-activity nest survey in accordance with federal guidelines (ECCC 2022b).
- Vegetation clearing will be completed outside the core maternity roosting period for bats of May 1 to August 31. Bat maternity roost surveys are planned for 2026 (Section 12.6), which will aid in determining potential for maternity roost trees within the PDAs.
- If an active bird nest is found, management practices will be followed, including applying an appropriate setback and timing restriction, and New Brunswick Fish & Wildlife and/or Canadian Wildlife Service (CWS) will be consulted, as appropriate.
- If key habitat features, such as bat maternity roosts, or raptor nests are encountered during construction, related work will immediately cease and New Brunswick Fish & Wildlife and/or CWS will be consulted, as appropriate.
- Domestic waste will be stored in secure receptacles to prevent attracting birds and other wildlife to the PDAs.



- Lighting (number of lights, intensity of lights, and amount of time lights are turned on) will be limited to that required to maintain site safety and security. Site lights will be shielded downward to avoid attracting/disorienting birds.
- Project vehicles will adhere to posted speed limits on access roads and internal site roads, aligning with provincial regulation and industry standards.
- Staff will report wildlife incidents to their supervisor, which will be reported to New Brunswick Fish & Wildlife and/or CWS, when appropriate.
- Personnel will not feed, harass, or hunt wildlife while working on the Project.

12.5 Residual Environmental Effects

For Wildlife and Wildlife Habitat, two potential environment effects were identified: change in wildlife habitat and change in wildlife mortality risk.

Residual effects (i.e., those remaining following implementation of mitigation) for each Project phase are evaluated below. The assessment of residual effects considers the following key factors:

- The PDAs cover approximately 171.1 ha of disturbed and undisturbed areas that will be lost or altered during the construction of the Project. For the purposes of the assessment of Wildlife and Wildlife Habitat, it is conservatively assumed that 100% of the PDA will be directly lost or disturbed, whereas in practice not all portions of the PDA will be directly disturbed. In transmission line and pipeline RoWs, vegetation will remain or be reclaimed with low-growing vegetation. The LAA includes the PDAs and a 500 m buffer. Indirect effects to Wildlife and Wildlife Habitat are assumed to extend up to this maximum distance outside of the PDAs; however, actual effects will vary depending on site-specific activities and conditions and may not extend to the full LAA.
- 18 SAR and 64 SOCC were identified from existing data records within 5 km of the Project.

12.5.1 Change in Wildlife Habitat

12.5.1.1 Habitat Loss

Project construction is expected to be the primary cause of direct change to wildlife habitat. Clearing of vegetation will remove individual plants and vegetation communities within the PDA, effectively removing or altering the existing wildlife habitat. During clearing, trees and shrubs are removed and understory vegetation is either removed or damaged. Remaining vegetation will be removed in areas where earthwork activities, which include excavation, grading, and infilling, will occur. In transmission line and pipeline RoWs, vegetation will remain or be reclaimed with low-growing vegetation, and subjected to regular vegetation maintenance during operations. Important habitat features such as nests, dens, burrows, and maternity roosts, may be altered or lost if present in the PDA. This may include habitat for wildlife SAR, some which use trees for roosting or nesting during sensitive life stages.

The PDAs cover approximately 171.1 ha of both disturbed (e.g., cleared land, transmission line RoW) and undisturbed (e.g., wooded, wetlands) areas that will be directly lost or altered during Project construction. It is assumed that 100% of the total PDA areas will be disturbed, based on the assumption of complete habitat loss or alteration within the Project footprint. This assumption is considered conservative (i.e., likely overstating rather than understating the impacts) given that it is unlikely that all of the land will be disturbed given the type of infrastructure and opportunities for revegetation and restoration of habitat in the linear corridors. An additional 1,782.7 ha within the LAA and outside the PDAs may be indirectly affected due to sensory disturbance (Table 11.2).

The Data Centre PDA (88.62 ha) is comprised of forested and wetland areas. Forested habitat within the Data Centre PDA consists of mixedwood (36.64 ha; 41.35%), coniferous (24.02 ha; 27.11%), and deciduous (1.18 ha; 1.33%) forest. Wetlands, including bogs, coniferous, mixedwood, and deciduous treed swamps, marshes, tall shrub swamps, and treed bogs account for 26.77 ha or 30.22% of the Data Centre PDA.

The Transmission Line PDA (67.40 ha) is comprised of undisturbed forested and wetland areas, as well as previously disturbed areas. Most of the habitat within the Transmission Line PDA is woodland consisting of coniferous (36.35 ha; 53.94%), mixedwood (7.20 ha; 10.69%), and deciduous forest (1.79 ha; 2.66%). Wetlands and waterbodies including bogs, coniferous treed swamps, fens, marshes, shrub wetlands, surface water and coastal/tidal water account for 7.14 ha or 10.59% of the Transmission Line PDA. Fens, marshes, and open water could provide suitable foraging habitat for Bank Swallow and Barn Swallow, although not within any Critical Habitat designated for Bank Swallow. Disturbed areas within the PDA, which could have the potential to support Common Nighthawk nesting activity, account for 14.91 ha (22.12%).

The Pipeline PDA (15.08 ha) is the smallest of the PDAs, given the linear nature of the Project component and distance between the source pipelines and Data Centre PDA, and consists of forested and wetland habitats, as well as previously disturbed areas. The majority is forested habitat made up of coniferous (6.91 ha; 45.84%), mixedwood (4.80 ha; 31.8%), and deciduous forest (0.49 ha; 3.28%), largely adjacent existing disturbed habitats. Wetlands consisting of coniferous treed swamp and shrub wetland account for a relatively small portion of the undisturbed area of the Pipeline PDA (0.58 ha; 3.82%). Disturbed areas within the Pipeline PDA account for 2.30 ha (15.26%).

Across PDAs, approximately 21.59 ha of coniferous treed swamp, 4.66 ha of treed bog, and 1.25 ha of mixedwood treed swamp will be lost or potentially altered, representing a loss/alteration of 27.5 ha of potentially suitable Canada Warbler breeding habitat. Approximately 25.9 ha of mature softwood stands and 8.68 ha of over-mature softwood stands are anticipated to be lost, representing a total loss of 34.58 ha in potential nesting and foraging habitat for Evening Grosbeak. Approximately 39.91 ha of mature mixedwood stands, and 1 ha of mature hardwood stands are anticipated to be lost across PDAs, representing a total loss of 40.91 ha of potentially suitable habitat for Eastern Wood-Pewee.

Approximately 39.91 ha of mature mixedwood forest, 6.27 ha of over-mature mixedwood forest, 1 ha of mature hardwood forest, 25.9 ha of mature softwood forest, and 8.68 ha of over-mature softwood forest will be lost, representing a total loss of 80.76 ha of habitat with the potential to house little brown myotis and northern myotis maternity colonies, should the necessary habitat attributes be present.



Vegetation removal can also result in habitat fragmentation and the creation of edge habitats. Roads and RoWs create an abrupt linear edge that can increase the proportion of edge habitat in an area, with potential effects on microclimate, light, and vegetation structure (i.e., habitat of wildlife). Species such as moose, snowshoe hare, and squirrels have been shown to avoid small forest open areas edges (Baril-Chauvette et al. 2024), although documented edge effects have been shown to vary among species and size of openings/edges. Those with large home ranges, such as moose, may be disproportionately affected because they require a minimum patch size for the habitat to be considered adequate; even when suitable habitat patches exist, they may be unattractive if they are too small (Dussault et al. 2006). Other species, such as bats, require connectivity between roosting and foraging areas, and fragmentation or loss of these habitats could increase travel distances and energetic costs (ECCC 2018). Alternatively, foraging little brown myotis are often associated with open habitats and edges, such as roads (ECCC 2018).

Mitigation measures will be implemented to reduce potential direct effects of vegetation clearing on habitat including restricting clearing and grubbing to areas necessary for Project construction and limiting new disturbance. For example, the Transmission Line PDA will parallel the existing transmission line RoW for a large proportion of the route. Additional mitigation will include avoiding vegetation clearing during sensitive periods (e.g., migratory breeding bird season, approximately mid-April to late-August (ECCC 2023b)). Where practicable, coarse woody debris and soil patches will remain undisturbed to support shelter, breeding and foraging opportunities for small mammals, amphibians, and ground-nesting birds. If key habitat features such as maternity roosts, or raptor nests are encountered during construction, work will cease; the Site Manager will be notified promptly, and the appropriate regulatory body will be informed, if required. Follow-up actions will be determined in consultation with regulators and a qualified biologist.

12.5.1.2 Sensory Disturbance

Despite mitigation measures, project activities during construction and operation may also indirectly affect wildlife habitat through sensory disturbance, with the magnitude of these effects associated with the intensity and nature of the activities. Activities during construction such as heavy equipment use and increased traffic result in increased human presence, noise, vibrations, light, fugitive dust, and other emissions (e.g., exhaust), which can have indirect effects on wildlife habitat quality. During operation and maintenance, sensory disturbance associated with the transmission line and pipeline are expected to be periodic, while sensory disturbance, particularly noise, associated with the data centre may be more pronounced. These sensory disturbance effects are expected to attenuate with distance from Project activities.



Lighting disturbance will be limited to the Data Centre facility and will be mitigated through the application of shielded lights and reducing the number of lights to only those necessary for safety. However, light associated with vehicle traffic, heavy equipment, and on-site lighting may still indirectly affect habitat quality, which may in turn lead to altered behaviour and activity patterns of some wildlife. For example, artificial light has the potential to attract or disorient nocturnally migrating birds (Poot et al. 2008) and species may avoid lit areas because of increased risks of predation (Willems et al. 2022). Alternatively, the presence of site lighting has the potential to benefit species that forage on flying insects, such as little brown myotis and Common Nighthawk, that may opportunistically feed on insects that become concentrated around light sources.

Site access and transportation activities during construction and traffic and transportation activities during operation and maintenance may indirectly affect wildlife habitat through dust deposition in adjacent areas. Depending on activity levels, forage availability for some species may be reduced if plants become covered in dust, and wildlife that forage within or adjacent to the PDA may therefore interact with vegetation subject to localized dust deposition.

Noise and visual disturbance generated during construction and operation and maintenance activities may affect habitat quality by causing some wildlife to avoid affected areas or to modify their behaviour, which can cause stress or other physiological effects (e.g., Barber at al. 2010; Naguib 2013). Noise can also interfere with wildlife communication (e.g., Dooling and Popper 2007), potentially affecting mate selection and reproductive success. These effects are generally more pronounced during sensitive life stages, such as courtship or breeding. Noise levels exceeding 10 decibels (dB) above ambient levels, or that are greater than 50 dB, can disrupt avifauna (ECCC 2023c). Noise and vibrations associated with blasting activities also can reduce the quality of wildlife habitat. For example, noise and vibrations near bat maternity colonies can disturb bats and may lead to roost abandonment, potentially reducing reproductive success (ECCC 2018). Refer to Section 8 (Acoustic Environment) for more information on Project-related noise.

12.5.2 Change in Wildlife Mortality Risk

Direct mortality risk to wildlife is primarily associated with clearing and site preparation activities during sensitive periods (e.g., nesting, roosting). Collisions with Project vehicles or other Project equipment (e.g., site lighting, conductors, towers, and transmission lines) may also directly affect the mortality risk of avifauna and other wildlife during both construction and operation and maintenance activities.

Construction-related vegetation removal, including grubbing, if taken place during the regional nesting period for migratory birds (approximately mid-April to late-August; ECCC 2023) poses a heightened risk of egg and nestling mortality. There is also an elevated mortality risk to other species with overlapping sensitive periods, including bats (maternity roosting) if present. Though vegetation clearing activities will be planned to occur outside of the regional nesting period for migratory birds, if an active nest is found during these activities, the surrounding area will remain undisturbed until fledging has occurred, or the nest is abandoned. If active roost sites (bats) are found, work in the vicinity will cease until appropriate follow-up is determined.



Seasonal factors similarly influence wildlife-vehicle collision risk during construction and operation and maintenance, with a potential increased mortality risk during periods such as the fall rut for moose (Vanlaar et al. 2019). Other factors that can affect the risk of wildlife-vehicle collisions include site lighting, time of day, driver fatigue, traffic volumes, vehicle speeds, wildlife mobility, and the presence of preferred habitat (particularly where this habitat occurs on both sides of a roadway) (Su et al. 2023, Thakur et al. 2025). Wildlife that are difficult to detect, including small-bodied animals (such as small mammals and some birds) and nocturnal species (such as bats), may be more susceptible to collisions with vehicles and other Project equipment. If locations with frequent wildlife interactions are identified, adaptive management measures will be implemented to reduce mortality risk to avifauna and other wildlife.

There is a potential for direct bird mortality through collisions with the transmission line. Calvert et al. (2013) estimated transmission line collision to be the third leading cause 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). There is the potential for some migrating birds to 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. These species are more susceptible to wire collision than many other birds (Erickson et al. 2001). Migration data from the Burchill Wind Project EIA showed that the average flight height for waterfowl, waterbirds, and raptors during spring migration averaged 420 m, 182 m, and 112 m respectively, while flight height for these species groups was lower during fall migration with an average of 20 m, 6.3 m, and 72 m respectively (Boreal 2019). Given the average tower height for 345kV transmission lines is between 28 m and 45 m, the risk of collision for these species groups may be higher in fall, but on average collisions may be avoided due to higher or lower flight height.

Waterfowl and waterbirds may be abundant along nearby coastal regions. Of note is an IBA approximately 2.04 km from the Pipeline PDA, at Saints Rest Marsh and Beach which is a fall stopover migration site for small sandpipers and other small shorebird species. Project planning provides mitigation for the risk of collisions with the transmission line, as conductors will parallel existing lines. The clustering transmission lines may reduce collision risk as the resultant network of wires is confined to a smaller area and is more visible, and birds only have to make a single ascent and decent to cross lines in this arrangement (APLIC 2012). Transmission lines do not pose a new threat in this region, as they already occur in adjacent RoW(s).

The risk of direct mortality to wildlife will be reduced through the implementation of timing restrictions on activities that involve the removal of vegetation. Clearing will be scheduled outside of critical periods for bird nesting and bat roosting periods whenever feasible, and nests, eggs, and shelters of migratory birds or other wildlife will not be disturbed or destroyed. If clearing is required during sensitive periods for birds or bats, targeted pre-clearing surveys will be completed for active bird nests and bat maternal colonies/roost sites.



Mortality risk to avifauna and other wildlife may also increase indirectly, through changes in access (e.g., increased access to hunting areas) and human-wildlife conflicts. Altered or improved access could lead to increased hunting, harvesting, poaching, outfitting, and outdoor recreation. Human-wildlife conflicts may also arise from improper waste disposal or if pets (e.g., dogs) are brought on site, which can attract potential predators (e.g., American black bear) and result in unintended injury or mortality.

Mitigation measures will be implemented to reduce indirect mortality risk to wildlife. These include storing food waste and garbage in secure containers to avoid attracting wildlife, prohibiting chasing, catching, diverting, following, or otherwise harassing wildlife, and documenting wildlife sightings. Nuisance animals (e.g., bears, coyotes) will be managed by the Site Manager (or designate) in consultation with regulators. A measurable change in long-term persistence or viability of wildlife populations due to the Project is not expected.

12.6 Follow-up and Monitoring

Surveys will be completed for wildlife and wildlife habitat during the 2026 field season. These will include early breeding bird surveys, breeding bird surveys, Common Nighthawk surveys, and bat habitat surveys.

Early breeding bird surveys will be conducted in spring 2026 as point counts to cover all three PDAs. Surveys will aim to categorize the early breeding communities focusing on forest-breeding raptors, woodpeckers, and other early cavity nesting species. Supplemental observations of any Pileated Woodpecker nesting activity will be recorded during these surveys, with nest cavity searches conducted in the Transmission Line and Pipeline PDAs where habitat is present.

Breeding bird surveys will be conducted to cover all three PDAs apart from the area of the Transmission Line PDA already covered by Stantec's 2024 breeding bird surveys in support of the SJC EIA (Stantec 2025). Breeding bird surveys will be conducted in June 2026 as a series of point counts distributed across representative habitat types.

Common Nighthawk surveys will be conducted within all three PDAs, apart from the area of the Transmission Line PDA already covered by Stantec's 2024 Common Nighthawk surveys in support of the SJC EIA (Stantec 2025). Surveys will be conducted in representative suitable habitats between June 15 and July 15, 2026, per the Canadian Nightjar Survey Protocol (Birds Canada 2024).

Bat maternity roost surveys will be conducted within all three PDAs in 2026. Based on the maternity roost habitat preferences of little brown myotis and northern myotis, area search surveys will be completed within areas of the PDAs classified as mature or overmature hardwood or mixedwood forests larger than 1 ha in size.



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13 Assessment of Environmental Effects on Socio-economic Environment

13.1 Scope of Assessment

The Project can affect the socio-economic environment through changes to land and resource use, infrastructure and services, and employment and economic conditions. These interactions are of interest to regulatory agencies, Indigenous groups, stakeholders, and members of the public, as they may directly influence community well-being, quality of life, and regional economic development in the vicinity of the Project. The socio-economic environment has, therefore, been selected as a VC in recognition of these concerns and values of New Brunswickers.

For the purposes of this assessment, the socio-economic environment is defined through the following interrelated components:

- Land and Resource Use - Refers to the current and planned use of public and private lands in the vicinity of the Project, including industrial, residential, commercial, recreational, forestry, and natural environments. It also considers nuisance effects, including changes to noise levels, as a result of Project construction and operation.
- Infrastructure and Services - Includes transportation networks, utilities (electricity, natural gas, telecommunications), water supply, wastewater and stormwater systems, emergency services, health services, accommodation availability, and other systems that support community needs. It also considers community perceptions related to safety, traffic, emergency preparedness, and access to essential services, recognizing that changes to infrastructure and service levels can influence overall quality of life and community comfort with development.
- Employment and Economy - Includes labour force conditions, employment levels, procurement activity, and spending within the local and regional economy, as well as expected benefits from construction employment, long-term operational staffing, and demand for goods and services. It also reflects broader economic factors such as income, business activity, labour availability, and contributions to local, regional, and provincial economic development. This component further considers how economic opportunities, or perceived economic risks, may influence community well-being by affecting household stability, local business confidence, and long-term socio-economic resilience.

13.1.1 Regulatory Context

Land use planning in New Brunswick is regulated by the New Brunswick *Community Planning Act*. The purpose of this legislation is to support the development of environmentally, economically, socially, and culturally sustainable communities, and guide regional and local planning decisions in the development of communities.

The Regional Development Corporation is a Crown corporation that plans, coordinates, and implements regional and economic development initiatives for the Province of New Brunswick under the *Regional Development Corporation Act.*

The Project is situated primarily within the municipal boundaries of the City of Saint John and is therefore governed partially by the City of Saint John Municipal Plan (City of Saint John, 2012). A portion of the transmission line extends beyond these City limits into the Fundy Shores local government area, where it is also subject to the Fundy Shores Rural Plan (Rural Community of Fundy Shores, 2025).

13.1.2 Assessment Boundaries

The assessment of potential environmental interactions between the Project and the socio-economic environment is focused on three PDAs and an LAA to reflect how different Project activities may influence nearby communities, regional infrastructure, labour markets, and land-use patterns.

The PDAs represent the anticipated area of direct physical disturbance associated with the construction, operation and maintenance of the Project. For the purposes of this EIA Registration, the Project encompasses three PDAs as described in Section 6.2.3 and shown on Figure 2.1: the Data Centre PDA, the Transmission Line PDA, and the Pipeline PDA.

The LAA encompasses surrounding communities and infrastructure systems where socio-economic effects may occur. This includes areas where workers may reside, businesses may experience increased demand, and community services may support Project-related activities. The LAA extends beyond the PDA to capture communities within a reasonable commuting distance of the site (Figure 13.1). Therefore, the LAA is Saint John County, with a specific focus on the City of Saint John, which is the regional service centre, and the community of Lorneville, which is the community closest to the PDA.

At a regional scale, the assessment considers the broader socio-economic conditions within Saint John County, acknowledging the wider trends that could influence or be influenced by the Project. Within this regional context, the assessment considers factors such as labour availability, supply-chain capacity, and the role of the Project within the industrial and economic landscape. Potential effects at the regional scale are more challenging to quantify, particularly regarding increased regional employment, contracting activity, and additional service requirements across Saint John County associated with the development of the Project and supporting infrastructure.

Temporal boundaries for the assessment are based on the timeframes over which potential effects could occur as a result of Project construction, and operation and maintenance phases as defined in Section 6.2.3.

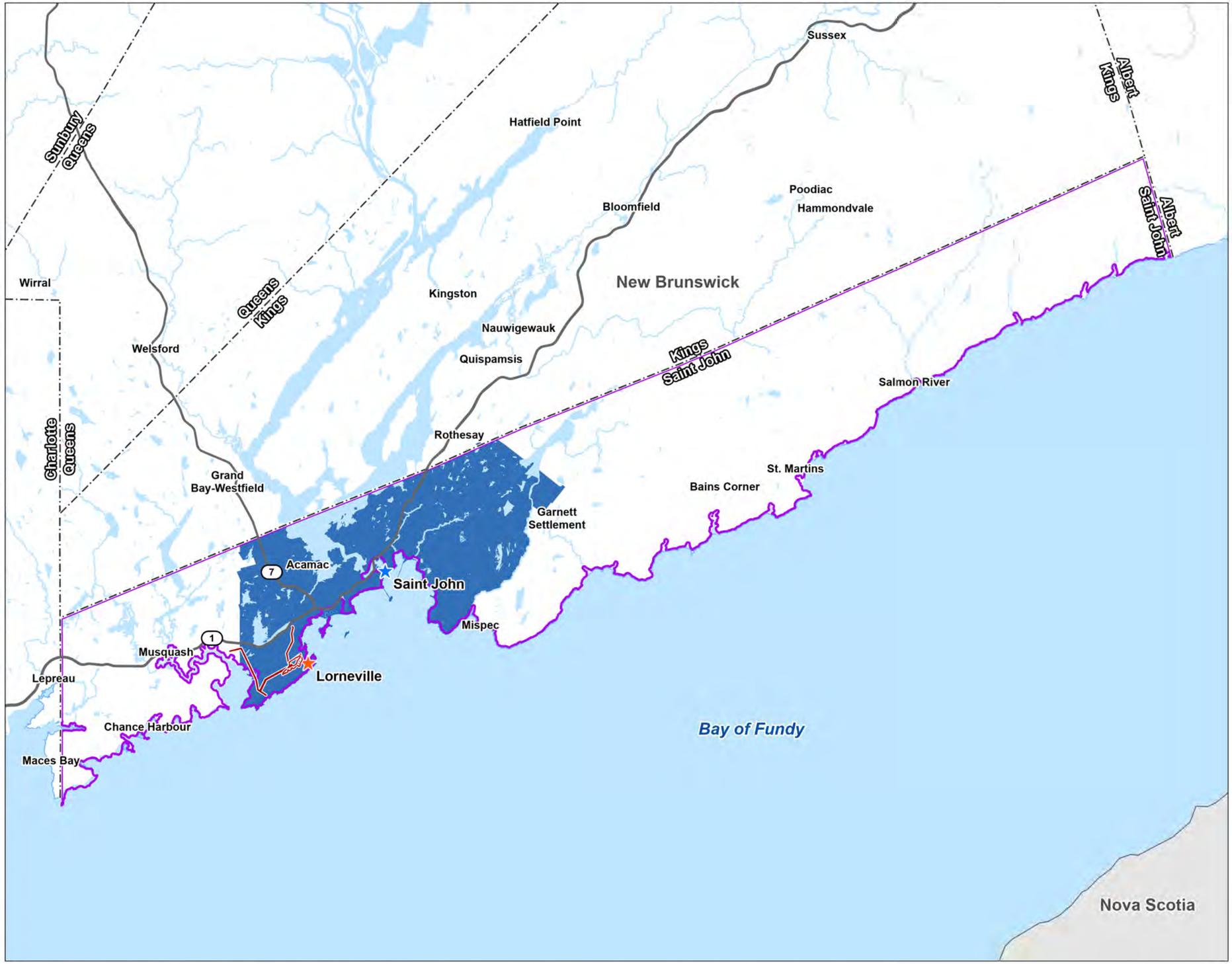


Figure No.
13.1

Title
Socio-Economic Local Assessment Area

Client/Project
121418636-012
Beacon Data Centres Inc.
Spruce Lake AI Data Centre

Project Location
Lorneville,
New Brunswick

Prepared by SC on 2026-03-11

N

0 5 10 15 km
(At original document size of 11x17)
1:380,000

Legend

- Lorneville
- Saint John
- Project Development Areas
- Local Assessment Area

Administrative Areas and Land Use

- County Boundary
- The City of Saint John

Other Features

- Highway
- Watercourse (NBHN)
- Waterbody (NBHN)



Notes
1. Coordinate System: NAD 1983 CSRS New Brunswick Stereographic
2. Data Sources: Beacon Data Centres Inc.; Data License with the Government of Canada (NRCan) and New Brunswick (NBDELG, NBNRED, Service NB); New Brunswick Power; Stantec
3. Background: Esri, USGS

Stantec

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13.2 Existing Conditions for the Socio-economic Environment

This section describes the existing socio-economic conditions within the LAA, including the influence of past and current human activities on community characteristics, land and resource use, and local and regional economic conditions. These baseline conditions form the foundation for assessing potential Project-related effects in Section 13.3.

13.2.1 Approach and Methods

Baseline socio-economic conditions for Saint John County were developed using secondary data, including Statistics Canada and Government of New Brunswick labour market and economic indicators. These sources were used to describe demographics, labour force conditions, employment patterns, land and resource use, and exist community services within the Project's assessment areas.

Information on infrastructure and services was obtained from the New Brunswick Department of Transportation and Infrastructure and public data sources on housing, health care services, and emergency response capacity, including websites and publications of municipalities and service providers.

Additional context was drawn from literature, government publications, public datasets, and regional media to identify socio-economic conditions and community considerations relevant to the Project.

A public open house held on November 5, 2025, provided additional qualitative insight (see Section 4 for more information on the open house). Attendance and participant input were documented and summarized to identify themes relevant to the socio-economic baseline. Given the self-selected nature of participation, these insights are considered qualitative indicators of community perspectives rather than statistically representative data. Reported concerns relevant to the consideration of potential effects on the socio-economic environment include:

- Long-term employment opportunities
- Project-related noise in residential areas
- Increased Project-related traffic
- Consumption of power from New Brunswick Power Corporation to support Project operation
- Loss of jobs post-operation

Professional judgment, informed by experience with similar projects in New Brunswick, was used to interpret baseline conditions, identify potential Project socio-economic interactions, and support the development of mitigation and management measures.

13.2.2 Description of Existing Conditions

13.2.2.1 Land and Resource Use

A portion of the Data Centre PDA (Figure 13.2) is located within the Spruce Lake Industrial Park expansion area in Lorneville, City of Saint John, a region characterized by a long-standing concentration of industrial, energy, and transportation infrastructure. This area forms part of New Brunswick's Southwest economic region, where land and resource use is influenced by industrial development, port and logistics operations, major utility corridors, and managed forests on both Crown and private lands. Key regional facilities, including the Coleson Cove Generating Station and the Burchill Wind Farm, further define the Lorneville Peninsula as an important energy production and transmission hub.

The Data Centre PDA is located entirely on municipally managed land within a portion of PID 55243596 zoned for industrial use (Figure 13.3), and being purchased by Saint John Industrial Parks (2024) Ltd. from the Regional Development Corporation. The Proponent plans to purchase the property prior to Project construction. The area is adjacent to existing utility corridors, supporting industrial development. No municipal parks, protected areas, or formal recreation facilities occur within the PDA. The nearest residential community is Lorneville, located outside the industrial zone, and 640 m from the PDA.

The Data Centre PDA is subject to municipal planning and zoning controls that designate the Spruce Lake Industrial Park for industrial development. Zoning requirements include a minimum 150 m setback between industrial operations and rural residences (City of Saint John 2025) with an additional 100 m exclusionary zone. Residential areas are located outside the immediate industrial zone, reducing the potential for land-use conflict. Recent planning and environmental review processes in the industrial park expansion area document community concerns related to wetlands, old-growth forest features, and private well protection considerations that have informed Project siting and design (Allan 2025). Under current conditions, existing land uses in the vicinity are compatible with further industrial development.

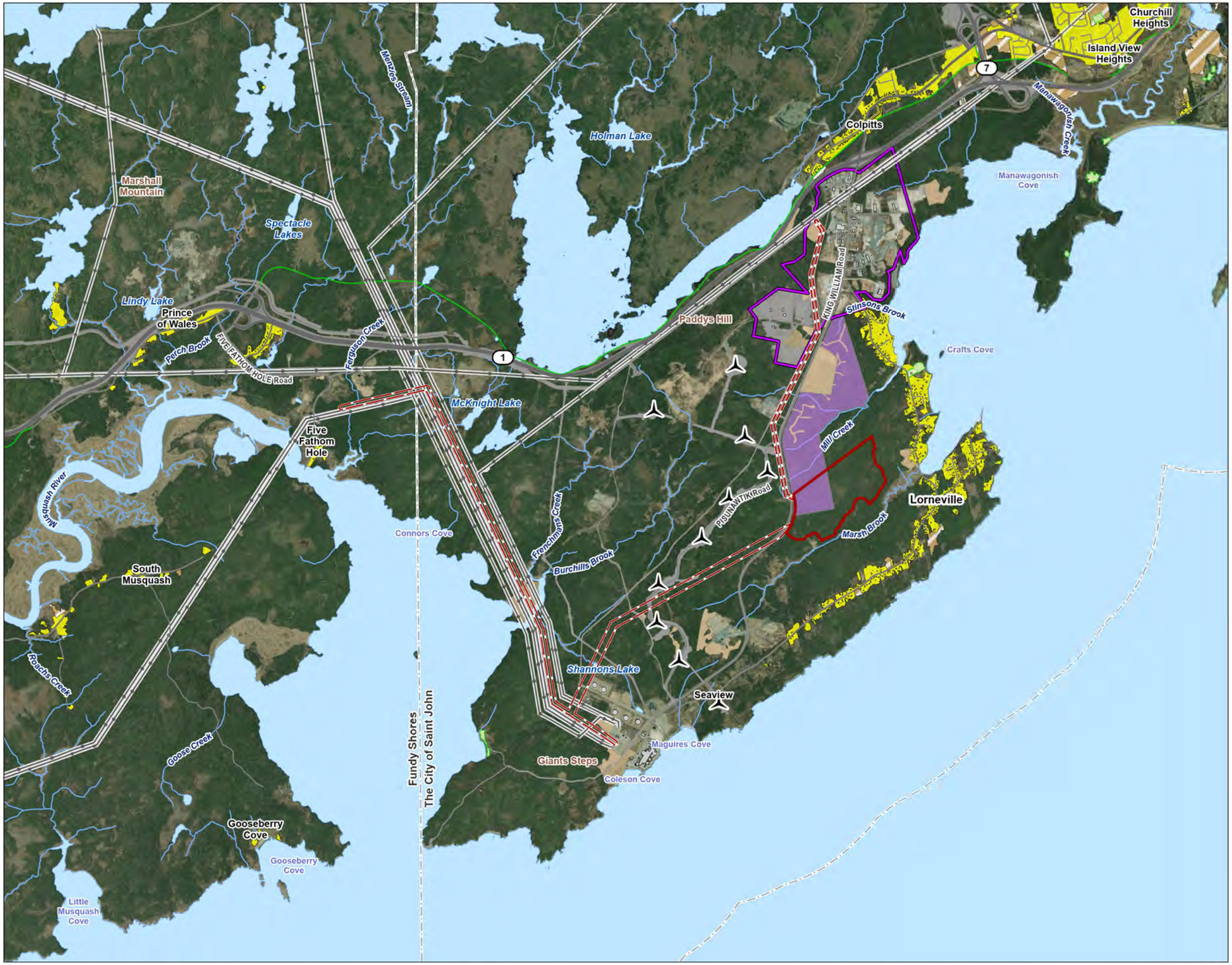


Figure No.
13.2

Title
Land Use of the Project Development Areas

Client/Project
Beacon Data Centres Inc.
Spruce Lake AI Data Centre

121418636-009

Project Location
Lorneville,
New Brunswick

Prepared by SC on 2026-03-11

N

0 1 2 km
(At original document size of 11x17)
1:50,000

Legend

Project Development Areas (PDA)
- Data Centre PDA
- Pipeline PDA
- Transmission Line PDA

Existing Infrastructure
- Turbine Location
- Transmission Line
- Highway
- Collector Road
- Local Road
- Building

Administrative Areas and Land Use
- Local Government Boundary
- Spruce Lake Industrial Park
- Spruce Lake Industrial Park Expansion Area - EIA Registration

Primary Land Use
- Agriculture
- Cleared Area
- Infrastructure
- Recreational
- Residential

Other Features
- Watercourse (NBHN)
- Waterbody (NBHN)

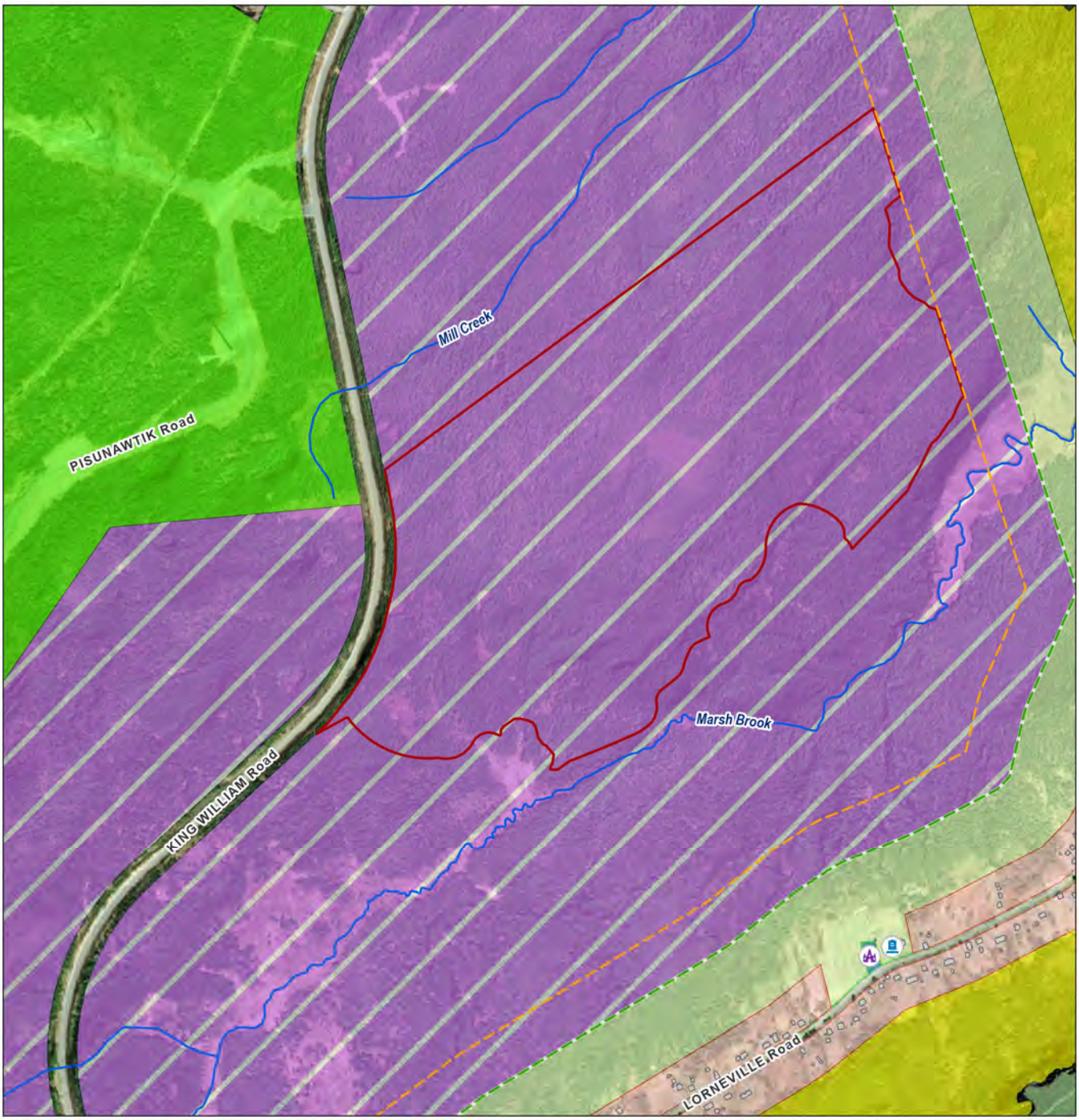


Notes
1. Coordinate System: NAD 1983 CSRS New Brunswick Stereographic
2. Data Sources: Beacon Data Centres Inc.; Data License with the Government of New Brunswick (NBDELG, NBNRED, Service NB) and City of Saint John; New Brunswick Power; Stantec
3. Background: Vantor, Esri, USGS

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Notes

1. Coordinate System: NAD 1983 CSRS New Brunswick Stereographic

2. Data Sources: Data License with the Government of New Brunswick (GeoNB, NBDNRED, NBHN, NBRN, SNB) and Canada (NRCan CanVec); City of Saint John

3. Background: Vantor, Esri, USGS

Legend

- Data Centre Project Development Area (PDA)

City of Saint John - Zoning Setbacks

- Vegetative Setback - 150m
- Exclusionary Setback - 250m

Land Use and Administration

City of Saint John Zoning

- Green Energy
- Neighbourhood Community Facility
- Park
- Rural
- Rural Residential
- Spruce Lake Industrial

Other Features

- Cemetery
- Church
- Building
- Watercourse (NBHN)

0 100 200 300 metres

(At original document size of 8.5x11)
1:12,500

N

Stantec

Project Location
Lorneville,
New Brunswick

Prepared / Revised by SC on 2026-03-12

Client/Project
Beacon Data Centres Inc.
Spruce Lake AI Data Centre

121418636-005

Figure No.
13.3

Title
Beacon Data Centre Site Overview

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The Transmission Line PDA is approximately 9.5 km long and 92 m wide (87–90 ha), crossing a mix of private and Crown properties (PIDs 00412189, 55186944, 00274381, 00434522, 55182638, 55186951, 55243588). The corridor will connect the Project to a new NB Power substation north of Coleson Cove near Five Fathom Hole. Route selection emphasizes the use of existing linear corridors and property boundaries to reduce new disturbance and avoid unnecessary bisecting of parcels. The corridor traverses industrial and mixed rural landscapes and may intersect forested areas, wetlands, and watercourses. Detailed design will identify features to maintain appropriate setbacks and reduce potential effects on sensitive attributes, such as wetlands and watercourses.

The Pipeline PDA is approximately 4.5 km long and 40 m wide (18 ha), crossing private and Crown land parcels (PIDs 00286377, 55154017, 55161681, 55200901, 55200927, 55213276, 55235477, 55239453, 00412189, 55186944). The alignment will connect the Data Centre PDA to the Maritimes & Northeast Pipeline Saint John Lateral and/or the Brunswick Pipeline through a metering station. Routing refinement prioritizes the use of existing linear features and previously disturbed areas, reducing new physical disturbance and avoiding wetlands and watercourses where feasible. Sensitive receptors are limited along this corridor and will be confirmed through ongoing survey work and engagement with landowners.

Recreational activities in the LAA include hiking, hunting, coastal walking, and nature observation, particularly within forested areas and along the Bay of Fundy shoreline. Irving Nature Park, located approximately 20 km northeast of the Project site, is the closest major formal recreation area. Other regional parks and natural areas occur throughout Greater Saint John; however, no designated parks or protected areas lie adjacent to the Project. The region's forests, wetlands, and previously disturbed landscapes support habitat, informal recreation, and forestry values important to local communities.

Lorneville residents have indicated that the proposed development would result in the loss of well-used wooded areas and informal trails that currently support local outdoor recreation. Residents also expressed concern that increases in noise, dust, and traffic associated with construction and future operations may diminish the community's traditionally quiet outdoor setting. Further, they anticipate reduced opportunities for wildlife observation and the removal of natural tree buffers that currently contribute to privacy, shade, and overall outdoor comfort.

13.2.2.2 Infrastructure and Services

Transportation Infrastructure

Saint John County benefits from proximity to major transportation infrastructure, including Highway Route 1, which provides direct connectivity to Saint John's industrial areas and the broader provincial network. Additional regional infrastructure includes the CN rail line, the Saint John Airport, and established freight corridors supporting industrial operations (Saint John Industrial Parks 2026). Access to the Spruce Lake Industrial Park is provided through existing municipal and industrial roadways designed to accommodate commercial and industrial traffic.

Electrical and Telecommunications Infrastructure

Lorneville is located near major provincial electrical infrastructure, including the Burchill Wind Farm and the Point Lepreau Nuclear Generating Station, which together contribute roughly half of New Brunswick's electricity supply (Canada Energy Regulator, 2021; NB Media Co-op, 2025). This proximity provides a strategic advantage for clean, energy-intensive industries.

The Project also benefits from being situated within a well-developed industrial corridor with established electrical transmission and distribution systems, natural gas availability, and broadband telecommunications utilities to support large-scale industrial operations typical of west Saint John.

Water and Wastewater Services

Water and wastewater services in Lorneville fall under the jurisdiction of the Province of New Brunswick and the City of Saint John (City of Saint John 2026; SNB 2026). Many properties in the community rely on private wells and septic systems, with provincial oversight provided through domestic wastewater treatment facility approvals, water quality approvals for water sources, and wellfield protection guidelines. These regulatory frameworks ensure that wastewater management, well protection, and water-quality safeguards are applied consistently across rural communities such as Lorneville (SNB 2026; City of Saint John 2026).

Waste Management Services

Waste management services for the Lorneville area are supported by the Crane Mountain Regional Landfill, located approximately 5 km north of the Project site at 10 Crane Mountain Road in Saint John. The facility, operated by the Fundy Regional Service Commission, provides disposal services for municipal and commercial solid waste, construction and demolition debris, and household hazardous waste, and is the primary waste management facility serving Saint John and surrounding communities. The landfill operates year-round and is currently undergoing a long-term capacity extension that will extend its operational life to at least 2070 (CBC News 2024). Given its established role in the region and available capacity, Crane Mountain Landfill is expected to be capable of accommodating Project-related waste volumes during construction and operation.

Emergency Services

Emergency services for Lorneville are delivered through municipal and provincial systems based in Saint John:

- **Fire Services:** Provided by the Saint John Fire Department, servicing west Saint John, including rural neighbourhoods such as Lorneville.
- **Police Services:** Delivered by the Saint John Police Force, with RCMP support for provincial-level matters.
- **Ambulance Services:** Provided province-wide through Ambulance New Brunswick (ANB).



The Saint John Regional Hospital, located at 400 University Avenue, is a full-service regional facility providing emergency care, inpatient units, outpatient clinics, and specialized medical services. The Saint Joseph's Hospital, located at 130 Bayard Drive in Saint John, provides emergency care, urgent care services, inpatient and outpatient clinics, diagnostic services, and is open daily from 8:30 a.m. to 9:00 p.m.

Community Facilities

The Lorneville Community Centre is located at 1141 Lorneville Road and is the primary hub for social, cultural, and recreational activity in the community. It serves as a gathering place for events, entertainment, and year-round programming. Located adjacent to a children's playground and a multipurpose sports field, the Centre also plays a central role in youth programming. In partnership with the City of Saint John, it hosts a free drop-in summer recreation program that provides supervised outdoor play, games, and crafts for local children, helping to support family needs in the area.

Accommodations

In 2021, Saint John County reported 34,630 households, reflecting a 5.4% increase relative to 2016. The County includes the City of Saint John and adjacent communities such as Musquash, Simonds, and Saint Martins (Statistics Canada 2022b).

Saint John's metropolitan area, which includes the neighbouring communities of Quispamsis, Rothesay, and Grand Bay Westfield, has been experiencing a high demand for rental units. Recent data indicate that the region's vacancy rate has increased to 2.1%, up from its record low of 1.7% in 2022 (CBC News 2026).

The Saint John area has approximately 30 to 40 hotels and motels that can support short-term worker accommodation. The closest accommodations to the Project are concentrated on the west side along Fairville Boulevard, including the Travelodge Suites by Wyndham Saint John, located roughly 8–10 km from Lorneville.

13.2.2.3 Employment and Economy

Employment and Economy baseline conditions for Lorneville are characterized using data from Saint John County and the Saint John Census Metropolitan Area (CMA), as no standalone census subdivision exists for Lorneville within the Statistics Canada framework. These geographic units provide the most appropriate representation of the labour force, population distribution, and economic structure relevant to the community.

Between 2016 and 2021, the City of Saint John's population increased from 67,575 to 69,895 residents, while the population of the Saint John CMA reached 130,613 residents, representing 3.5% growth (Statistics Canada 2022a).

Demographic indicators confirm an aging population profile within both Saint John County and the Saint John CMA. The County recorded a median age of 44 in 2021. Within the CMA, 18.3% of the population fell within the 65–84 age cohort, and the working-age population (15–64) accounted for 64.6% of total residents.

Educational attainment levels in Saint John County are comparable to those observed across the CMA, with 49.5% of residents aged 15 and over holding a postsecondary credential, 34.3% holding a high school diploma only, and 16.2% having no certificate, diploma, or degree; additionally, 18.2% of residents possess a bachelor's degree or higher (Statistics Canada 2022b).

Key employment sectors for the Saint John region include health care and social assistance, retail trade, accommodation and food services, administrative and support services, and education. Industrial activities remain concentrated in port operations, manufacturing, energy production, and transportation logistics. Labour force data for 2021 indicate an unemployment rate of 9.2% within the 25–64 age cohort in the Saint John CMA.

13.3 Potential Effects and Effect Pathways

A summary of the potential effects and Project effect pathways to be assessed for the socio-economic environment is provided in Table 13.1. Potential environmental effects and effects pathways were selected based on the review of similar projects in NB and other parts of Canada, and professional judgement.

Table 13.1 Potential Effects and Effect Pathways for Socio-economic Environment

Potential Effect	Effect Pathway(s)
Change in Land and Resource Use	• Site preparation, vegetation clearing, grading, and construction of data halls, power generation facilities, and the substation may alter existing land uses within the Spruce Lake Industrial Park and along transmission line and natural gas pipeline rights-of-way. • Construction of activities and linear infrastructure development may temporarily affect access to Crown lands, forestry roads, or recreational areas used by residents or local land users. • Noise, traffic, or visual disturbance from construction or operations may create temporary nuisance effects for nearby land users, industrial tenants, or properties (e.g., Burchill Wind Farm workers). • Introduction of new industrial components (transmission structures, pipelines, switchyard) may influence how adjacent lands can be used in the future (e.g., setback requirements, vegetation clearing zones). • Project siting and built form may interact with municipal landuse plans, industrial park planning objectives, or community expectations regarding environmental protection, buffers, and the intensity of industrial activity.
Change in Infrastructure and Services	• Construction workforce and contractor presence may increase demand for local housing, rental units, and temporary accommodations, particularly during peak construction periods. • Delivery of construction materials, prefabricated modules, and heavy equipment may increase traffic volumes and heavy haul movements on King William Road and connecting industrial routes, with potential effects on road users and transportation system capacity. • Project demand for municipal water, wastewater, and stormwater services may interact with municipal servicing capacity.
Change in Employment and Economy	• Construction labour demand may generate short-term employment opportunities for trades, equipment operators, labourers, engineers, and technicians within the Saint John CMA. • Procurement of construction materials, equipment, and services may benefit regional fabricators, transport companies, environmental consultants, and local suppliers. • Longterm operational staffing for the data centre and the power generation facility may create stable, skilled jobs (e.g., IT specialists, facility operators, O&M technicians). • Project expenditures may increase economic activity in Saint John through spending on accommodations, fuel, food services, maintenance contracts, industrial services, and local goods. • Indirect and induced economic effects (housing, retail purchasing, supply chain demand) may occur during construction and operations, contributing to regional economic diversification. • Potential labour-market competition with concurrent industrial projects may create short-term labour-availability pressures within specialized trades.

13.4 Mitigation and Management Measures

The following mitigation measures specific to socio-economic components have been identified for the Project:

13.4.1 Land and Resource Use

- Advance communication will be provided to land users regarding any changes in land access, and alternative access will be offered, where feasible.
- Regular engagement will be maintained with nearby communities, landowners, and stakeholders throughout construction.
- Project updates and opportunities will be shared with Indigenous groups to support transparent and ongoing communication.
- Dedicated community contact mechanisms will be maintained to respond to questions, concerns, and inquiries.
- Traffic management measures are addressed in the Projects Traffic Management Plan, which includes controls to reduce potential effects on land and resource use.
- Refer to Sections 7.4 and 8.4 for mitigation to reduce air and noise emissions, respectively, which will also mitigate effects on land and resource use.
- A Complaint Resolution Procedure will be implemented to address and resolve socio-economic concerns.

13.4.2 Infrastructure and Services

- Coordination with local accommodation providers will occur to avoid unnecessary pressure on regional housing availability during peak workforce periods.
- Demand for municipal services (water, wastewater, stormwater) will be planned in collaboration with the City of Saint John.
- Worker transportation plans (e.g., carpooling, staggered shifts) will be considered to reduce peak-hour volumes, where practical.
- The Project will prioritize hiring locally skilled workers, helping to reduce in-migration and mitigate potential demands on regional housing, community infrastructure, and municipal services.

13.4.3 Employment and Economy

- Local employment and procurement will be prioritized whenever feasible to support regional economic participation and enhance benefits for the Saint John region.
- Engagement with regional training institutions and workforce groups will support awareness of job opportunities and promote local hiring.



13.5 Residual Environmental Effects

Potential environmental effects on the socio-economic environment were identified in Section 13.3. For the socio-economic environment three effects were identified: change in land and resource; change in infrastructure, and services; and change in employment and economy.

Residual effects (i.e., those remaining following implementation of mitigation) for each Project phase are evaluated below.

13.5.1 Change in Land and Resource Use

The Project is located within the Spruce Lake Industrial Park, an area formally designated and zoned for industrial development under the City of Saint John's Municipal Plan and Zoning By-law. This zoning framework anticipates and supports uses of the type proposed by the Project. Required buffers between industrial and residential areas, along with setbacks for higher-risk industrial activities, are currently established in the planning framework. The Project is therefore compatible with existing land-use designations, and its development aligns with the long-term vision for the industrial park expansion.

Adjacent lands within the LAA include mixed rural and industrial resource uses, with informal recreation such as walking, hunting, wildlife viewing, and seasonal ATV/snowmobile use occurring in the broader landscape. These activities reflect general use of rural woodlands rather than designated recreation areas. The Project footprint itself, particularly the Data Centre PDA, is currently situated within a planned industrial area where formal recreational use is limited. For the linear components, the Transmission Line and Pipeline PDAs largely follow existing utility corridors, forestry roads, or previously disturbed access routes; therefore, the Project is not expected to create new permanent access points or open previously inaccessible lands.

Project-related air emissions, fugitive dust, and construction noise could potentially influence nearby land and resource uses; however, these effects will be localized, intermittent, and primarily contained within the PDA. Predicted operational noise levels remain within applicable provincial limits, including nighttime thresholds, and mitigation measures for air and noise will further reduce potential off-site effects.

Access restrictions during construction and operation will be limited to the PDA and required work areas along linear corridors. These restrictions will be temporary and localized and are not expected to interfere with broader recreational use of surrounding lands. The Proponent will provide advance notification of construction schedules, including any temporary road closures or access adjustments, for local residents and land users.

The Project will result in permanent loss of wildlife habitat within the PDA, which may influence recreational activities such as hunting or wildlife observation. However, the affected area is small relative to the broader landscape, and displacement of wildlife is expected to be localized, without population-level effects.

Residual effects on recreational land and resource use are therefore predicted to be low, and the Project is not expected to alter established regional land-use patterns.



13.5.2 Change in Infrastructure and Services

During Project construction, increased movements of passenger vehicles and heavy trucks within the LAA will occur as workers, materials, and equipment are transported using the local road network. These activities may result in temporary and localized interruptions to vehicle and pedestrian access, particularly during peak construction periods.

The total labour force required for construction, including direct and indirect employment, is expected to reach up to approximately 1,200 local employment opportunities. Most of these workers are expected to be drawn from Saint John and nearby communities and therefore will not require additional permanent housing or place measurable pressure on the existing regional housing stock. The Saint John region is characterized by a mature and diverse labour force, with 64.6% of residents aged 15–64, and a broad mix of educational backgrounds that support industrial and service sector employment (Statistics Canada 2021a). Locally hired workers are expected to commute to the Project site.

Should a portion of the construction workforce require temporary accommodations, the Saint John region has an established inventory of hotels and motels, including options located on the west side along Fairville Boulevard, approximately 8 to10 km from Lorneville. These facilities can accommodate short-term stays; however, the region's tight rental market, where vacancy rates have historically remained below 2% (Brunswick Brokers 2022), indicates that longer-term accommodations are limited. Workers requiring extended stays may therefore need to rely primarily on hotel capacity rather than rental housing. Although these facilities provide convenient options for temporary lodging, the scarcity of available rental units suggests that long-term accommodation for workers may remain constrained.

The Project will also interact with municipal services. During operations, the facility will draw on local water and electricity. The City of Saint John has confirmed that it has the capacity to supply the Project's anticipated domestic water needs, and water use is expected to be adequately accommodated by the municipal system. The Proponent will continue coordination with NB Power regarding energy supply, and has indicated it can accommodate anticipated power requirements.

Solid waste generated during construction and operation will be managed in accordance with provincial regulations. Non-hazardous waste will be disposed of at approved off-site facilities. The existing municipal waste services are expected to have adequate capacity for the Project.

Emergency services in the Saint John CMA including fire, police, and medical response, are well-established and serve a regional population of approximately 130,000. The Project is not expected to create demands beyond existing service capacity. Standard health and safety procedures, emergency response coordination, and communication protocols will be in place to avoid significant service disruptions.

During operation and maintenance, the Project is anticipated to have a negligible environmental effect on transportation, infrastructure, and public services. Staffing requirements for these phases will be minimal and are not expected to strain housing availability or community services within the LAA. Workers will be accommodated in the nearby Saint John city centre, where adequate housing, amenities, and services exist to support the operational workforce without affecting local capacity.



13.5.3 Change in Employment and Economy

Project construction is expected to have positive effects on employment and economy through the generation of up to 1,200 direct and indirect employment opportunities, creating short-term jobs for tradespersons, equipment operators, laborers, technicians, engineers, and project management staff. As described in Section 13.5.4, the majority of direct Project workers are anticipated to be sourced locally and commute from within the LAA.

Construction activity will require substantial procurement of materials, equipment, and specialized services, generating economic opportunities for regional suppliers such as fabricators, transport and logistics firms, environmental and engineering consultants, industrial service providers, and local retail and equipment vendors. Project related spending on accommodations, fuel, food services, maintenance, and other local goods and services will further stimulate the regional economy throughout the construction period.

Construction is also expected to generate indirect and induced economic effects, including increased activity in supply chains, retail purchasing, and service industries. These effects contribute to broader regional economic diversification and support the longstanding industrial–service economy of the Saint John CMA. At the same time, high concurrent demand for specialized trades may create short-term labour availability pressures, and contribute to localized wage inflation, depending on the timing of other industrial projects in the region.

Residents, communities, and businesses will be informed of upcoming workforce and procurement needs.

During operations, the Project is expected to support approximately 210 long-term skilled positions, including IT specialists, facility operators, maintenance technicians, and administrative and support staff. These roles provide stable employment within the region and contribute to the development of specialized technical capacity in the local labour force.

Operational spending on utilities, maintenance, contracted services, and local goods will further contribute to the regional economy. Indirect and induced effects, such as increased spending by employees, long-term service contracts, and demand for local suppliers, are expected to provide ongoing economic benefits throughout the Project's operational life.

13.6 Follow-up and Monitoring

A dedicated follow-up and monitoring program is not proposed for the socio-economic environment. However, the Project will implement a Complaint Resolution Procedure to address concerns raised by community members, land users, or other stakeholders over the course of construction and operations. The procedure will:

- Identify a clear point of contact for submitting complaints or inquiries.
- Outline the process for receiving, documenting, and reviewing concerns.
- Establish timelines and responsibilities for responding to complaints.



- Identify actions to mitigate or resolve issues, where appropriate.
- Provide a mechanism to determine whether additional mitigation measures or follow-up monitoring should be implemented in response to validated concerns.

This procedure will address concerns related to socio-economic factors such as land and resource use, traffic, community services, or economic or employment interactions are addressed in a transparent and timely manner.

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14 Assessment of Environmental Effects on Heritage Resources

14.1 Scope of Assessment

Heritage resources are those resources related to 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 present, their integrity is highly susceptible to construction and ground-disturbing activities.

Heritage resources have been selected as a VC in recognition of the interest of provincial and federal regulatory agencies who are responsible for the management of these resources as well as the general public and First Nations communities 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 archaeological, built heritage, and palaeontological resources.

This assessment considers potential changes to heritage resources from the Project. The scope of the assessment is based on applicable regulations and policies, the professional judgment of the Stantec Archaeology Team, and knowledge of potential interactions between the Project and heritage resources.

Project activities that include surface or sub-surface ground disturbance can interact with heritage resources, where they are present. Construction of the Project therefore represents the greatest potential for interactions with heritage resources, as it is anticipated that once constructed, there won't be further groundbreaking activities during the operational phase of the Project.

14.1.1 Regulatory Context

Heritage resources in New Brunswick are regulated under the *Heritage Conservation Act* (2010). The regulatory management of heritage resources is the mandate of the New Brunswick Department of Tourism, Heritage and Culture, and is administered by its Archaeology and Heritage Branch (AHB).

The assessment for heritage resources has been undertaken through the completion of historical, archaeological, built heritage, and palaeontological research. The Province of New Brunswick provides specific guidance for conducting archaeological impact assessments in the Guidelines and Procedures for Conducting Professional Archaeological Assessments in New Brunswick (the "Archaeological Guidelines"; AS 2012). Regulatory requirements for mitigation related to built and palaeontological heritage are determined in consultation with staff from AHB.

Consultation and engagement activities have occurred as part of the heritage resources component of the Project. During the background research for heritage resources, regulatory agencies were contacted to gather information on known and potential heritage resources near the Project.

14.1.2 Assessment Boundaries

The assessment of potential interactions between the Project and Heritage Resources is focused on three PDAs and an LAA. Spatial boundaries are shown in Figure 2.1.

The PDAs represent the anticipated area of direct physical disturbance associated with the construction, operation and maintenance of the Project. For the purposes of this EIA Registration, the Project encompasses three PDAs as described in Section 6.2.3 and shown on Figure 2.1: the Data Centre PDA, the Transmission Line PDA, and the Pipeline PDA, along with a Field Study Area, as the Data Centre PDA was not defined until after the 2025 Archaeological Impact Assessment (AIA). The Field Study Area excludes the Transmission Line PDA and Pipeline PDA.

The LAA for Heritage Resources is defined as the area within which the environmental effects of the Project can be measured or predicted and can be thought of as the theoretical “zone of influence” of the Project on the atmospheric environment. Given that potential interactions with heritage resources are limited to the Project footprint where construction activities are planned, the LAA for heritage resources is the same as the three PDAs.

Temporal boundaries for the assessment are based on the timeframes over which potential effects could occur as a result of Project construction, and operation and maintenance phases as defined in Section 6.2.3.

14.2 Existing Conditions

14.2.1 Approach and Methods

- Information on the existing conditions (i.e., known information) regarding heritage resources was gathered through a combination of documentary research and consultation with Archaeology and Heritage Branch (AHB).

The following sources were consulted to gather an understanding of the general and specific history of the PDA/LAA and Field Study Area:

- Published, unpublished, and online works about local history, the environment, and previous archaeological work carried out in the area.
- The Archaeological Predictive Model (APM) of the Field Study Area, provided by AHB (AHB 2025), which depicts areas with high and medium potential for archaeological resources, based on anthropological, geographic, and geological data. A review of this APM demonstrated that some of the Field Study Area is shown as having potential palaeo-shoreline modelling, resulting in elevated archaeological potential from a desktop analysis.
- Reports on file at AHB (including CRM 2024 and Stantec 2025).
- Representatives from AHB.
- Documents in the Provincial Archives of New Brunswick (PANB).

- Department of Natural Resources historic aerial photographs.
- The Canadian Register of Historic Places and the New Brunswick Register of Historic Places databases.

For information regarding archaeological resources, AHB was contacted ahead of the 2025 AIA to request an APM for the Field Study Area and surrounding areas. The APM presents information from a variety of heritage related and environmental databases, as well as identifies areas determined by the Province that have elevated potential for archaeological resources. Typically, the shoreline areas of all watercourses and coastlines are considered by AHB as having either “high” potential (0–50 m from the watercourse bank or coastline) or “medium” potential (50–80 m from watercourse bank or coastline) for pre-contact archaeological resources. Confluences of any two watercourses are considered to have “high” potential for pre-contact archaeological resources within 100 m from the watercourse banks. Also included are potential palaeo-shorelines that may have been present as early as 13,000-years before present (BP). Together, these areas are referred to in this VC as elevated potential zones. The APM determined that the Field Study Area has watercourse shoreline archaeological areas as well as potential palaeo-shorelines (AHB 2025).

The field component of the AIA consisted of an archaeological field survey (walkover) of the Field Study Area and did not include the Transmission Line PDA and Pipeline PDA. The walkover considered the results of the APM data (AHB 2025), the requirements of the Archaeological Guidelines (AS 2012), as well as the professional judgment of the Stantec Archaeology Team. The walkover consisted of walking transects within the Field Study Area (Figure 14.1) to evaluate the interpretations on the APM and to identify areas of elevated potential for archaeological resources. Where they occurred, these areas were delineated and labeled as “Polygons” using handheld GIS devices with 3 to 5 m accuracy. Polygons are typically identified for avoidance or archaeological mitigation (e.g., shovel testing), where avoidance is not practical.

Built heritage resources are typically identified through a review of federal and provincial databases for built heritage resources and information on the potential for palaeontological resources (i.e., fossils) to be present in bedrock layers of the Field Study Area was gathered from a review of palaeontological and surficial geology literature. The results are described in Section 14.2.2.3 below.

14.2.2 Description of Existing Conditions

14.2.2.1 Previous Studies

Spruce Lake Industrial Park Expansion AIA

A previous AIA was conducted in 2023 to support an Environmental Impact Assessment (EIA) for another project, adjacent to and overlapping the Data Centre PDA (i.e., Spruce Lake Industrial Park Expansion) and a portion of the assessment area for that AIA overlaps with part of the Data Centre PDA (CRM 2024) (Figure 14.1). For the portion of the CRM AIA that overlaps with the Data Centre PDA, no areas of elevated archaeological potential were identified (CRM 2024). It is anticipated that the results and recommendations in the CRM AIA have been approved by AHB and Stantec can rely on the results of

that assessment for this VC. A review of the 2025 APM did not identify any 80 m archaeological buffers around any watercourses within the CRM AIA that are now within the boundary of the Data Centre PDA (CRM 2024; AHB 2025). It is anticipated that no additional AIAs nor any mitigation related to archaeological resources are required within that section of the Data Centre PDA.

Saint John Corridor AIA

Stantec recently completed an AIA in 2024 and 2025 for a transmission line (i.e., Saint John Corridor), a portion of which is parallel to the Transmission Line PDA (Stantec 2026 (pending)). For the portions of the transmission lines that are parallel and overlap with the Spruce Lake Data Centre transmission line, no areas of elevated archaeological potential were identified. Any areas of the Transmission Line PDA that were not previous assessed will be assessed in a new AIA.

14.2.2.2 Environment

The Project is located in the Fundy Coastal Ecodistrict which encompasses the southern coastline of New Brunswick from Passamaquoddy Bay in the west to Shepody Bay in the east, including Campobello Island, Deer Island, and Grand Manan Island. The distinguishing features of this ecoregion are flat, low-lying salt marshes and gently rolling hills between 30 and 80 m elevation to steep, and rugged cliffs between 100 m and 300 m elevation. The surficial geology at this location is comprised of blanket and veneer loamy lodgment till and minor ablation till (Mv2), and associated material deposited directly by glacier ice (NBDNR 2007; Stantec 2016). Typically, these sediments consist of clay, silt, sand, gravel, rubble, and boulders, between 0.5 m and 1 m thick (Rampton 1982).

Figure No.

14.1

Title

Archaeological Impact Assessment Results

Client/Project

121418636-303

Beacon Data Centres Inc.
Spruce Lake AI Data Centre

Project Location

Lorneville,
New Brunswick

Prepared by SC on 2026-02-27
QR by CB on 2026-02-27

N

0 50 100 150 200 250 metres
(At original document size of 11x17)
1:10,000

Legend

- Project Site (Field Study Area)
- Project Development Areas (PDA)
  - Data Centre PDA
  - Pipeline PDA
  - Transmission Line PDA
- Site Plan
  - Estimated Project Footprint
- Archaeology
  - Historically Significant Feature
  - Archaeological Tracklines*
  - Approximate Walkover Coverage
  - Elevated Archaeological Potential Area
  - Elevated Archaeological Potential Buffer (80m)
- Previously Assessed Areas
  - CRM Assessment Area (2024)
  - EIA Registration (Dillon 2025)
- Waterways and Wetlands
  - LiDAR-Derived Watercourse (Stantec 2025)[4]
  - Watercourse (NBHN)
  - Watercourse Flow Direction
  - Waterbody (NBHN)
  - Field-Delineated Wetland (Stantec 2025)
  - Wetland (NBELG)
  - Provincially Significant Wetland
- Other Features
  - Road
  - Contour - 1m (Stantec)
  - Building

Project Location:



Notes

1. Coordinate System: NAD 1983 CSRS New Brunswick Stereographic
2. Data Sources: Beacon Data Centres Inc.; Data License with the Government of New Brunswick (NBDELG, NBNRED, Service NB); New Brunswick Power; Stantec
3. Background: Esri, USGS
4. LiDAR-Derived watercourses produced from GIS desktop analysis to support aquatic fieldwork. Service New Brunswick 1m digital elevation model (DEM) used for analysis.

Stantec

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14.2.2.3 Archaeological Resources

Pre-Contact Period

The Pre-Contact Period is defined as the period of human occupation of the lands of eastern Canada for the entirety of the timeframe from the first arrival of humans, approximately 13,000-years BP, up to the time of contact between these Indigenous populations and the European explorers when they first encountered North America, generally interpreted to be approximately 500- to 1000-years BP.

Archaeological evidence from Pennfield, New Brunswick, approximately 40 km west of the Project, indicates that the first peoples (Sagiwe'k Lnu'k or "Ancient Ones" in the Mi'kmaq language) to inhabit modern day New Brunswick likely arrived in the region at the end of the Pleistocene roughly 12 to 13,000-years BP (Dignam et al. 2012; Suttie et al. 2013). The retreating glaciers would have opened the land for human occupation and early Indigenous populations could have settled in the vicinity of the Project shortly thereafter. As the earliest period of human occupation in New Brunswick, the Palaeoindian Period from 12,000- to 8,000-years BP (Deal 2023) occurred during a time of extreme environmental and geographic change in the region immediately following the melting of glaciers, the exact nature of which is not well understood. At the end of the last glaciation, a general warming trend began and the glaciers that covered this region began to break apart. By 12,000-years BP, most of the interior portions of New Brunswick were ice-free although the Project location was likely submerged under water until 10,000-years BP (Shaw et al. 2002). The mixture of glacial lake mosaics, incremental forest development, and open habitats during this period created favourable conditions for caribou herds (Newby et al. 2005) and a number of other small and large mammals, which are believed to be the primary food sources for people moving into the area at that time.

The Maritime Archaic Period (8,000- to 3,000-years BP) starts at the end of the Palaeoindian Period and extends until the beginning of the Woodland Period (3,000- to 500-years BP) (Deal 2023). The Archaic Period is further subdivided based on changes in material culture, particularly tool type, into different periods (Early, Middle, Late, and Terminal). The Archaic Period is usually identified by the presence of tools that differ from those of the Palaeoindian Period. A higher proportion of ground stone tools relative to flaked stone tools are characteristic of the Archaic Period (Robinson 1992). Animal remains recovered from Archaic period archaeological sites suggest a focus on living near interior waterways and wetlands (Robinson 1992; Petersen 1991; Spiess and Mosher 2006). Other Archaic period sites are located on the floodplains of major watercourses and on the margins of lakes and wetlands (Suttie 2005; Tuck 1993).

The current inventory of archaeological sites in the province reveals that most Pre-Contact sites have been dated to the Maritime Woodland Period (3,000- to 500-years BP), based on the type of stone tools identified as well as evidence from style and dates of pottery found (Petersen and Sanger 1993; Rutherford 1993). Like the Archaic Period, the Woodland Period is subdivided (Early, Middle, and Late Woodland) based on changes in material culture over time. During this period, the climatic and geographic conditions of New Brunswick were analogous to those of the present. The environmental conditions in which Woodland Period sites have been found vary widely. Stantec is aware of at least two pre-contact archaeological sites of undetermined age within 3 km of the PDA (BhDm-11 at Seely Point and BgDn-1 at Maguires Cove). While undoubtedly the peoples from all pre-contact time periods were the

ancestors of Indigenous populations currently living in the province, it is in the Woodland Period that archaeologists begin to identify this population as the direct descendants of the Peskotomuhkati, Wolastoqey, and Mi'kmaq groups currently living in New Brunswick. Recent research, however, has placed renewed emphasis on a cultural continuum from earlier periods while also pointing to a more complex and fluid cultural landscape for the northeast Atlantic region, as a whole (Holyoke and Hrynick 2022).

The Project lies within the traditional territory of the Indigenous people of the Mi'kmaq, Peskotomuhkati and Wolastoqey First Nations. The Wolastoqey First Nation's territory is largely defined by the drainage area of the Saint John River, which they originally named the Wolastoq, or "beautiful river" (Perley and Blair 2003). The territory surrounding the mouth of the Wolastoq from 1600 onwards was not the exclusive hunting ground of any Indigenous group, rather an intercultural borderland, shared by two or more Indigenous groups. This was especially the case during the French fur trade (Marquis 2008). Portage routes from Saint John to the Passamaquoddy Bay suggest a high probability that the Saint John area was used by different Indigenous groups (Ganong 1899; Moran 2015), with detailed ethnographic sketches of Wolastoqey, Peskotomuhkati and Mi'kmaq travelling in different canoes in southern New Brunswick (Mallery 1894). This also includes the Mi'kmaq from Bear River who harvested porpoises and sold the oil at Saint John (Marquis 2008).

The Saint John area is traditionally known as Manwagonessek in Wolastoqiyik culture and is interpreted to have the meaning of "a place for clams" or "where they collect dead seals" (Ganong 1896; Lnu Place Names in New Brunswick 2024). Samuel de Champlain's 1604 map of the approaches to Saint John Harbour shows the locations of Indigenous inhabitants of this area. In the area of Mispec, the images show three Indigenous people with spears beside a grazing caribou (Wright 2008). Robert Campbell's 1788 map of Saint John identifies the entire Mispec area as "Caribou Plains". The presence of Caribou, among other flora and fauna in the Mispec area, would have attracted Pre-Contact Indigenous populations (Stantec 2016). Other place names identified outside the Project area is the Wolastoqiyik name for Red Head, Squasodek, interpreted as a "landing place or look out", and the Peskotomuhkati name for Musquash Harbour, Tlunquahdik, meaning "a treaty place" (Lnu Places Names of New Brunswick 2024). It is interpreted that since the lower portion of the Wolatoqey River Valley and the Saint John area witnessed a high level of activity from Indigenous peoples during the Pre-Contact and Historic periods, there are likely hundreds of pre-contact archaeological sites outside the PDAs.

Welamukotuk (formerly Oromocto First Nation) is the closest First Nation community to the Project and is situated approximately 78 km north of the Project.

Historic Period

The Historic Period is defined as the period from the arrival of mostly European-derived peoples to North America, approximately 500-years BP, until the modern era.

The year 1604 also marked the first time Europeans discovered the mouth of the Saint John River (Wolastoq) while Champlain conducted his reconnaissance of the Bay of Fundy which happened to coincide with the feast day of Saint-Jean-Baptiste. The mouth of the Saint John River provided a strategic location during the Acadian Civil War (1635-1654) and, under the administration of Charles de Saint-Étienne de la Tour, Fort Sainte Marie (also known as Fort La Tour) was built on the east side of the river in 1631 (MacDonald 1983).

Following the expulsion of the Acadians in 1755, most, if not all, of the Acadian settlements along the Wolastoq were destroyed by 1758 (Gordon and Grant 1975). After the end of the American Revolution in 1783, large tracts of land were made available in Nova Scotia (which at the time included the land of what is now the province of New Brunswick) to those forced to leave the United States because of their loyalty to the British Crown. A considerable number of settlers, Loyalists, and others of European descent established themselves up and down the Wolastoq River valley during this time. The main section of the settlement was called Parr Town, named after John Parr (1725-1791), governor of the Province of Nova Scotia from 1782-1791. Following the arrival of the Loyalists, the Province of New Brunswick was created and separated from Nova Scotia. The western section of the City of Saint John was named Carleton, in honor of Sir Guy Carleton, 1st Baron of Dorchester (1724-1808). It was renamed Saint John by Ward Chipman in May 1785 and received a royal charter in 1785, making it the first incorporated city in Canada (PANB 2025). The area of Millidgeville is named after Thomas Millidge (1776-1838), a merchant, magistrate and member of the Legislative Assembly of New Brunswick and Thomas Edward Millidge (1814-1894), who was a shipbuilder for 33 years. By 1898, Millidgeville had one post office, four stores, one hotel, one church, one hall, one sawmill and a population of 350. It is now part of the City of Saint John (PANB 2025).

By the 1830s the lumber industry was flourishing, and a sawmill had been built at the mouth of the Mispec River to support the shipbuilding industry in the City of Saint John. Much of the lumber from this region was exported to Britain (Stantec 2016). By 1871, Saint John was the fourth largest city in the Dominion of Canada and had a population of 45,000 people. Businesses in Saint John flourished throughout much of the 19th century while the rural hinterland remained stagnant (Buckner and Reid 1994). The city's prosperity, however, was cut short when the Great Saint John Fire of 1877 destroyed two-fifths of the city, including a large portion of the central business district.

In 1898, the City of Saint John was a port of entry, a major centre of lumber manufacturing and export, and a centre where several railways connected. There were cotton and lumber mills, rolling mills, brass foundries, iron foundries, nail factories, machine shops, sash and door factories, tannery and shoe factories, nail factories, furniture stores, lead and paint works, breweries, pork-packing operations, vinegar factories, fish packing plants and soap factories (PANB 2025). Lorneville, which today is within the City of Saint John limits, was first called Pisarinco and settled in 1854. It was originally a fishing, farming, and lumbering community with approximately 60 families. By 1898, Pisarinco had a population of 1,000 and was renamed Lorneville in 1902 (PANB 2025).

Results of the 2025 Archaeological Impact Assessment

Figure 14.1 presents the scope of the field assessment completed in 2025 (approximate walkover coverage). The remaining areas within the PDAs (excluding the overlapping CRM (2024) assessment area) that will be impacted by construction activities, and hence where archaeological resources, if present, could be impacted will be subject to a field assessment in the Spring of 2026. This includes some areas of the data centre footprint, the portions of the new transmission line not already recently assessed by Stantec, and the RoW for the new gas pipelines.

The purpose of the archaeological walkover assessment was to evaluate the information presented on the APM focusing on areas of elevated archaeological potential (AHB 2025), as well as to provide additional evidence for the APM finding of low archaeological potential. It is noted that the results presented here are for the archaeological walkover completed to date, and that additional walkover is required for the Project scheduled to take place in the spring of 2026.

The APM did not identify any known archaeological sites or resources within the Field Study Area; however, the Model indicated the possible presence of palaeo-shoreline areas across a considerable portion of the Field Study Area. The southern boundary of the Data Centre PDA touches upon locations of elevated archaeological potential based on the proximity of Marsh Brook. The 2025 AIA identified 19 areas of elevated archaeological potential and one potential Historically Significant Feature (HSF) within the Field Study Area. However, only 14 elevated potential areas and one potential HSF remain within the Data Centre PDA (Figure 14.1). Several modern debris piles and the remains of hunting stands or wooden cabins (all interpreted to be early to mid 20th century) were noted throughout the Data Centre PDA. They are not interpreted to be archaeologically significant. Much of the PDA is forested with numerous wetland areas, old woods roads, and ATV trails. Some areas of the PDA were subject to Historic Period tree harvesting activities as noted by the presence of skidder trails, piles of cut wood, and gas and oil cans.

Due to the unsuitable terrain and topographical conditions, much of the PDA was determined to have low potential for archaeological resources. There conditions included steep slopes, low wet saturated ground, wetlands, surface or near-surface bedrock, and very uneven terrain with shallow soil development. Such locations were assessed as unlikely to be suitable for Pre-Contact or Historic period human settlement or habitation. However, the AIA did identify 19 areas of elevated archaeological potential with well drained, flat or mildly hummocky forested terraces near the shorelines of mapped and field identified watercourses or were within the potential palaeo-shoreline modelling on the APM (AHB 2025), and thus potentially suitable for habitation or use be peoples from the past. Only 14 of these elevated potential areas are within the Data Centre PDA. Out of those 14 elevated potential areas, only five elevated potential areas (Table 14.1) are anticipated to be impacted based on the facility layout. One potential historically significant feature (HSF) was also identified during the AIA (CKM-HSF-001); this is located in the northeastern portion of the Data Centre PDA (Figure 14.1). This HSF consists of a wooden structure with only timbers remaining and potential 19th – 20th century metal debris scattered on a bedrock surface. Approximately 30 m southeast of CKM-HSF-001, there is a 20th century lean too/camp structure with a metal stove pipe protruding from the top of the lean-to. It is unknown if this is associated with CKM-HSF-001. It is interpreted to not be archaeologically significant.

The areas of elevated archaeological potential identified during the 2025 AIA are presented in Table 14.1.

Table 14.1 Areas of Elevated Archaeological Potential and Potential HSFs within the Data Centre PDA to Date

Elevated Archaeological Potential Area	Description	Anticipated to Be Impacted by Construction
CKM-POLY-001	Medium potential palaeo-shoreline area on a bedrock knoll.	Yes
CKM-POLY-002	Medium potential palaeo-shoreline area that is relatively flat and dry in a cedar forest.	Yes
CKM-POLY-005	Medium potential palaeo-shoreline area that is relatively flat and overlooks a gradual down slope.	No
CKM-POLY-006	Medium potential palaeo-shoreline area that is relatively flat and overlooks a gradual down slope.	No
CKM-POLY-007	High potential flat terrace adjacent to Marsh Brook and borders WC-05.	No
CKM-POLY-010	High/medium potential palaeo-shoreline area that is relatively flat and overlooks WC-02b.	No
CKM-POLY-011	Medium potential palaeo-shoreline area that has a raised terrace over a gentle slope and borders WC-03b.	No
CKM-POLY-012	High/medium potential palaeo-shoreline area that has a flat terrace and borders WC-01a and WC-01b.	No
CKM-POLY-013	Medium potential palaeo-shoreline area on a raised knoll.	Yes
CKM-HSF-001	Potential remains of log cabin and metal debris.	Yes
CRB-POLY-001	High potential shoreline terrace overlooking WC-02b.	No
CRB-POLY-003	Medium potential palaeo-shoreline area overlooking a spruce bog and wetland.	No
CRB-POLY-004	High potential terrace with raised banks overlooking WC-07.	No
CRB-POLY-005	Medium potential palaeo-shoreline area with dry ground overlooking WC-07.	Yes
CRB-POLY-006	Medium potential palaeo-shoreline area overlooking a spruce forest and bedrock knoll.	Yes

14.2.2.4 Built Heritage Resources

A search of the Canadian Register of Historic Places (CRHP 2025) and the New Brunswick Register of Historic Places (NBRHP 2025) found that there are no registered historic places or heritage sites within the three PDAs. Therefore, as there will be no interaction with the Project, built heritage will not be considered further in this assessment.

14.2.2.5 Palaeontological Resources

No specific palaeontological study has been undertaken for this Project. It is known that there are rock formations in proximity, and perhaps within the three PDAs, that could contain palaeontological resources (i.e., fossils) (NBDNR 2007).

14.3 Potential Effects and Effect Pathways

A summary of the potential effects and Project effect pathways to be assessed for Heritage Resources is provided in Table 14.2. Potential environmental effects and effects pathways were selected based on the review of similar projects in NB and other parts of Canada, and professional judgement.

Table 14.2 Potential Effects and Effect Pathways for Heritage Resources

Potential Effect	Effect Pathway(s)
Change in heritage resources	Disturbance or alteration of whole or part of a heritage resource resulting from Project ground disturbance during construction, and that is not mitigated.

There is the potential for the Project to interact with Heritage Resources during the following activities:

- Site Preparation
- Access Road Construction
- Equipment Mobilization, Installation, and Construction
- Transmission line construction
- Natural gas pipeline construction

Heritage resources are located on or immediately beneath the ground surface and because these resources are static and finite, Project interactions that may affect heritage resources are restricted to physical works that are associated with ground disturbance and are associated with the construction phase. Therefore, potential environmental effects are anticipated during construction only. Operation and maintenance activities are not anticipated to require further ground disturbance and therefore, not anticipated to interact with heritage resources. Similarly, start-up and commissioning, site clean-up and reclamation will not result in ground disturbance outside the PDA and therefore are not anticipated to interact with heritage resources.

14.4 Mitigation Measures

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

- Complete the walkover of the PDAs not assessed in 2025, including the transmission line and pipeline RoWs.
- Implement archaeological shovel testing in areas of identified elevated archaeological potential (Figure 14.1) that cannot be avoided by the Project.
- Implement exploratory archaeological shovel testing around the potential HSF CKM-HSF-001, if this location cannot be avoided by the Project to determine if this feature warrants registration as an archaeological site.
- If this testing results in Registration, then an application for a Site Alteration Permit (SAP) will be required for ground disturbing works within 100 m of the HSF. It is recommended that the conditions listed on the SAP be adhered to.
- Implement archaeological monitoring during construction activities in areas of elevated archaeological potential. where pre-construction shovel testing is not practical
- Implement additional mitigation (e.g., archaeological excavation), as warranted. if significant heritage resources are discovered during the shovel testing. This additional mitigation is to be developed in consultation with provincial regulators and First Nations communities, as applicable
- Develop an Accidental Discovery of Heritage Resources Contingency Plan that includes the unplanned discovery or archaeological and palaeontological resources and follow this during the construction phase of the Project, in consultation with provincial regulators and Indigenous communities, as applicable.

14.5 Residual Environmental Effects

As heritage resources are static and situated on or beneath the ground surface, initial ground disturbance during construction activities has the greatest potential to adversely affect heritage resources, if present. With the planned mitigation presented in Section 14.4, is it anticipated that the potential for heritage resources to be impacted by the Project will be investigated and that where significant heritage resources are present, they will be avoided or mitigated.

The 2025 walkover identified nineteen areas of elevated archaeological potential and one potential HSF (Figure 14.1) within the Field Study Area. Based on the design of the Project at the time of writing the EIA, construction activities appear to interact with only five areas of elevated archaeological potential and the one potential HSF including: CKM-POLY-001, CKM-POLY-002, CKM-POLY-013, CKM-HSF-001, CRB-POLY-005 and CRB-POLY-006. Archaeological shovel testing of these locations will be implemented prior to construction to determine if archaeological resources area present. Those areas of the PDA not subject to walkover in 2025, including the routes for the natural gas pipeline and transmission line, will be assessed in 2026, prior to construction. Areas of elevated archaeological potential within the data centre, transmission line, and/or the pipeline, if identified, will be subject to

archaeological shovel testing prior to construction. If significant archaeological resources are identified within the footprint of any of these Project locations, these resources will be mitigated (e.g., documented and/or excavated under an AFRP) in consultation with AHB, and First Nations, as applicable, prior to construction.

As interactions will be limited to the three PDAs where Project-related ground disturbance could occur, these additional investigations will mitigate the potential for adverse interactions between the Project and heritage resources. The Accidental Discovery of Heritage Resources Contingency Plan will be implemented in the unlikely event of an unplanned discovery of a heritage resource such as an artifact or fossil during the construction phases of the Project where ground disturbance is required. Therefore, with the implementation of mitigation measures outlined in Section 14.4, residual environmental effects from the Project on heritage resources are not anticipated.

14.6 Follow-up and Monitoring

As noted in Section 14.5, additional archaeological surveys will be conducted prior to construction. If significant archaeological resources are identified within the footprint of any of these Project locations, these resources will be avoided or mitigated (e.g., documented and/or excavated under an AFRP) in consultation with AHB, and First Nations, as applicable, prior to construction.

Given that the required mitigation for archaeological resources and the commitment to complete the supplemental field work noted in Section 14.5 prior to construction, as well as the development of and adherence to an Accidental Discovery of Heritage Resources Contingency Plan, no follow-up is proposed for Heritage Resources for the Project.

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15 Assessment of Environmental Effects on Indigenous Land and Resource Use

This section assesses the potential interactions between construction, and operation and maintenance of the Project and Indigenous Land and Resource Use.

15.1 Scope of Assessment

Indigenous Land and Resource use has been selected as a VC in recognition of the constitutionally protected rights of Indigenous Peoples and in recognition of their current and historical use of land and resources as an integral part of their lives and culture. This VC includes the practices of hunting, trapping, fishing, and gathering, as well as the use of ancestral lands to follow Indigenous customs, practices, and traditions. In this VC, the current and historical use of land by Indigenous Peoples refers to the use of land and resources for traditional purposes within the last 100 years of “living memory”. This assessment is limited to the PDA, as this is the area that will be directly affected by Project activities.

For the assessment of potential effects of the Project on the use of the PDA by Indigenous Peoples prior to 100 years ago, the reader is referred to the Heritage Resources VC (Section 14), where such use would result in archaeological sites that may have been created during earlier timeframes.

Indigenous Peoples in Canada 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). All watercourses within the PDAs are also considered Crown land due to the riparian rights of access and use by all members of the public including Indigenous People and their ability to access, gather, and hunt/fish, within these watercourses is included in this assessment. Activities that may be taking place on privately owned land within the PDAs are anticipated to be incidental (i.e., at the discretion of the private landowner and subject to landowner permission) and are not considered in this assessment.

The Proponent is currently engaging with Indigenous communities regarding the Project as well as the Provincial umbrella organizations representing the Indigenous communities in New Brunswick. Should information regarding land and resource use be identified during the consultation and/or EIA process, this information will be taken into consideration in Project planning as the Project advances. The assessment of effects in this VC has been made based on data and information available at the time of writing and provides general information about possible land and resource use activities that may be carried out by Indigenous persons (as informed by general knowledge). A dedicated traditional knowledge study has not been undertaken for this Project. This chapter does not presume or replace information that has been made available to the Proponent in confidence or that may become available through further engagement with Indigenous communities and organizations.

Activities associated with the construction, operation and maintenance of the Project can interact with Indigenous land and resource use within the PDA by limiting access to the land and/or by causing adverse environmental effects on populations of species and/or habitats of importance for Indigenous land and resource use activities.

15.1.1 Regulatory Context

In Canada, federal and provincial regulatory agencies have a duty to consult with Indigenous Peoples prior to carrying out any activity or authorization that might infringe upon Indigenous treaty rights. In New Brunswick, the Department of Indigenous Affairs (NBDIA) operates under the mandate to provide guidance and direction to the provincial government and government departments on consultation with the First Nations of New Brunswick. NBDIA can also provide guidance to proponents engaging with New Brunswick's Indigenous Peoples about their respective projects.

As presented in the *Guide to Environmental Impact Assessment in New Brunswick* (NBDELG 2023), pursuant to Section 5(2) of the New Brunswick Environmental Impact Assessment Regulation 87-83, proponents are required to describe cultural activities, hunting, fishing, gathering, and traditional uses by First Nations, take these uses into consideration in terms of their interactions with the Project, and describe the mitigation to address adverse interactions.

15.1.2 Assessment Boundaries

The assessment of potential interactions between the Project and Indigenous Land and Resource Use is focused on three PDAs and an LAA. Spatial boundaries are shown in Figure 15.1.

The PDAs represent the anticipated area of direct physical disturbance associated with the construction, operation and maintenance of the Project. For the purposes of this EIA Registration, the Project encompasses three PDAs as described in Section 6.2.3 and shown on Figure 2.1: the Data Centre PDA, the Transmission Line PDA, and the Pipeline PDA.

The LAA is defined as the area within which the environmental effects of the Project can be measured or predicted and can be thought of as the theoretical "zone of influence" of the Project on Indigenous land and resource use activities. For a potential change in Indigenous land and resource use, the LAA is defined as a 500 m buffer around each of the three PDAs, with a focus on Crown lands (Figure 15.1).

Temporal boundaries for the assessment are based on the timeframes over which potential effects could occur as a result of Project construction, and operation and maintenance phases as defined in Section 6.2.3.

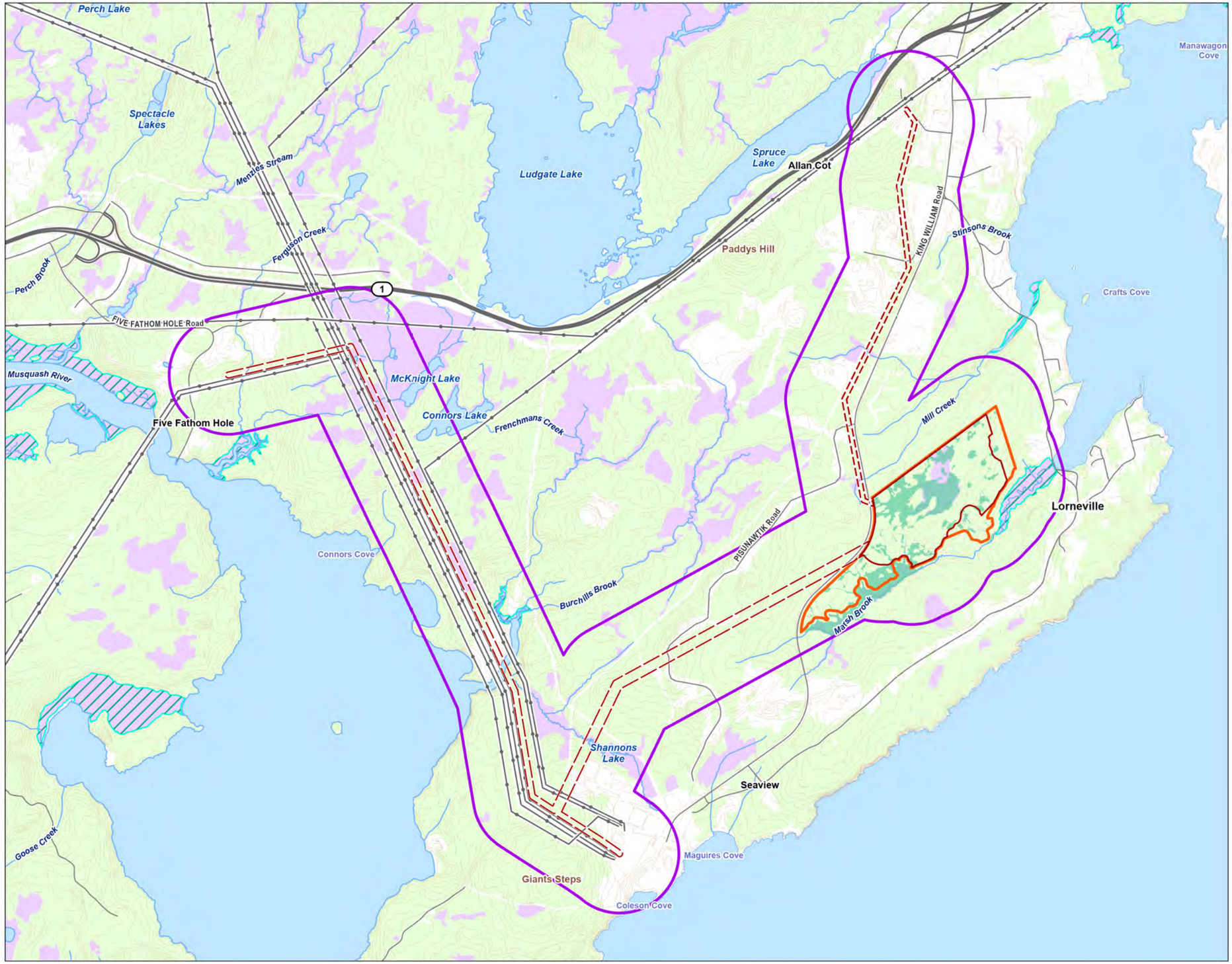


Figure No.
15.1

Title
Indigenous Land and Resource Use Spatial Boundaries

Client/Project
121418636-014
Beacon Data Centres Inc.
Spruce Lake AI Data Centre

Project Location
Lorneville,
New Brunswick

Prepared / Revised by SC on 2026-03-13

N

0 0.5 1 1.5 km
(At original document size of 11x17)
1:35,000

Legend

- Local Assessment Area
- Project Site (Field Study Area)

Project Development Areas (PDA)

- Data Centre PDA
- Pipeline PDA
- Transmission Line PDA

Other Features

- Transmission Line (Existing)
- Highway
- Collector Road
- Local Road

Waterways and Wetlands

- Watercourse (NBHN)
- Field-Delineated Wetland (Stantec 2025)
- Wetland (NBELG)
- Provincially Significant Wetland
- Forested Area



Notes
1. Coordinate System: NAD 1983 CSRS New Brunswick Stereographic
2. Data Sources: Beacon Data Centres Inc.; Data License with the Government of New Brunswick (NBDELG, NBNRED, Service NB); New Brunswick Power; Stantec
3. Background: Esri, CGIAR, USGS

Stantec

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C:\01181-gp\fsd1\work\group\121\active\121418636\11_environmental\2_drawings\3_draft_figures\APRX\1 Constraints_OpenHouse_Mapping\121418636 Beacon Lorneville Constraints.aprx Revised: 2026-03-27 By: schubbs

15.2 Existing Conditions

15.2.1 Approach and Methods

Engagement for this Project with the Indigenous Peoples of New Brunswick has been initiated by Voltagrid/Beacon and will continue into the future. In a virtual meeting held with Mi'gmawe'l Tplu'taqnn Incorporated (MTI), MTI indicated that the Project may infringe upon lands that are considered by them to be unceded Indigenous territory, not solely municipal land, and advised that MTI will not support any loss of its unceded territory. A Mi'gmaq Rights Impact Assessment (MRIA) process has been initiated (Section 4). The exact nature, scope, and detail of Indigenous engagement is determined by the Indigenous communities and organizations involved. The basis for the assessment of potential environmental effects to Indigenous land and resource use is derived primarily from information included in other VCs. For example, information reported in Fish and Fish Habitat (Section 10), Vegetation and Wetlands (Section 11), and Wildlife and Wildlife Habitat (Section 12) regarding the presence of wildlife species and their associated habitats, and land cover types was used to inform the assessment of fishing, hunting, trapping and other traditional activities in the vicinity of the Project. This information has been combined with information from a literature review, past project and engagement experience with Indigenous communities, and the professional judgment of the Stantec study team.

15.2.2 Description of Existing Conditions

There are fifteen First Nations communities within the province of New Brunswick, consisting of six Wolastoqey Nation communities and nine Mi'kmaq Nation communities. In addition to these fifteen communities, there is one other distinct, self-governing community belonging to the Peskotomuhkati Nation at Skutik (St. Andrews, New Brunswick). The Government of New Brunswick is currently working with this Peskotomuhkati community towards their official recognition as a First Nation community in New Brunswick and Canada. Based on ethno-historical accounts, oral histories, archaeological research, and historical texts, Wolastoqey, Mi'kmaq, and Peskotomuhkati nations and their ancestors have lived on and used the land and resources of what is now New Brunswick, since the retreat of the glaciers approximately 13,000 years ago. There are no current First Nation communities located within the PDAs. The closest Indigenous community to the PDA is Welamukotuk (formerly Oromocto First Nation) located approximately 75 km north of the PDA.

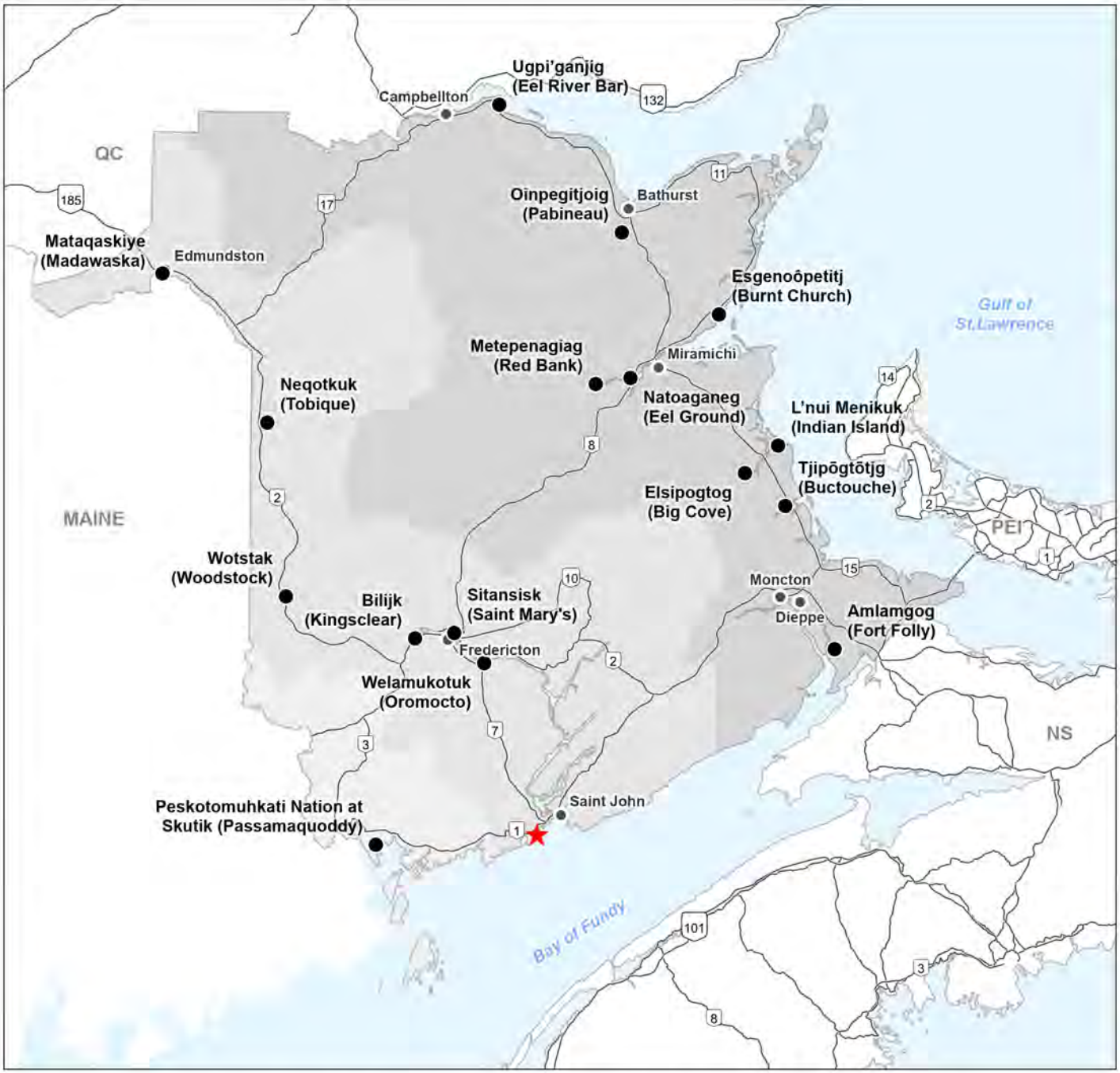


Figure No.
15.2

Title
Indigenous Communities in New Brunswick

Client/Project
Beacon Data Centres Inc.
Spruce Lake AI Data Centre

121418636-007

Project Location
New Brunswick, Canada

Prepared by SC on 2026-02-18

N

0 25 50 km
(At original document size of 8.5x11)
1:2,600,000

Legend

- Project Location
- First Nation
- Mi'kmaq Territory
- Wolastoqiyik Territory
- Peskotomuhkati Territory

Other Features

- Populated Centre
- Major Road

Notes
1. Coordinate System: NAD 1983 CSRS New Brunswick Stereographic
2. Data Sources: Government of New Brunswick, New Brunswick Power; Wolastoqey Nation; Mi'gmawe'l Tplu'taqnn Inc.
3. Background: ESRI; Government of New Brunswick

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The PDAs and LAA spans the traditional territories of the Wolastoqiyik (Wolastoqey), Peskotomuhkati and Mi'kmaq First Nations in areas that have been used for hunting, fishing, gathering and travel within and outside their respective territories. Wolastoqey territory is largely defined by the drainage area of the Saint John River, which they call the Wolastoq, or "beautiful river" (Perley and Blair 2003). Peskotomuhkati territory includes parts of Maine, USA, and New Brunswick and is largely defined by southwest New Brunswick's Passamaquoddy Region and was believed to have extended as far east as Point Lepreau ("Map No. 12" in Ganong 1899). Mi'kmaq territory includes all of Nova Scotia, Prince Edward Island, the Gaspé Peninsula in Quebec, and eastern portions of New Brunswick. While ethnohistoric maps like Ganong's "Map No. 12" (1899) depict sharply delimited territorial boundaries, these are most likely post-Contact Period constructs that obscures a more fluid reality. More recent research suggests that the territory surrounding the mouth of the Wolastoq was not the exclusive hunting ground of any one group, but rather an intercultural borderland involving the dynamic movements of all three (Marquis 2008; Moran 2015).

The documented history of the Wolastoq drainage area and the surrounding Indigenous communities, published by THRIVE Consulting (2015), details the deep spiritual and cultural connection of local Indigenous groups to the land and local resources. Not only was the Wolastoq important for fishing, but the adjacent lands were also highly valued since they provided resources to build essentials (e.g., canoes, housing, tools, pottery) and resources for ceremonial purposes, and the lands were used to hunt, trap, and gather (Perley 2005). Different resources were used depending on the season. For example, in the spring, maple tree sap was collected in bark containers. Early Europeans noted that sap was used to quench thirst (Timmins et al. 1992). During late spring and early summer, fiddleheads were abundant and harvested along streams and on many islands within the Wolastoq for consumption and for selling at local markets (Maliseet Nation Conservation Council 2011). In a spoken history study, participants recounted participating in fiddlehead harvesting in the month of May and annual temporary camp sites were established for this activity (Perley and Blair 2003).

In addition to fiddleheads, the Wolastoqey were known to gather other plants within the Wolastoq watershed for consumption, medicinal, and ceremonial purposes. Some of the plants that were harvested include calamus roots (*Acorus americanus*), wild onions (*Allium spp.*), sweet grass (*Anthoxanthum hirtum, Anthoxanthum nitens),* and wild rice (*Zizania aquatica/Zizanica palustris*) (Maliseet Nation Conservation Council 2011) as well as hemlock bark (*Tsuga canadensis*) (Perley and Blair 2003). In the summer, sweet grass was used in basket making, as were white ash *(Fraxinus americana*) and black ash (*Fraxinus nigra*) trees. Large baskets were sold to farmers for gathering produce and fish, and for use as pack baskets and clothes baskets. Smaller and more ornate baskets were made for storing sewing supplies, combs, handkerchiefs, or were sold as decorative Easter baskets (Perley and Blair 2003). Baskets were often used for trading with local farmers and residents along the Wolastoq; however, Wolastoqey people themselves also used them. In exchange for the baskets, farmers provided goods such as eggs, potatoes, salt pork, beef, and produce. Cedar (*Cedrus spp.)* and birch (*Betula spp.)* trees were used commonly to build canoes. Maple (*Acer spp.),* butternut (*Juglans cinerea*), and ash wood were often used to make paddles. Boiled pine (*Pinus spp.)* resin was made into pitch for sealing and mending canoes (Timmins et al. 1992). Black ash, white ash, and other tree species were used for furniture making, string, and axe handles. Alder (*Alnus spp.),* maple, willow (*Salix spp.),* and birch bark were also used for furniture making.



15.2.2.1 Fish and Fish Habitat

The Project is in the West Fundy composite watershed, east of the Musquash River (NBDNRED 2012). The watercourses crossed by the Data Centre PDA contain tributaries of Marsh Brook along the southern boundary of the Project and Mill Creek just to the north of the Project boundary (Figure 10.2 in Section 10.2). As per Section 10.2 (Fish and Fish Habitat) and for the purposes of the assessment, it was determined that no fish-bearing watercourses were found within the Data Centre PDA. There were seven watercourses which flow out of the Data Centre PDA and into Marsh Brook or Mill Creek which have the potential to seasonally support freshwater fish populations in their lower reaches due to connectivity with larger watercourses. These watercourses may support fish populations in the LAA which provide the opportunity for small scale recreational or Indigenous fisheries in Marsh Brook and Mill Creek. Field assessments conducted in support of the Project have identified American eel (*Anguilla rostrata*) and brook trout (*Salvelinus fontinalis*) in Mill Creek (Dillon 2024) and brook trout and mummichog (*Fundulus heteroclitus*) in Marsh Brook (Section 10), which, while not in the Data Centre PDA, does fall within the LAA for this VC. The remaining watercourses of the Data Centre PDA were determined not to contain fish habitat because they were considered overland drainages, had no visible channel, no connectivity to fish-bearing water, or a combination of these characteristics (Section 10). The proposed Transmission Line PDA and proposed Pipeline PDA were not surveyed during the 2025 field surveys (Section 10); however, they were interpreted through topographic mapping and publicly available LiDAR to estimate potential to contain fish habitat. Twenty-seven watercourses/ waterbodies were identified in the Transmission Line PDA, and 15 watercourses were identified in the Pipeline PDA. Field surveys are planned for 2026 at these watercourses to determine fish presence and the potential for fish habitat (Section 10).

All watercourses within the three PDAs are considered Crown land and thus include riparian rights by all members of the public including Indigenous persons. For those fish bearing watercourses, brook trout was the most common and abundant species, while both American eel and brook trout are anticipated to be candidates for Indigenous harvesting based on the field studies completed to date.

15.2.2.2 Vegetation and Wetlands

Information on habitat types and plant species within the Project PDAs and LAA was gathered through a combination of a literature review, field studies, and desktop information using topographic mapping and publicly available LiDAR. Field studies completed in 2025 of the early Data Centre PDA determined the presence of 11 tree species that are understood to be culturally important to Indigenous Peoples including Black Ash, Speckled Alder (*Alnus incana*), Red Maple (*Acer rubrum*), Upland Willow (*Salix humilis),* and various birch (*Betula spp.*) and pine (*Pinus spp.)* species (Timmins et al. 1992). Habitat conditions within the transmission line and pipeline PDAs were evaluated through aerial imagery interpretation and review of forest inventory and geological information, and there are anticipated to be some plants in those PDAs that are used by Indigenous People (e.g., Sweetflag, hair and vanilla sweetgrass) (Section 11; Maliseet Nation Conservation Council 2011). These areas will be field assessed in 2026.



Many of the tree species have historically been and continue to be used for furniture making, string, and tool handles due to their bendable bark while others are documented to be used by Indigenous People for consumption, medicinal, and ceremonial purposes (Maliseet Nation Conservation Council 2011; Perley and Blair 2003; Timmins et al. 1992). Black ash (wiskoq in the Mi'kmaq language) has been identified within the PDA which is a species of importance to Indigenous communities (COSEWIC 2018). The wood from this tree is prized for its high bendability and is ideal for making barrel hoops, furniture, snowshoe frames, and canoe ribs, and it continues to be used today for these items as well as Indigenous basketry.

15.2.2.3 Wildlife

Many wildlife species were observed directly or indirectly (e.g., scat, footprints) near the Project area during recent field surveys including., American Black Bear (*Ursus americanus*), Moose (*Alces alces*), White-tailed Deer (*Odocoileus virginianus*), American Mink (*Neogale vison*), North American River Otter (*Lontra canadensis*), Red Fox (*Vulpes vulpes*), Raccoon (*Procyon lotor*), Striped Skunk (*Mephitis mephitis*), Eastern Coyote (*Canis latrans*), Red Squirrel (*Tamiasciurus hudsonicus*) and Snowshoe Hare (*Lepus americanus*) (Table 12.1 in Section 12 for full list). Large mammal species, such as Black Bear, Moose, and White-tailed Deer are known to be traditional food sources for Indigenous groups and consumed fresh or preserved through drying and smoking (Lepofsky and Lertzman 2008; Hoffman 1955; Wallis and Wallis 1955). Smaller mammals are commonly harvested through trapping and small-game hunting and contribute both to subsistence and material culture, providing supplementary food sources, and were used for fur, insulation, trim, and inter-community trade (Lepofsky and Lertzman 2008; Turner et al. 2000, Thornton 2012). North American Porcupine (*Erethizon dorsatum*) quills have held cultural importance to Indigenous People, which are used extensively in decorative quillwork applied to garments and storage and decorative vessels, as well as their uses (MacGregor 1987; Gustafson 1980).

15.2.2.4 Current Use

At this time, it is not known if any Indigenous use activities are taking place within the PDAs; however, given the historically documented extensive use and understanding of the importance of coastal regions of the Province, it is assumed for the purposes of this assessment that there are or have been Indigenous use activities taking place within the PDAs. VoltaGrid/ Beacon continues to engage with the Indigenous communities and organizations (Section 4) and if additional information regarding Indigenous land and resource use be identified during these discussions, this information will support Project planning and evaluated for the development of additional mitigation measures.

15.3 Potential Effects and Effect Pathways

A summary of the potential effects and Project effect pathways that are being assessed for Indigenous Land and Resource Use is provided in Table 15.2. Potential effects and effects pathways were selected based on the review of similar projects in New Brunswick and other parts of Canada, and professional judgement.

Table 15.1 Potential Effects and Effect Pathways for Indigenous Land and Resource Use

Potential Effect	Effect Pathway(s)
Change in Indigenous land and resource use	• Direct loss of local resource use areas through site preparation and earthworks and construction / installation of infrastructure and equipment (i.e., the physical presence of the Project). • Project activities may affect land and resource users or cause behavioural changes and/or mortality of harvested wildlife species due to the presence of sensory disturbances associated with noise emissions from heavy equipment, transport of materials, and increased traffic/activity. • Changes in water quality associated with emissions, discharges, and wastes to the surface water environment have the potential to adversely affect fish and fish habitat.

Project components or activities that result in a change in the amount of land available to practice Indigenous land and resource use activities, or in restricted access to an area that limits the use of the resources found in that area, can affect Indigenous land and resource use. The following Project activities will interact with the environment and may result in a change to Indigenous land and resource use:

- Data Centre site preparation
- Pipeline construction and operation (vegetation management)
- Transmission line construction and operations (vegetation maintenance)

The potential environmental effects of the Project on Indigenous land and resource use will be the same for each of the PDAs (i.e., the Data Centre, the transmission line, and the pipeline), where the footprint of these components fall on Crown and publicly available land. Therefore, the discussion below of the interactions with Indigenous land and resources apply to the Crown and publicly available lands within each of these project components, only.

Construction activities for the Project pose the highest potential effect on Indigenous land and resource use. While environmental effects could persist throughout the Project's lifespan, these potential effects will first occur during initial site preparation (i.e., vegetation clearing and groundbreaking), when access to the PDAs would be restricted and no longer accessible for Indigenous use. Therefore, potential effects on Indigenous land and resource use are conservatively considered to begin as soon as site preparation commences. Following this, while those environmental effects would continue throughout the Project life though at a generally lower magnitude than during construction. In some cases, the magnitude of effects will be partially reversed, as access the transmission line and pipeline RoWs will be restored, although the wildlife habitat in those areas will have changed. Transmission line and pipeline infrastructure will generally follow existing linear corridors, where feasible. Although new RoWs will be established, access will be restored and maintained following construction, with only minor and periodic interruptions associated with vegetation management activities.



Site preparation through clearing, grubbing, grading, and other earthworks activities, as well as the implementation of site access restrictions for safety and security reasons, will result in a loss of access to land and resources in the PDAs. This loss of access will be permanent for the Data Centre PDA, but temporary for the transmission line and pipeline PDAs. Construction activities that generate noise and air emissions may temporarily cause sensory disturbance to wildlife in the surrounding forests areas away from the direct impact areas of the PDAs.

As per Section 10 (Fish and Fish Habitat), the loss of riparian vegetation during construction may increase adverse runoff volumes to nearby watercourses. Vegetation clearing and grading activities during construction can increase runoff, sedimentation, and turbidity to watercourses which could affect the quality of fish habitat. The potential for deleterious substances entering watercourses (i.e., oil, grease, concrete washout or liquid concrete) may also increase during construction and could affect fish habitat quality or fish health and survival. Such interactions to watercourses during construction could affect Indigenous fishing (if practiced) in the watercourses that are fed by those within the PDAs if those interactions result in depleted stocks.

As per Section 11 (Vegetation and Wetlands), construction will require vegetation clearing and grubbing, resulting in the direct loss of vegetation communities within the PDAs. Site preparation activities, including wetland infilling, excavation, dewatering, and access route development, could alter soil conditions, hydrology, and wetland function. Equipment operation and material movement may contribute to soil compaction, erosion, dust generation, and the introduction or spread of non-native or invasive plant species. During operations, vegetation maintenance and the application of de-icing agents may also affect adjacent vegetation and wetlands. Such changes to vegetation communities and wetland habitats could affect Indigenous plant harvesting (if practiced) within the PDAs if they result in reduced availability or quality of culturally important species.

As described in Section 12 (Wildlife and Wildlife Habitat), site preparation and vegetation clearing will result in the direct loss of wildlife habitat and potential habitat features (e.g., nests, dens, roosting sites) within the PDAs. Clearing activities may also fragment habitat and create edge effects, altering microclimate and vegetation structure in adjacent areas and potentially affecting wildlife presence and movement patterns. Construction and operational activities may contribute to sensory disturbance (e.g., noise, light, dust, vibration, and human activity), which could result in habitat avoidance or changes in behaviour. Wildlife mortality risk may increase through vegetation clearing, vehicle collisions, human-wildlife conflict, accidental release of deleterious substances, and improved access that could facilitate predation, hunting, or poaching across the landscape. Habitat alteration and disturbance may also indirectly affect wildlife health and survival through increased stress or reduced habitat quality. Such changes to wildlife and wildlife habitat could affect Indigenous harvesting of wildlife species (if practiced) within the PDAs if they result in reduced availability, quality or access to traditionally used species.



15.4 Mitigation Measures

The Indigenous Land and Resource Use VC links with other VCs where potential Project effects on biophysical resources may diminish the quality and quantity of land and resources available for Indigenous communities or individuals. The mitigation measures for this VC rely on the assessments of potential environmental effects of the Project on Fish and Fish Habitat (Section 10), Vegetation and Wetlands (Section 11), and Wildlife and Wildlife Habitat (Section 12), and the reader is directed to those VCs for additional information. Mitigation to be implemented by VoltaGrid/ Beacon to address potential environmental effects to Indigenous Land and Resource Use include the following:

- Continue engagement activities with Indigenous communities to determine if there are current land and resource use activities within the PDAs and LAA and that the mitigation presented will seek to address concerns that are raised.
- If use is identified, provide Indigenous communities or individuals who currently use the PDAs the opportunity to harvest/ gather species of importance to land and resource use prior to the initiation of construction activities. It is further recommended that the opportunity to conduct these harvesting/ gathering activities be timed appropriately for the harvest of the species of interest, to the extent practical.
- Implement measures to mitigate the risk of fish mortality and fish habitat as included in the Fish and Fish Habitat VC, Section 10.
- Implement measures to mitigate a change in plants, vegetation, and wetlands as included in the Vegetation and Wetlands VC, Section 11.
- Implement measures to mitigate a change in wildlife habitat or risk of wildlife mortality as included in the Wildlife and Wildlife Habitat VC, Section 12.
- Implement measures to mitigate sites of cultural and/ or ceremonial importance as included in the heritage resources VC, Section 14.
- Signage will be placed on access roads used by construction equipment to warn the public of construction activities in that area for their safety.
- Reclamation of the PDA will consider Indigenous land and resource use following closure of the Project.

As noted in the VC sections referenced above, Project-related environmental effects on natural resources, including plant, wildlife, and fish species potentially used by Indigenous peoples, are anticipated to be limited in magnitude. The Project will result in a slight, long-term loss of habitat within the Transmission Line and Pipeline PDAs that could support Indigenous land and resource use. However, while the nature of the wildlife habitat within the component RoWs will change, access to these locations will resume following the completion of construction. While the loss of access to the Data Centre PDA will be permanent, the lands outside the Data Centre PDA are anticipated to still be available for land and resources use. Wildlife within the Data Centre PDA will be displaced to available adjacent locations where suitable habitats also exist. Project-related facilities and infrastructure will be designed and implemented in an effort to reduce potential effects, while supporting safe, efficient, and culturally respectful development and operation of the Project.

15.5 Residual Environmental Effects

Potential environmental effects on the indigenous land and resource use were identified in Section 15.3. For Indigenous land and resource use, the effect identified was a change in Indigenous land and resource use. Residual effects (i.e., those remaining following implementation of mitigation [Section 15.4]) are evaluated below. The assessment of residual effects considers the following key factors:

- The Project has been designed to avoid or reduce the loss of fish and fish habitat and reduce changes in vegetation and wetland, and wildlife habitats through planning and design, to the extent practical.
- Mitigation measures include standard proven mitigation measures that incorporate best management practices and consider regulations and guidelines that govern land, water, and resource protection.

15.5.1 Change in Indigenous Land and Resource Use

Construction activities, such as site preparation, earthworks and infrastructure development, will lead to a direct loss of a small area of land for Indigenous land and resource use in the PDAs. Based on the current proposed Project layout, approximately 12 ha of Crown land (i.e., watercourses and 30 m buffer) habitat loss is anticipated in the Data Centre PDA. The area of Crown/Public access land with the linear component of the Project are: 8 ha of Crown land along the Pipeline PDA and 46 ha within the transmission line PDA. For the purposes of this assessment, it is assumed that this habitat will be lost or altered. However, this is a very conservative estimate as, except for forest clearing, the only ground disturbance with the transmission line PDA will be limited to the structure locations, and for both the pipeline and transmission line, the habitat with these PDAs will be partially restored following construction These PDAs will revegetate and be available for use by wildlife and these lands will be available for access to Indigenous Peoples. Watercourses within these linear PDAs are not anticipated to be impacted by these linear features during their operational phase. Signage will be installed around the PDAs to alert land and resource users of the presence of the Project and its facilities. Safety-based restricted access zones around Project activities will be enforced during construction and throughout the life of the Project, as warranted. Some of these restrictions will be temporary during construction; others will be for the life of



the Project. Resource areas within the PDAs will therefore not be available for harvesting during this timeframe, but are anticipated to be displaced to lands immediately adjacent to the PDAs. In addition to the loss of area available, Project activities may result in sensory disturbance effects (e.g., noise, dust, visual) to Indigenous land and resource-use activities (hunting, trapping, outfitting, and fishing) which could affect the quality of outdoor experience. Sensory disturbances related to the Project have the potential to influence where users choose to pursue resource use activities and how wildlife may use the land. For example, Project activities could result in a decrease in interest in resource activities near the PDAs, particularly where undisturbed or undeveloped areas with these resources are available elsewhere. Mitigation measures will include timing of Project construction activities to avoid breeding/nesting seasons, the implementation of speed limits on Project access roads, limiting the amount of on-site lighting to that needed for the safe operation of the facility, and prohibiting hunting or harassment of wildlife by on-site Project personnel. It is therefore anticipated that associated effects on harvesting success rates will only result in a small change within the LAA, but not adversely effect Indigenous land and resource use activities outside the LAA, should these activities be occurring. Fish and fish habitat in the LAA could also be affected by noise disturbances, surface runoff from areas of disturbance, direct discharges of wastewater to waterbodies, changes to watershed areas, and work within water (e.g., culvert or bridge placement or upgrades). The Project has been planned to avoid these pathways to the extent practicable through shifting of infrastructure away from watercourses. Where avoidance is not practical, mitigation will be implemented to reduce the potential for effects as outlined in Section 10.3. Together with the application of best practices in accordance with DFO's Measures to Protect Fish and Fish Habitat (DFO 2025), residual Project related effects relating to Project construction, surface water runoff, and removal of vegetation are anticipated to be low in magnitude for fish habitat quality. Through the application of mitigation measures, residual effects from the Project on a change in Indigenous land and resource use are anticipated to result in a small change in the LAA with a small affected land base and numerous opportunities to hunt, trap, and fish outside of the PDAs. It is therefore predicted that hunting, trapping, outfitting, and fishing activities will be able to continue at or near current levels. Project effects on Indigenous land and resource use are expected to occur within the PDAs (from the direct loss of area) and LAA (from indirect sensory and interruption disturbances). Residual effects are anticipated to begin during the construction phase and persist throughout the entire life of the Project. These effects will initially arise as construction activities commence and are expected to continue through the operational period, although the PDAs for the transmission line and pipeline will be partially restored (i.e., revegetated, but with a changed vegetation make up). Residual effects will occur at an irregular frequency, with sensory effects such as noise, vibrations, or other disturbances associated with Project activities occurring intermittently. These intermittent events may include sounds from heavy equipment operation, material transport, and increased traffic, which will not follow a fixed pattern but instead arise sporadically as work progresses.

While it is not known if Indigenous land and resource use activities are currently taking place within the PDAs, the Project is located in areas that are and would have been available for use in the past for hunting, fishing, gathering, and travel within and outside of Indigenous territories.



15.6 Follow-up and Monitoring

The Proponent remains committed to ongoing engagement with Indigenous communities and organizations who may be engaging in land and resource use activities within the PDA and LAA. This includes sharing information on the Project, updates on ongoing and planned activities, a discussion of issues and concerns, and planned mitigation measures. Planned future surveys for fish and fish habitat (Section 10.6), vegetation and wetlands (Section 11.6) wildlife and wildlife habitat (Section 12.6), and heritage resources (Section 14.6) may also provide additional context for Indigenous land and resource use in the PDAs. Should additional effects be identified, the Proponent will seek to develop appropriate mitigation in consultation with the affected First Nations and regulatory agencies. As engagement continues, traditional knowledge provided for the PDAs will be incorporated to the extent practical, and residual effects on Indigenous land and resource use will be reviewed.

15.7 References

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16 Effects of the Environment on the Project

Environmental conditions, including climate, climate change and geological hazards (e.g., seismicity), could affect or damage Project infrastructure or activities, resulting in failures, malfunctions, or accidental events, which in turn, could result in adverse environmental effects and/or public health and safety risk.

Potential adverse effects on the Project by the physical environment are important considerations throughout the planning, engineering, and implementation of the Project. Effects of the environment are largely addressed through Project planning and engineering design. The Project will rely on design standards and proven methods and technologies that have been tested and proven successful in similar climates.

Potential effects of climate and climate change and geological hazards on the Project are presented below.

16.1 Climate and Climate Change

16.1.1 Existing Climate

The Project is located primarily within the municipal boundaries of the City of Saint John, southern New Brunswick. Existing atmospheric conditions are characterized using Environment and Climate Change Canada (ECCC) data from the Saint John Airport meteorological station (Airport meteorological station), since it is located nearest to the Project and has sufficient available data. Climate normals data for the 30-year period from 1991 to 2020 are presented below, including temperature, precipitation, and wind data. Climate normals data refer to statistical results using the observed climate values for a given location over a specified period of time; for the Canadian climate normals this is typically a 30-year time period (ECCC 2025).

16.1.1.1 Temperature

The daily average temperatures at the Saint John Airport meteorological station range between -7.9 degrees Celsius (°C) to 17.3°C, with the lowest average temperatures occurring in January and the highest occurring in July. Extreme daily minimum and maximum temperatures range between -13.2°C (January) to 33.7°C (July) (ECCC 2025). The 1991 to 2020 temperature climate normals for the Saint John Airport meteorological station are presented in Table 16.1. These include daily average, daily maximum, daily minimum, extreme daily maximum, and extreme daily minimum temperature data.

Table 16.1 Temperature Climate Normals, Saint John Airport, NB (1991–2020)

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Temperature													
Daily Average (°C)	-7.9	-7.1	-2.6	3.7	9.4	14.1	17.3	17.1	13.1	7.9	2.4	-3.5	5.3
Daily Maximum (°C)	-2.5	-1.6	2.6	8.8	15.3	20	23	23	18.8	13	6.9	1.3	10.7
Daily Minimum (°C)	-13.2	-12.6	-7.7	-1.6	3.5	8.1	11.6	11.2	7.4	2.6	-2	-8.3	-0.1
Extreme Daily Maximum (°C)	14.5	13.3	25.4	22.7	33	30.7	33.7	33.3	33.1	28.3	19.7	16.4	-
Date (mm/dd/ yyyy)	1/14/2006	2/21/1994	3/21/2012	4/22/2016	5/22/1992	6/30/1997	7/5/2013	8/31/2010	9/1/2010	10/9/2011	11/3/1999	12/12/2008	-
Extreme Daily Minimum (°C)	-33.2	-28.3	-28.4	-14.8	-5.5	-1.8	3.5	0.4	-3.9	-8.4	-16.9	-26.7	-
Date (mm/dd/ yyyy)	2/16/2009	2/13/1992	3/4/2014	4/5/1995	5/2/2015	6/3/2018	7/12/2010	8/22/2004	9/30/1995	10/27/2018	11/30/1996	12/29/1993	-

Source: ECCC (2025)

16.1.1.1 Precipitation

Total annual average precipitation (snow and rain) at the Saint John Airport meteorological station is 1,271 mm, with 215 cm of snow and 1,074 mm of rain. Monthly average precipitation ranges between 73 to 138.2 mm, with the least occurring in August and the most occurring in November (ECCC 2025). The 1991 to 2020 precipitation climate normals for the Airport meteorological station are presented in Table 16.2. These include rainfall, snowfall, precipitation, extreme daily rainfall, extreme daily snowfall, and extreme daily precipitation.

16.1.1.1 Wind

Winds at the Saint John Airport meteorological station prevail from the northwest direction during the fall and winter months and from the south during the spring and summer months. The monthly average wind speeds range from 11.6 kilometres per hour (km/h) in August to 17.9 km/h in March. The wind speed is generally lower in the summer months (June, July, and August) (ECCC 2025). The 1991 to 2020 wind climate normals for the Saint John Airport meteorological station are presented in Table 16.3.

Table 16.2 Precipitation Normals, Saint John Airport, NB (1991–2020)

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Precipitation													
Rainfall (mm)	65.6	52.7	74.2	82	93.1	85.1	86.4	71.3	112.2	137.1	126.4	87.5	1,074
Snowfall (cm)	59.8	45.5	36.8	16.3	0.8	0	0	0	0	0.9	12.5	42.2	215
Precipitation (mm)	116.1	91.9	107.3	100.2	93.9	86.8	89.5	73	108.8	138	138.2	127.6	1,271
Extreme Daily Rainfall (mm)	71.4	73.8	78	66.7	65.9	76.4	78.4	107.5	104.4	88	88.5	82	-
Date (mm/dd/yyyy)	1/24/1998	2/13/2008	3/8/2008	4/28/2005	5/24/2013	6/4/2006	7/26/2013	8/29/2009	9/7/2008	10/24/2009	11/27/2013	12/10/2014	-
Extreme Daily Snowfall (cm)	34.3	27	30	15	7.6	0	0	0	0	15.4	30.2	29.1	-
Date (mm/dd/yyyy)	1/4/2003	2/1/1992	3/10/2001	4/26/1992	5/6/1992	6/1/1991	7/1/1991	8/1/1991	9/21/1991	10/30/2011	11/23/2011	12/15/2003	-
Extreme Daily Precipitation (mm)	75.6	78.9	78	66.7	65.9	76.4	78.4	107.5	104.4	88.2	88.5	95.5	-
Date (mm/dd/yyyy)	1/24/1998	2/13/2008	3/8/2008	4/28/2005	5/24/2013	6/4/2006	7/26/2013	8/29/2009	9/7/2008	10/24/2009	11/27/2013	12/1/2020	-

Source: ECCC (2025)

Table 16.3 Wind Climate Normals, Saint John Airport, NB (1991–2020)

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Wind Speed (km/h)	17	17.2	17.9	17	15.3	13.6	11.9	11.6	13	15.5	16.3	17.3	15.3
Most Frequent Wind Direction	N	NW	N	N	S	S	S	S	SW	N	N	NW	N
Extreme Wind Speed (km/h)	74	74	69	63	63	54	50	70	67	67	72	83	-
Date (mm/dd/yyyy hh:mi)	1/25/1996 2:00	2/19/2004 15:00	3/9/2005 8:00	4/24/2004 23:00	5/14/2002 11:00	6/24/2002 11:00	7/22/2003 18:00	8/29/2011 3:00	9/25/1991 18:00	10/11/2004 23:00	11/29/2003 11:00	12/18/2000 5:00	-
Extreme Gust Speed (km/h)	111	98	111	96	96	76	65	96	102	98	100	111	-
Date (mm/dd/yyyy)	1/31/2013	2/9/2000	3/13/1993	4/13/2020	5/14/2002	6/8/1995	7/22/2003	8/20/1991	9/7/2019	10/17/2019	11/3/2018	12/18/2000	-
Days with Winds ≥52 km/h	2.8	2.9	2.4	1.6	0.58	0.13	0	0.17	0.29	1.7	1.8	3.3	17.5
Days with Winds ≥63 km/h	0.63	0.81	0.45	0.26	0.16	0	0	0.11	0.05	0.15	0.16	1.1	3.8
Days with Winds ≥90 km/h	0.32	0.14	0.2	0.05	0.05	0	0	0.04	0.06	0.05	0.15	0.47	1.5

Source: ECCC (2025)

16.1.1.2 Extreme Weather Events

Tornadoes, storm surges, hurricanes, and severe storms are extreme weather events known to occur in New Brunswick. The occurrence of tornadoes in New Brunswick is considered rare (Cheng et al. 2013). New Brunswick has experienced only seven confirmed tornadoes over land since 2017, with five of those occurring in 2024. Tornadoes are rated for intensity and damage on the Enhanced Fujita (EF) Scale which ranges from Weak (EF0) to Violent (EF5) (SPC nd). Only one of the seven tornadoes that occurred in New Brunswick since 2017 was rated as strong (EF2) with damage from these seven tornadoes recorded as being limited to trees and the movement of unsecured items (Western University 2024). Wind speeds of EF2 tornadoes range from 178 km/h to 216 km/h (SPC nd). The tornado nearest the Project occurred more than 90 km north of the Project in Sheffield, NB (Western University 2024). The maximum wind gust recorded between 1991 and 2020 at the Saint John weather station was 111 km/h (ECCC 2025).

Storm surges are unusually high rises in the water level of seas or large lakes that occur when strong winds push water onto land (ECCC 2017). Lands and infrastructure on low lying lakeshores and coastlines are most at risk of damage from storm surges. As the Project is not situated on low lying coastlines or lake shores, it is not at risk of being adversely affected by storm surges.

Storms, post-tropical storms, and hurricanes are extreme weather events that are typically accompanied by high winds and precipitation. Hurricanes are a category of storms classified as having winds exceeding 120 km/h. The energy in hurricanes is derived from warm tropical waters and typically diminishes to post-tropical storm status as the hurricane moves northwards from the Caribbean into colder northern oceanic waters. Post-tropical storms are therefore more common in New Brunswick than hurricanes.

Lightning is a natural electrical discharge of short duration and high voltage that occurs between clouds or between a cloud and the ground or a structure attached to the ground. For New Brunswick cities during the period of 1999–2018, Saint John has the lowest number of recorded occurrences for cloud to ground lightning flashes (8,664) and the fewest days (15.8) in which lightning occurred within 25 km of the city (Government of Canada 2019).

16.1.2 Climate Projections and Potential Impacts

The closest ECCC weather station with climate normals data is the Saint John A station located near the Saint John Airport (45.317628 N, 065.8896960 W), approximately 40 km east of the Project location (ECCC 2025). The data provided for Saint John A weather station are considered to be representative of the Project area.

The Government of New Brunswick released a report that assessed the climate change risk for the province (Government of New Brunswick nd) describing how the climate of New Brunswick is expected to change in the future. A summary of climate projections is provided below:

- Winter average temperature is expected to increase by 4.4°C in the 2050s and by 6.7°C by the end of the century. Summer average temperature is expected to increase by 3.2°C in the 2050s and by 5.7°C by the end of the century. This will lead to fewer frost days but also more extremely hot days (>35 with Humidex). These conditions lead to a slightly higher risk of droughts and wildfires.
- Precipitation is projected to increase, particularly in the winter and spring, with less snow and more rain. However, this increase is partly expected to bring heavier precipitation over shorter periods of time which can potentially lead to flooding. Fewer freezing rain and ice storms are predicted in the 2050s and 2080s.
- As temperatures rise, ocean water warming will result in tropical storms travelling further north before weakening. This means higher extreme wind speeds and higher storm surges. Warmer waters carry less oxygen and with increasing atmospheric CO_2 levels also become increasingly acidic.
- Sea level rise around New Brunswick is projected to reach 1 metre by 2100, potentially more if there are substantive reductions in the Antarctic Ice Sheet. The relative sea level change during coastal flooding is expected to increase by 58 cm in the 2050s and 104 cm by the end of the century.

Due to its inland location, the Project will not be affected by sea level rise, higher tides, or storm surges. The Project is located in proximity to small tributaries on or near the Project site and a minimum of 30 m setback will be adhered to as part of Project design. After construction is completed and the Project is operational, most activities (except for some inspection and maintenance) will occur indoors and will not be affected by extreme weather.

Rising temperatures and drier conditions resulting from climate change may increase the risk of wildfires. The increase of fire risk with climate change within northeastern Canada is moderate (Whitman et al. 2015). The Project is not likely to sustain damage from potential wildfires due to the lack of organic matter as fuel; but forests adjacent to the Project and along roads could be hazardous to Project operations during an active wildfire. Wildfires are not expected to result in substantial damages to the Project but could indirectly result in an interruption of Project operations.

The Project will be designed to meet applicable engineering codes and standards. The following additional measures will be implemented to reduce climate-related risks to the Project:

- Fire protection systems will be in place in accordance with applicable codes and standards. Fire water networks will be provided around all sections of the facility containing flammable fluids.



- The Emergency Response Plan (ERP) for the Project will describe emergency response measures, training requirements, roles and responsibilities, and reporting procedures in the event of a fire at or near the Project site. The ERP will also address cooperation with other local emergency response providers including the local firefighting forces.
- On-site fire prevention and response equipment will be provided and maintained, and employees will trained in safe response to a fire at the facility.
- Water management structures will be designed to attenuate storm events, thus helping to prevent flooding.

Project design to accommodate environmental factors and implementation of other mitigation measures as discussed above, will effectively reduce or avoid potential effects of climate and climate change (current and projected) on the Project.

16.2 Geological Hazards

Geological hazards are hazards from geological conditions or processes that pose risk to people, property and the environment and can include earthquakes, landslides, and sinkholes.

As described in Section 9.2.2.5 and 9.2.2.7.1, the bedrock geology underlying the Project primarily consists of Late Devonian-Early Carboniferous age greyish green and red siltstone, sandstone and shale with massive and amygdaloidal basalt, peperitic basal, and basaltic breccia of the Lorneville Group, Taylors Island Formation (NBDNR 2008). The Taylors Island Formation is not susceptible to Karst topography, therefore risk of sinkholes is very low. This geology also has low susceptibility to landslides, but localized, site-specific slope instability can occur where steep slopes, weak surficial materials or erosion is present. Site-specific geotechnical investigations will inform site design and erosion controls will be used to reduce risk of erosion.

The Project occurs in the Northern Appalachians seismic zone, which includes most of New Brunswick and parts of New England. Seismic activity in this area has generally been low with 11 earthquakes of magnitude 3.0 to 4.0 occurring in the past 50 years within 100 km of the LAA, and none with a magnitude of 4.0 or greater (Natural Resources Canada 2021). The Geologic Survey of Canada assesses the relative seismic hazard for the general area of the Project to be moderate, meaning there is a 5 % to 15 % chance that significant damage from seismic activity will occur every 50 years (Geologic Survey of Canada 2025).

The Project is not predicted to affect geological hazard risk and the likelihood of geological hazards to affect the Project is low. There is low potential for a major seismic event to occur in the LAA. Minor seismic activities have low potential to damage Project infrastructure or cause delays in construction or maintenance activities. Project structures will be built in accordance with industry standards to withstand minor seismic events.

16.3 References

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17 Accidents, Malfunctions and Unplanned Events

This section describes potential accidents, malfunctions, and unplanned events that are not part of any planned activity or normal operation of the Project that could result in adverse environmental effects. Accidents, malfunctions, and unplanned events could occur during any phase of the Project, although most can be prevented and/or mitigated through Project design and implementation of standard operating procedures.

A Project-specific Environmental Management Plan (EMP) and Emergency Response Plan (ERP) will be prepared prior to Project construction. The EMP will serve as an overarching operational document that will document commitments, address regulatory requirements, and provide direction to Project personnel through protection procedures and best management practices to reduce or eliminate potential adverse environmental effects of the Project. The ERP will include emergency response and contingency procedures to prevent and respond to accidents. malfunctions and other unplanned events.

Based on knowledge of the Project, past experiences and studies, the assessment of accidents, malfunctions, and unplanned events focuses on the following scenarios that have a reasonable potential of occurrence and could result in adverse environmental effects:

- Pipeline Leak or Rupture
- Fire
- Fuel and Hazardous Material Spill
- Discovery of Contaminated Soils or Hazardous Materials
- Vehicle Accident
- Failure of Erosion and Sediment Controls

Each scenario is described below and assessed with consideration of likelihood of occurrence, preventative measures to reduce likelihood of occurrence, emergency response and contingency measures, and likely effects on the environment should the event occur.

17.1 Pipeline Leak or Rupture

Although unlikely to occur, there is a possibility of a natural gas pipeline leak or rupture which could result in high pressure gas escaping into the atmosphere. This accidental event could occur during Project construction in close proximity to existing operational natural gas pipelines, or through a breach or failure of the Project pipelines during Project operations.



In the event of a natural gas pipeline leak or rupture, the natural gas would rise upward and dissipate with the volume of natural gas and wind conditions affecting the area of dissipation. Public evacuation may be required, temporarily disrupting other land and resource users. If the escaping gas were to ignite, it would cause a localized explosion and fire, potentially affecting public health and safety and the natural environment (see Section 17.2 for more on Fire).

The Saint John Lateral and Brunswick Pipeline are both regulated by the Canada Energy Regulator (CER) and have CER-compliant ERPs which would be implemented in the event of pipeline incident involving those pipelines. The natural gas distribution pipeline for the Project will be regulated by the New Brunswick Energy and Utilities Board (NBEUB) under the *Pipeline Act, 2005* and will comply with applicable regulations and standards (e.g., Pipeline Regulation; CSA Z662- Oil and Gas Pipeline Systems; CEAZ246.2 – Emergency Preparedness and Response for Petroleum and Natural Gas Industry Systems). A Project-specific ERP will include incident prevention and emergency response procedures for Project-related natural gas infrastructure. In the unlikely event of an incident, local emergency responders will be engaged to coordinate an appropriate emergency response.

Best management practices for pipeline construction and operation (including damage prevention measures when constructing in proximity to existing pipelines) will be followed for the Project. Safety protection systems will be installed for Project-related natural gas infrastructure to provide rapid detection and isolation of gas releases. The Project pipeline will be marked for public awareness and damage-prevention programs similar to those in place for existing pipelines in the region to reduce risk of damage and accidental releases. Given the highly regulated nature of natural gas systems, the risk of a pipeline leak or rupture occurring and causing adverse environmental effects is low.

17.2 Fire

There is potential that a fire could occur during Project construction and/or operations and maintenance activities. A fire affecting Project components would likely involve Project infrastructure, a vehicle, or other heavy equipment used during construction or operation and maintenance activities. A pipeline leak or rupture could also result in explosion or fire. It is also possible that Project-related machinery could ignite a fire of nearby combustible materials (e.g., grass, brush, trees). An uncontrolled fire could result in adverse effects (including offsite effects) on air quality, wildlife and wildlife habitat, vegetation and wetlands, the socio-economic environment (e.g., property damage on surrounding lands, risk to public health and safety) and Indigenous land and resource use.

Project facilities will be designed with fire protection system in accordance with applicable regulatory codes and standards. Risks associated with a Project-related fire will be also mitigated in accordance with the EMP which will include the following measures:

- Project-related vehicles will be equipped with fire extinguishers sized and rated as appropriate.
- Project personnel will be trained in the proper use of fire extinguishers.
- Flammable and combustible materials (including wastes that may be soaked in flammable materials (i.e., oily rags) will be stored appropriately onsite.

- Project vehicles will park in designated areas, avoiding areas of long grass.
- Fires will be reported immediately to local emergency response service.

Given Project design and the implementation of standard fire prevention mitigation (e.g., construction crews trained in the use of fire extinguishers, and access to local firefighting services), the likelihood of a Project-related fire becoming uncontrolled and causing offsite environmental effects is low.

17.3 Fuel and Hazardous Materials Spill

Hazardous materials may be used during construction, and operation and maintenance of the Project. A spill of hazardous material can occur in any environment where petroleum, oils, lubricants (POLs) or other hazardous materials are used or stored. A spill of hazardous materials could result from equipment spills, spills from vehicles, an on-site trucking accident, or tank leak or rupture that occurs within the PDAs.

A rupture or leak from diesel fuel storage (if required) would likely represent the worst-case Project spill scenario, although the most likely credible spill scenario would be a small fuel release associated with vehicle or heavy machinery use (e.g., hydraulic line break) or refueling of machinery. Depending on the location, volume and timing of the spill, such an event could potentially result in significant adverse environmental effects on water resources, fish and fish habitat, wildlife and wildlife habitat, and/or vegetation and wetlands.

Risk associated with a POLs or hazardous material spill will be reduced through proper use and storage of materials including implementation of the following measures:

- Construction and operational equipment will be frequently inspected for possible fuel and hydraulic system leaks and leaks detected will be repaired immediately where possible. If the repair cannot be completed immediately, drip pans or alternative containment will be put in place to prevent loss of POLs or other hazardous materials to the environment.
- Lubricants and other petroleum products will be stored according to provincial regulations, and waste oils will be disposed of in accordance with provincial regulations.
- Secondary containment will be designed for onsite POLs and hazardous materials storage to contain the full storage volume.
- Hazardous materials will be transported in compliance with the *Transportation of Dangerous Goods Act* and Regulations; any material requiring disposal will be disposed of at an approved facility.
- Storage of all hazardous materials will comply with WHMIS requirements, and appropriate material safety data sheets will be located at the storage site.
- All construction and operational staff will be trained to handle, store, and dispose of hazardous materials.
- Equipment refueling and maintenance will be conducted at designated sites and not within 30 m of a watercourse or wetland.



The following spill contingency and response measures will be implemented to reduce adverse effects on the environment:

- The spill will be reported to the appropriate authorities as outlined in the ERP. This may include first calling 911 if the spilled material represents an immediate threat toward public safety.
- Spill containment kits will be kept onsite, and relevant site personnel will be trained in kit use.
- The initial steps of spill response will involve the prevention of further spillage followed by confinement of the spilled materials. If the release cannot be controlled or contained, secondary containment of the materials may be performed possibly involving the transfer of materials to other containers.
- Spills that occur along the ground surface may be controlled by the use of absorbents if the spill is fairly small. Larger spills may require the use of soil, sand or other relatively inert material to dam the spill. All attempts will be made to intercept and contain the spill to reduce the possibility of discharge into sensitive areas including wetlands and watercourses.
- Clean-up will consist of collecting as much of the spilled material as possible to avoid future contamination. Absorbents used, and any contaminated soil, sand or gravel, are to be placed in appropriate labelled waste containers. Spill materials will be similarly placed in appropriate containers with the proper WHMIS labels. Care should be taken to avoid mixing spilled material with incompatible materials.
- In the unlikely event that a hazardous material spill reaches a body of water or other nearby sensitive area, 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 completed, and remediation measures implemented as required.
- Monitoring and follow-up activities will be implemented to return the environment to its previous state.

Potential Project-related spills, if they do occur, are likely to be contained, and remediated in a timely manner through contingency planning and emergency response procedures.

17.4 Discovery of Contaminated Soils or Hazardous Materials

Contaminated soils and/or hazardous materials could be encountered from legacy activities such as forestry or illegal dumping within the Project PDAs. Construction activities could liberate contaminants such as fuel oil and other hydrocarbons or pesticides into the environment by unearthing and exposing contaminated soils or rupturing old containers.

Legacy contaminants and hazardous materials in soils or containers can include fuel oils and other hydrocarbons, antifreeze, and pesticides, which can be exposed to surface runoff from construction activities and enter watercourses, wetlands, or groundwater.

The EMP will outline measures to be implemented in the event of discovery of contaminated soils or hazardous materials, which will include similar measures to prevent and respond to a hazardous material spill (Section 17.3).

Should a discovery of contaminated soils or hazardous materials occur, all efforts will be made to protect the safety of onsite workers and the public and to contain the identified material. Workers will report the contamination to the appropriate authorities. With the implementation of measures to protect human health and the environment in the event of discovery of a contaminated site or hazardous material during Project construction, risk of adverse environment effects is low.

17.5 Vehicle Accident

During the construction and operation and maintenance of the Project, there is the potential for a vehicle collision to occur, including a vehicle-to-vehicle collision, vehicle-to-pedestrian collision, or vehicle collision with surrounding private property, Project infrastructure, or wildlife.

In the event of a vehicle accident there is the potential for injury or loss of life (human or wildlife) and/or damage to infrastructure or property. There is also potential for fire and hazardous materials to be released into the environment. Effects and mitigation measures related to fire and spills are addressed in Sections 17.2 and 17.3, respectively.

The following measures will be implemented to reduce risk of vehicle collision:

- Project vehicles will be inspected regularly to confirm safety and serviceability and will be driven only by licenced operators.
- The transport of oversized loads during Project construction will be in accordance with applicable permitting requirements of the New Brunswick Department of Transportation and Infrastructure.
- Traffic control measures will be implemented as needed on public roads to reduce public safety risk during Project construction, particularly during transport of oversized loads.
- The operation of Project vehicles will comply with posted speed limits and applicable traffic rules and regulations.
- If a Project vehicle encounters wildlife on access roads, the driver will reduce speed if it is safe to do so, to avoid a collision.
- Project personnel will immediately contact emergency services in the event of a collision.
- Local emergency and response officials will attend to any vehicle incidents to provide emergency response as required.

With the implementation of best management practices, the risk of an adverse environmental effect occurring from a vehicle accident is low.



17.6 Failure of Erosion and Sediment Controls

A failure of Project-related erosion and sedimentation control devices can occur during construction and operation activities due to the exposure of soil from clearing or excavation of land and failure of planned controls. This scenario has the potential to interact with water resources and terrestrial resources, as failure of control measures could result in the unintended erosion of land and/or the release of silt into the surrounding environment. An accidental release of sediment or sediment-laden water may adversely affect water resources, fish and fish habitat, vegetation and wetlands, wildlife and wildlife habitat, the socio-economic environment (e.g., adjacent land use), and Indigenous land and resource use.

Mitigation measures to reduce likelihood of failure of erosion and sediment controls include measures designed to help prevent erosion and sedimentation from occurring in the first place, with monitoring and maintenance measures to maintain integrity of these control measures so they continue to work effectively. The EMP will contain environmental protection procedures for erosion and sediment control including specifications for design, installation, monitoring and maintenance of control measures. In addition to proper design and installation of control measures prior to site disturbance, key mitigation measures to reduce the likelihood of failure of erosion and sediment controls include the following:

- Erosion and sediment control measures will be inspected regularly and maintained in good working order. In the event that control measures are not working as intended, they will be repaired or replaced to reduce risk of adverse environmental effects.
- In the event of extreme wet weather events, where erosion protection and sediment control measures may be compromised, site preparation activities may be suspended.
- Water quality monitoring will be conducted regularly to document regulatory compliance of offsite runoff.

Proper design, implementation, monitoring and maintenance of erosion and sediment controls for the Project will reduce likelihood and/or mitigate potential adverse environmental effects occurring from erosion and sediment control failure.

17.7 Summary

Accidents, malfunctions, and unplanned events may occur during any Project phase and could potentially result in adverse environmental effect if left unmitigated. The Project will be planned, designed, constructed, operated, and monitored to reduce the likelihood for accidents, malfunctions, and unplanned events to occur and/or the severity of such events if they did occur. With the implementation of design features, best management practices and contingency/response measures, residual adverse environmental effects as a result of Project-related accidents, malfunctions and/or unplanned events will be prevented or reduced to avoid unacceptable effects to the environment.



18 Closing

Beacon and VoltaGrid, are proposing the development of the Spruce Lake AI Data Centre Project in the Spruce Lake Industrial Park in Lorneville, NB. The Project involves the construction and operation of a 390 MW data centre, which includes four data halls and a 190 MW natural gas-powered generation facility. The Project requires an EIA Determination Review under Section 5(2) of the New Brunswick Environmental Impact Assessment Regulation 87-83 of the *Clean Environment Act*.

The data centre will be located on a parcel of land being purchased by the Saint John Industrial Parks (2024) Inc. The Proponent plans to purchase this property prior to Project construction. The Project also includes two 345 kV transmission lines to supply an additional 200 MW from the NB Power grid to power the data centre, and two 4.5 km long 8” diameter pipelines connecting to the M&NP Saint John Lateral and/or the Emera Inc. Brunswick Pipeline, which will supply the power generation facility with natural gas. Associated supporting infrastructure includes a substation, switchyards, a gas-metering station, administration facilities, and stormwater management. Industrial water service will be provided by the City of Saint John. Subject to receipt of the necessary approvals, construction is anticipated to begin in 2026, with commercial operations expected to commence in 2028. The life of the Project will depend on contractual arrangements with end users of the data centre, but the minimum operating life is anticipated to be 25 to 30 years.

The Proponent has conducted Indigenous and public engagement to provide information on the Project and obtain feedback to inform Project planning. This included hosting an open house at the Lorneville Community Centre in November 2025. Key issues raised during engagement included labour and employment opportunities; distance to residential areas and noise levels; traffic control; effects on wetlands and forested areas; power consumption and emissions; water usage; and post-closure economics. MTI has indicated they will be conducting a Migmaq Rights Impact Assessment.

This EIA Registration document assessed potential effects of the Project on the following VCs:

- Atmospheric Environment
- Acoustic Environment
- Water Resources
- Fish and Fish Habitat
- Vegetation and Wetlands
- Wildlife and Wildlife Habitat
- Socio-economic Environment
- Heritage Resources
- Indigenous Land and Resource Use

Desktop data and field surveys were conducted to characterize baseline conditions for the VCs. Additional baseline data surveys including fish and fish habitat, wetland, vascular plant, bird, bat habitat, and archaeological surveys are planned for 2026 within areas not previously surveyed prior to the EIA Registration.

Potential changes to baseline conditions due to Project activities were assessed using quantitative and qualitative methods. Quantitative modelling was conducted to predict changes in air quality and the acoustic environment due to Project operations. Calculations of direct loss of vegetation, wetlands and wildlife habitat are conservative, as the actual developed footprint of the Project is anticipated to be smaller than the PDA as presented in this EIA Registration.

Mitigation measures have been proposed to avoid or reduce potential adverse residual environmental effects. In addition to best management practices and engineering design mitigation to reduce air and noise emissions and the physical footprint of disturbance, other key mitigation measures include the development and implementation of an Environmental Management Plan, Stormwater Management Plan, Complaint Resolution Procedure, and Emergency Response Plan. Approvals will be obtained prior to construction for the alteration of unavoidable watercourses and wetlands, with habitat compensation implemented and monitored, as applicable.

The Proponent will continue to share information regarding the Project, its potential environmental effects, and proposed mitigation measures, and will work collaboratively with affected First Nations, community members, and regulatory agencies to develop additional mitigation, as warranted. As engagement progresses and new information becomes available, it will be considered in the Project planning accordingly.

Appendices

Appendix A AC CDC Report

Atlantic Canada Conservation Data Centre
Centre de données sur la conservation du Canada atlantique

Data Report 8946: Lorneville, NB

Prepared 28 October 2025
by P. Greyson, Conservation Data Analyst

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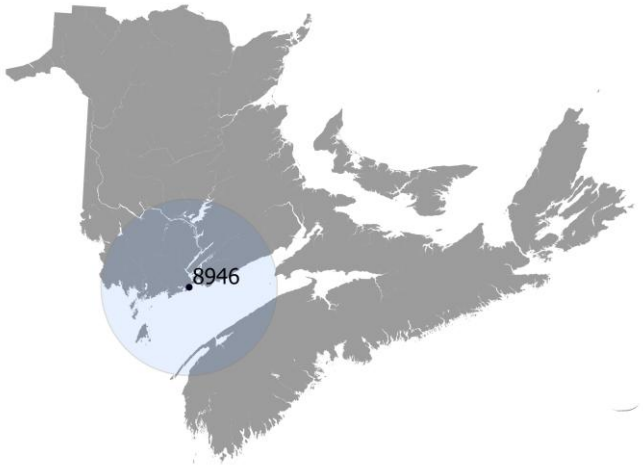
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Map 1. A 100 km buffer around the study area

1.0 PREFACE

The Atlantic Canada Conservation Data Centre (AC CDC; www.accdc.com) is a member of the NatureServe network, a collaborative alliance of natural heritage programs and conservation data centres operating across all 50 U.S. states, nine Canadian provinces, three territories, and several countries in Central and South America. Established over five decades ago, the NatureServe network employs a standardized and scientifically rigorous methodology for the collection, analysis, and dissemination of biodiversity data. Since its founding in 1997, the AC CDC has served as the authoritative source of information on species at risk and ecological communities within the jurisdictions of New Brunswick, Nova Scotia, Prince Edward Island, and Newfoundland and Labrador. Although AC CDC operates as a non-governmental organization, it receives core funding and support from six federal agencies and four provincial governments and is supplemented by external grants and data processing fees.

In response to formal requests and for a service fee, the AC CDC queries its database and provides customized data reports detailing the known occurrences of rare and endangered flora and fauna within a defined area of interest. These reports are further supplemented by spatial information on protected and conserved areas and sites identified as ecologically significant or sensitive. This service supports evidence-based decision-making in environmental assessments, land-use planning, and natural resource management and are vital to the conservation of biodiversity in Atlantic Canada.

1.1 DATA LIST

Included datasets:

Filename	Contents
LornevilleNB_8946ob.xls	Rare or legally-protected Flora and Fauna in your study area
LornevilleNB_8946ob100km.xls	A list of Rare and legally protected Flora and Fauna within 100 km of your study area
LornevilleNB_8946msa.xls	Managed and Biologically Significant Areas in your study area

1.2 DATA USE RESTRICTIONS

The Atlantic Canada Conservation Data Centre (AC CDC) makes every effort to ensure the accuracy of the data it manages; however, it assumes no responsibility for any errors or omissions in the data provided. By accepting data from the AC CDC, recipients agree to the following terms of use:

a) Data must be used only by qualified personnel who are aware of landowner sensitivities and the potential risks that disclosure of rare and/or endangered species locations may pose to those species.
b) Data may be used only by the designated Data User. Any third-party requiring access must submit a separate request to the AC CDC.
c) Data must be deleted and no longer used 12 months after receipt. Continued use requires submission of a new request for updated data.
d) All data provided reflects the contents of the AC CDC's database at the time of the request.
e) Each record includes an estimate of locational uncertainty, which must be considered when assessing the record's relevance to a specific location. Please refer to the accompanying Data Dictionary for further details.
f) AC CDC data responses are not to be construed as exhaustive inventories of taxa in an area of interest.
g) The absence of a taxon does not imply that the species is absent from the area of interest.

1.3 ADDITIONAL INFORMATION

The accompanying Data Dictionary provides metadata for the data provided.

Please direct any additional questions about AC CDC data to the following individuals:

Plants, Lichens, Ranking Methods, All other Inquiries
Sean Blaney
Senior Scientist / Executive Director
(506) 364-2658
sean.blaney@accdc.ca

Animals (Fauna)
John Klymko
Zoologist
(506) 364-2660
john.klymko@accdc.ca

Data Management, GIS
Charity Robicheau
Senior Conservation Data Analyst
charity.robicheau@accdc.ca

Billing
Jean Breau
Financial Manager / Executive Assistant
(506) 364-2657
jean.breau@accdc.ca

Questions on the biology of Federal Species at Risk can be directed to AC CDC: (506) 364-2658, with questions on Species at Risk regulations to: Samara Eaton, Canadian Wildlife Service (NB and PE): (506) 364-5060 or Julie McKnight, Canadian Wildlife Service (NS): (902) 426-4196.

For provincial information about rare taxa and protected areas, or information about game animals, deer yards, old growth forests, archeological sites, fish habitat etc., in New Brunswick, please contact Hubert Askanas, Energy and Resource Development: (506) 453-5873.

For provincial information about rare taxa and protected areas, or information about game animals, deer yards, old growth forests, archeological sites, fish habitat etc., in Nova Scotia, please contact Donna Hurlburt, NS DLF: (902) 679-6886. To determine if location-sensitive species (section 4.3) occur near your study site please contact a NS DLF Regional Biologist:

Western: Emma Vost
(902) 670-8187
Emma.Vost@novascotia.ca

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Eastern: Maureen Cameron-MacMillan
(902) 295-2554
Maureen.Cameron-MacMillan@novascotia.ca

For provincial information about rare taxa and protected areas, or information about game animals, fish habitat etc., in Prince Edward Island, please contact Garry Gregory, PEI Dept. of Communities, Land and Environment: (902) 569-7595.

2.0 RARE AND ENDANGERED SPECIES

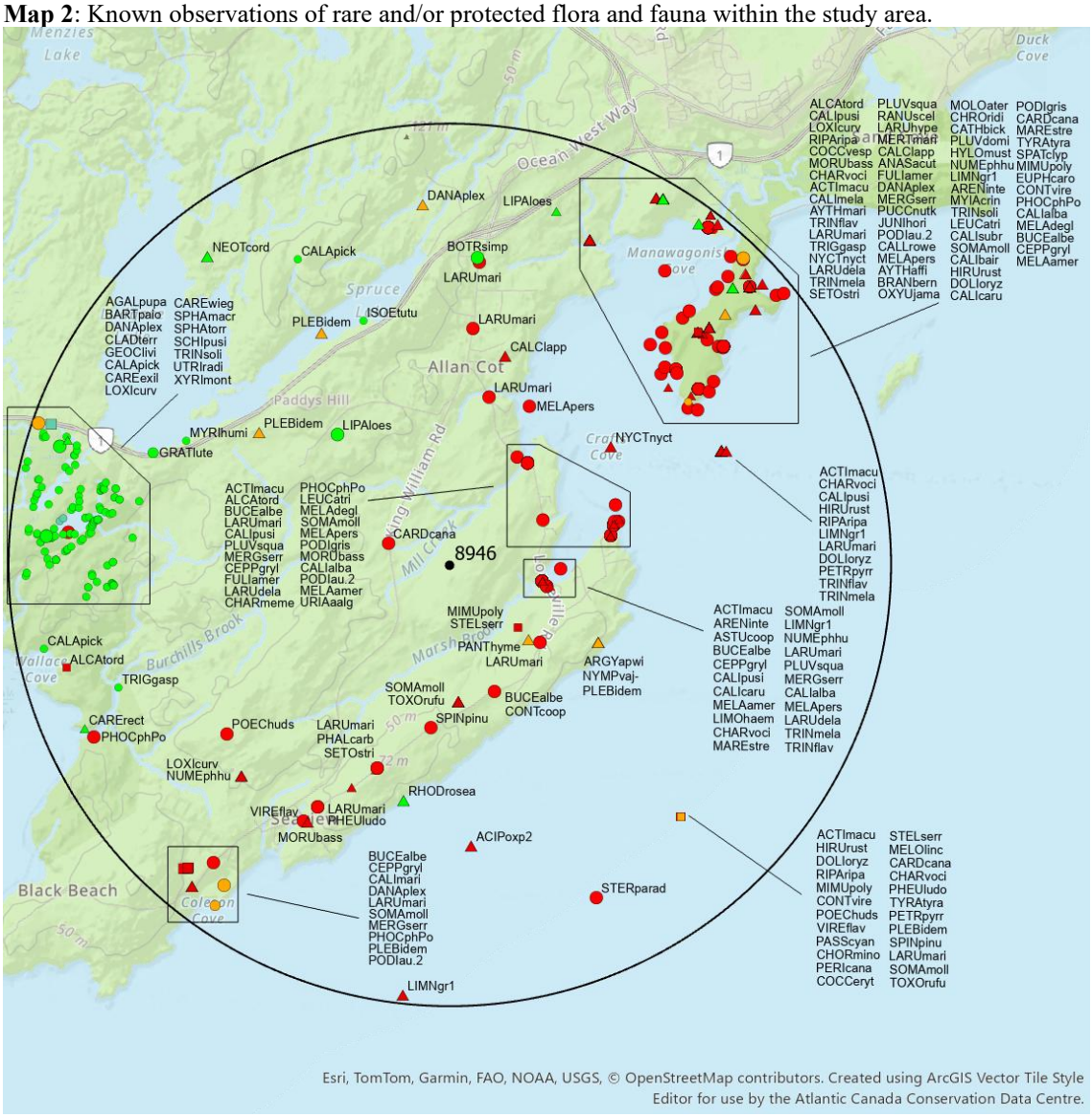
2.1 FLORA

The study area contains 141 records of 22 vascular and 7 records of 3 nonvascular flora (Map 2 and attached: *ob.xls), excluding 'location-sensitive' species.

2.2 FAUNA

The study area contains 985 records of 79 vertebrate and 23 records of 6 invertebrate fauna (Map 2 and attached data files - see 1.1 Data List), excluding 'location-sensitive species'. Please see section 4.3 to determine if 'location-sensitive' species occur near your study site.

Map 2: Known observations of rare and/or protected flora and fauna within the study area.



Resolution

- 1.0 = Within 10s of metres
- 1.7 = Within 50s of metres
- 2.0 = Within 100s of metres
- 2.7 = Within 500s of metres
- 3.0 = Within kilometres
- 3.7 = Within 5s of kilometres
- 4.0 = Within 10s of kilometres
- 4.7 = Within 50s of kilometres

Higher taxon

- Vertebrate fauna
- Invertebrate fauna
- Vascular flora
- Nonvascular flora

3.0 SPECIAL AREAS

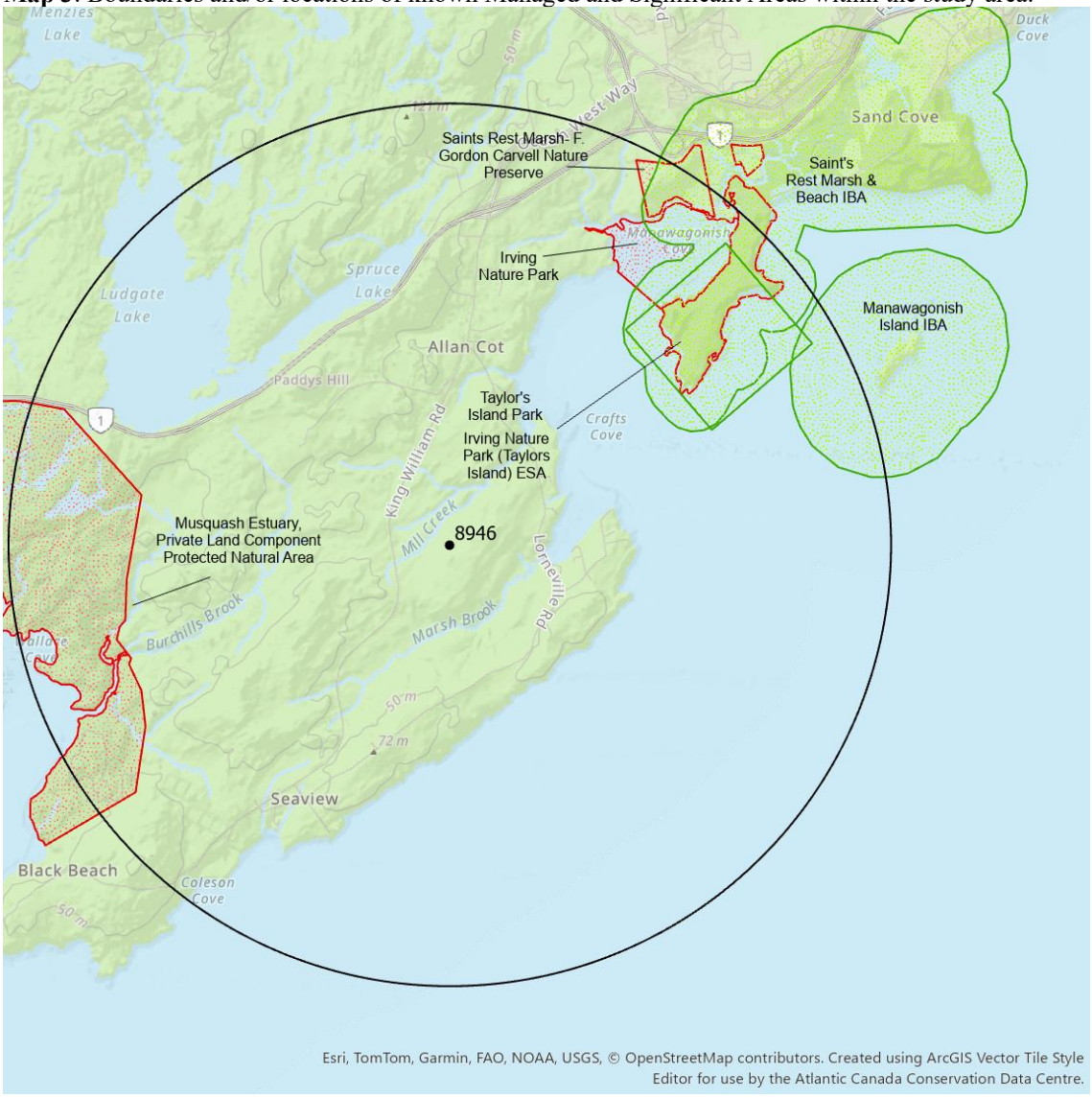
3.1 MANAGED AREAS

The GIS scan identified 4 managed areas in the vicinity of the study area (Map 3 and attached file: *msa.xls).

3.2 SIGNIFICANT AREAS

Significant Areas are sites with a conservation designation and management that qualifies them for listing in the Canadian Protected and Conserved Areas Database (CPCAD; https://www.canada.ca/en/environment-climate-change/services/national-wildlife-areas/protected-conserved-areas-database.html). The absence of a "Significant Area" within a site or region does not indicate an absence of ecologically significant properties. The GIS scan identified 3 biologically significant sites in the vicinity of the study area (Map 3 and attached file: *msa.xls).

Map 3: Boundaries and/or locations of known Managed and Significant Areas within the study area.



4.0 RARE SPECIES LISTS

Rare and/or endangered taxa (excluding "location-sensitive" species, section 4.3) within the study area listed in order of concern, beginning with legally listed taxa, with the number of observations per taxon and the distance in kilometers from study area centroid to the closest observation (± the precision, in km, of the record). [P] = vascular plant, [N] = nonvascular plant, [A] = vertebrate animal, [I] = invertebrate animal, [C] = community. Note: records are from attached files *ob.xls/*ob.shp only.

4.1 FLORA

	Scientific *Name*	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)
N	*Sphagnum macrophyllum*	Sphagnum				S1	1	4.4 ± 0.01
N	*Sphagnum torreyanum*	a Peatmoss				S3S4	3	4.0 ± 0.01
N	*Cladonia terrae-novae*	Newfoundland Reindeer Lichen				S3S4	3	4.8 ± 8.0
P	*Gratiola lutea*	Golden Hedge-hyssop				S1	1	3.6 ± 0.05
P	*Puccinellia nutkaensis*	Alaska Alkaligrass				S2	1	4.5 ± 1.0
P	*Schizaea pusilla*	Little Curlygrass Fern				S2	8	4.0 ± 0.01
P	*Ranunculus sceleratus*	Cursed Buttercup				S2S3	1	4.8 ± 0.75
P	*Rhodiola rosea*	Roseroot				S3	1	2.7 ± 1.4
P	*Bartonia paniculata ssp. iodandra*	Branched Bartonia				S3	1	4.6 ± 0.19
P	*Myriophyllum humile*	Low Water Milfoil				S3	1	3.3 ± 0.01
P	*Agalinis purpurea var. parviflora*	Small-flowered Purple False Foxglove				S3	3	3.6 ± 0.01
P	*Isoetes tuckermanii ssp. tuckermanii*	Tuckerman's Quillwort				S3	2	2.9 ± 0.01
P	*Botrychium simplex*	Least Moonwort				S3	1	3.5 ± 0.2
P	*Mertensia maritima*	Sea Lungwort				S3S4	3	4.8 ± 0.75
P	*Utricularia radiata*	Little Floating Bladderwort				S3S4	2	4.1 ± 0.01
P	*Geocaulon lividum*	Northern Comandra				S3S4	5	3.8 ± 0.01
P	*Juniperus horizontalis*	Creeping Juniper				S3S4	1	4.5 ± 1.0
P	*Carex exilis*	Coastal Sedge				S3S4	40	3.8 ± 0.01
P	*Carex wiegandii*	Wiegand's Sedge				S3S4	3	3.8 ± 0.01
P	*Carex recta*	Estuary Sedge				S3S4	1	4.5 ± 0.5
P	*Triglochin gaspensis*	Gaspé Arrowgrass				S3S4	2	4.0 ± 0.01
P	*Liparis loeselii*	Loesel's Twayblade				S3S4	2	1.9 ± 0.2
P	*Neottia cordata*	Heart-leaved Twayblade				S3S4	1	4.4 ± 1.0
P	*Calamagrostis pickeringii*	Pickering's Reed Grass				S3S4	56	3.6 ± 0.01
P	*Xyris montana*	Northern Yellow-Eyed-Grass				S3S4	5	4.1 ± 0.01

4.2 FAUNA

	Scientific *Name*	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)
A	*Charadrius melodus melodus*	Piping Plover melodus subspecies	Endangered	Endangered	Endangered	S1B	1	1.5 ± 0.2
A	*Hylocichla mustelina*	Wood Thrush	Threatened	Threatened	Threatened	S1S2B	1	4.0 ± 1.5
A	*Riparia riparia*	Bank Swallow	Threatened	Threatened	Endangered	S2B	17	3.3 ± 1.0
A	*Catharus bicknelli*	Bicknell's Thrush	Threatened	Threatened	Threatened	S2B	1	4.0 ± 1.5
A	*Acipenser oxyrinchus pop. 2*	Atlantic Sturgeon - Maritimes populations	Threatened		Threatened	S3B,S3N	2	3.2 ± 2.5
A	*Tringa flavipes*	Lesser Yellowlegs	Threatened			S3M	7	1.1 ± 0.5
A	*Limosa haemastica*	Hudsonian Godwit	Threatened			S3M	1	1.1 ± 0.5
A	*Limnodromus griseus ssp. 1*	Short-billed Dowitcher hendersoni/griseus	Threatened			S3M	31	1.1 ± 0.5
A	*Hirundo rustica*	Barn Swallow	Special Concern	Threatened	Threatened	S2B	12	3.3 ± 1.0
A	*Euphagus carolinus*	Rusty Blackbird	Special Concern	Special Concern	Special Concern	S2S3B,S3M	1	3.9 ± 2.82
A	*Contopus cooperi*	Olive-sided Flycatcher	Special Concern	Special Concern	Endangered	S3B	1	1.5 ± 0.25
A	*Contopus virens*	Eastern Wood-Pewee	Special Concern	Special Concern	Special Concern	S3B	2	3.9 ± 4.02
A	*Dolichonyx oryzivorus*	Bobolink	Special Concern	Threatened	Threatened	S3B	4	3.3 ± 1.0
A	*Coccothraustes vespertinus*	Evening Grosbeak	Special Concern	Special Concern		S3B,S3S4N,SUM	1	4.0 ± 3.22

	Scientific *Name*	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)
A	*Chordeiles minor*	Common Nighthawk	Special Concern	Special Concern	Threatened	S3B,S4M	1	3.9 ± 7.07
A	*Cardellina canadensis*	Canada Warbler	Special Concern	Threatened	Threatened	S3S4B	3	0.7 ± 0.15
A	*Phocoena phocoena pop. 1*	Harbour Porpoise - Northwest Atlantic Population	Special Concern		Special Concern	S4	4	2.0 ± 0.2
A	*Calidris subruficollis*	Buff-breasted Sandpiper	Special Concern	Special Concern		SNA	2	4.0 ± 1.5
A	*Fulica americana*	American Coot	Not At Risk			S1B	2	1.5 ± 0.2
A	*Astur cooperii*	Cooper's Hawk	Not At Risk			S1S2B	1	1.1 ± 0.2
A	*Podiceps grisegena*	Red-necked Grebe	Not At Risk			S2N,S3M	8	1.9 ± 0.5
A	*Calidris canutus rufa*	Red Knot rufa subspecies	E,SC	Endangered	Endangered	S2M	7	1.1 ± 0.5
A	*Vireo flavifrons*	Yellow-throated Vireo				S1?B	5	3.3 ± 0.15
A	*Tringa melanoleuca*	Greater Yellowlegs				S1?B,S4S5M	18	1.1 ± 0.5
A	*Leucophaeus atricilla*	Laughing Gull				S1B	2	2.0 ± 0.5
A	*Uria aalge*	Common Murre				S1B	1	1.9 ± 0.2
A	*Alca torda*	Razorbill				S1B	7	1.9 ± 0.2
A	*Aythya marila*	Greater Scaup				S1B,S2N,S4M	2	4.0 ± 1.5
A	*Oxyura jamaicensis*	Ruddy Duck				S1B,S2S3M	3	4.0 ± 1.5
A	*Aythya affinis*	Lesser Scaup				S1B,S4M	9	4.0 ± 1.5
A	*Sterna paradisaea*	Arctic Tern				S1B,SUM	1	4.1 ± 0.2
A	*Chroicocephalus ridibundus*	Black-headed Gull				S1N,S2M	1	4.0 ± 1.5
A	*Branta bernicla*	Brant				S1N,S2S3M	2	4.0 ± 1.5
A	*Calidris alba*	Sanderling				S1N,S3S4M	30	1.1 ± 0.5
A	*Nycticorax nycticorax*	Black-crowned Night Heron				S1S2B	2	2.3 ± 1.0
A	*Stelgidopteryx serripennis*	Northern Rough-winged Swallow				S1S2B	2	1.0 ± 7.07
A	*Calidris bairdii*	Baird's Sandpiper				S1S2M	7	4.0 ± 1.5
A	*Melanitta americana*	American Scoter				S1S2N,S5M	17	1.1 ± 0.2
A	*Petrochelidon pyrrhonota*	Cliff Swallow				S2B	2	3.3 ± 1.0
A	*Mimus polyglottos*	Northern Mockingbird				S2B	4	1.0 ± 7.07
A	*Somateria mollissima*	Common Eider				S2B,S2N,S4M	131	1.1 ± 0.2
A	*Mareca strepera*	Gadwall				S2B,S3M	8	1.1 ± 0.2
A	*Tringa solitaria*	Solitary Sandpiper				S2B,S4S5M	2	4.0 ± 1.5
A	*Phalacrocorax carbo*	Great Cormorant				S2N	2	2.8 ± 0.75
A	*Larus hyperboreus*	Glaucous Gull				S2N	1	4.8 ± 0.2
A	*Melanitta perspicillata*	Surf Scoter				S2N,S4M	36	1.1 ± 0.2
A	*Melanitta deglandi*	White-winged Scoter				S2N,S4M	6	1.9 ± 0.2
A	*Toxostoma rufum*	Brown Thrasher				S2S3B	2	1.6 ± 2.41
A	*Larus delawarensis*	Ring-billed Gull				S2S3B,S4N,S5M	113	1.1 ± 0.2
A	*Pluvialis dominica*	American Golden-Plover				S2S3M	14	4.0 ± 1.5
A	*Calcarius lapponicus*	Lapland Longspur				S2S3N,SUM	6	2.4 ± 1.0
A	*Larus marinus*	Great Black-backed Gull				S3	64	1.1 ± 0.1
A	*Loxia curvirostra*	Red Crossbill				S3	3	3.4 ± 1.75
A	*Spinus pinus*	Pine Siskin				S3	2	1.9 ± 0.25
A	*Spatula clypeata*	Northern Shoveler				S3B	1	4.0 ± 1.5
A	*Charadrius vociferus*	Killdeer				S3B	11	1.1 ± 0.5
A	*Cepphus grylle*	Black Guillemot				S3B	32	1.1 ± 0.25
A	*Coccyzus erythropthalmus*	Black-billed Cuckoo				S3B	1	3.9 ± 7.07
A	*Myiarchus crinitus*	Great Crested Flycatcher				S3B	1	3.9 ± 4.02
A	*Pheucticus ludovicianus*	Rose-breasted Grosbeak				S3B	3	3.1 ± 0.25
A	*Passerina cyanea*	Indigo Bunting				S3B	1	3.9 ± 7.07
A	*Molothrus ater*	Brown-headed Cowbird				S3B	1	4.0 ± 1.5
A	*Mergus serrator*	Red-breasted Merganser				S3B,S4S5N,S5M	36	1.1 ± 0.2
A	*Anas acuta*	Northern Pintail				S3B,S5M	2	4.8 ± 0.2
A	*Numenius phaeopus hudsonicus*	Whimbrel				S3M	10	1.1 ± 0.5
A	*Arenaria interpres*	Ruddy Turnstone				S3M	11	1.1 ± 0.5

	Scientific *Name*	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)
A	*Calidris pusilla*	Semipalmated Sandpiper				S3M	67	1.1 ± 0.2
A	*Calidris melanotos*	Pectoral Sandpiper				S3M	10	4.0 ± 1.5
A	*Podiceps auritus pop. 2*	Horned Grebe - Western population		Special Concern	Special Concern	S3N	13	1.9 ± 0.1
A	*Bucephala albeola*	Bufflehead				S3N	114	1.1 ± 0.1
A	*Calidris maritima*	Purple Sandpiper				S3N	2	4.5 ± 15.5
A	*Perisoreus canadensis*	Canada Jay				S3S4	1	3.9 ± 7.07
A	*Poecile hudsonicus*	Boreal Chickadee				S3S4	3	3.2 ± 0.15
A	*Tyrannus tyrannus*	Eastern Kingbird				S3S4B	4	3.9 ± 7.07
A	*Actitis macularius*	Spotted Sandpiper				S3S4B,S4M	28	1.1 ± 0.2
A	*Melospiza lincolnii*	Lincoln's Sparrow				S3S4B,S4M	1	3.9 ± 7.07
A	*Setophaga striata*	Blackpoll Warbler				S3S4B,S5M	2	2.4 ± 0.25
A	*Pluvialis squatarola*	Black-bellied Plover				S3S4M	11	1.1 ± 0.5
A	*Morus bassanus*	Northern Gannet				SHB	4	1.9 ± 0.1
I	*Danaus plexippus*	Monarch	Endangered	Endangered	Endangered	S2S3?B	10	3.3 ± 0.01
I	*Calligrapha rowena*	Rowena's Leaf Beetle				S3	1	4.2 ± 0.75
I	*Plebejus idas empetri*	Crowberry Blue				S3	6	1.9 ± 2.5
I	*Argynnis aphrodite winni*	Aphrodite Fritillary				S3	1	1.9 ± 2.5
I	*Nymphalis l-album j-album*	Compton Tortoiseshell				S3	3	1.9 ± 2.5
I	*Pantala hymenaea*	Spot-Winged Glider				S3B	2	1.2 ± 1.0

4.3 LOCATION SENSITIVE SPECIES

The Department of Natural Resources in each Maritimes province considers a number of species "location sensitive". Concern about exploitation of location-sensitive species precludes inclusion of precise coordinates in this report. Those intersecting your study area are indicated below with "**YES**".

New Brunswick

Scientific *Name*	Common Name	SARA	Prov Legal Prot	Known within the Study Site?
Chrysemys picta picta	Eastern Painted Turtle	Special Concern		No
Chelydra serpentina	Snapping Turtle	Special Concern	Special Concern	No
Glyptemys insculpta	Wood Turtle	Threatened	Threatened	No
Haliaeetus leucocephalus	**Bald Eagle**		**Endangered**	**YES**
Falco peregrinus pop. 1	**Peregrine Falcon - anatum/tundrius pop.**		**Endangered**	**YES**
Cicindela marginipennis	Cobblestone Tiger Beetle	Endangered	Endangered	No
Coenonympha nipisiquit	Maritime Ringlet	Endangered	Endangered	No
Bat hibernaculum or bat species occurrence		[Endangered][1]	[Endangered][1]	No

1 *Myotis lucifugus* (Little Brown Myotis), *Myotis septentrionalis* (Long-eared Myotis), and *Perimyotis subflavus* (Tri-colored Bat or Eastern Pipistrelle) are all Endangered under the Federal Species at Risk Act and the NB Species at Risk Act.

4.4 SOURCE BIBLIOGRAPHY

The recipient of these data shall acknowledge the AC CDC and the data sources listed below in any documents, reports, publications or presentations, in which this dataset makes a significant contribution.

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5.0 RARE SPECIES WITHIN 100 KM

A 100 km buffer around the study area contains 55395 records of 161 vertebrate and 3061 records of 97 invertebrate fauna; 11747 records of 334 vascular and 4215 records of 266 nonvascular flora (attached: *ob100km.xls).

Taxa within 100 km of the study site that are rare and/or endangered in the province in which the study site occurs (including “location-sensitive” species). All ranks correspond to the province in which the study site falls, even for out-of-province records. Taxa are listed in order of concern, beginning with legally listed taxa, with the number of observations per taxon and the distance in kilometers from study area centroid to the closest observation (± the precision, in km, of the record).

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)	Prov
A	*Myotis lucifugus*	Little Brown Myotis	Endangered	Endangered	Endangered	S1	239	10.7 ± 1.0	NB
A	*Myotis septentrionalis*	Northern Myotis	Endangered	Endangered	Endangered	S1	43	10.7 ± 0.1	NB
A	*Perimyotis subflavus*	Tricolored Bat	Endangered	Endangered	Endangered	S1	42	10.7 ± 0.1	NB
A	*Eubalaena glacialis*	North Atlantic Right Whale	Endangered	Endangered	Endangered	S1	8	52.0 ± 0.35	NB
A	*Osmerus mordax pop. 2*	Rainbow Smelt - Lake Utopia Large-bodied population	Endangered	Endangered	Threatened	S1	2	48.2 ± 10.0	NB
A	*Charadrius melodus melodus*	Piping Plover melodus subspecies	Endangered	Endangered	Endangered	S1B	29	1.5 ± 0.2	NB
A	*Sterna dougallii*	Roseate Tern	Endangered	Endangered	Endangered	S1B	3	44.3 ± 0.5	NB
A	*Dermochelys coriacea pop. 2*	Leatherback Sea Turtle - Atlantic population	Endangered	Endangered	Endangered	S1S2N	5	14.8 ± 50.0	NB
A	*Salmo salar pop. 1*	Atlantic Salmon - Inner Bay of Fundy population	Endangered	Endangered	Endangered	S2	39	27.2 ± 0.1	NB
A	*Salmo salar pop. 7*	Atlantic Salmon - Outer Bay of Fundy population	Endangered		Endangered	SNR	82	12.1 ± 1.08	NB
A	*Lasionycteris noctivagans*	Silver-haired Bat	Endangered			SUB,S1?M	4	13.7 ± 1.0	NB
A	*Lasiurus borealis*	Eastern Red Bat	Endangered			SUB,S2?M	10	13.0 ± 1.0	NB
A	*Lasiurus cinereus*	Hoary Bat	Endangered			SUB,S2?M	34	13.0 ± 1.0	NB
A	*Rangifer tarandus pop. 2*	Caribou - Atlantic-Gaspésie population	Endangered	Endangered	Extirpated	SX	4	30.8 ± 5.0	NB
A	*Sturnella magna*	Eastern Meadowlark	Threatened	Threatened	Threatened	S1B	44	37.3 ± 7.07	NB
A	*Bubo scandiacus*	Snowy Owl	Threatened			S1N,S2S3M	53	11.2 ± 0.2	NB
A	*Asio flammeus*	Short-eared Owl	Threatened	Special Concern	Special Concern	S1S2B	19	46.2 ± 7.07	NB
A	*Hylocichla mustelina*	Wood Thrush	Threatened	Threatened	Threatened	S1S2B	181	10.3 ± 7.07	NB
A	*Hydrobates leucorhous pop. 1*	Leach's Storm-Petrel - Atlantic Population	Threatened			S1S2B	157	31.9 ± 32.0	NB
A	*Riparia riparia*	Bank Swallow	Threatened	Threatened	Endangered	S2B	1287	10.3 ± 1.0	NB
A	*Catharus bicknelli*	Bicknell's Thrush	Threatened	Threatened	Threatened	S2B	24	4.0 ± 1.5	NB
A	*Glyptemys insculpta*	Wood Turtle	Threatened	Threatened	Threatened	S2S3	1929	100.0 ± 0.01	NB
A	*Chaetura pelagica*	Chimney Swift	Threatened	Threatened	Threatened	S2S3B,S2M	1318	100.0 ± 0.01	NB
A	*Acipenser oxyrinchus pop. 2*	Atlantic Sturgeon - Maritimes populations	Threatened		Threatened	S3B,S3N	52	11.3 ± 2.5	NB
A	*Tringa flavipes*	Lesser Yellowlegs	Threatened			S3M	688	1.1 ± 0.5	NB
A	*Limosa haemastica*	Hudsonian Godwit	Threatened			S3M	97	1.1 ± 0.5	NB
A	*Limnodromus griseus ssp. 1*	Short-billed Dowitcher hendersoni/griseus	Threatened			S3M	884	1.1 ± 0.5	NB
A	*Anguilla rostrata*	American Eel	Threatened		Threatened	S4N	185	12.2 ± 0.2	NB
A	*Coturnicops noveboracensis*	Yellow Rail	Special Concern	Special Concern	Special Concern	S1?B,SUM	4	67.4 ± 7.07	NB
A	*Histrionicus histrionicus pop. 1*	Harlequin Duck - Eastern population	Special Concern	Special Concern	Endangered	S1B,S2N	190	10.7 ± 0.2	NB

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A	*Botaurus exilis*	Least Bittern	Special Concern	Threatened	Threatened	S1S2B	53	11.4 ± 0.15	NB
A	*Antrostomus vociferus*	Eastern Whip-Poor-Will	Special Concern	Threatened	Threatened	S2B	84	13.1 ± 7.07	NB
A	*Hirundo rustica*	Barn Swallow	Special Concern	Threatened	Threatened	S2B	1681	10.1 ± 0.2	NB
A	*Balaenoptera physalus pop. 1*	Fin Whale - Atlantic population	Special Concern	Special Concern	Special Concern	S2S3	34	25.5 ± 0.5	NB
A	*Euphagus carolinus*	Rusty Blackbird	Special Concern	Special Concern	Special Concern	S2S3B,S3M	182	12.1 ± 1.21	NB
A	*Bucephala islandica pop. 1*	Barrow's Goldeneye - Eastern Population	Special Concern	Special Concern	Special Concern	S2S3N,S3M	54	10.9 ± 0.4	NB
A	*Acipenser brevirostrum*	Shortnose Sturgeon	Special Concern	Special Concern	Special Concern	S3	21	100.0 ± 10.0	NB
A	*Chelydra serpentina*	Snapping Turtle	Special Concern	Special Concern	Special Concern	S3	448	11.1 ± 1.95	NB
A	*Contopus cooperi*	Olive-sided Flycatcher	Special Concern	Special Concern	Endangered	S3B	508	1.5 ± 0.25	NB
A	*Contopus virens*	Eastern Wood-Pewee	Special Concern	Special Concern	Special Concern	S3B	1061	10.3 ± 7.07	NB
A	*Dolichonyx oryzivorus*	Bobolink	Special Concern	Threatened	Threatened	S3B	1789	100.0 ± 0.01	NB
A	*Coccothraustes vespertinus*	Evening Grosbeak	Special Concern	Special Concern		S3B,S3S4N,SUM	458	10.3 ± 7.07	NB
A	*Chordeiles minor*	Common Nighthawk	Special Concern	Special Concern	Threatened	S3B,S4M	504	10.2 ± 0.07	NB
A	*Phalaropus lobatus*	Red-necked Phalarope	Special Concern	Special Concern		S3M	235	17.9 ± 0.95	NB
A	*Cardellina canadensis*	Canada Warbler	Special Concern	Threatened	Threatened	S3S4B	1205	0.7 ± 0.15	NB
A	*Phocoena phocoena pop. 1*	Harbour Porpoise - Northwest Atlantic Population	Special Concern		Special Concern	S4	284	12.9 ± 0.5	NB
A	*Chrysemys picta picta*	Eastern Painted Turtle	Special Concern	Special Concern		S4	550	10.1 ± 1.0	NB
A	*Anarhichas lupus*	Atlantic Wolffish	Special Concern	Special Concern	Special Concern	SNR	2	45.4 ± 0.2	NB
A	*Hemidactylium scutatum*	Four-toed Salamander	Not At Risk			S1?	18	75.8 ± 0.1	NS
A	*Fulica americana*	American Coot	Not At Risk			S1B	20	1.5 ± 0.2	NB
A	*Falco peregrinus pop. 1*	Peregrine Falcon - anatum/tundrius	Not At Risk		Endangered	S1B,S3M	692	1.5 ± 0.2	NB
A	*Astur cooperii*	Cooper's Hawk	Not At Risk			S1S2B	68	1.1 ± 0.2	NB
A	*Buteo lineatus*	Red-shouldered Hawk	Not At Risk			S1S2B	57	12.2 ± 0.2	NB
A	*Aegolius funereus*	Boreal Owl	Not At Risk			S1S2B,SUM	5	34.8 ± 7.07	NB
A	*Chlidonias niger*	Black Tern	Not At Risk			S2B	357	22.6 ± 0.4	NB
A	*Podiceps grisegena*	Red-necked Grebe	Not At Risk			S2N,S3M	742	1.9 ± 0.5	NB
A	*Globicephala melas*	Long-finned Pilot Whale	Not At Risk			S2S3	3	14.0 ± 1.0	NB
A	*Desmognathus fuscus pop. 2*	Northern Dusky Salamander - Quebec / New Brunswick population	Not At Risk			S3	49	10.5 ± 1.0	NB
A	*Megaptera novaeangliae pop. 2*	Humpback Whale - Western North Atlantic Population	Not At Risk			S3	109	50.6 ± 0.05	NB
A	*Sterna hirundo*	Common Tern	Not At Risk			S3B,SUM	360	11.2 ± 1.0	NB
A	*Lagenorhynchus acutus*	Atlantic White-sided Dolphin	Not At Risk			S3S4	3	14.0 ± 1.0	NB
A	*Haliaeetus leucocephalus*	Bald Eagle	Not At Risk		Endangered	S4	2224	1.1 ± 0.2	NB
A	*Lynx canadensis*	Canada Lynx	Not At Risk		Special Concern	S4	20	30.0 ± 1.0	NB
A	*Calidris canutus rufa*	Red Knot rufa subspecies	E,SC	Endangered	Endangered	S2M	408	1.1 ± 0.5	NB
A	*Odobenus rosmarus pop. 5*	Atlantic Walrus - Nova Scotia - Newfoundland - Gulf of St Lawrence population	X		Extirpated	SX	1	70.4 ± 5.0	NS
A	*Thryothorus ludovicianus*	Carolina Wren				S1	47	18.8 ± 7.07	NB
A	*Salvelinus alpinus*	Arctic Char				S1	3	81.3 ± 0.02	NB
A	*Sorex dispar kirklandi*	a long-tailed shrew				S1	2	34.8 ± 1.0	NB
A	*Vireo flavifrons*	Yellow-throated Vireo				S1?B	17	12.1 ± 1.21	NB

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A	*Tringa melanoleuca*	Greater Yellowlegs				S1?B,S4S5M	1391	1.1 ± 0.5	NB
A	*Aythya americana*	Redhead				S1B	9	11.3 ± 0.15	NB
A	*Gallinula galeata*	Common Gallinule				S1B	37	11.2 ± 0.15	NB
A	*Antigone canadensis*	Sandhill Crane				S1B	16	23.4 ± 0.1	NB
A	*Bartramia longicauda*	Upland Sandpiper				S1B	49	33.7 ± 0.15	NB
A	*Phalaropus tricolor*	Wilson's Phalarope				S1B	61	11.4 ± 7.07	NB
A	*Leucophaeus atricilla*	Laughing Gull				S1B	92	14.2 ± 0.2	NB
A	*Rissa tridactyla*	Black-legged Kittiwake				S1B	109	28.0 ± 0.2	NB
A	*Uria aalge*	Common Murre				S1B	173	1.9 ± 0.2	NB
A	*Alca torda*	Razorbill				S1B	264	1.9 ± 0.2	NB
A	*Fratercula arctica*	Atlantic Puffin				S1B	187	15.1 ± 15.0	NB
A	*Progne subis*	Purple Martin				S1B	223	18.8 ± 7.07	NB
A	*Aythya marila*	Greater Scaup				S1B,S2N,S4M	58	10.3 ± 0.2	NB
A	*Oxyura jamaicensis*	Ruddy Duck				S1B,S2S3M	71	12.1 ± 2.82	NB
A	*Aythya affinis*	Lesser Scaup				S1B,S4M	231	10.3 ± 0.5	NB
A	*Eremophila alpestris*	Horned Lark				S1B,S4N,S5M	47	24.6 ± 0.2	NB
A	*Sterna paradisaea*	Arctic Tern				S1B,SUM	129	18.7 ± 16.09	NB
A	*Chroicocephalus ridibundus*	Black-headed Gull				S1N,S2M	46	14.2 ± 0.2	NB
A	*Branta bernicla*	Brant				S1N,S2S3M	549	14.7 ± 0.2	NB
A	*Calidris alba*	Sanderling				S1N,S3S4M	969	1.1 ± 0.5	NB
A	*Butorides virescens*	Green Heron				S1S2B	35	12.8 ± 5.73	NB
A	*Nycticorax nycticorax*	Black-crowned Night Heron				S1S2B	72	11.4 ± 7.07	NB
A	*Empidonax traillii*	Willow Flycatcher				S1S2B	146	11.4 ± 7.07	NB
A	*Stelgidopteryx serripennis*	Northern Rough-winged Swallow				S1S2B	22	1.0 ± 7.07	NB
A	*Troglodytes aedon*	House Wren				S1S2B	30	11.4 ± 7.07	NB
A	*Calidris bairdii*	Baird's Sandpiper				S1S2M	141	14.1 ± 0.5	NB
A	*Melanitta americana*	American Scoter				S1S2N,S5M	870	1.1 ± 0.2	NB
A	*Petrochelidon pyrrhonota*	Cliff Swallow				S2B	636	100.0 ± 0.01	NB
A	*Cistothorus palustris*	Marsh Wren				S2B	436	10.3 ± 7.07	NB
A	*Mimus polyglottos*	Northern Mockingbird				S2B	160	1.0 ± 7.07	NB
A	*Pooecetes gramineus*	Vesper Sparrow				S2B	94	100.0 ± 0.01	NS
A	*Somateria mollissima*	Common Eider				S2B,S2N,S4M	2550	1.1 ± 0.2	NB
A	*Mareca strepera*	Gadwall				S2B,S3M	231	1.1 ± 0.2	NB
A	*Tringa solitaria*	Solitary Sandpiper				S2B,S4S5M	307	100.0 ± 0.45	NB
A	*Pinicola enucleator*	Pine Grosbeak				S2B,S4S5N,S4S5M	84	40.9 ± 0.01	NB
A	*Phalacrocorax carbo*	Great Cormorant				S2N	364	10.9 ± 1.21	NB
A	*Somateria spectabilis*	King Eider				S2N	58	42.0 ± 12.07	NB
A	*Larus hyperboreus*	Glaucous Gull				S2N	169	10.1 ± 0.2	NB
A	*Melanitta perspicillata*	Surf Scoter				S2N,S4M	221	1.1 ± 0.2	NB
A	*Melanitta deglandi*	White-winged Scoter				S2N,S4M	76	1.9 ± 0.2	NB
A	*Asio otus*	Long-eared Owl				S2S3	17	42.4 ± 6.44	NB
A	*Picoides dorsalis*	American Three-toed Woodpecker				S2S3	9	49.3 ± 7.07	NB
A	*Salmo salar*	Atlantic Salmon				S2S3	3	84.5 ± 0.01	NS
A	*Toxostoma rufum*	Brown Thrasher				S2S3B	96	1.6 ± 2.41	NB
A	*Icterus galbula*	Baltimore Oriole				S2S3B	247	100.0 ±	NB

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A	*Larus delawarensis*	Ring-billed Gull				S2S3B,S4N,S5M	823	0.01 1.1 ± 0.2	NB
A	*Pluvialis dominica*	American Golden-Plover				S2S3M	292	13.8 ± 1.5	NB
A	*Calcarius lapponicus*	Lapland Longspur				S2S3N,SUM	45	12.5 ± 0.5	NB
A	*Larus marinus*	Great Black-backed Gull				S3	1077	1.1 ± 0.1	NB
A	*Picoides arcticus*	Black-backed Woodpecker				S3	68	10.4 ± 0.02	NB
A	*Loxia curvirostra*	Red Crossbill				S3	204	100.0 ± 0.01	NB
A	*Spinus pinus*	Pine Siskin				S3	410	1.9 ± 0.25	NB
A	*Prosopium cylindraceum*	Round Whitefish				S3	1	84.0 ± 0.12	NB
A	*Salvelinus namaycush*	Lake Trout				S3	4	16.8 ± 0.1	NB
A	*Sorex maritimensis*	Maritime Shrew				S3	1	75.1 ± 0.95	NS
A	*Spatula clypeata*	Northern Shoveler				S3B	209	11.6 ± 0.15	NB
A	*Charadrius vociferus*	Killdeer				S3B	943	1.1 ± 0.5	NB
A	*Tringa semipalmata*	Willet				S3B	211	10.4 ± 8.37	NB
A	*Cepphus grylle*	Black Guillemot				S3B	1058	1.1 ± 0.25	NB
A	*Coccyzus erythropthalmus*	Black-billed Cuckoo				S3B	213	11.6 ± 3.22	NB
A	*Myiarchus crinitus*	Great Crested Flycatcher				S3B	406	12.8 ± 5.73	NB
A	*Piranga olivacea*	Scarlet Tanager				S3B	133	18.8 ± 7.07	NB
A	*Pheucticus ludovicianus*	Rose-breasted Grosbeak				S3B	899	10.3 ± 7.07	NB
A	*Passerina cyanea*	Indigo Bunting				S3B	124	12.7 ± 0.15	NB
A	*Molothrus ater*	Brown-headed Cowbird				S3B	324	10.3 ± 7.07	NB
A	*Setophaga tigrina*	Cape May Warbler				S3B,S4S5M	181	17.4 ± 7.07	NB
A	*Mergus serrator*	Red-breasted Merganser				S3B,S4S5N,S5M	567	1.1 ± 0.2	NB
A	*Anas acuta*	Northern Pintail				S3B,S5M	85	11.4 ± 0.1	NB
A	*Anser caerulescens*	Snow Goose				S3M	10	29.5 ± 0.53	NB
A	*Numenius phaeopus hudsonicus*	Whimbrel				S3M	466	1.1 ± 0.5	NB
A	*Arenaria interpres*	Ruddy Turnstone				S3M	753	1.1 ± 0.5	NB
A	*Calidris pusilla*	Semipalmated Sandpiper				S3M	2695	1.1 ± 0.2	NB
A	*Calidris melanotos*	Pectoral Sandpiper				S3M	349	11.7 ± 0.5	NB
A	*Phalaropus fulicarius*	Red Phalarope				S3M	129	31.9 ± 32.0	NB
A	*Podiceps auritus pop. 2*	Horned Grebe - Western population		Special Concern	Special Concern	S3N	309	1.9 ± 0.1	NB
A	*Bucephala albeola*	Bufflehead				S3N	1500	1.1 ± 0.1	NB
A	*Calidris maritima*	Purple Sandpiper				S3N	267	11.7 ± 15.3	NB
A	*Uria lomvia*	Thick-billed Murre				S3N,S3M	69	10.9 ± 8.05	NB
A	*Perisoreus canadensis*	Canada Jay				S3S4	403	10.3 ± 7.07	NB
A	*Poecile hudsonicus*	Boreal Chickadee				S3S4	292	10.3 ± 0.01	NB
A	*Eptesicus fuscus*	Big Brown Bat				S3S4	50	13.0 ± 1.0	NB
A	*Synaptomys cooperi*	Southern Bog Lemming				S3S4	78	38.8 ± 1.0	NB
A	*Tyrannus tyrannus*	Eastern Kingbird				S3S4B	736	10.9 ± 0.2	NB
A	*Vireo gilvus*	Warbling Vireo				S3S4B	279	100.0 ± 0.01	NB
A	*Morone saxatilis*	Striped Bass				S3S4B,S3S4N	11	11.0 ± 0.2	NB
A	*Actitis macularius*	Spotted Sandpiper				S3S4B,S4M	1320	1.1 ± 0.2	NB
A	*Melospiza lincolnii*	Lincoln's Sparrow				S3S4B,S4M	350	10.3 ± 7.07	NB
A	*Gallinago delicata*	Wilson's Snipe				S3S4B,S5M	1037	12.7 ± 1.0	NB
A	*Setophaga striata*	Blackpoll Warbler				S3S4B,S5M	117	17.4 ± 7.07	NB
A	*Pluvialis squatarola*	Black-bellied Plover				S3S4M	1197	1.1 ± 0.5	NB
A	*Morus bassanus*	Northern Gannet				SHB	900	1.9 ± 0.1	NB
A	*Lanius ludovicianus*	Loggerhead Shrike				SXB	1	78.5 ± 1.5	NB
C	*Quercus macrocarpa - Acer*	Bur Oak - Red Maple /				S2	1	76.8 ± 0.01	NB

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	rubrum / Onoclea sensibilis - Carex arcta Forest	Sensitive Fern - Northern Clustered Sedge Forest							
C	*Acer saccharinum / Onoclea sensibilis - Lysimachia terrestris Forest*	Silver Maple / Sensitive Fern - Swamp Yellow Loosestrife Forest				S3	1	62.9 ± 0.05	NB
C	*Acer saccharum - Fraxinus americana / Polystichum acrostichoides Forest*	Sugar Maple - White Ash / Christmas Fern Forest				S3S4	1	37.7 ± 0.01	NB
I	*Bombus bohemicus*	Ashton Cuckoo Bumble Bee	Endangered	Endangered	Endangered	S1	23	12.1 ± 5.0	NB
I	*Danaus plexippus*	Monarch	Endangered	Endangered	Endangered	S2S3?B	1136	11.7 ± 0.2	NB
I	*Bombus affinis*	Rusty-patched Bumble Bee	Endangered	Endangered	Endangered	SH	3	64.2 ± 100.0	NB
I	*Bombus suckleyi*	Suckley's Cuckoo Bumble Bee	Threatened		Endangered	SH	1	17.3 ± 5.0	NB
I	*Gomphurus ventricosus*	Skillet Clubtail	Special Concern	Endangered	Data Deficient	S2	120	64.8 ± 0.01	NB
I	*Cicindela marginipennis*	Cobblestone Tiger Beetle	Special Concern	Endangered	Special Concern	S2S3	190	74.5 ± 0.01	NB
I	*Ophiogomphus howei*	Pygmy Snaketail	Special Concern	Special Concern	Special Concern	S2S3	16	50.2 ± 0.05	NB
I	*Alasmidonta varicosa*	Brook Floater	Special Concern	Special Concern	Special Concern	S3	3	91.6 ± 0.2	NB
I	*Lampsilis cariosa*	Yellow Lampmussel	Special Concern	Special Concern	Special Concern	S3	102	41.0 ± 1.0	NB
I	*Bombus terricola*	Yellow-banded Bumble Bee	Special Concern	Special Concern	Special Concern	S4	259	12.8 ± 5.0	NB
I	*Coccinella transversoguttata richardsoni*	Transverse Lady Beetle	Special Concern	Special Concern	Endangered	SH	17	13.1 ± 1.0	NB
I	*Appalachina sayana*	Spike-lip Crater Snail	Not At Risk			S3?	1	20.3 ± 1.0	NB
I	*Epeoloides pilosulus*	Macropis Cuckoo Bee	Data Deficient	Endangered		S1?	3	73.4 ± 1.5	NB
I	*Cicindela scutellaris lecontei*	Smooth Tiger Beetle				S1	11	81.0 ± 0.2	NB
I	*Conotrachelus juglandis*	Butternut Curculio				S1	3	89.3 ± 0.2	NB
I	*Chrysops moechus*	Adulterous Deer Fly				S1	1	78.4 ± 0.2	NB
I	*Haematopota rara*	Shy Cleg				S1	1	92.1 ± 1.0	NB
I	*Corythucha juglandis*	a lace bug				S1	1	89.3 ± 0.2	NB
I	*Tharsalea dorcas claytoni*	Clayton's Copper Butterfly				S1	1	73.5 ± 0.1	NB
I	*Erora laeta*	Early Hairstreak				S1	4	67.8 ± 2.5	NS
I	*Polites origenes*	Crossline Skipper				S1?	7	58.7 ± 0.01	NB
I	*Icaricia saepiolus amica*	Greenish Blue				S1S2	5	47.8 ± 0.1	NB
I	*Pachydiplax longipennis*	Blue Dasher				S1S2	55	22.7 ± 0.1	NB
I	*Encyclops caeruleus*	Cerulean Long-horned Beetle				S2	1	93.6 ± 0.01	NB
I	*Scaphinotus viduus*	Bereft Snail-eating Beetle				S2	5	42.1 ± 2.1	NB
I	*Brachyleptura circumdata*	Dark-shouldered Long-horned Beetle				S2	6	79.1 ± 0.01	NB
I	*Satyrium calanus falacer*	Falacer Hairstreak				S2	28	100.0 ± 0.5	NB
I	*Strymon melinus*	Gray Hairstreak				S2	10	11.4 ± 0.1	NB
I	*Chrysops aestuans*	Furious Deer Fly				S2S3	3	24.9 ± 1.5	NB
I	*Chrysops delicatulus*	Delicate Deer Fly				S2S3	4	13.1 ± 5.0	NB
I	*Tabanus vivax*	Vivacious Horse Fly				S2S3	1	98.0 ± 0.2	NB
I	*Ophiogomphus colubrinus*	Boreal Snaketail				S2S3	40	23.6 ± 1.0	NB
I	*Sphaeroderus nitidicollis*	Polished Snail-eating Beetle				S3	1	79.1 ± 0.5	NB
I	*Sphaeroderus canadensis*	Canada Snail-eating Beetle				S3	1	13.9 ± 0.2	NB
I	*Lepturopsis biforis*	Two-spotted Long-horned Beetle				S3	1	13.1 ± 1.0	NB
I	*Orthosoma brunneum*	Moist Long-horned Beetle				S3	22	100.0 ± 0.2	NS

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I	*Pronocera collaris*	Redneck Longhorn Beetle				S3	2	80.0 ± 0.25	NB
I	*Elaphrus americanus*	Boreal Elaphrus Beetle				S3	1	81.6 ± 0.5	NB
I	*Semanotus terminatus*	Light Long-horned Beetle				S3	1	84.7 ± 0.2	NB
I	*Desmocerus palliatus*	Elderberry Borer				S3	16	13.1 ± 1.0	NB
I	*Agonum excavatum*	Excavated Harp Ground Beetle				S3	1	81.6 ± 0.5	NB
I	*Clivina americana*	America Pedunculate Ground Beetle				S3	1	81.6 ± 0.5	NB
I	*Olisthopus parmatus*	Tawny-bordered Harp Ground Beetle				S3	1	79.1 ± 0.5	NB
I	*Tachys scitulus*	Handsome Riverbank Ground Beetle				S3	1	81.6 ± 0.5	NB
I	*Carabus serratus*	Serrated Ground Beetle				S3	1	96.0 ± 0.2	NB
I	*Coccinella hieroglyphica kirbyi*	a Ladybird Beetle				S3	1	13.1 ± 1.0	NB
I	*Hippodamia parenthesis*	Parenthesis Lady Beetle				S3	12	13.1 ± 1.0	NB
I	*Stenocorus vittiger*	Shrub Long-horned Beetle				S3	2	80.0 ± 0.2	NB
I	*Gnathacmaeops pratensis*	Meadow Flower Longhorn Beetle				S3	5	13.1 ± 1.0	NB
I	*Pogonocherus mixtus*	Mixed-spotted Flatface Sawyer				S3	1	13.1 ± 1.0	NB
I	*Xylotrechus undulatus*	Spruce Zebra Beetle				S3	3	71.2 ± 0.2	NS
I	*Mioptachys flavicauda*	Yellow-tipped Riverbank Ground Beetle				S3	1	84.7 ± 0.2	NB
I	*Calligrapha rowena*	Rowena's Leaf Beetle				S3	2	4.2 ± 0.75	NB
I	*Badister neopulchellus*	Red-black Spotted Beetle				S3	1	81.6 ± 0.5	NB
I	*Gonotropis dorsalis*	Birch Fungus Weevil				S3	1	84.7 ± 0.2	NB
I	*Naemia seriata*	Seaside Lady Beetle				S3	22	14.8 ± 0.2	NB
I	*Beckerus appressus*	Compressed Click Beetle				S3	1	96.3 ± 0.2	NB
I	*Ceruchus piceus*	Black Stag Beetle				S3	2	76.0 ± 0.2	NS
I	*Staphylinus ornaticauda*	Ornate-rumped Rove Beetle				S3	1	94.0 ± 0.2	NB
I	*Saperda vestita*	Linden Borer				S3	1	93.3 ± 0.2	NB
I	*Saperda imitans*	Oblique-banded Long-horned Beetle				S3	2	29.6 ± 0.2	NB
I	*Saperda lateralis*	Red-edged Long-horned Beetle				S3	2	18.2 ± 0.01	NB
I	*Trachysida aspera brevifrons*	a Longhorned Beetle				S3	2	13.1 ± 1.0	NB
I	*Enoclerus muttkowskii*	Muttkowski's Checkered Beetle				S3	1	90.0 ± 5.19	NB
I	*Epargyreus clarus*	Silver-spotted Skipper				S3	40	15.1 ± 0.01	NB
I	*Hesperia sassacus*	Indian Skipper				S3	20	45.9 ± 0.2	NB
I	*Euphyes bimacula*	Two-spotted Skipper				S3	18	42.4 ± 0.05	NB
I	*Satyrium acadica*	Acadian Hairstreak				S3	19	13.1 ± 5.0	NB
I	*Plebejus idas empetri*	Crowberry Blue				S3	29	1.9 ± 2.5	NB
I	*Argynnis aphrodite winni*	Aphrodite Fritillary				S3	29	1.9 ± 2.5	NB
I	*Boloria bellona*	Meadow Fritillary				S3	59	48.8 ± 0.01	NB
I	*Nymphalis l-album j-album*	Compton Tortoiseshell				S3	41	1.9 ± 2.5	NB
I	*Gomphurus vastus*	Cobra Clubtail				S3	138	46.3 ± 0.5	NB
I	*Celithemis martha*	Martha's Pennant				S3	47	11.3 ± 0.1	NB
I	*Ladona exusta*	White Corporal				S3	17	16.0 ± 0.2	NB
I	*Enallagma pictum*	Scarlet Bluet				S3	40	11.3 ± 0.1	NB
I	*Ischnura kellicotti*	Lilypad Forktail				S3	19	11.3 ± 0.1	NB

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I	*Arigomphus furcifer*	Lilypad Clubtail				S3	24	71.0 ± 0.5	NB
I	*Alasmidonta undulata*	Triangle Floater				S3	41	21.2 ± 1.0	NB
I	*Atlanticoncha ochracea*	Tidewater Mucket				S3	156	16.3 ± 1.0	NB
I	*Philomycus flexuolaris*	Winding Mantleslug				S3	10	85.3 ± 0.2	NB
I	*Striatura ferrea*	Black Striate Snail				S3	1	91.5 ± 1.0	NB
I	*Neohelix albolabris*	Whitelip Snail				S3	3	40.5 ± 0.01	NB
I	*Spurwinkia salsa*	Saltmarsh Hydrobe				S3	34	11.3 ± 0.1	NB
I	*Pantala hymenaea*	Spot-Winged Glider				S3B	20	1.2 ± 1.0	NB
I	*Dinothenarus capitatus*	Helmet Rove Beetle				S3S4	1	65.7 ± 0.2	NB
I	*Paracardiophorus propinquus*	Kindred Heart Click Beetle				S3S4	4	6.4 ± 0.2	NB
I	*Pedilus elegans*	Elegant Fire-coloured Beetle				S3S4	1	67.1 ± 1.05	NB
I	*Oxygonus montanus*	Catskill Mountain Click Beetle				S3S4	3	96.1 ± 0.58	NB
I	*Collops vittatus*	Banded Soft-winged Flower Beetle				S3S4	4	45.9 ± 0.2	NB
I	*Nitidula bipunctata*	Two-dots Sap Beetle				S3S4	3	78.6 ± 0.2	NS
I	*Saperda populnea moesta*	Poplar Gall Long-horned Beetle				S3S4	1	13.1 ± 1.0	NB
I	*Bombus griseocollis*	Brown-belted Bumble Bee				S3S4	18	66.9 ± 0.2	NB
I	*Lanthus vernalis*	Southern Pygmy Clubtail				S3S4	4	89.9 ± 0.2	NB
I	*Somatochlora forcipata*	Forcipate Emerald				S3S4	22	30.7 ± 0.2	NB
I	*Somatochlora tenebrosa*	Clamp-Tipped Emerald				S3S4	15	83.3 ± 0.01	NB
I	*Eristalis brousii*	Hourglass Drone Fly				SH	6	13.1 ± 5.0	NB
N	*Erioderma mollissimum*	Graceful Felt Lichen	Endangered	Endangered	Endangered	SH	1	95.9 ± 1.0	NB
N	*Erioderma pedicellatum (Atlantic pop.)*	Boreal Felt Lichen - Atlantic pop.	Endangered	Endangered	Endangered	SH	1	68.5 ± 1.0	NB
N	*Pannaria lurida*	Wrinkled Shingle Lichen	Threatened	Threatened	Endangered	S1?	158	100.0 ± 0.01	NB
N	*Heterodermia squamulosa*	Scaly Fringe Lichen	Threatened			S1?	66	15.8 ± 0.1	NB
N	*Anzia colpodes*	Black-foam Lichen	Threatened	Threatened	Endangered	S1S2	54	72.5 ± 1.0	NB
N	*Fuscopannaria leucosticta*	White-rimmed Shingle Lichen	Threatened			S2	183	100.0 ± 0.01	NB
N	*Peltigera hydrothyria*	Eastern Waterfan	Threatened	Threatened	Threatened	S2S3	286	78.8 ± 0.01	NB
N	*Pectenia plumbea*	Blue Felt Lichen	Special Concern	Special Concern	Special Concern	S1	629	23.6 ± 0.2	NB
N	*Sclerophora peronella (Atlantic pop.)*	Frosted Glass-whiskers (Atlantic population)	Special Concern	Special Concern		S1	118	78.7 ± 0.01	NS
N	*Pseudevernia cladonia*	Ghost Antler Lichen	Not At Risk			S2S3	41	16.3 ± 0.01	NB
N	*Aphanorrhegma serratum*	Lidded Earth Moss				S1	1	89.2 ± 0.2	NS
N	*Imbribryum muehlenbeckii*	Muehlenbeck's Bryum Moss				S1	1	16.2 ± 1.0	NB
N	*Didymodon rigidulus var. gracilis*	a moss				S1	1	98.9 ± 1.0	NB
N	*Sphagnum macrophyllum*	Sphagnum				S1	10	11.8 ± 0.01	NB
N	*Coscinodon cribrosus*	Sieve-Toothed Moss				S1	1	10.4 ± 0.1	NB
N	*Syntrichia ruralis*	a Moss				S1	1	80.9 ± 0.1	NB
N	*Sticta fuliginosa*	Peppered Moon Lichen				S1	9	77.7 ± 3.0	NS
N	*Leptogium hirsutum*	Jellyskin Lichen				S1	24	100.0 ± 0.01	NB
N	*Sclerophora amabilis*	Collared Glass-whiskers Lichen				S1	4	85.0 ± 0.01	NS
N	*Bactrospora brodoi*	a lichen				S1	1	23.6 ± 0.2	NB
N	*Cladonia straminea*	Reptilian Pixie-cup Lichen				S1	5	30.0 ± 0.2	NB

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N	*Hypotrachyna minarum*	Hairless-spined Shield Lichen				S1	20	67.7 ± 1.0	NB
N	*Parmotrema arnoldii*	Powdered Ruffle Lichen				S1	5	23.6 ± 0.2	NB
N	*Parmotrema perlatum*	Powdered Ruffle Lichen				S1	36	33.8 ± 0.01	NB
N	*Pseudevernia consocians*	Common Antler Lichen				S1	1	32.1 ± 0.01	NB
N	*Punctelia appalachensis*	Appalachian Speckleback Lichen				S1	68	33.9 ± 0.01	NB
N	*Coccocarpia palmicola*	Salted Shell Lichen				S1	19	52.2 ± 0.01	NB
N	*Peltigera collina*	Tree Pelt Lichen				S1	7	72.2 ± 0.2	NB
N	*Peltigera malacea*	Veinless Pelt Lichen				S1	2	78.3 ± 0.5	NS
N	*Bryoria bicolor*	Electrified Horsehair Lichen				S1	1	96.0 ± 1.0	NB
N	*Cladonia krogiana*	Krog's Pixie Lichen				S1	2	29.2 ± 0.5	NB
N	*Hygrobiella laxifolia*	Lax Notchwort				S1?	1	93.7 ± 1.0	NB
N	*Atrichum angustatum*	Lesser Smoothcap Moss				S1?	2	70.4 ± 0.36	NS
N	*Bartramia ithyphylla*	Straight-leaved Apple Moss				S1?	1	93.7 ± 0.1	NB
N	*Pseudocalliergon trifarium*	Three-ranked Spear Moss				S1?	1	8.6 ± 0.1	NB
N	*Dichelyma falcatum*	a Moss				S1?	2	31.3 ± 1.0	NB
N	*Dicranum bonjeanii*	Bonjean's Broom Moss				S1?	1	92.6 ± 1.0	NB
N	*Oxyrrhynchium hians*	Light Beaked Moss				S1?	4	69.7 ± 0.01	NS
N	*Plagiothecium latebricola*	Alder Silk Moss				S1?	2	5.4 ± 0.1	NB
N	*Niphotrichum ericoides*	Dense Rock Moss				S1?	1	85.0 ± 3.2	NB
N	*Rhytidium rugosum*	Wrinkle-leaved Moss				S1?	2	79.3 ± 0.1	NB
N	*Splachnum pensylvanicum*	Southern Dung Moss				S1?	1	94.9 ± 1.0	NB
N	*Platylomella lescurii*	a Moss				S1?	7	64.6 ± 0.2	NS
N	*Enchylium tenax*	Soil Tarpaper Lichen				S1?	1	91.9 ± 0.01	NS
N	*Bacidia arceutina*	a lichen				S1?	4	23.6 ± 0.2	NB
N	*Ephebe hispidula*	Dryside Rockshag Lichen				S1?	1	82.1 ± 0.05	NS
N	*Ephebe perspinulosa*	Thread Lichen				S1?	1	86.3 ± 0.2	NS
N	*Euopsis granatina*	Lesser Rockbud Lichen				S1?	1	78.9 ± 1.33	NS
N	*Graphis elegans*	a lichen				S1?	2	71.5 ± 0.2	NB
N	*Pertusaria propinqua*	a Lichen				S1?	2	96.0 ± 1.0	NB
N	*Pilophorus fibula*	New England Matchstick Lichen				S1?	1	36.4 ± 0.01	NB
N	*Psorula rufonigra*	Blue-edged Scale Lichen				S1?	1	69.8 ± 8.0	NS
N	*Rhizocarpon umbilicatum*	a Lichen				S1?	1	92.4 ± 1.0	NB
N	*Spilonema revertens*	Rock Hairball Lichen				S1?	5	77.9 ± 0.01	NS
N	*Peltigera venosa*	Fan Pelt Lichen				S1?	3	39.3 ± 0.01	NB
N	*Cladonia oricola*	Cladonia Lichen				S1?	2	10.8 ± 0.01	NB
N	*Usnea flammea*	Coastal Bushy Beard Lichen				S1?	2	67.4 ± 0.2	NB
N	*Odontoschisma francisci*	Holt's Notchwort				S1S2	1	98.9 ± 1.0	NB
N	*Harpanthus flotovianus*	Great Mountain Flapwort				S1S2	1	96.3 ± 1.0	NB
N	*Pallavicinia lyellii*	Lyell's Ribbonwort				S1S2	15	21.7 ± 1.0	NB
N	*Radula tenax*	Tenacious Scalewort				S1S2	1	86.9 ± 0.2	NS
N	*Reboulia hemisphaerica*	Purple-margined Liverwort				S1S2	3	74.6 ± 0.2	NS
N	*Solenostoma obovatum*	Egg Flapwort				S1S2	1	26.6 ± 0.1	NB
N	*Brachythecium acuminatum*	Acuminate Ragged Moss				S1S2	5	73.3 ± 100.0	NB
N	*Ptychostomum salinum*	Saltmarsh Bryum				S1S2	2	28.3 ± 1.0	NB
N	*Pseudocampylium radicale*	Long-stalked Fine Wet Moss				S1S2	1	94.3 ± 1.0	NB
N	*Tortula obtusifolia*	a Moss				S1S2	1	54.4 ± 0.1	NB

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N	*Distichium inclinatum*	Inclined Iris Moss				S1S2	5	98.8 ± 0.1	NB
N	*Ditrichum pallidum*	Pale Cow-hair Moss				S1S2	6	68.7 ± 3.2	NS
N	*Drummondia prorepens*	a Moss				S1S2	1	81.9 ± 0.01	NS
N	*Fissidens taxifolius*	Yew-leaved Pocket Moss				S1S2	3	75.8 ± 0.2	NS
N	*Sphagnum platyphyllum*	Flat-leaved Peat Moss				S1S2	4	70.2 ± 0.2	NS
N	*Timmia norvegica*	a moss				S1S2	3	66.0 ± 0.1	NB
N	*Timmia norvegica var. excurrens*	a moss				S1S2	1	98.8 ± 0.1	NB
N	*Tomentypnum falcifolium*	Sickle-leaved Golden Moss				S1S2	1	18.9 ± 1.0	NB
N	*Tortella humilis*	Small Crisp Moss				S1S2	4	95.0 ± 0.1	NB
N	*Pseudotaxiphyllum distichaceum*	a Moss				S1S2	3	28.3 ± 1.0	NB
N	*Hamatocaulis vernicosus*	a Moss				S1S2	5	35.5 ± 100.0	NB
N	*Haplocladium microphyllum*	Tiny-leaved Haplocladium Moss				S1S2	1	68.7 ± 3.2	NS
N	*Umbilicaria vellea*	Grizzled Rocktripe Lichen				S1S2	1	99.1 ± 1.0	NB
N	*Cladonia rappii*	Slender Ladder Lichen				S1S2	2	23.5 ± 8.0	NB
N	*Lecanora insignis*	a rim lichen				S1S2	3	42.4 ± 0.2	NB
N	*Pilophorus cereolus*	Powdered Matchstick Lichen				S1S2	2	36.4 ± 0.01	NB
N	*Anaptychia crinalis*	Hanging Fringed Lichen				S1S2	2	26.5 ± 8.0	NB
N	*Calypogeia neesiana*	Nees' Pouchwort				S1S3	2	37.0 ± 1.0	NB
N	*Fuscocephaloziopsis connivens*	Forcipated Pincerwort				S1S3	1	26.1 ± 0.05	NB
N	*Cephaloziella elachista*	Spurred Threadwort				S1S3	1	8.2 ± 5.0	NB
N	*Porella pinnata*	Pinnate Scalewort				S1S3	2	43.8 ± 1.0	NB
N	*Ricciocarpos natans*	Purple-fringed Liverwort				S1S3	2	79.6 ± 0.01	NB
N	*Amphidium mougeotii*	a Moss				S2	11	26.3 ± 1.2	NB
N	*Anomodon viticulosus*	a Moss				S2	7	12.7 ± 0.6	NB
N	*Cirriphyllum piliferum*	Hair-pointed Moss				S2	2	81.2 ± 0.01	NB
N	*Cynodontium strumiferum*	Strumose Dogtooth Moss				S2	1	76.1 ± 8.0	NB
N	*Dicranella palustris*	Drooping-Leaved Fork Moss				S2	8	60.7 ± 100.0	NB
N	*Didymodon ferrugineus*	Rusty Beard Moss				S2	2	35.5 ± 1.0	NB
N	*Ditrichum flexicaule*	Flexible Cow-hair Moss				S2	1	26.3 ± 1.2	NB
N	*Fontinalis hypnoides*	a moss				S2	1	89.1 ± 0.01	NB
N	*Anomodon tristis*	a Moss				S2	4	64.5 ± 0.2	NS
N	*Hygrohypnum bestii*	Best's Brook Moss				S2	5	86.8 ± 0.1	NB
N	*Hypnum pratense*	Meadow Plait Moss				S2	1	8.8 ± 0.1	NB
N	*Isothecium myosuroides*	Slender Mouse-tail Moss				S2	12	26.3 ± 1.2	NB
N	*Meesia triquetra*	Three-ranked Cold Moss				S2	4	67.9 ± 0.2	NS
N	*Physcomitrium immersum*	a Moss				S2	8	43.8 ± 1.0	NB
N	*Platydictya jungermannioides*	False Willow Moss				S2	4	30.1 ± 0.35	NB
N	*Pohlia elongata*	Long-necked Nodding Moss				S2	7	95.0 ± 0.1	NB
N	*Seligeria calcarea*	Chalk Brittle Moss				S2	1	26.3 ± 1.2	NB
N	*Sphagnum lindbergii*	Lindberg's Peat Moss				S2	8	11.2 ± 0.01	NB
N	*Tayloria serrata*	Serrate Trumpet Moss				S2	3	41.7 ± 1.0	NB
N	*Tetrodontium brownianum*	Little Georgia				S2	2	98.4 ± 0.1	NB
N	*Tetraplodon mnioides*	Entire-leaved Nitrogen Moss				S2	3	23.0 ± 0.5	NB

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N	*Thamnobryum alleghaniense*	a Moss				S2	19	62.8 ± 0.2	NS
N	*Tortula mucronifolia*	Mucronate Screw Moss				S2	1	10.6 ± 0.01	NB
N	*Ulota phyllantha*	a Moss				S2	8	28.3 ± 1.0	NB
N	*Zygodon viridissimus var. rupestris*	Green Rock Yoke Moss				S2	2	67.0 ± 0.2	NS
N	*Anomobryum julaceum*	Slender Silver Moss				S2	5	61.4 ± 0.1	NB
N	*Usnea ceratina*	Warty Beard Lichen				S2	3	52.1 ± 0.01	NB
N	*Cladonia incrassata*	Powder-foot British Soldiers Lichen				S2	2	26.2 ± 0.5	NB
N	*Cladonia wainioi*	False Reindeer Lichen				S2	3	76.5 ± 0.2	NB
N	*Leptogium corticola*	Blistered Jellyskin Lichen				S2	93	42.1 ± 1.0	NB
N	*Leptogium milligranum*	Stretched Jellyskin Lichen				S2	14	100.0 ± 0.01	NB
N	*Nephroma laevigatum*	Mustard Kidney Lichen				S2	35	22.9 ± 0.2	NB
N	*Peltigera lepidophora*	Scaly Pelt Lichen				S2	6	39.3 ± 0.01	NB
N	*Anacamptodon splachnoides*	a Moss				S2?	1	73.4 ± 0.2	NS
N	*Andreaea rothii*	Dusky Rock Moss				S2?	2	29.3 ± 0.1	NB
N	*Ptychostomum pallescens*	Tall Clustered Bryum				S2?	2	11.3 ± 1.0	NB
N	*Dichelyma capillaceum*	Hairlike Dichelyma Moss				S2?	1	99.1 ± 2.7	NB
N	*Dicranum spurium*	Spurred Broom Moss				S2?	8	13.6 ± 0.7	NB
N	*Hygrohypnum montanum*	a Moss				S2?	1	76.7 ± 1.0	NB
N	*Schistostega pennata*	Luminous Moss				S2?	3	60.7 ± 100.0	NB
N	*Seligeria diversifolia*	a Moss				S2?	2	61.4 ± 0.1	NB
N	*Sphagnum angermanicum*	a Peatmoss				S2?	3	16.4 ± 10.0	NB
N	*Trichodon cylindricus*	Cylindric Hairy-teeth Moss				S2?	2	91.6 ± 0.2	NS
N	*Plagiomnium rostratum*	Long-beaked Leafy Moss				S2?	6	65.9 ± 0.01	NB
N	*Ramalina labiosorediata*	Chalky Ramalina Lichen				S2?	1	83.8 ± 0.2	NB
N	*Collema leptaleum*	Crumpled Bat's Wing Lichen				S2?	4	82.9 ± 0.01	NB
N	*Imshaugia placorodia*	Eyed Starburst Lichen				S2?	2	78.6 ± 0.2	NS
N	*Nephroma arcticum*	Arctic Kidney Lichen				S2?	1	96.8 ± 1.0	NB
N	*Usnea merrillii*	Beaded Beard Lichen				S2?	16	23.6 ± 0.2	NB
N	*Physcia subtilis*	Slender Rosette Lichen				S2?	1	99.4 ± 0.01	NS
N	*Ptychostomum cernuum*	Swamp Bryum				S2S3	3	32.5 ± 4.3	NB
N	*Buxbaumia aphylla*	Brown Shield Moss				S2S3	7	75.7 ± 15.0	NB
N	*Calliergonella cuspidata*	Common Large Wetland Moss				S2S3	17	22.6 ± 0.1	NB
N	*Drepanocladus polygamus*	Polygamous Hook Moss				S2S3	4	88.3 ± 0.2	NS
N	*Palustriella falcata*	Curled Hook Moss				S2S3	3	26.3 ± 1.2	NB
N	*Didymodon rigidulus*	Rigid Screw Moss				S2S3	10	12.7 ± 0.6	NB
N	*Ephemerum serratum*	a Moss				S2S3	5	78.7 ± 0.2	NS
N	*Fissidens bushii*	Bush's Pocket Moss				S2S3	19	12.7 ± 0.6	NB
N	*Hypnum cupressiforme var. filiforme*	a Moss				S2S3	2	78.5 ± 0.2	NS
N	*Isopterygiopsis pulchella*	Neat Silk Moss				S2S3	4	97.5 ± 0.2	NS
N	*Neckera complanata*	a Moss				S2S3	10	12.7 ± 0.6	NB
N	*Orthotrichum elegans*	Showy Bristle Moss				S2S3	3	61.5 ± 2.4	NB
N	*Pohlia proligera*	Cottony Nodding Moss				S2S3	2	98.4 ± 1.5	NB
N	*Codriophorus fascicularis*	Clustered Rock Moss				S2S3	2	68.7 ± 0.01	NB
N	*Bucklandiella affinis*	Lesser Rock Moss				S2S3	4	71.4 ± 0.01	NS
N	*Scorpidium scorpioides*	Hooked Scorpion Moss				S2S3	4	15.0 ± 1.0	NB

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N	*Seligeria campylopoda*	a Moss				S2S3	1	35.5 ± 100.0	NB
N	*Sphagnum centrale*	Central Peat Moss				S2S3	7	68.9 ± 5.0	NS
N	*Sphagnum pylaesii*	Simple Peatmoss				S2S3	1	16.3 ± 0.01	NB
N	*Sphagnum subfulvum*	a Peatmoss				S2S3	4	18.9 ± 1.0	NB
N	*Taxiphyllum deplanatum*	Imbricate Yew-leaved Moss				S2S3	1	28.3 ± 1.0	NB
N	*Zygodon viridissimus*	Green Rock Yoke-moss				S2S3	4	68.9 ± 5.0	NS
N	*Schistidium agassizii*	Elf Bloom Moss				S2S3	5	61.5 ± 2.4	NB
N	*Loeskeobryum brevirostre*	a Moss				S2S3	17	26.3 ± 1.2	NB
N	*Cyrtomnium hymenophylloides*	Short-pointed Lantern Moss				S2S3	4	78.6 ± 0.2	NB
N	*Sphaerophorus globosus*	Northern Coral Lichen				S2S3	98	19.2 ± 0.28	NB
N	*Cetrariella delisei*	Snowbed Icelandmoss Lichen				S2S3	2	23.5 ± 8.0	NB
N	*Chaenotheca xyloxena*	a lichen				S2S3	4	23.6 ± 0.2	NB
N	*Cladonia acuminata*	Scantily Clad Pixie Lichen				S2S3	2	95.9 ± 1.0	NB
N	*Cladonia sulphurina*	Greater Sulphur-cup Lichen				S2S3	5	96.7 ± 0.2	NB
N	*Myelochroa aurulenta*	Powdery Axil-bristle Lichen				S2S3	2	37.0 ± 0.01	NB
N	*Lichenomphalia umbellifera*	Green-pea Mushroom Lichen				S2S3	2	28.6 ± 0.2	NB
N	*Parmeliopsis ambigua*	Green Starburst Lichen				S2S3	1	93.6 ± 1.0	NB
N	*Polychidium muscicola*	Eyed Mossthorns Woollybear Lichen				S2S3	14	32.3 ± 7.57	NB
N	*Umbilicaria polyphylla*	Petalled Rocktripe Lichen				S2S3	3	21.7 ± 1.0	NB
N	*Hypotrachyna revoluta*	Granulating Loop Lichen				S2S3	25	14.2 ± 0.2	NB
N	*Cladonia coccifera*	Eastern Boreal Pixie-cup Lichen				S2S3	1	29.2 ± 0.2	NB
N	*Punctelia caseana*	Case's Speckled-back Lichen				S2S3	8	14.8 ± 0.2	NB
N	*Cynodontium tenellum*	Delicate Dogtooth Moss				S3	6	28.3 ± 1.0	NB
N	*Hypnum curvifolium*	Curved-leaved Plait Moss				S3	9	62.9 ± 0.2	NS
N	*Tortella fragilis*	Fragile Twisted Moss				S3	1	98.8 ± 0.1	NB
N	*Schistidium maritimum*	a Moss				S3	9	28.3 ± 1.0	NB
N	*Hymenostylium recurvirostrum*	Curve-beak Beardless Moss				S3	13	62.9 ± 0.2	NS
N	*Collema nigrescens*	Blistered Tarpaper Lichen				S3	7	86.3 ± 0.01	NS
N	*Solorina saccata*	Woodland Owl Lichen				S3	14	29.1 ± 1.0	NB
N	*Usnea subgracilis*	Silken Beard Lichen				S3	13	23.2 ± 0.2	NB
N	*Ahtiana aurescens*	Eastern Candlewax Lichen				S3	12	24.0 ± 1.0	NB
N	*Normandina pulchella*	Rimmed Elf-ear Lichen				S3	57	35.1 ± 0.2	NB
N	*Cladonia brevis*	Short Peg Lichen				S3	1	29.2 ± 0.2	NB
N	*Cladonia strepsilis*	Olive Cladonia Lichen				S3	9	36.9 ± 0.2	NB
N	*Hypotrachyna catawbiensis*	Powder-tipped Antler Lichen				S3	85	10.9 ± 0.2	NB
N	*Scytinium lichenoides*	Tattered Jellyskin Lichen				S3	20	18.5 ± 1.0	NB
N	*Nephroma bellum*	Naked Kidney Lichen				S3	6	70.5 ± 0.2	NB
N	*Peltigera degenii*	Lustrous Pelt Lichen				S3	3	87.3 ± 1.0	NB
N	*Leptogium laceroides*	Short-bearded Jellyskin Lichen				S3	14	36.5 ± 0.5	NB
N	*Peltigera membranacea*	Membranous Pelt Lichen				S3	21	38.6 ± 0.01	NB

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N	*Cladonia botrytes*	Wooden Soldiers Lichen				S3	1	99.7 ± 0.01	NB
N	*Cladonia deformis*	Lesser Sulphur-cup Lichen				S3	9	32.2 ± 0.01	NB
N	*Hypotrachyna afrorevoluta*	Pustulate Revolute Loop Lichen				S3	81	31.7 ± 0.2	NB
N	*Aulacomnium androgynum*	Little Groove Moss				S3?	13	26.3 ± 1.2	NB
N	*Ptychostomum inclinatum*	Blunt-tooth Thread Moss				S3?	2	68.7 ± 3.2	NS
N	*Dicranella rufescens*	Red Forklet Moss				S3?	4	93.5 ± 4.5	NB
N	*Rhytidiadelphus loreus*	Lanky Moss				S3?	5	70.3 ± 0.01	NS
N	*Sphagnum lescurii*	a Peatmoss				S3?	15	26.1 ± 0.1	NB
N	*Sphagnum inundatum*	a Sphagnum				S3?	2	43.8 ± 0.77	NB
N	*Calicium tigillare*	a lichen				S3?	2	5.6 ± 0.2	NB
N	*Biatora mendax*	a dot lichen				S3?	4	35.2 ± 0.2	NB
N	*Rostania occultata*	Crusted Tarpaper Lichen				S3?	4	88.6 ± 0.2	NS
N	*Cystocoleus ebeneus*	Rockgossamer Lichen				S3?	1	78.9 ± 0.26	NS
N	*Scytinium subtile*	Appressed Jellyskin Lichen				S3?	10	49.3 ± 0.2	NB
N	*Chaenotheca gracilenta*	a lichen				S3?	1	23.6 ± 0.2	NB
N	*Alyxoria varia*	Scribble Lichen				S3?	1	31.9 ± 0.2	NB
N	*Peltigera neckeri*	Black-saddle Pelt Lichen				S3?	1	95.7 ± 5.0	NB
N	*Anomodon rugelii*	Rugel's Anomodon Moss				S3S4	5	71.2 ± 0.2	NS
N	*Barbula convoluta*	Lesser Bird's-claw Beard Moss				S3S4	4	86.6 ± 0.01	NS
N	*Brachytheciastrum velutinum*	Velvet Ragged Moss				S3S4	6	70.0 ± 0.35	NB
N	*Calliergon giganteum*	Giant Spear Moss				S3S4	1	87.9 ± 0.01	NS
N	*Dicranella cerviculata*	a Moss				S3S4	3	28.3 ± 1.0	NB
N	*Dicranum majus*	Greater Broom Moss				S3S4	16	23.0 ± 0.5	NB
N	*Dicranum leioneuron*	a Dicranum Moss				S3S4	1	99.4 ± 0.1	NB
N	*Encalypta ciliata*	Fringed Extinguisher Moss				S3S4	1	99.1 ± 0.1	NB
N	*Fissidens bryoides*	Lesser Pocket Moss				S3S4	3	36.1 ± 5.0	NB
N	*Elodium blandowii*	Blandow's Bog Moss				S3S4	2	17.8 ± 0.73	NB
N	*Heterocladium dimorphum*	Dimorphous Tangle Moss				S3S4	1	61.5 ± 2.4	NB
N	*Isopterygiopsis muelleriana*	a Moss				S3S4	18	26.3 ± 1.2	NB
N	*Myurella julacea*	Small Mouse-tail Moss				S3S4	5	26.3 ± 1.2	NB
N	*Orthotrichum speciosum*	Showy Bristle Moss				S3S4	5	79.4 ± 0.2	NS
N	*Physcomitrium pyriforme*	Pear-shaped Urn Moss				S3S4	24	45.9 ± 0.2	NB
N	*Pogonatum dentatum*	Mountain Hair Moss				S3S4	3	28.3 ± 1.0	NB
N	*Sphagnum torreyanum*	a Peatmoss				S3S4	7	4.0 ± 0.01	NB
N	*Sphagnum austinii*	Austin's Peat Moss				S3S4	2	5.1 ± 1.8	NB
N	*Sphagnum contortum*	Twisted Peat Moss				S3S4	4	22.7 ± 0.8	NB
N	*Sphagnum quinquefarium*	Five-ranked Peat Moss				S3S4	6	26.3 ± 1.2	NB
N	*Splachnum rubrum*	Red Collar Moss				S3S4	1	35.3 ± 1.2	NB
N	*Tetraphis geniculata*	Geniculate Four-tooth Moss				S3S4	8	23.0 ± 0.5	NB
N	*Tetraplodon angustatus*	Toothed-leaved Nitrogen Moss				S3S4	3	28.3 ± 1.0	NB
N	*Tomentypnum nitens*	Golden Fuzzy Fen Moss				S3S4	1	67.8 ± 0.2	NS
N	*Weissia controversa*	Green-Cushioned Weissia				S3S4	7	26.7 ± 1.5	NB
N	*Abietinella abietina*	Wiry Fern Moss				S3S4	2	71.2 ± 0.55	NB
N	*Trichostomum tenuirostre*	Acid-Soil Moss				S3S4	7	12.7 ± 0.6	NB
N	*Pannaria rubiginosa*	Brown-eyed Shingle Lichen				S3S4	81	31.7 ± 0.2	NB

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N	*Pseudocyphellaria holarctica*	Yellow Specklebelly Lichen				S3S4	213	100.0 ± 0.01	NB
N	*Ramalina thrausta*	Angelhair Ramalina Lichen				S3S4	14	24.0 ± 1.0	NB
N	*Hypogymnia vittata*	Slender Monk's Hood Lichen				S3S4	38	24.0 ± 1.0	NB
N	*Scytinium teretiusculum*	Curly Jellyskin Lichen				S3S4	16	41.6 ± 0.01	NB
N	*Montanelia panniformis*	Shingled Camouflage Lichen				S3S4	4	96.0 ± 1.0	NB
N	*Cladonia terrae-novae*	Newfoundland Reindeer Lichen				S3S4	37	10.3 ± 1.0	NB
N	*Cladonia floerkeana*	Gritty British Soldiers Lichen				S3S4	8	31.6 ± 0.2	NB
N	*Cladonia parasitica*	Fence-rail Lichen				S3S4	3	49.6 ± 8.0	NB
N	*Xylopsora friesii*	a Lichen				S3S4	2	36.1 ± 0.2	NB
N	*Nephroma parile*	Powdery Kidney Lichen				S3S4	39	38.6 ± 0.01	NB
N	*Nephroma resupinatum*	a lichen				S3S4	3	88.6 ± 0.05	NS
N	*Protopannaria pezizoides*	Brown-gray Moss-shingle Lichen				S3S4	88	23.6 ± 0.2	NB
N	*Parmelia fertilis*	Fertile Shield Lichen				S3S4	3	31.8 ± 0.2	NB
N	*Usnea silesiaca*	Blackened Beard Lichen				S3S4	2	42.4 ± 0.2	NB
N	*Usnea strigosa*	Bushy Beard Lichen				S3S4	55	12.7 ± 0.2	NB
N	*Fuscopannaria sorediata*	a Lichen				S3S4	41	33.4 ± 0.2	NB
N	*Stereocaulon condensatum*	Granular Soil Foam Lichen				S3S4	10	29.2 ± 0.5	NB
N	*Stereocaulon paschale*	Easter Foam Lichen				S3S4	3	29.2 ± 0.2	NB
N	*Pannaria conoplea*	Mealy-rimmed Shingle Lichen				S3S4	172	100.0 ± 0.01	NB
N	*Physcia tenella*	Fringed Rosette Lichen				S3S4	2	39.5 ± 0.01	NB
N	*Anaptychia palmulata*	Shaggy Fringed Lichen				S3S4	205	100.0 ± 0.01	NB
N	*Peltigera neopolydactyla*	Undulating Pelt Lichen				S3S4	11	36.5 ± 0.5	NB
N	*Cladonia amaurocraea*	Quill Lichen				S3S4	1	30.0 ± 0.2	NB
N	*Grimmia anodon*	Toothless Grimmia Moss				SH	2	12.9 ± 10.0	NB
N	*Leucodon brachypus*	a Moss				SH	6	64.2 ± 100.0	NB
N	*Thelia hirtella*	a Moss				SH	8	71.1 ± 0.2	NS
P	*Juglans cinerea*	Butternut	Endangered	Endangered	Endangered	S1	253	100.0 ± 0.2	NB
P	*Polemonium vanbruntiae*	Van Brunt's Jacob's-ladder	Threatened	Threatened	Threatened	S1	128	22.9 ± 0.01	NB
P	*Fraxinus nigra*	Black Ash	Threatened			S3S4	625	10.4 ± 0.6	NB
P	*Isoetes prototypus*	Prototype Quillwort	Special Concern	Special Concern	Endangered	S1	30	32.8 ± 0.05	NB
P	*Symphyotrichum anticostense*	Anticosti Aster	Special Concern	Special Concern	Special Concern	S3	2	12.6 ± 0.56	NB
P	*Pterospora andromedea*	Woodland Pinedrops			Endangered	S1	25	99.3 ± 0.01	NB
P	*Cryptotaenia canadensis*	Canada Honewort				S1	1	79.1 ± 1.0	NB
P	*Antennaria parlinii ssp. fallax*	Parlin's Pussytoes				S1	8	65.3 ± 1.0	NB
P	*Antennaria howellii ssp. petaloidea*	Pussy-Toes				S1	4	10.9 ± 5.0	NB
P	*Bidens discoidea*	Swamp Beggarticks				S1	3	79.0 ± 0.5	NB
P	*Pseudognaphalium obtusifolium*	Eastern Cudweed				S1	9	97.5 ± 0.26	NS
P	*Hieracium paniculatum*	Panicled Hawkweed				S1	20	57.5 ± 0.5	NB

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P	*Senecio pseudoarnica*	Seabeach Ragwort				S1	34	73.7 ± 0.2	NB
P	*Barbarea orthoceras*	American Yellow Rocket				S1	3	72.4 ± 10.0	NB
P	*Cardamine parviflora*	Small-flowered Bittercress				S1	17	40.9 ± 0.5	NB
P	*Cardamine concatenata*	Cut-leaved Toothwort				S1	5	66.7 ± 0.01	NB
P	*Draba arabisans*	Rock Whitlow-Grass				S1	27	25.7 ± 0.5	NB
P	*Draba glabella*	Rock Whitlow-Grass				S1	12	14.7 ± 1.0	NB
P	*Mononeuria groenlandica*	Greenland Stitchwort				S1	6	21.7 ± 0.01	NB
P	*Chenopodiastrum simplex*	Maple-leaved Goosefoot				S1	9	81.6 ± 1.0	NB
P	*Blitum capitatum*	Strawberry-Blite				S1	4	13.1 ± 1.0	NB
P	*Hypericum virginicum*	Virginia St. John's-wort				S1	19	10.1 ± 0.01	NB
P	*Viburnum acerifolium*	Maple-leaved Viburnum				S1	11	89.0 ± 1.2	NB
P	*Corema conradii*	Broom Crowberry				S1	55	10.7 ± 10.0	NB
P	*Vaccinium boreale*	Northern Blueberry				S1	1	31.0 ± 0.01	NB
P	*Vaccinium corymbosum*	Highbush Blueberry				S1	8	71.4 ± 1.95	NS
P	*Vaccinium uliginosum*	Alpine Bilberry				S1	1	21.8 ± 0.01	NB
P	*Euphorbia polygonifolia*	Seaside Spurge				S1	8	69.7 ± 0.5	NB
P	*Hylodesmum glutinosum*	Large Tick-trefoil				S1	16	96.2 ± 0.01	NS
P	*Lespedeza capitata*	Round-headed Bush-clover				S1	14	76.5 ± 0.2	NB
P	*Gentiana rubricaulis*	Purple-stemmed Gentian				S1	19	48.2 ± 0.01	NB
P	*Lomatogonium rotatum*	Marsh Felwort				S1	4	51.9 ± 0.53	NB
P	*Proserpinaca pectinata*	Comb-leaved Mermaidweed				S1	17	15.9 ± 0.01	NB
P	*Lycopus virginicus*	Virginia Bugleweed				S1	2	81.7 ± 0.01	NB
P	*Pycnanthemum virginianum*	Virginia Mountain Mint				S1	4	47.7 ± 0.01	NB
P	*Decodon verticillatus*	Swamp Loosestrife				S1	5	98.6 ± 0.1	NS
P	*Polygonum douglasii*	Douglas Knotweed				S1	2	80.8 ± 0.01	NB
P	*Lysimachia hybrida*	Lowland Yellow Loosestrife				S1	14	90.2 ± 0.01	NB
P	*Lysimachia quadrifolia*	Whorled Yellow Loosestrife				S1	19	18.3 ± 1.0	NB
P	*Primula laurentiana*	Laurentian Primrose				S1	52	62.8 ± 2.0	NS
P	*Crataegus jonesiae*	Jones' Hawthorn				S1	5	69.6 ± 0.1	NB
P	*Potentilla canadensis*	Canada Cinquefoil				S1	15	12.0 ± 0.01	NB
P	*Rubus flagellaris*	Northern Dewberry				S1	7	7.2 ± 1.0	NB
P	*Galium brevipes*	Limestone Swamp Bedstraw				S1	1	73.3 ± 5.0	NB
P	*Saxifraga paniculata ssp. laestadii*	Laestadius' Saxifrage				S1	40	26.2 ± 10.0	NB
P	*Agalinis tenuifolia*	Slender Agalinis				S1	23	81.6 ± 0.2	NB
P	*Gratiola lutea*	Golden Hedge-hyssop				S1	22	3.6 ± 0.05	NB
P	*Pedicularis canadensis*	Canada Lousewort				S1	22	56.9 ± 0.01	NB
P	*Viola fimbriatula*	Ovate-leaved Violet				S1	57	65.7 ± 0.01	NS
P	*Carex atlantica ssp. atlantica*	Atlantic Sedge				S1	2	79.9 ± 0.01	NB
P	*Carex backii*	Rocky Mountain Sedge				S1	1	80.2 ± 0.01	NB
P	*Carex blanda*	Eastern Woodland Sedge				S1	1	95.3 ± 0.01	NB
P	*Carex merritt-fernaldii*	Merritt Fernald's Sedge				S1	7	72.0 ± 0.1	NB
P	*Carex salina*	Saltmarsh Sedge				S1	2	9.0 ± 1.0	NB
P	*Carex scirpoidea*	Scirpuslike Sedge				S1	6	77.1 ± 0.01	NB
P	*Carex waponahkikensis*	Dawn-land Sedge				S1	1	71.9 ± 0.01	NB
P	*Carex grisea*	Inflated Narrow-leaved Sedge				S1	24	52.1 ± 0.01	NB
P	*Carex saxatilis*	Russet Sedge				S1	14	11.8 ± 10.0	NB

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P	*Cyperus diandrus*	Low Flatsedge				S1	7	85.6 ± 0.2	NB
P	*Eleocharis flavescens var. olivacea*	Bright-green Spikerush				S1	12	10.0 ± 0.01	NB
P	*Scirpus pendulus*	Hanging Bulrush				S1	1	81.2 ± 0.01	NB
P	*Sisyrinchium angustifolium*	Narrow-leaved Blue-eyed-grass				S1	15	10.9 ± 1.0	NB
P	*Juncus greenei*	Greene's Rush				S1	1	39.6 ± 0.5	NB
P	*Juncus subtilis*	Creeping Rush				S1	1	56.1 ± 5.0	NB
P	*Allium canadense*	Canada Garlic				S1	2	48.0 ± 0.5	NB
P	*Goodyera pubescens*	Downy Rattlesnake-Plantain				S1	25	68.4 ± 0.71	NB
P	*Malaxis monophyllos var. brachypoda*	North American White Adder's-mouth				S1	3	73.4 ± 10.0	NB
P	*Platanthera flava var. herbiola*	Pale Green Orchid				S1	31	40.4 ± 0.01	NB
P	*Platanthera macrophylla*	Large Round-Leaved Orchid				S1	14	52.0 ± 0.01	NB
P	*Spiranthes casei*	Case's Ladies'-Tresses				S1	6	99.6 ± 0.1	NB
P	*Spiranthes casei var. novaescotiae*	Case's Ladies'-Tresses				S1	3	11.7 ± 0.01	NB
P	*Bromus pubescens*	Hairy Wood Brome Grass				S1	6	76.6 ± 0.01	NB
P	*Cinna arundinacea*	Sweet Wood Reed Grass				S1	56	56.7 ± 0.01	NB
P	*Danthonia compressa*	Flattened Oat Grass				S1	23	12.5 ± 0.01	NB
P	*Dichanthelium dichotomum*	Forked Panic Grass				S1	19	38.4 ± 1.0	NB
P	*Glyceria obtusa*	Atlantic Manna Grass				S1	28	11.4 ± 0.01	NB
P	*Potamogeton friesii*	Fries' Pondweed				S1	6	15.9 ± 5.0	NB
P	*Potamogeton nodosus*	Long-leaved Pondweed				S1	8	70.3 ± 0.01	NB
P	*Potamogeton strictifolius*	Straight-leaved Pondweed				S1	2	32.8 ± 0.01	NB
P	*Xyris difformis*	Bog Yellow-eyed-grass				S1	25	23.9 ± 0.1	NB
P	*Asplenium ruta-muraria var. cryptolepis*	Wallrue Spleenwort				S1	4	25.7 ± 0.01	NB
P	*Cystopteris laurentiana*	Laurentian Bladder Fern				S1	1	78.8 ± 1.0	NB
P	*Dryopteris filix-mas ssp. brittonii*	Britton's Male Fern				S1	1	65.6 ± 0.2	NB
P	*Huperzia selago*	Northern Firmoss				S1	1	92.1 ± 1.0	NS
P	*Sceptridium oneidense*	Blunt-lobed Moonwort				S1	4	61.4 ± 0.5	NB
P	*Sceptridium rugulosum*	Rugulose Grapefern				S1	1	80.3 ± 1.0	NB
P	*Selaginella rupestris*	Rock Spikemoss				S1	44	66.5 ± 0.2	NS
P	*Cuscuta campestris*	Field Dodder				S1?	3	80.9 ± 10.0	NB
P	*Polygonum aviculare ssp. neglectum*	Narrow-leaved Knotweed				S1?	5	85.7 ± 0.5	NB
P	*Galium trifidum ssp. subbiflorum*	Three-petaled Bedstraw				S1?	1	48.0 ± 1.4	NB
P	*Alisma subcordatum*	Southern Water Plantain				S1?	3	42.2 ± 0.4	NB
P	*Carex laxiflora*	Loose-Flowered Sedge				S1?	2	69.6 ± 5.0	NS
P	*Wolffia columbiana*	Columbian Watermeal				S1?	15	78.2 ± 0.1	NB
P	*Euphrasia farlowii*	Farlow's Eyebright				S1S2	2	48.0 ± 1.4	NB
P	*Spiranthes ochroleuca*	Yellow Ladies'-tresses				S1S2	17	53.9 ± 0.01	NB
P	*Potamogeton bicupulatus*	Snailseed Pondweed				S1S2	6	16.6 ± 0.01	NB
P	*Spiranthes cernua*	Nodding Ladies'-Tresses				S1S3	41	12.7 ± 0.01	NB
P	*Spiranthes arcisepala*	Appalachian Ladies'-tresses				S1S3	37	25.2 ± 0.2	NB
P	*Spiranthes incurva*	Sphinx Ladies'-tresses				S1S3	2	75.3 ± 0.2	NB
P	*Neottia bifolia*	Southern Twayblade			Endangered	S2	27	79.2 ± 0.2	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)	Prov
P	*Sanicula trifoliata*	Large-Fruited Sanicle				S2	1	47.3 ± 5.0	NB
P	*Hieracium robinsonii*	Robinson's Hawkweed				S2	8	93.6 ± 0.01	NB
P	*Atriplex glabriuscula var. franktonii*	Frankton's Saltbush				S2	5	52.3 ± 1.0	NB
P	*Hypericum x dissimulatum*	Disguised St. John's-wort				S2	10	45.6 ± 1.0	NB
P	*Viburnum dentatum*	Southern Arrow-Wood				S2	1	71.7 ± 1.0	NS
P	*Viburnum dentatum var. lucidum*	Northern Arrow-Wood				S2	157	100.0 ± 0.01	NB
P	*Astragalus eucosmus*	Elegant Milk-vetch				S2	6	35.6 ± 0.01	NB
P	*Quercus macrocarpa*	Bur Oak				S2	231	15.7 ± 1.0	NB
P	*Nuphar x rubrodisca*	Red-disk Yellow Pond-lily				S2	13	21.3 ± 1.0	NB
P	*Polygaloides paucifolia*	Fringed Milkwort				S2	27	53.2 ± 1.0	NB
P	*Persicaria amphibia var. emersa*	Long-root Smartweed				S2	81	40.2 ± 0.01	NB
P	*Micranthes virginiensis*	Early Saxifrage				S2	3	99.3 ± 0.01	NB
P	*Scrophularia lanceolata*	Lance-leaved Figwort				S2	5	30.9 ± 5.0	NB
P	*Carex albicans var. emmonsii*	White-tinged Sedge				S2	12	16.0 ± 0.05	NB
P	*Cyperus lupulinus ssp. macilentus*	Hop Flatsedge				S2	75	75.0 ± 0.01	NB
P	*Calypso bulbosa var. americana*	Calypso				S2	4	19.6 ± 0.5	NB
P	*Coeloglossum viride*	Long-bracted Frog Orchid				S2	6	47.2 ± 5.0	NB
P	*Cypripedium parviflorum var. makasin*	Small Yellow Lady's-Slipper				S2	4	9.2 ± 1.6	NB
P	*Platanthera huronensis*	Fragrant Green Orchid				S2	7	91.3 ± 1.0	NB
P	*Festuca subverticillata*	Nodding Fescue				S2	1	99.9 ± 1.0	NS
P	*Puccinellia nutkaensis*	Alaska Alkaligrass				S2	11	4.5 ± 1.0	NB
P	*Schizaea pusilla*	Little Curlygrass Fern				S2	40	4.0 ± 0.01	NB
P	*Coryphopteris simulata*	Bog Fern				S2	12	80.3 ± 0.01	NB
P	*Toxicodendron radicans var. radicans*	Eastern Poison Ivy				S2?	16	39.6 ± 0.01	NB
P	*Symphyotrichum novi-belgii var. crenifolium*	New York Aster				S2?	9	12.6 ± 0.1	NB
P	*Humulus lupulus var. lupuloides*	Common Hop				S2?	4	89.1 ± 0.8	NB
P	*Rubus x recurvicaulis*	arching dewberry				S2?	5	24.1 ± 5.0	NB
P	*Symphyotrichum racemosum*	Small White Aster				S2S3	14	47.6 ± 0.01	NB
P	*Alnus serrulata*	Smooth Alder				S2S3	37	57.9 ± 0.01	NB
P	*Cuscuta acadiana*	Acadian Dodder				S2S3	2	26.0 ± 0.01	NB
P	*Gentiana linearis*	Narrow-Leaved Gentian				S2S3	5	93.9 ± 5.0	NB
P	*Hedeoma pulegioides*	American False Pennyroyal				S2S3	64	10.7 ± 0.5	NB
P	*Aphyllon uniflorum*	One-flowered Broomrape				S2S3	30	15.7 ± 1.0	NB
P	*Persicaria careyi*	Carey's Smartweed				S2S3	14	37.9 ± 5.0	NB
P	*Hepatica americana*	Round-lobed Hepatica				S2S3	36	52.0 ± 1.0	NB
P	*Ranunculus sceleratus*	Cursed Buttercup				S2S3	8	4.8 ± 0.75	NB
P	*Rosa acicularis ssp. sayi*	Prickly Rose				S2S3	1	40.6 ± 0.01	NB
P	*Cephalanthus occidentalis*	Common Buttonbush				S2S3	42	69.9 ± 0.2	NB
P	*Galium obtusum*	Blunt-leaved Bedstraw				S2S3	4	56.7 ± 1.0	NB
P	*Euphrasia randii*	Rand's Eyebright				S2S3	47	7.2 ± 0.5	NB
P	*Dirca palustris*	Eastern Leatherwood				S2S3	1	99.6 ± 0.5	NB
P	*Verbena urticifolia*	White Vervain				S2S3	3	99.4 ± 2.26	NB

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)	Prov
P	*Viola novae-angliae*	New England Violet				S2S3	16	37.9 ± 15.62	NB
P	*Carex comosa*	Bearded Sedge				S2S3	5	67.7 ± 0.01	NS
P	*Carex rostrata*	Narrow-leaved Beaked Sedge				S2S3	2	48.0 ± 1.4	NB
P	*Carex vacillans*	Estuarine Sedge				S2S3	4	60.8 ± 1.0	NB
P	*Scirpus atrovirens*	Dark-green Bulrush				S2S3	1	99.5 ± 0.01	NB
P	*Juncus ranarius*	Seaside Rush				S2S3	1	48.0 ± 1.4	NB
P	*Allium tricoccum*	Wild Leek				S2S3	85	36.4 ± 0.5	NB
P	*Corallorhiza maculata var. occidentalis*	Spotted Coralroot				S2S3	6	72.0 ± 0.1	NB
P	*Corallorhiza maculata var. maculata*	Spotted Coralroot				S2S3	7	60.9 ± 1.51	NB
P	*Elymus canadensis*	Canada Wild Rye				S2S3	2	79.6 ± 1.0	NB
P	*Piptatheropsis canadensis*	Canada Ricegrass				S2S3	6	58.2 ± 0.5	NB
P	*Puccinellia phryganodes ssp. neoarctica*	Creeping Alkali Grass				S2S3	20	22.1 ± 0.5	NB
P	*Poa glauca*	Glaucous Blue Grass				S2S3	20	10.4 ± 2.5	NB
P	*Potamogeton vaseyi*	Vasey's Pondweed				S2S3	5	15.9 ± 1.0	NB
P	*Isoetes tuckermanii ssp. acadiensis*	Acadian Quillwort				S2S3	9	42.9 ± 0.02	NB
P	*Botrychium tenebrosum*	Swamp Moonwort				S2S3	1	90.6 ± 0.01	NB
P	*Panax trifolius*	Dwarf Ginseng				S3	38	26.0 ± 0.5	NB
P	*Artemisia campestris ssp. caudata*	Tall Wormwood				S3	170	71.2 ± 0.12	NB
P	*Nabalus racemosus*	Glaucous Rattlesnakeroot				S3	96	11.4 ± 0.01	NB
P	*Tanacetum bipinnatum ssp. huronense*	Lake Huron Tansy				S3	15	21.5 ± 1.0	NB
P	*Pseudognaphalium macounii*	Macoun's Cudweed				S3	11	10.4 ± 0.5	NB
P	*Impatiens pallida*	Pale Jewelweed				S3	6	77.5 ± 0.01	NB
P	*Turritis glabra*	Tower Mustard				S3	1	84.1 ± 0.5	NB
P	*Arabis pycnocarpa*	Cream-flowered Rockcress				S3	13	10.6 ± 0.5	NB
P	*Cardamine maxima*	Large Toothwort				S3	46	16.6 ± 0.4	NB
P	*Boechera stricta*	Drummond's Rockcress				S3	17	10.7 ± 1.0	NB
P	*Sagina nodosa*	Knotted Pearlwort				S3	32	10.8 ± 0.01	NB
P	*Sagina nodosa ssp. borealis*	Knotted Pearlwort				S3	2	69.0 ± 5.0	NS
P	*Stellaria humifusa*	Saltmarsh Starwort				S3	8	16.5 ± 1.0	NB
P	*Stellaria longifolia*	Long-leaved Starwort				S3	8	11.3 ± 10.0	NB
P	*Oxybasis rubra*	Red Goosefoot				S3	8	10.8 ± 0.2	NB
P	*Hudsonia tomentosa*	Woolly Beach-heath				S3	3	22.1 ± 0.01	NB
P	*Cornus obliqua*	Silky Dogwood				S3	226	39.4 ± 0.01	NB
P	*Lonicera oblongifolia*	Swamp Fly Honeysuckle				S3	25	13.0 ± 5.0	NB
P	*Viburnum lentago*	Nannyberry				S3	83	84.4 ± 0.01	NB
P	*Rhodiola rosea*	Roseroot				S3	161	11.9 ± 5.0	NB
P	*Oxytropis campestris var. johannensis*	Field Locoweed				S3	3	25.3 ± 50.0	NB
P	*Bartonia paniculata*	Branched Bartonia				S3	2	16.4 ± 0.2	NB
P	*Bartonia paniculata ssp. iodandra*	Branched Bartonia				S3	67	13.3 ± 1.0	NB
P	*Gentianella amarella ssp. acuta*	Northern Gentian				S3	6	10.8 ± 0.25	NB
P	*Geranium bicknellii*	Bicknell's Crane's-bill				S3	12	12.7 ± 5.0	NB

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P	*Myriophyllum farwellii*	Farwell's Water Milfoil				S3	18	15.2 ± 0.5	NB
P	*Myriophyllum humile*	Low Water Milfoil				S3	17	3.3 ± 0.01	NB
P	*Myriophyllum quitense*	Andean Water Milfoil				S3	72	13.8 ± 0.01	NB
P	*Proserpinaca palustris*	Marsh Mermaidweed				S3	48	38.6 ± 0.01	NB
P	*Utricularia resupinata*	Inverted Bladderwort				S3	26	12.1 ± 0.1	NB
P	*Fraxinus pennsylvanica*	Red Ash				S3	252	10.2 ± 0.2	NB
P	*Rumex pallidus*	Seabeach Dock				S3	27	14.5 ± 0.5	NB
P	*Rumex occidentalis*	Western Dock				S3	1	87.1 ± 1.0	NB
P	*Podostemum ceratophyllum*	Horn-leaved Riverweed				S3	26	48.9 ± 0.2	NB
P	*Primula mistassinica*	Mistassini Primrose				S3	16	12.5 ± 0.01	NB
P	*Pyrola minor*	Lesser Pyrola				S3	5	24.0 ± 0.01	NB
P	*Clematis occidentalis*	Purple Clematis				S3	25	16.3 ± 0.1	NB
P	*Ranunculus flabellaris*	Yellow Water Buttercup				S3	21	32.6 ± 0.5	NB
P	*Amelanchier canadensis*	Canada Serviceberry				S3	17	25.7 ± 1.0	NB
P	*Crataegus scabrida*	Rough Hawthorn				S3	7	25.6 ± 0.01	NB
P	*Rubus occidentalis*	Black Raspberry				S3	9	58.2 ± 0.5	NB
P	*Salix myricoides*	Bayberry Willow				S3	2	69.7 ± 0.8	NB
P	*Salix nigra*	Black Willow				S3	196	15.9 ± 1.0	NB
P	*Salix interior*	Sandbar Willow				S3	22	71.1 ± 0.07	NB
P	*Comandra umbellata*	Bastard's Toadflax				S3	1	84.1 ± 10.0	NB
P	*Agalinis purpurea var. parviflora*	Small-flowered Purple False Foxglove				S3	24	3.6 ± 0.01	NB
P	*Valeriana uliginosa*	Swamp Valerian				S3	1	87.3 ± 1.0	NB
P	*Viola adunca*	Hooked Violet				S3	8	63.6 ± 1.0	NB
P	*Symplocarpus foetidus*	Eastern Skunk Cabbage				S3	215	21.4 ± 1.0	NB
P	*Carex adusta*	Lesser Brown Sedge				S3	5	14.5 ± 1.0	NB
P	*Carex arcta*	Northern Clustered Sedge				S3	55	56.1 ± 0.01	NB
P	*Carex conoidea*	Field Sedge				S3	53	5.7 ± 1.0	NB
P	*Carex garberi*	Garber's Sedge				S3	4	35.2 ± 0.5	NB
P	*Carex granularis*	Limestone Meadow Sedge				S3	4	79.1 ± 5.0	NB
P	*Carex gynocrates*	Northern Bog Sedge				S3	4	90.0 ± 0.1	NB
P	*Carex hirtifolia*	Pubescent Sedge				S3	3	55.2 ± 0.5	NB
P	*Carex ormostachya*	Necklace Spike Sedge				S3	7	41.5 ± 0.01	NB
P	*Carex plantaginea*	Plantain-Leaved Sedge				S3	10	94.5 ± 0.2	NB
P	*Carex prairea*	Prairie Sedge				S3	1	72.2 ± 5.0	NS
P	*Carex rosea*	Rosy Sedge				S3	38	35.1 ± 0.5	NB
P	*Carex sprengelii*	Longbeak Sedge				S3	13	74.9 ± 0.5	NB
P	*Carex tenuiflora*	Sparse-Flowered Sedge				S3	17	74.6 ± 1.0	NB
P	*Carex vaginata*	Sheathed Sedge				S3	14	84.5 ± 0.01	NB
P	*Carex livida*	Livid Sedge				S3	2	10.4 ± 2.5	NB
P	*Cyperus esculentus*	Perennial Yellow Nutsedge				S3	8	70.9 ± 0.1	NB
P	*Cyperus esculentus var. leptostachyus*	Perennial Yellow Nutsedge				S3	112	47.3 ± 0.01	NB
P	*Cyperus squarrosus*	Awned Flatsedge				S3	48	44.1 ± 0.05	NB
P	*Eriophorum gracile*	Slender Cottongrass				S3	12	23.0 ± 0.2	NB
P	*Blysmopsis rufa*	Red Bulrush				S3	3	68.8 ± 0.5	NB
P	*Elodea nuttallii*	Nuttall's Waterweed				S3	12	40.4 ± 0.04	NB
P	*Juncus vaseyi*	Vasey Rush				S3	1	51.9 ± 0.37	NB
P	*Najas gracillima*	Thread-Like Naiad				S3	12	39.7 ± 0.02	NB
P	*Cypripedium reginae*	Showy Lady's-Slipper				S3	44	9.2 ± 0.5	NB
P	*Neottia auriculata*	Auricled Twayblade				S3	10	7.2 ± 1.0	NB
P	*Platanthera grandiflora*	Large Purple Fringed				S3	68	5.5 ± 0.2	NB

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)	Prov
P	*Platanthera orbiculata*	Small Round-leaved Orchid				S3	17	16.6 ± 2.5	NB
P	*Spiranthes lucida*	Shining Ladies'-Tresses				S3	17	35.2 ± 0.01	NB
P	*Bromus latiglumis*	Broad-Glumed Brome				S3	5	55.2 ± 0.01	NB
P	*Dichanthelium linearifolium*	Narrow-leaved Panic Grass				S3	17	51.8 ± 0.01	NB
P	*Leersia virginica*	White Cut Grass				S3	98	34.9 ± 0.01	NB
P	*Schizachyrium scoparium*	Little Bluestem				S3	43	40.2 ± 0.01	NB
P	*Zizania aquatica*	Southern Wild Rice				S3	2	75.4 ± 0.2	NS
P	*Zizania aquatica var. aquatica*	Eastern Wild Rice				S3	5	56.6 ± 0.1	NB
P	*Adiantum pedatum*	Northern Maidenhair Fern				S3	5	16.1 ± 1.0	NB
P	*Asplenium trichomanes*	Maidenhair Spleenwort				S3	21	12.3 ± 0.1	NB
P	*Anchistea virginica*	Virginia chain fern				S3	20	79.3 ± 0.2	NS
P	*Woodsia alpina*	Alpine Cliff Fern				S3	11	26.3 ± 0.5	NB
P	*Woodsia glabella*	Smooth Cliff Fern				S3	61	39.0 ± 1.0	NB
P	*Isoetes tuckermanii ssp. tuckermanii*	Tuckerman's Quillwort				S3	31	2.9 ± 0.01	NB
P	*Diphasiastrum x sabinifolium*	Savin-leaved Ground-cedar				S3	10	15.4 ± 1.0	NB
P	*Huperzia appressa*	Mountain Firmoss				S3	38	14.0 ± 1.0	NB
P	*Sceptridium dissectum*	Dissected Moonwort				S3	31	7.8 ± 0.5	NB
P	*Botrychium lanceolatum ssp. angustisegmentum*	Narrow Triangle Moonwort				S3	10	10.7 ± 0.5	NB
P	*Botrychium simplex*	Least Moonwort				S3	11	3.5 ± 0.2	NB
P	*Ophioglossum pusillum*	Northern Adder's-tongue				S3	9	10.2 ± 1.0	NB
P	*Selaginella selaginoides*	Low Spikemoss				S3	10	18.6 ± 0.1	NB
P	*Crataegus succulenta*	Fleshy Hawthorn				S3?	1	94.3 ± 5.0	NB
P	*Crataegus submollis*	Quebec Hawthorn				S3?	18	36.9 ± 1.0	NB
P	*Platanthera hookeri*	Hooker's Orchid				S3?	31	26.4 ± 0.01	NB
P	*Solidago altissima*	Tall Goldenrod				S3S4	5	35.1 ± 1.0	NB
P	*Symphyotrichum boreale*	Boreal Aster				S3S4	17	11.4 ± 0.01	NB
P	*Betula pumila*	Bog Birch				S3S4	25	68.5 ± 1.0	NB
P	*Mertensia maritima*	Sea Lungwort				S3S4	112	14.1 ± 1.0	NB
P	*Subularia aquatica ssp. americana*	American Water Awlwort				S3S4	14	32.1 ± 0.05	NB
P	*Lobelia cardinalis*	Cardinal Flower				S3S4	409	44.8 ± 7.81	NB
P	*Callitriche hermaphroditica*	Northern Water-starwort				S3S4	7	41.4 ± 1.0	NB
P	*Viburnum edule*	Squashberry				S3S4	11	93.2 ± 0.01	NB
P	*Crassula aquatica*	Water Pygmyweed				S3S4	12	55.7 ± 0.01	NB
P	*Penthorum sedoides*	Ditch Stonecrop				S3S4	92	43.4 ± 0.2	NB
P	*Elatine americana*	American Waterwort				S3S4	7	18.8 ± 1.0	NB
P	*Hedysarum americanum*	Alpine Hedysarum				S3S4	2	35.7 ± 0.5	NB
P	*Fagus grandifolia*	American Beech				S3S4	612	12.2 ± 0.25	NB
P	*Geranium robertianum*	Herb Robert				S3S4	77	13.1 ± 1.0	NB
P	*Stachys hispida*	Smooth Hedge-Nettle				S3S4	6	38.6 ± 0.5	NB
P	*Stachys pilosa*	Hairy Hedge-Nettle				S3S4	9	19.4 ± 0.01	NB
P	*Stachys pilosa var. pilosa*	Marsh Hedge-Nettle				S3S4	1	79.1 ± 0.01	NB
P	*Teucrium canadense*	Canada Germander				S3S4	17	68.1 ± 1.0	NS
P	*Utricularia radiata*	Little Floating Bladderwort				S3S4	90	10.9 ± 0.02	NB
P	*Utricularia gibba*	Humped Bladderwort				S3S4	34	11.0 ± 0.05	NB
P	*Fraxinus americana*	White Ash				S3S4	358	100.0 ± 0.2	NS
P	*Epilobium densum*	Downy Willowherb				S3S4	20	14.0 ± 5.0	NB

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P	*Fallopia scandens*	Climbing False Buckwheat				S3S4	47	20.1 ± 7.35	NB
P	*Rumex persicarioides*	Peach-leaved Dock				S3S4	1	76.0 ± 0.01	NB
P	*Littorella americana*	American Shoreweed				S3S4	32	100.0 ± 0.01	NB
P	*Thalictrum confine*	Northern Meadow-rue				S3S4	111	22.4 ± 5.0	NB
P	*Drymocallis arguta*	Tall Wood Beauty				S3S4	21	35.0 ± 0.5	NB
P	*Rosa palustris*	Swamp Rose				S3S4	98	16.1 ± 1.0	NB
P	*Rubus pensilvanicus*	Pennsylvania Blackberry				S3S4	28	15.6 ± 0.01	NB
P	*Galium boreale*	Northern Bedstraw				S3S4	7	31.2 ± 1.0	NB
P	*Galium labradoricum*	Labrador Bedstraw				S3S4	21	48.0 ± 1.0	NB
P	*Salix pedicellaris*	Bog Willow				S3S4	57	23.7 ± 1.0	NB
P	*Geocaulon lividum*	Northern Comandra				S3S4	12	3.8 ± 0.01	NB
P	*Parnassia glauca*	Fen Grass-of-Parnassus				S3S4	1	97.4 ± 10.0	NB
P	*Agalinis neoscotica*	Nova Scotia Agalinis				S3S4	132	5.3 ± 0.01	NB
P	*Limosella australis*	Southern Mudwort				S3S4	12	72.6 ± 0.1	NB
P	*Ulmus americana*	White Elm				S3S4	306	11.0 ± 0.2	NB
P	*Boehmeria cylindrica*	Small-spike False-nettle				S3S4	174	44.8 ± 7.81	NB
P	*Juniperus horizontalis*	Creeping Juniper				S3S4	94	4.5 ± 1.0	NB
P	*Carex capillaris*	Hairlike Sedge				S3S4	16	10.4 ± 2.0	NB
P	*Carex eburnea*	Bristle-leaved Sedge				S3S4	17	43.8 ± 0.77	NB
P	*Carex exilis*	Coastal Sedge				S3S4	151	3.8 ± 0.01	NB
P	*Carex haydenii*	Hayden's Sedge				S3S4	121	18.2 ± 1.0	NB
P	*Carex lupulina*	Hop Sedge				S3S4	192	36.4 ± 0.2	NB
P	*Carex tenera*	Tender Sedge				S3S4	76	39.1 ± 0.01	NB
P	*Carex wiegandii*	Wiegand's Sedge				S3S4	49	3.8 ± 0.01	NB
P	*Carex recta*	Estuary Sedge				S3S4	11	4.5 ± 0.5	NB
P	*Carex atratiformis*	Scabrous Black Sedge				S3S4	1	10.4 ± 0.5	NB
P	*Cladium mariscoides*	Smooth Twigrush				S3S4	122	10.9 ± 0.15	NB
P	*Cyperus dentatus*	Toothed Flatsedge				S3S4	244	17.5 ± 0.5	NB
P	*Eleocharis quinqueflora*	Few-flowered Spikerush				S3S4	11	22.5 ± 0.01	NB
P	*Rhynchospora capitellata*	Small-headed Beakrush				S3S4	26	53.1 ± 0.01	NB
P	*Trichophorum clintonii*	Clinton's Clubrush				S3S4	52	19.2 ± 0.28	NB
P	*Bolboschoenus fluviatilis*	River Bulrush				S3S4	61	20.6 ± 0.03	NB
P	*Triglochin gaspensis*	Gaspé Arrowgrass				S3S4	24	4.0 ± 0.01	NB
P	*Lilium canadense*	Canada Lily				S3S4	149	22.1 ± 0.2	NB
P	*Triantha glutinosa*	Sticky False-Asphodel				S3S4	8	35.3 ± 0.5	NB
P	*Corallorhiza maculata*	Spotted Coralroot				S3S4	25	10.8 ± 1.0	NB
P	*Liparis loeselii*	Loesel's Twayblade				S3S4	16	1.9 ± 0.2	NB
P	*Neottia cordata*	Heart-leaved Twayblade				S3S4	23	4.4 ± 1.0	NB
P	*Platanthera obtusata*	Blunt-leaved Orchid				S3S4	47	12.7 ± 2.5	NB
P	*Calamagrostis pickeringii*	Pickering's Reed Grass				S3S4	170	3.6 ± 0.01	NB
P	*Calamagrostis stricta*	Slim-stemmed Reed Grass				S3S4	2	16.4 ± 2.5	NB
P	*Eragrostis pectinacea*	Tufted Love Grass				S3S4	25	39.8 ± 0.01	NB
P	*Stuckenia filiformis*	Thread-leaved Pondweed				S3S4	7	10.4 ± 2.5	NB
P	*Potamogeton praelongus*	White-stemmed Pondweed				S3S4	12	10.4 ± 1.5	NB
P	*Potamogeton richardsonii*	Richardson's Pondweed				S3S4	39	10.4 ± 1.6	NB
P	*Xyris montana*	Northern Yellow-Eyed-Grass				S3S4	62	4.1 ± 0.01	NB
P	*Cryptogramma stelleri*	Steller's Rockbrake				S3S4	3	31.8 ± 1.0	NB
P	*Asplenium viride*	Green Spleenwort				S3S4	22	8.9 ± 0.05	NB
P	*Dryopteris fragrans*	Fragrant Wood Fern				S3S4	42	12.5 ± 0.02	NB
P	*Equisetum palustre*	Marsh Horsetail				S3S4	12	19.1 ± 0.01	NB

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	# recs	Distance (km)	Prov
P	*Polypodium appalachianum*	Appalachian Polypody				S3S4	23	12.7 ± 0.6	NB
P	*Montia fontana*	Water Blinks				SH	1	49.4 ± 1.0	NB
P	*Solidago caesia*	Blue-stemmed Goldenrod				SX	2	13.1 ± 1.0	NB
P	*Celastrus scandens*	Climbing Bittersweet				SX	2	97.2 ± 100.0	NB
P	*Carex swanii*	Swan's Sedge				SX	84	66.5 ± 0.01	NS

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The recipient of these data shall acknowledge the AC CDC and the data sources listed below in any documents, reports, publications or presentations, in which this dataset makes a significant contribution.

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15	Wisniowski, C. & Dowding, A. 2019. NB species occurrence data for 2016-2018. Nature Trust of New Brunswick.
14	Blaney, C.S.; Spicer, C.D.; Mazerolle, D.M. 2005. Fieldwork 2005. Atlantic Canada Conservation Data Centre. Sackville NB, 2333 recs.
14	Clayden, S.R. 2005. Confidential supplement to Status Report on Ghost Antler Lichen (Pseudevernia cladonia). Committee on the Status of Endangered Wildlife in Canada, 27 recs.
14	Department of Natural Resources and Energy Development. 2022. Wood Turtle records for New Brunswick. Government of New Brunswick, 28 records.
14	Downes, C. 1998-2000. Breeding Bird Survey Data. Canadian Wildlife Service, Ottawa, 111 recs.
14	Edsall, J. 2001. Lepidopteran records in New Brunswick, 1997-99. , Pers. comm. to K.A. Bredin. 91 recs.
14	Hughes, C. Bombus specimens in the AFC insect collection. Atlantic Forestry Centre. 2022.
14	McAlpine, D.F. 1998. NBM Science Collections databases to 1998. New Brunswick Museum, Saint John NB, 241 recs.
14	McLean, K. 2019. Wood Turtle observations . Clean Annapolis River Project.
14	McLean, K. 2020. Wood Turtle observations . Clean Annapolis River Project.
14	McNeil, J.A. 2019. Snapping Turtle records, 2019. Mersey Tobeatic Research Institute.
14	McNeil, Jeffie. 2023. 2022 Turtle Records. Mersey Tobeatic Research Institute.
14	Riley, Jonathan and Viola, Ashlea. Records of Species of Conservation Concern (lichens) near Goldsmith Lake on March 25, 2025. Riley, J., 17 records.
14	Sabine, M. 2016. NB DNR staff incidental Black Ash observations. New Brunswick Department of Natural Resources.
14	Taylor, A. D., Ohashi, K., Sheng, J., Litvak, M. K. 2016. Oceanic Distribution, Behaviour, and a Winter Aggregation Area of Adult Atlantic Sturgeon, Acipenser oxyrinchus oxyrinchus, in the Bay of Fundy, Canada. PLoS One, 11(4), e0152470. doi:10.1371/journal.pone.0152470.
14	Toms, B. 2018. Bat Species data from www.batconservation.ca for Nova Scotia. Mersey Tobeatic Research Institute, 547 Records.
13	G.Proulx, R. Newell, A. Mills, D. Bayne. 2018. Selaginella rupestris records, Digby Co. Nova Scotia Lands and Forestry, 1387601 recs.
13	Robinson, S.L. 2014. 2013 Field Data. Atlantic Canada Conservation Data Centre.
12	GBIF. 2023. GBIF Diptera data for the Maritime provinces. Global Biodiversity Information Facility. https://doi.org/10.15468/dl.pyrsd4
12	Manthorne, A. 2019. Incidental aerial insectivore observations. Birds Canada.
12	Mazerolle, D.M. 2016. Atlantic Canada Conservation Data Centre Fieldwork 2017. Atlantic Canada Conservation Data Centre.
11	Blaney, C.S. 2018. Atlantic Canada Conservation Data Centre Fieldwork 2018. Atlantic Canada Conservation Data Centre.
11	Canadian National Collection of Insects Arachnids, and Nematodes Bombus specimen database export. Government of Canada. 2022.
11	Layberry, R.A. & Hall, P.W., LaFontaine, J.D. 1998. The Butterflies of Canada. University of Toronto Press. 280 pp+plates.
11	Riley, Jonathan and Viola, Ashlea. 2025. SAR and rare lichen records from Porcupine Hills, Bridgetown, NS. Riley, Jonathan, 13 records.
11	Riley, Jonathan. 2024. Tracked species observed at Goldsmith Lake peninsula in November 2024. Pers. comm., 12 records.
11	Shortt, R. UNB specimen data for various tracked species formerly considered secure. Connell Memorial Herbarium, UNB, Fredericton NB. 2019.
11	Webster, R.P. 2004. Lepidopteran Records for National Wildlife Areas in New Brunswick. Webster, 1101 recs.
10	Blaney, C.S. 2017. Atlantic Canada Conservation Data Centre Fieldwork 2017. Atlantic Canada Conservation Data Centre.
10	Kennedy, Joseph. 2010. New Brunswick Peregrine records, 2010. New Brunswick Dept Natural Resources, 16 recs (11 active).
10	McNeil, J.A. 2016. Blandings Turtle (Emydoidea blandingii), Eastern Ribbonsnake (Thamnophis sauritus), Wood Turtle (Glyptemys insculpta), and Snapping Turtle (Chelydra serpentina) sightings, 2016. Mersey Tobeatic Research Institute, 774 records.
10	Nature Conservancy of Canada. 2022-2023. NCC Data for NB 2022-2023. NCC, 318 recs.
10	Neily, T.H. Tom Neily NS Sphagnum records (2009-2014). T.H. Neily, Atlantic Canada Conservation Data Centre. 2019.
10	Noseworthy, J. 2013. Van Brunt's Jacob's-ladder observations along tributary of Dipper Harbour Ck. Nature Conservancy of Canada, 10 recs.
9	Blaney, C.S.; Mazerolle, D.M.; Oberndorfer, E. 2007. Fieldwork 2007. Atlantic Canada Conservation Data Centre. Sackville NB, 13770 recs.
9	Bryson, Ian. 2024. Nova Scotia vascular and non-vascular flora observations Sept 2023-Oct 2024. Fraxinus Environmental & Geomatics, 10882 records.
9	Caissie, A. Herbarium Records. Fundy National Park, Alma NB. 1961-1993.
9	Christie, D.S. 2000. Christmas Bird Count Data, 1997-2000. Nature NB, 54 recs.
9	Lovit, M. 2015. Rare Passamaquoddy Flora of Grand Manan. New Brunswick Museum, Florence M. Christie Grant in Botany, 32 pp.
9	Munro, Marian K. Nova Scotia Provincial Museum of Natural History Herbarium Database. Nova Scotia Provincial Museum of Natural History, Halifax, Nova Scotia. 2014.
9	Sabine, M. 2016. Black Ash records from NB DNR permanent forest sampling Plots. New Brunswick Department of Natural Resources, 39 recs.
9	Staicer, Cindy. 2022. 2021 Landbird Species at Risk observations. Dalhousie University.
8	Benedict, B. Connell Herbarium Specimens. University New Brunswick, Fredericton. 2000.
8	Doucet, D.A. & Edsall, J.; Brunelle, P.-M. 2007. Miramichi Watershed Rare Odonata Survey. New Brunswick ETF & WTF Report, 1211 recs.
8	Doucet, D.A. 2008. Fieldwork 2008: Odonata. ACCDC Staff, 625 recs.
8	Edsall, J. 2007. Personal Butterfly Collection: specimens collected in the Canadian Maritimes, 1961-2007. J. Edsall, unpubl. report, 137 recs.
8	Klymko, J. Dataset of butterfly records at the New Brunswick Museum not yet accessioned by the museum. Atlantic Canada Conservation Data Centre. 2016.
8	Litvak, M.K. 2001. Shortnose Sturgeon records in four NB rivers. UNB Saint John NB. Pers. comm. to K. Bredin, 6 recs.
8	McNeil, Jeffie. 2022. 2021 Turtle Records. Mersey Tobeatic Research Institute.
8	Nature Conservancy of Canada. 2024. NCC NB 2024 Species Records. Nature Conservancy of Canada, 45 recs.
8	Parker, M.S.R. 2011. Hampton Wind Farm 2010: significant floral/faunal observations. , 13 recs.
8	Webster, R.P. 2006. Survey for Suitable Salt Marshes for the Maritime Ringlet, New Populations of the Cobblestone Tiger Beetle, & New Localities of Three Rare Butterfly Species. New Brunswick WTF

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	Report, 28 recs.
8	Wisniowski, C. 2018. Optimizing wood turtle conservation in New Brunswick through collaboration, strategic planning, and landowner outreach. Nature Trust of New Brunswick, 10 records.
8	Wissink, R. 2000. Rare Plants of Fundy: maps. Parks Canada, 20 recs.
8	Young, Elva. 2019. Epargyreus clarus records from Charlotte County. Young, Elva, pers. comm.
8	Zinck, M. & Roland, A.E. 1998. Roland's Flora of Nova Scotia. Nova Scotia Museum, 3rd ed., rev. M. Zinck; 2 Vol., 1297 pp.
7	Basquill, S.P. 2003. Fieldwork 2003. Atlantic Canada Conservation Data Centre, Sackville NB, 69 recs.
7	Brooks, Fiona. 2025. Pectenia plumbea records from July to October 2024 for Southwest Nova Scotia. Atlantic Canada Conservation Data Centre, 14 records.
7	Chapman, C.J. 2018. Atlantic Canada Conservation Data Centre botanical fieldwork 2018. Atlantic Canada Conservation Data Centre, 11171 recs.
7	e-Butterfly. 2019. Export of Maritimes records and photos. McFarland, K. (ed.) e-butterfly.org.
7	Haughian, Sean. 2021. Update to lichen data from 2017-2021. Nova Scotia Museum.
7	Hinds, H.R. 1992. Rare Vascular Plants of Fundy National Park. , 10 recs.
7	King, Amelia. 2020. Belleisle Watershed Coalition Turtle Watch Data. Belleisle Watershed Coalition.
7	McAlpine, D.F. 1983. Status & Conservation of Solution Caves in New Brunswick. New Brunswick Museum, Publications in Natural Science, no. 1, 28pp.
7	Pepper, C. 2021. Rare bird, plant and mammal observations in Nova Scotia, 2017-2021.
7	Webster, R.P. Atlantic Forestry Centre Insect Collection, Maritimes butterfly records. Natural Resources Canada. 2014.
6	Bateman, M.C. 2000. Waterfowl Brood Surveys Database, 1990-2000. Canadian Wildlife Service, Sackville, unpublished data. 149 recs.
6	Blaney, C.S.; Mazerolle, D.M. 2011. Fieldwork 2011. Atlantic Canada Conservation Data Centre. Sackville NB.
6	Cameron, R.P. 2018. Degelia plumbea records. Nova Scotia Environment.
6	Chaput, G. 2002. Atlantic Salmon: Maritime Provinces Overview for 2001. Dept of Fisheries & Oceans, Atlantic Region, Science Stock Status Report D3-14. 39 recs.
6	Mersey Tobetic Research Institute. 2021. 2020 Monarch records from the MTRI monitoring program. Mersey Tobetic Research Institute, 72 records.
6	Newington, Nina. 2023. Email to James Churchill regarding a SAR Birds near Goldsmith Lake, Annapolis County. pers. comm.
6	Richardson, D., Anderson, F., Cameron, R, McMullin, T., Clayden, S. 2014. Field Work Report on Black Foam Lichen (Anzia colpodes). COSEWIC.
6	Robicheau, Charity. 2025. Incidental SAR bird and turtle records from July-August 2025. Atlantic Canada Conservation Data Centre, 7 records.
6	Sabine, D.L. Dwayne Sabine's Bombus terricola and Bombus queen records. Dwayne L. Sabine. 2018.
6	Shortt, R. Connell Herbarium Black Ash specimens. University New Brunswick, Fredericton. 2019.
6	Speers, L. 2001. Butterflies of Canada database. Agriculture & Agri-Food Canada, Biological Resources Program, Ottawa, 190 recs.
6	Taylor, A. D., Litvak, M. K. 2017. Timing and Location of Spawning Based on Larval Capture and Ultrasonic Telemetry of Atlantic Sturgeon in the Saint John River, New Brunswick. Transactions of the American Fisheries Society, 146(2): 283-290.
6	Webster, R.P. Database of R.P. Webster butterfly collection. 2017.
5	Belliveau, A. 2013. Rare species records from Nova Scotia. Mersey Tobeatic Research Institute, 296 records. 296 recs.
5	Belliveau, A.G. 2021. E.C. Smith Herbarium and Atlantic Canada Conservation Data Centre Fieldwork 2021. E.C. Smith Herbarium.
5	Blaney, C.S.; Spicer, C.D. 2001. Fieldwork 2001 (checklist taxa). Atlantic Canada Conservation Data Centre. Sackville NB, 173 recs.
5	Boyne, A.W. 2000. Harlequin Duck Surveys. Canadian Wildlife Service, Sackville, unpublished data. 5 recs.
5	Doucet, D.A. 2007. Lepidopteran Records, 1988-2006. Doucet, 700 recs.
5	Ferguson, D.C. 1954. The Lepidoptera of Nova Scotia. Part I, macrolepidoptera. Proceedings of the Nova Scotian Institute of Science, 23(3), 161-375.
5	Hicklin, P.W. 1999. The Maritime Shorebird Survey Newsletter. Calidris, No. 7. 6 recs.
5	Hubley, Nicole. 2022. Monarch (Danaus plexippus) records submitted to MTRI from the 2021 field season. Mersey Tobeatic Research Institute.
5	Marshall, L. 1998. Atlantic Salmon: Southwest New Brunswick outer-Fundy SFA 23. Dept of Fisheries & Oceans, Atlantic Region, Science. Stock Status Report D3-13. 6 recs.
5	Mersey Tobeatic Research Institute. 2022. Bat data from Bat Hotline from 2020-2022. Toms, Brad (ed.) Mersey Tobeatic Research Institute, 85 records.
5	Mersey Tobeatic Research Institute. 2023. NS Turtle Records. Mersey Tobeatic Research Institute, 214 recs.
5	Mersey Tobeatic Research Institute. 2024. Barn swallow records from volunteers. Pers. comm., 16 records.
5	Moldowan, Patrick Chrysemys picta records from COSEWIC status report. pers. comm. 2021.
5	Nature NB. 2025. Monarch and Salt Marsh Copper records for NB in 2024. Nature NB, 9 records.
5	Robicheau, Charity. 2023. Field data from 2023. Atlantic Canada Conservation Data Centre, 14 records.
5	Robinson, Sarah. 2025. Bank swallow colonies and suitable habitat from surveys in Woodward's Cove, Grand Manan in 2022. CBCL Limited, 10 records.
4	Beardmore, T. 2017. 2017 Butternut observations. Natural Resources Canada.
4	Bredin, K.A. 2001. WTF Project: Freshwater Mussel Fieldwork in Freshwater Species data. Atlantic Canada Conservation Data Centere, 101 recs.
4	Brooks, Fiona. 2025. Tracked species records from Corbett Lake and Goldsmith Lake in December 2024. Atlantic Canada Conservation Data Centre, 6 records.
4	Catling, P.M. 1981. Taxonomy of autumn-flowering Spiranthes species of southern Nova Scotia in Can. J. Bot. , 59:1250-1273. 30 recs.
4	Clayden, S.R. 2003. NS lichen ranks, locations. Pers. comm to C.S. Blaney. 1p, 5 recs, 5 recs.
4	Clayden, S.R. 2012. NBM Science Collections databases: vascular plants. New Brunswick Museum, Saint John NB, 57 recs.
4	Cronin, P. & Ayer, C.; Dubee, B.; Hooper, W.C.; LeBlanc, E.; Madden, A.; Pettigrew, T.; Seymour, P. 1998. Fish Species Management Plans (draft). NB DNRE Internal Report. Fredericton, 164pp.
4	LaPaix, R.W. 2014. Trans-Canada Energy East Pipeline Environmental Assessment, Records from 2013-14. Stantec Consulting, 5 recs.
4	Layberry, R.A. 2012. Lepidopteran records for the Maritimes, 1974-2008. Layberry Collection, 1060 recs.
4	Majka, C.G. & McCorquodale, D.B. 2006. The Coccinellidae (Coleoptera) of the Maritime Provinces of Canada: new records, biogeographic notes, and conservation concerns. Zootaxa. Zootaxa, 1154:

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4	Marx, M. & Kenney, R.D. 2001. North Atlantic Right Whale Database. University of Rhode Island, 4 recs.
4	NS DNR. 2017. Black Ash records from NS DNR Permanent Sample Plots (PSPs), 1965-2016. NS Dept of Natural Resources.
4	Patrick, A.; Horne, D.; Noseworthy, J. et. al. 2017. Field data for Nova Scotia and New Brunswick, 2015 and 2017. Nature Conservancy of Canada.
4	Phinney, Lori; Toms, Brad; et. al. 2016. Bank Swallows (Riparia riparia) in Nova Scotia: inventory and assessment of colonies. Merset Tobeiatc Research Institute, 25 recs.
4	Proulx, Lisa and Newington, Nina. 2025. SAR bird records from Corbett and Dalhousie Lakes, June and July 2025. Pers. comm., 4 records.
4	Staicer, C. & Bliss, S.; Achenbach, L. 2017. Occurrences of tracked breeding birds in forested wetlands. , 303 records.
4	Usvyatsov, S., Picka, J., Hardy, R. S., Shepherd, T. D., Watmough, J., Litvak, M. K. 2012. Modeling the timing of spawning and hatching of shortnose sturgeon, Acipenser brevirostrum, in the Saint John River, New Brunswick, Canada. Canadian Journal of Fisheries and Aquatic Sciences, 69(8): 1316-1328. https://doi.org/10.1139/f2012-062.
4	Whitmore, M.M., Litvak, M.K. 2018. Fine-scale movement of juvenile Atlantic sturgeon (Acipenser oxyrinchus oxyrinchus) during aggregations in the lower Saint John River Basin, New Brunswick, Canada. Canadian Journal of Fisheries and Aquatic Sciences, 75(12): 2332-2342.
3	Adams, J. & Herman, T.B. 1998. Thesis, Unpublished map of C. insculpta sightings. Acadia University, Wolfville NS, 88 recs.
3	Benjamin, L.K. 2012. NSDNR fieldwork & consultant reports 2008-2012. Nova Scotia Dept Natural Resources, 196 recs.
3	Bishop, G. 2012. Field data from September 2012 Anticosti Aster collection trip. , 135 rec.
3	Blaney, C.S.; Spicer, C.D.; Rothfels, C. 2004. Fieldwork 2004. Atlantic Canada Conservation Data Centre. Sackville NB, 1343 recs.
3	Clayden, S.R. 2006. Pseudevernia cladonia records. NB Museum. Pers. comm. to S. Blaney, Dec, 4 recs.
3	Clayden, S.R. 2020. Email to Sean Blaney regarding Pilophorus cereus and P. fibula at Fidele Lake area, Charlotte County, NB. pers. comm., 2 records.
3	Clayden, S.R.; Goltz, J.P. 2018. Emails to Sean Blaney on occurrence of Polygonum douglasii at Big Bluff, Kings Co., New Brunswick. pers. comm., 1 record.
3	Forbes, G. 2001. Bog Lemming, Phalarope records, NB. , Pers. comm. to K.A. Bredin. 6 recs.
3	Forbes, G. 2021. Chrysemys, Chelydra, and Glyptemys records from New Brunswick. pers. comm.
3	Laurel Bernard. 2023. NB Black Tern Obs 2023. Nature Conservancy of Canada, 3 recs.
3	Lautenschlager, R.A. 2005. Survey for Species at Risk on the Canadian Forest Service's Acadia Research Forest near Fredericton, New Brunswick. Atlantic Canada Conservation Data Centre, 6. 3 recs.
3	Maddox, G.D., Cannell, P.F. 1982. The Butterflies Of Kent Island, Grand Manan, New Brunswick. Journal of the Lepidopterists' Society, 36(4): 264-268.
3	Nash, Vicky. 2018. Hammond River Angling Association Wood Turtle observations. Hammond River Angling Association, 3 recs.
3	Newell, R.E. 2006. Rare plant observations in Digby Neck. Pers. comm. to S. Blaney, 6 recs.
3	Newington, Nina. 2023. Anzia colpodes at Beal's Brook, NS. Pers. comm. to J. Churchill.
3	Newington, Nina. 2024. Common Nighthawk recordings. Pers. comm., 3 records.
3	Sabine, Mary. 2025. Pinedrop Observations on Currie Mountain. New Brunswick Department of Nautral Resources and Energy Development, 3 recs.
3	Spicer, C.D. 2003. Mount Allison Herbarium Database. Mount Allison University, 5939 recs.
3	Vost, Emma. 2023. Bird observations - 2023. Pers. Comm.
3	Wallace, Shaylyn. 2024. Snapping Turtle records collected in 2023 by NBDERD.
3	Wildlife Division. 2021. Fraxinus nigra records assembled to define and model habitat. Nova Scotia Department of Natural Resources and Renewables.
3	Wissink, R. 2006. Fundy National Park Digital Database. Parks Canada, 41 recs.
2	Amirault, D.L. 1997-2000. Unpublished files. Canadian Wildlife Service, Sackville, 470 recs.
2	Amiro, Peter G. 1998. Atlantic Salmon: Inner Bay of Fundy SFA 22 & part of SFA 23. Dept of Fisheries & Oceans, Atlantic Region, Science Stock Status Report D3-12. 4 recs.
2	Anon. 2017. Export of Maritimes Butterfly records. Global Biodiversity Information Facility (GBIF).
2	Bagnell, B.A. 2003. Update to New Brunswick Rare Bryophyte Occurrences. B&B Botanical, Sussex, 5 recs.
2	Belliveau, A.G. 2020. Email to Colin Chapman on new NS locations for Allium tricoccum. Chapman, C.J. (ed.) Acadia University.
2	Benjamin, L.K. (compiler). 2002. Significant Habitat & Species Database. Nova Scotia Dept of Natural Resources, 32 spp, 683 recs.
2	Bishop, G., Bagnell, B.A. 2004. Site Assessment of Musquash Harbour, Nature Conservancy of Canada Property - Preliminary Botanical Survey. B&B Botanical, 12pp.
2	Blaney, C.S. 2003. Fieldwork 2003. Atlantic Canada Conservation Data Centre. Sackville NB, 1042 recs.
2	Blaney, C.S. Miscellaneous specimens received by ACCDC (botany). Various persons. 2001-08.
2	Broell, F., Taylor, A.D., Litvak, M.K., Bezanson, A., Taggart, C.T. 2016. Post-tagging behaviour and habitat use in shortnose sturgeon measured with high-frequency accelerometer and PSATs. Animal Biotelemetry, 4(11). https://doi.org/10.1186/s40317-016-0103-x.
2	Brown, Constance Lynn. 2023. Wood turtle records for New Brunswick. University of New Brunswick. Pers. comm., 2 records.
2	Cameron, R.P. 2009. Cyanolichen database. Nova Scotia Environment & Labour, 1724 recs.
2	Clapp, Harold. 2025. Pectenia Plumbea near Sixth Lake. Maritimes Lichen Practitioners, 2 recs.
2	Clayden, S.R. 2020. Email regarding Blue Felt Lichen (Pectenia plumbea) occurrences in New Brunswick, from Stephen Clayden to Sean Blaney. pers. comm., 2 records.
2	Connor, Kevin. 2023. Survey123 Black Ash observations. New Brunswick Department of Energy and Resource Development.
2	Edsall, J. 1992. Summer 1992 Report. New Brunswick Bird Info Line, 2 recs.
2	Edsall, J. 1993. Spring 1993 Report. New Brunswick Bird Info Line, 3 recs.
2	Emma Vost. 2022. Bank swallow colony and broad-winged hawk sightings in Bridgetown, NS. Personal communication, 4.
2	Forbes, Graham. 2022. Email to Sean Blaney and Connie Brown, re: Snapping Turtle nest sites in Fredericton observed in 2022. University of New Brunswick, NB Cooperative Fish and Wildlife Research Unit, 2 records.

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2	Goltz, J. 2017. Harlequin Duck observations. New Brunswick Department of Agriculture, Aquaculture and Fisheries.
2	Goltz, J.P. 2001. Botany Ramblings April 29-June 30, 2001. N.B. Naturalist, 28 (2): 51-2. 8 recs.
2	Goltz, J.P. 2002. Botany Ramblings: 1 July to 30 September, 2002. N.B. Naturalist, 29 (3):84-92. 7 recs.
2	Hay, G.U. 1885. Report of Committee on Botany for 1885. Natural History Society of New Brunswick, 42-48.
2	Hayes, Jodi. 2022. Email to AC CDC regarding Snapping Turtle, NB.
2	Hinds, H.R. 1999. A Vascular Plant Survey of the Musquash Estuary in New Brunswick. , 12pp.
2	Hunsinger, J. 2021. Species at Risk records from Medway Community Forest Cooperative monitoring plots and baited game cameras, 2019-2020. Medway Community Forest Cooperative, 16 records.
2	Li, X., Litvak, M.K., Hughes Clark, J.E. 2007. Overwintering habitat use of shortnose sturgeon (Acipenser brevirostrum): defining critical habitat using a novel underwater video survey and modeling approach. Canadian Journal of Fisheries and Aquatic Sciences, 64: 1248-1257.
2	McCain, J. & R.B. Pike and A.R. Hodgdon. 1973. The vascular flora of Kent Island, New Brunswick. Rhodora 75:311-322, 2 records.
2	Mersey Tobeatic Research Institute (MTRI). 2025. Herptiles Atlas records from 2024. Feltham, Carter (ed.) MTRI, Web site: 32 records.
2	Misc. rare species records gathered by NSDNR staff or communicated to NSDNR and forwared to ACCDC
2	Neily, T.H. & Pepper, C.; Toms, B. 2018. Nova Scotia lichen database [as of 2018-03]. Mersey Tobeatic Research Institute.
2	Neily, T.H. & Pepper, C.; Toms, B. 2020. Nova Scotia lichen database [as of 2020-05-25]. Mersey Tobeatic Research Institute, 668 recs.
2	Newington, Nina and Proulx, Lisa. Sclerophora peronella occurrences near Tupper Brook, NS. Nova Scotia Department of Natural Resources and Renewables. Pers. comm., 2 records.
2	Newington, Nina. 2024. SAR bird ARU recordings west of Goldsmith Lake, Annapolis County. , 2 recs.
2	Olsen, R. Herbarium Specimens. Nova Scotia Agricultural College, Truro. 2003.
2	Palmer, Julie; McOrmand, Bonnie. 2024. Olive-Sided Flycatcher in Goldsmith Lake Wilderness Area. Save Our Old Forests Association NS, 2 recs.
2	Perrin, J., Russel, J. 1912. Catalogue of Butterflies and Moths, Mostly Collected in the Neighborhood of Halifax and Digby, Nova Scotia. Proceedings and Transactions of the Nova Scotian Institute of Science, 12(3), 258-290.
2	Proulx, V.D. 2002. Selaginella rupestris sight record at Centreville, Nova Scotia. Virginia D. Proulx collection, 2 recs.
2	Richardson, D., Anderson, F., Cameron, R, Pepper, C., Clayden, S. 2015. Field Work Report on the Wrinkled Shingle lichen (Pannaria lurida). COSEWIC.
2	Riley, J. 2020. Digby County Pannaria lurida observations. Pers. comm. to J.L. Churchill.
2	Riley, J. 2023. Rare and at Risk lichens and plants near Goldsmith Lake, NS. Pers. comm. to J.L. Churchill.
2	Sabine, Dwayne. 2023. Fraxinus nigra observation near Gleason Road. iNaturalist.
2	Sheffield, C.S. 2004. The Rare Cleptoparasitic Bee Epeoloides pilosula (Hymenoptera: Apoidea: Apidae) Discovered in Nova Scotia, Canada, with Distributional Notes
2	Voscort, L. Bombus terricola specimens collected during MSc research in southwestern Nova Scotia. Acadia University. 2022.
2	Wallace, Shaylyn. 2023. Wood Turtle Locations - 2023. New Brunswick Department of Natural Resources and Energy Development.
2	White, S. 2019. Notable species sightings, 2018. East Coast Aquatics.
1	
1	Allen, Cory. 2021. Email to John Klymko regarding Glyptemys insculpta observation. Personal communication.
1	Amirault, D.L. & Stewart, J. 2007. Piping Plover Database 1894-2006. Canadian Wildlife Service, Sackville, 3344 recs, 1228 new.
1	Andrew Cranton. Deceased Atlantic White-Sided Dolphins. Annapolis Royal Volunteer Fire Department, 1 rec.
1	Anon. Dataset of butterfly records for the Maritime provinces. Museum of Comparative Zoology, Harvard University. 2017.
1	Bayne, D.Z. 2014. 2014 rare species observations from southwest Nova Scotia. Nova Scotia Department of Natural Resources, 46 recs.
1	Belliveau, A. 2012. 2012 Atlantic Coastal Plain Flora observations. Mersey Tobeatic Research Institute, 1543.
1	Belliveau, A.G. E.C. Smith Herbarium Specimen Database 2019. E.C. Smith Herbarium, Acadia University. 2019.
1	Benedict, B. Agalinis neoscotica specimen from Grand Manan. 2009.
1	Benjamin, L.K. 2009. Boreal Felt Lichen, Mountain Avens, Orchid and other recent records. Nova Scotia Dept Natural Resources, 105 recs.
1	Benjamin, L.K. 2011. NSDNR fieldwork & consultant reports 1997, 2009-10. Nova Scotia Dept Natural Resources, 85 recs.
1	Boulanger, L.W. & Wood, G.W., Osgood, E.A., and Dirks, C.O. 1967. Native bees associated with the low bush blueberry in Maine and eastern Canada. Maine Agricultural Experiment Station and Canada Agricultural Research Station., Technical Series Bulletin T 26. 22 pp.
1	Bredin, K.A. 2000. NB & NS Bog Project, fieldwork. Atlantic Canada Conservation Data Centre, Sackville, 1 rec.
1	Brooks, Fiona. 2025. SAR lichen records from April and May 2025. Atlantic Canada Conservation Data Centre, 154 records.
1	Brunelle, P.-M. (compiler). 2010. ADIP/MDDS Odonata Database: NB, NS Update 1900-09. Atlantic Dragonfly Inventory Program (ADIP), 935 recs.
1	Brunelle, P.-M. 2005. Wood Turtle observations. Pers. comm. to S.H. Gerriets, 21 Sep. 3 recs, 3 recs.
1	Brunton, D. F. & McIntosh, K. L. Agalinis neoscotica herbarium record from D. F. Brunton Herbarium. D.F. Brunton Herbarium, Ottawa. 2005.
1	Brunton, Dan. 2022. Record of Isoetes prototypus near Sand Lake, NS. pers. comm.
1	Calhoun, J.C. Butterfly records databased at the McGuire Center for Lepidoptera and Biodiversity. Calhoun, J.C. 2020.
1	Cartwright, Kim. Lynx canadensis sightings in southwest Nova Scotia. Pers. comm., 2 records.
1	Chiasson, R. 2024. Chelydra serpentina and Dryophytes versicolor records from the 2024 field season. Pers. comm.
1	Clayden, S.R. 2007. NBM Science Collections. Pers. comm. to D. Mazerolle, 1 rec.
1	Clayden, S.R. 2022. Email to Sean Blaney regarding Heterodermia squamulosa record in Loch Alva PNA. , 1 record.
1	Clayden, S.R. 2023. Email to Sean Blaney regarding Golden-Pert (Gratiola lutea) at Loch Alva and Ludgate Lake, New Brunswick. pers. comm., 1 record.
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Appendix B Air Quality Dispersion Model Report

Spruce Lake AI Data Centre Project
Air Dispersion Modelling Study

Draft Report

March 27, 2026

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Limitations

The conclusions in the Report titled Spruce Lake AI Data Centre Project Air Dispersion Modelling Study are Stantec's professional opinion, as of the time of the Report, and concerning the scope described in the Report. The opinions in the document are based on conditions and information existing at the time the scope of work was conducted and do not take into account any subsequent changes. The Report relates solely to the specific project for which Stantec was retained and the stated purpose for which the Report was prepared. The Report is not to be used or relied on for any variation or extension of the project, or for any other project or purpose, and any unauthorized use or reliance is at the recipient's own risk.

Stantec has assumed all information received from Beacon New Brunswick Inc (the "Client") and third parties in the preparation of the Report to be correct. While Stantec has exercised a customary level of judgment or due diligence in the use of such information, Stantec assumes no responsibility for the consequences of any error or omission contained therein.

This Report is intended solely for use by the Client in accordance with Stantec's contract with the Client. While the Report may be provided by the Client to applicable authorities having jurisdiction and to other third parties in connection with the project, Stantec disclaims any legal duty based upon warranty, reliance or any other theory to any third party, and will not be liable to such third party for any damages or losses of any kind that may result.

Executive Summary

Beacon New Brunswick Inc. (Beacon) retained Stantec Consulting Ltd. (Stantec) to conduct an Air Dispersion Modelling (ADM) study to assess the potential effects on air quality from the Spruce Lake AI Data Centre Project (the Project).

This ADM study was conducted to support the ongoing planning of the Project, and the environmental assessment (EA). The purpose of the ADM study was to provide information on the potential environmental effects of the Project on air quality in the vicinity of the Project.

The United States Environmental Protection Agency (US EPA) plume dispersion model, AERMOD, was used in the study to assess the potential environmental effects of the Project activities on air quality. The ADM study area consists of a 20 km by 20 km area, centered on the Project. The emissions inventory for the sources associated with Project activities was developed using engineering estimates provided by the client.

As New Brunswick (NB) does not have provincial guidance for conducting dispersion modelling, the modelling was conducted with reference to the acceptable methods and approaches in the Air Dispersion Modelling Guideline for Ontario (ADMG), as outlined in OMECC's Guidance Document (OMECC 2017) — an approach that has been recommended by the New Brunswick Department of Environment and Local Government (NBDELG) in previous dispersion modelling projects in New Brunswick.

The Project's emission sources include 50 natural gas fired Jenbacher J624 generator engines and eight natural gas fired condensing boilers. The contaminants of interest for this assessment are carbon monoxide (CO), nitrogen dioxide (NO_2), sulphur dioxide (SO_2), particulate matter with aerodynamic particle diameter less than or equal to 2.5 microns ($PM_{2.5}$), particulate matter with aerodynamic particle diameter less than or equal to 10 microns (PM_{10}), total particulate matter (TSP), formaldehyde (CH_2O), and ammonia (NH_3).

Predicted ground-level concentrations from the dispersion modelling are compared to the ambient air quality criteria in Schedule B of the New Brunswick Air Quality Regulation – Clean Air Act (NBDELG 2018) as well as standards from other jurisdictions for air contaminants of concern that are not in the NB criteria. $PM_{2.5}$ does not have NB criterion; therefore, the Canadian Ambient Air Quality Standards (CAAQS 2020) were applied (CCME 2017). CH_2O and NH_3 also do not have NB criteria, or CAAQS, so Ontario's ambient air quality criteria (OMECC 2020) were used for comparison purposes. New Brunswick has recently issued revised draft air quality objectives so the predicted concentrations were also compared against the proposed New Brunswick ambient air quality objectives although they are not yet finalized and thus subject to change (NBDELG 2025).

Representative background concentrations were added where applicable to the model predicted values to account for influences from other existing regional emission sources not included in the modeling to assess cumulative effects on air quality.

The results of the dispersion modelling show that the maximum predicted ground-level concentrations of air contaminants modelled (including background) are less than the applied ambient criteria.



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Appendix A Emission Calculations

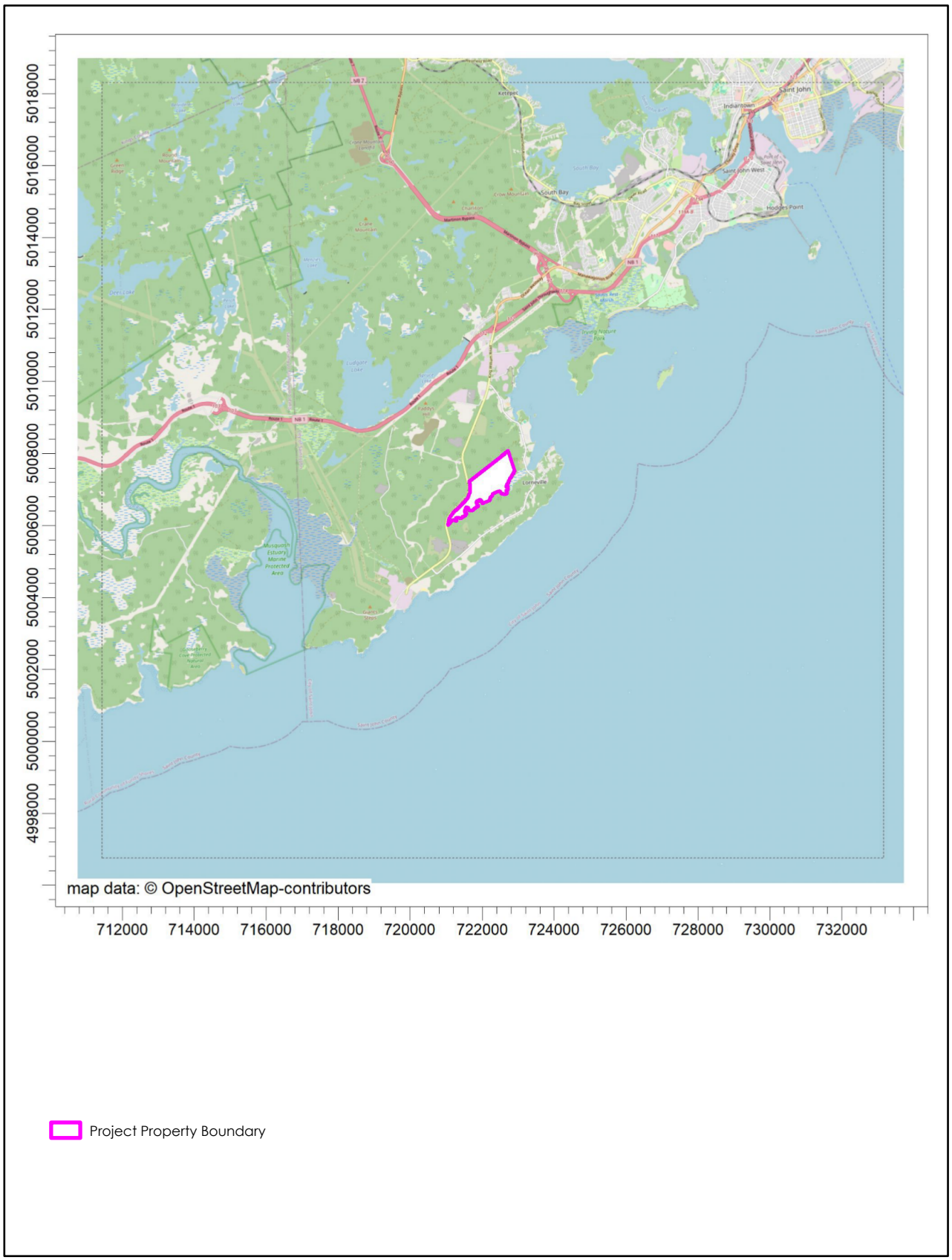
1 Introduction

Beacon New Brunswick Inc. (Beacon) is proposing to construct, own, and operate an electricity generation facility as part of Spruce Lake AI Data Centre Project (the Project) in Lorneville, New Brunswick (NB). The total electrical site production features a capacity of 190 MWe of continuous, dispatchable electricity to the four on-site data centers planned. The electricity generation facility is the part of the data centre Project that will emit air contaminants and is thus the focus of this report. The Project is located southwest of Saint John, New Brunswick, in the Lorneville Industrial Park. Beacon retained Stantec Consulting Ltd. (Stantec) to conduct an Air Dispersion Modelling (ADM) study to assess the potential effects on air quality from the Project.

The United States Environmental Protection Agency (US EPA) plume dispersion model, AERMOD (Version 24142), is used in the study. As the province of New Brunswick does not have guidance for air contaminant dispersion modelling, the general approach used in this modelling study follows the methods described in Air Dispersion Modelling Guideline for Ontario (ADMG) (OMECC 2017; hereafter referred as the “ADMG Document”) — an approach that has been recommended by the New Brunswick Department of Environment and Local Government (NBDELG) in previous dispersion modelling projects in New Brunswick.

The ADM study area consists of a 20 km by 20 km area, centered around the Beacon facility, in Lorneville, New Brunswick. The ADM study area is shown in Figure 1.1.

In this study, the predicted concentrations from the dispersion modelling are compared to the ambient air quality criteria in Schedule B of the New Brunswick Air Quality Regulation – Clean Air Act (NBDELG 2018), as well as other standards from other jurisdictions for air contaminants of concern that are not included in the NB criteria. This report is presented in six sections.



Study Area for Air Dispersoin Modelling

1.1 Project Overview

Beacon is planning to construct a 190 MW electricity generation station comprising of 50 Jenbacher J624 engines and eight Clearfire CFLC-5000 condensing boilers to meet the data centre buildings energy needs. The 50 natural gas-fired engines will be installed in a generation area that will include 10 modular units, and each consists of five Jenbacher J624 engines.

The 10 modular power plant platform units consist of five subunits each housing a Jenbacher J624 engine. For each engine, the design combines the exhaust gases from the engines with air streams from the cooler and engine room ventilation into a single discharge to improve plume rise and dispersion. There is a stack for each engine in each of the 10 modular platforms, 50 stacks in all.

While Beacon only needs to operate 42 engines to produce 190 MW power, dispersion modelling has been completed based on the conservative assumption that all 50 engines are operating continuously at the maximum rated capacity. This would provide an overly conservative (higher) result in ground-level predictions as compared to the plan of operating 42 engines.



2 Air Contaminants Assessed

The ADM study considered air contaminants released from the engines and boilers using natural gas. The air contaminants assed in the ADM study included the following:

- Carbon Monoxide (CO)
- Nitrogen dioxide (NO_2)
- Sulphur dioxide (SO_2)
- Particulate matter with aerodynamic particle diameter less than or equal to 2.5 microns ($PM_{2.5}$)
- Particulate matter with aerodynamic particle diameter less than or equal to 10 microns (PM_{10})
- Total particulate matter (TSP)
- Formaldehyde (CH_2O)
- Ammonia (NH_3)

CH_2O is a product of incomplete combustion, and NH_3 emissions are associated with ammonia slip from the selective catalytic reduction (SCR) system. Hydrogen sulphide (H_2S) is not included in the assessment because sweet natural gas will be used as fuel with negligible amount of H_2S.

These air contaminants are provided in Table 2-1, alongside the applicable air quality criteria. Air contaminants with NB specific criteria used the current New Brunswick Maximum Permissible Ground-Level Concentrations (GLCs) (NBDELG 2018). $PM_{2.5}$ does not have a NB or Ontario criteria; therefore, the Canadian Ambient Air Quality Standards (CAAQS 2020) were applied (CCME 2017). CH_2O and NH_3 do not have NB criteria, nor CAAQS; therefore, Ontario's ambient air quality criteria (OMECC 2020) were used for comparison purposes.

In September 2025, New Brunswick released proposed updates to its ambient air quality objectives (NBDELG 2025) as part of the ongoing review and modernization of the *Clean Air Act*. The proposed objectives are also presented in Table 2.1 for comparison with the existing provincial objectives. The proposed objectives are provided for information purposes only, as they remain in draft form and have not yet been finalized. The existing ambient air quality objectives continue to be used to determine compliance with predicted concentrations at the time of completion of this study.

Table 2-1 Air Contaminants Modelled and Air Quality Criteria

Air Contaminant	Units	*Air Quality Regulations*				Proposed Updates to Ambient Air Quality Objectives				
		1 hour	8 hours	24 hours	Annual	10 minutes	1 hour	8 hours	24 hours	Annual
CO	micrograms per cubic meter ($\mu g/m^3$)	35,000	15,000	-	-	-	30,000	10,000	-	-
NO_2	$\mu g/m^3$	400	-	200	100	-	200	-	-	-
SO_2 [a]	$\mu g/m^3$	450 [a]	-	150 [a]	30 [a]	178	-		-	-
$PM_{2.5}$ [b]	$\mu g/m^3$	-	-	27 [c]	8.8 [d]	-	47	-	23	8
PM_{10}	$\mu g/m^3$	-	-	-	-	-	94	-	54	18
TSP	$\mu g/m^3$	-	-	120	70 [e]	-	200	-	120	70 [e]
CH_4O [f]	$\mu g/m^3$	-	-	65	-	-	-	-	34	4.3
NH_3 [f]	$\mu g/m^3$	-	-	100	-	-	-	-	30	-

[a] The current objectives for SO_2 are lower for Charlotte, Kings, and Saint John counties due to historical exceedances of air quality objectives in these areas; Project falls in Saint John County; the predicted concentrations will be compared to the lower objectives

[b] Existing objectives are based on Canadian Ambient Air Quality Standards (CAAQS) (CCME 2025); proposed objectives are provincial objective

[c] 3-year average of the annual 98th percentile of the daily 24-hour average concentrations

[d] 3-year average of the annual average concentrations

[e] Geometric mean

[f] Objectives are based on Ontario Ambient Air Quality Criteria (OMECP 2020)

3 Study Methodology

3.1 Overview

The methodology for the ADM study consists of the following:

- Develop an emissions inventory and background concentration inventory to represent maximum emissions from the Project
- Process required model inputs including meteorological data and topographic data
- Model air contaminant releases from the engine and boiler stacks using the US EPA plume dispersion model AERMOD to predict the maximum GLCs within a 20 km by 20 km domain centered around the Project
- Compare the predicted maximum GLCs (including background concentrations where applicable) to the identified air quality objectives.

The potential effects of the Project emissions on ambient air quality are estimated through the use of a numerical atmospheric dispersion model, AERMOD. Dispersion models simulate transport, dispersion, transformation, and deposition processes of air contaminants in the atmosphere. Dispersion models are used to predict ambient air quality changes for a wide range of meteorological conditions and account for local terrain influences. Because of the many uncertainties associated with the application of dispersion models, the model results can be viewed as “best estimates” relative to the decision-making process when standardized model approaches are adopted (US EPA 2005).

3.2 Model Description

Dispersion modelling was conducted using the latest version of the United States Environmental Protection Agency (US EPA) AERMOD dispersion modelling system (Version 24142) (US EPA 2024). The AERMOD system is recommended in the ADMG and has historically been accepted for assessing air quality compliance in New Brunswick. The AERMOD modelling system consists of three separate programs, including the plume dispersion model (AERMOD), a meteorological pre-processor (AERMET), and a terrain pre-processor (AERMAP).



AERMOD is a steady-state plume dispersion model which can simulate the effects of hourly varying meteorological conditions on air contaminant transport, dispersion, transformation, and deposition. The model is designed to estimate near-field (less than 50 km) GLCs considering terrain influences. The concentration distribution in the plume is assumed to be Gaussian in both horizontal and vertical directions. AERMOD contains algorithms for near-source effects such as building downwash, transitional plume rise, and partial plume penetration.

AERMOD requires hourly meteorological data processed with the AERMET meteorological pre-processor including parameters that characterize the amount of turbulence in the atmosphere (friction velocity and Monin-Obukhov length). AERMOD produces hourly average pollutant concentrations that can be further processed to obtain predictions for other averaging periods. Input terrain elevations at receptor locations for the AERMOD model are assigned by the terrain pre-processor AERMAP. In addition to terrain elevations, AERMAP assigns a height scale to each receptor location which represents the terrain height that has the greatest influence on dispersion for an individual receptor.

At the time that the modelling was completed, Version 24142 was the most recent version of the AERMOD model available from the US EPA.

3.3 Model Input Preparation

The inputs for the ADM study consist of three components: 1) meteorological data; 2) receptor grid and terrain data; and 3) source characteristics and emissions data. These components are described briefly in the following sections.

3.3.1 Meteorology

Meteorology influences the way air contaminants released from industrial and natural sources disperse in the atmosphere. Thus, the meteorology has a direct effect on ambient air quality. Atmospheric dispersion of the air contaminants emitted is governed by wind direction, wind speed, and the amount of turbulence that exists in the mixed layer of air in contact with the ground. Turbulence levels are dependent on thermal effects (e.g., vertical temperature stratification) and mechanical effects caused by topography, surface roughness, and wind speed. The height of the mixing layer determines the vertical extent to which emissions are likely to be transported.

Meteorological data were obtained and processed in accordance with the ADMG (OMECC 2017). Five years of Weather Research and Forecasting (WRF) model data covering the period of 2021 to 2025 were obtained and processed using AERMET Version 24142 (the meteorological processor for AERMOD). The processed AERMET output files (generated using the WRF data with a grid resolution of 4 km) were obtained from Lakes Environmental (Lakes Environmental 2024).

A five-year wind rose plot of the 2021–2025 WRF data set (for the Project site) is provided in Figure 3-1. The wind rose plot shows the distribution of wind directions and wind speeds based on where the wind is blowing from. The dominant winds are from the southwest directions. Both the low wind speeds and strong winds also occurred most frequently from the southwest quadrant.



The meteorological data are used to assess the changes to air quality associated with Project emissions to account for the seasonal and diurnal variations over a five-year period, and for the amount of turbulence in the atmosphere. The data are viewed as being representative of the wide range of weather conditions that could occur in the region.

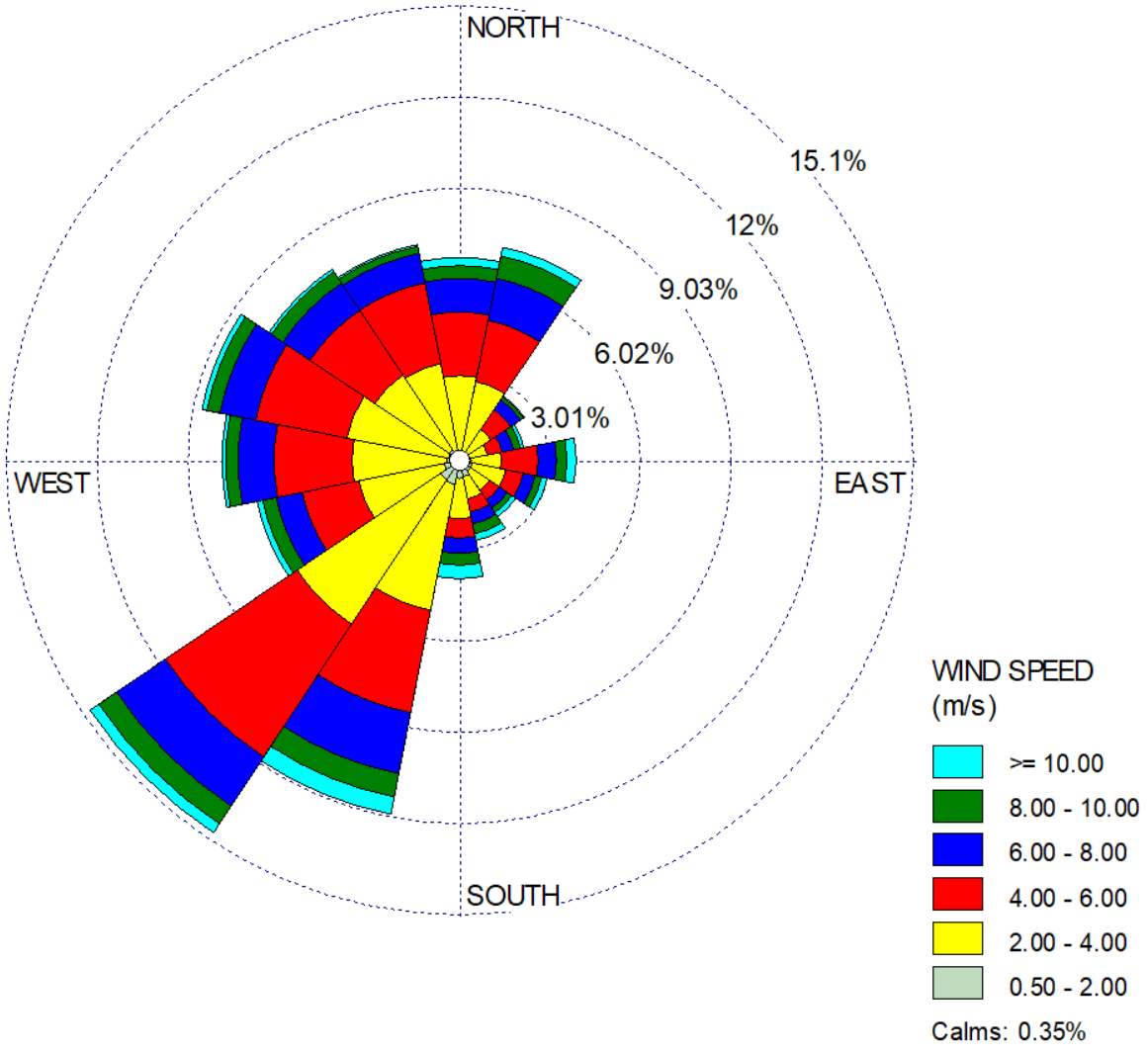


Figure 3-1 Five-year Wind Rose Plot – Project Site (WRF Data 2021-2025)

3.3.2 Receptor Grid and Terrain Data

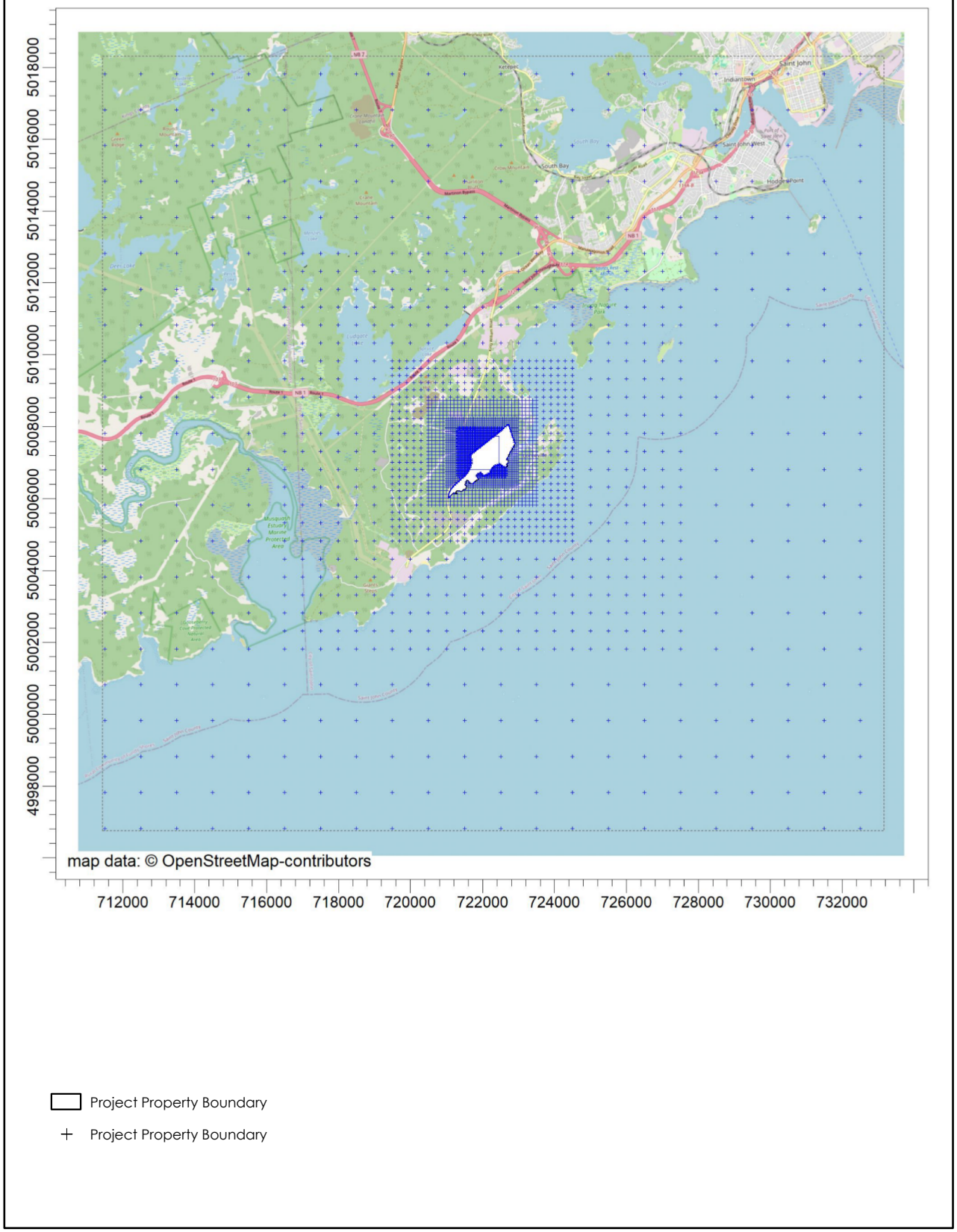
The terrain elevation data covering the study area were obtained from the Canadian Digital Elevation Data (CDED) with a resolution of 30 m. The terrain dataset was processed using AERMAP to establish terrain elevations and calculate hill scale values at the receptor locations, which are required to run AERMOD. The hill scale values are related to the size and height of the terrain and are calculated by AERMAP based on surrounding terrain elevations in the area of the specific receptor location.

The receptor grid used in the modelling study was developed generally following the guidance for the nested grid spacing defined in the ADMG (OMECC 2017), as follows:

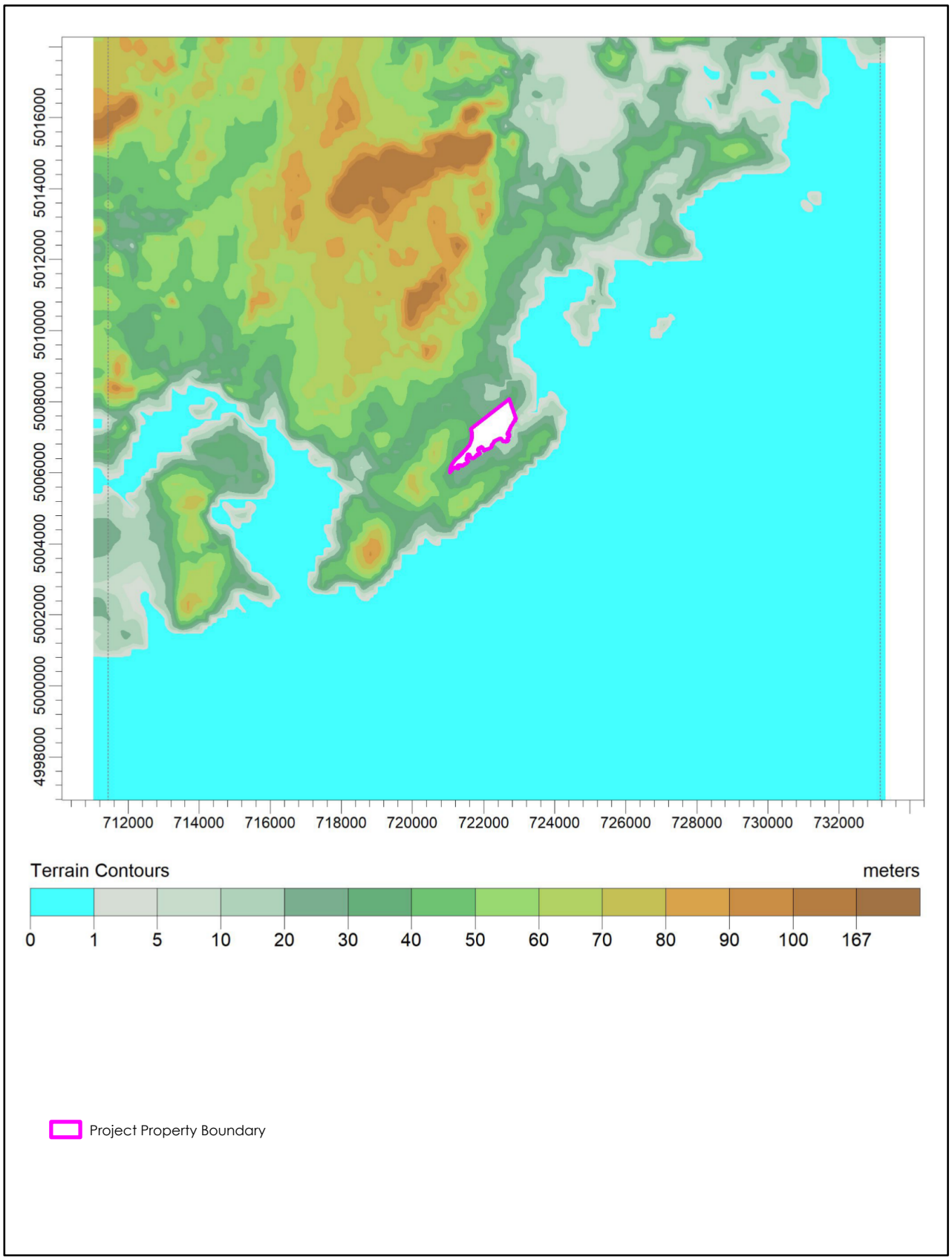
- 20 m spacing along the Project boundary
- 20 m spacing within 200 m of the rectangle which contains all modelled sources
- 50 m spacing within 500 m from the rectangle
- 100 m spacing within 1000 m from the rectangle
- 200 m spacing within 2000 m from the rectangle
- 500 m spacing within 5000 m from the rectangle
- 1000 m spacing beyond 5000 m from the rectangle

The described grid comprises 5,224 receptor locations. This extent of the receptor grid is considered sufficient to indicate the magnitude and spatial variation of the ground-level concentrations of air contaminants resulting from the Project emissions.

The receptor grid used in the modelling is shown in Figure 3-2, while Figure 3-3 is a plot of the terrain elevation data within the study area.



Receptor Grid Applied in the Dispersion Modelling



Terrain Elevations within the Study Area

3.3.3 Source Characteristics

The source input data required to run the AERMOD dispersion model for this study consisted of two main components: 1) source information and emissions data; 2) building downwash analysis (to account for building wake effects). These components are briefly described in the following sections.

3.3.3.1 Source Information and Emissions Data

The source data required to run the AERMOD dispersion model includes the following:

- Physical locations of the emission sources (point sources)
- Emission rate of the selected air contaminant
- Physical heights of the emission sources (stack exit height)
- Diameters of the stack exits (stack exit diameter)
- Average exhaust gas exit velocities
- Average exhaust gas temperatures

The contaminants of interest for this assessment are CO, NO_2, SO_2, $PM_{2.5}$, PM_{10}, TSP, CH_2O, and NH_3. CO, NO_2, and SO_2 are products of natural gas combustion. Particulate matter and CH_2O are products of incomplete combustion and NH_3 emissions are associated with SCR system based on ammonia slip (trace ammonia released from the system), estimated at a concentration of 5 ppm.

Beacon provided detailed source emission characteristics for the engines and boilers. The Project has 50 Jenbacher J624 engines and eight Clearfire CFLC-500 condensing boilers. Each Jenbacher J624 engine is equipped with high efficiency emission control systems including SCR and oxidation catalysts that substantially reduce emissions. The SCR system is estimated to reduce engine NO_X emissions by more than 95%. The oxidation catalyst is estimated to reduce CO and CH_2O emissions by more than 95% and 90%, respectively.

Table 3.1 provides the stack parameters and emissions rates for a generator engine. Emission rates were estimated based on the performance data sheets for the Jenbacher engines.

The exhaust stream for each engine is combined with its cooler and ventilation streams into a single discharge. The stack exit temperature and exit velocity are based on the combined plume of combustion gas and cooler and ventilation exhausts for each engine.

Although Beacon only requires 42 engines to generate 190 MW as needed for the Project, the dispersion modelling assessment was conservatively based on all 50 engines operating continuously at their maximum rated capacity. Figure 3.4 shows the Project plot plan with location of buildings, generation area, modular units, and stacks. Figure 3.5 shows the layout of the 10 modular units in the generation area.



The boiler exhaust parameters and emission rates are provided in Table 3.2. The NO_X emission rate is based on 30 ppm NO_X at 3% O_2 in the exhaust gas. The CO, CH_4O, and CH_2O emission rates are calculated using AP-42 emission factor for external combustion sources (US EPA 1998) and $PM_{2.5}$ emission rate is based on CEPEI (Canadian Energy partnership for Environmental Innovation) emission factor for boilers (CEPEI 2017). TSP emission rate is assumed to be the same as the $PM_{2.5}$ emission rate. SO_2 emission rate is based on 4 ppm sulphur content in the natural gas fuel, based on general pipeline specifications. Table 3.3 provides the location coordinates of each of the 50 generator stacks and eight boiler stacks.

The NO_X emissions from the Project for new electricity generation facilities are subject to federal emission limits based on Multi-Sector Air Pollutant Regulations (ECCC 2016). Table 3.4 shows federal emission criteria for generator engines along with emission rates in equivalent units. Project emissions meet federal emission standards for new electrical generation facilities.

Table 3-1 Emission Rates and Stack Parameters Associated with Generator Engine (per generator)

Source		Generator Engine
Make/Model		Jenbacher J624
Period of Operation		Continuous
Power Rating	MW (Output)	4.6
Fuel Heat Input (HHV)	GJ/h	41.7
Fuel Type		Sweet Natural Gas
Stack Parameters		
Stack Height	m	21.4
Stack Inside Diameter [a]	m	5.09
Exit Temperature [b]	K	368.7
Exit Velocity	m/s	8.0
Emission Rate [c]		
CO	g/s	0.141
NO_X	g/s	0.0737
SO_2	g/s	0.0101
$PM_{2.5}/PM_{10}/TSP$	g/s	0.0189
CH_4O	g/s	0.0378
NH_3 [e]	g/s	0.0241

Notes:

[a] Stack diameter is equivalent of 5.57 m length and 3.65 m width based on equipment drawings .

[b] Exit temperature is based on combined flow rate - cooler outlet flow rate of 6261 Am^3/min (366 k), ventilation outlet flow rate of 2650 Am^3/min (330 K), and engine exhaust flow rate of 880 Am^3/min (623 K).

[c] Emission rates from Jenbacher performance specifications

[d] Based on 5 ppm ammonia slip (Engine exhaust rate 6.70 Sm^3/s at 15 ºC and 1 atm)

Table 3-2 Stack Parameters and Emissions for each Boiler

Source		**Condensing Boiler**
Make/Model		**Clearfire CFLC-5000**
Period of Operation		Continuous
Power Rating	MW	1.47
Fuel Heat Input (HHV)	GJ/h	5.28
	MMBtu/h	5.0
Fuel Consumption	$10^3m^3/d$	3.17
Fuel Type		Sweet Natural Gas
Stack Parameters		
Stack Height	m	18.3
Stack Inside Diameter	m	0.356
Exit Temperature	K	350
Exit Velocity	m/s	5.8
Exhaust Flow rate	Sm^3/s dry, corrected to 3% O_2)	0.374
Emission Factor		
NO_X	30 ppm (corrected to 3% O_2)	16.0
CO (AP-42)	lb/MMBtu (HHV)	0.082
$PM_{2.5}$ (CEPEI)	g/GJ (HHV)	0.134
CH_4O	lb/MMBtu (HHV)	7.35E-05
VOC	lb/MMBtu (HHV)	5.39E-03
Emission Rate		
CO	g/s	0.0519
NO_X	g/s	0.0219
$PM_{2.5}$	g/s	0.000933
SO_2 [a]	g/s	0.000397
CH_4O	g/s	0.0000463
VOC	g/s	0.00340

Notes:

[a] Based on 4 ppm sulphur content in the natural gas

Table 3-3 Location and Base Elevation of each Generator and Boiler Stack

Model ID	UTM NAD83 Zone 19 Easting (m)	UTM NAD83 Zone 19 Northing (m)	Base Elevation (m)
Generator Stacks			
J1	721,698	5,007,194	36.0
J2	721,703	5,007,198	35.9
J3	721,708	5,007,202	35.7
J4	721,713	5,007,206	35.4
J5	721,718	5,007,210	35.5
J6	721,729	5,007,218	35.3
J7	721,734	5,007,222	35.3
J8	721,739	5,007,226	35.3
J9	721,744	5,007,230	35.3
J10	721,749	5,007,234	35.3
J11	721,760	5,007,242	34.0
J12	721,764	5,007,246	33.9
J13	721,769	5,007,250	33.7
J14	721,775	5,007,254	33.6
J15	721,780	5,007,258	33.6
J16	721,790	5,007,266	33.0
J17	721,795	5,007,270	33.0
J18	721,800	5,007,274	33.0
J19	721,805	5,007,278	33.0
J20	721,810	5,007,282	32.9
J21	721,821	5,007,290	32.5
J22	721,826	5,007,294	32.5
J23	721,831	5,007,298	32.5
J24	721,836	5,007,302	32.5
J25	721,841	5,007,306	32.5
J26	721,876	5,007,261	32.0
J27	721,871	5,007,257	32.0
J28	721,866	5,007,253	32.0
J29	721,861	5,007,250	32.0
J30	721,856	5,007,246	32.0
J31	721,845	5,007,237	32.6
J32	721,840	5,007,233	32.6
J33	721,835	5,007,230	32.6
J34	721,830	5,007,226	32.8



Model ID	UTM NAD83 Zone 19 Easting (m)	UTM NAD83 Zone 19 Northing (m)	Base Elevation (m)
J35	721,825	5,007,222	33.0
J36	721,814	5,007,213	33.0
J37	721,809	5,007,209	33.0
J38	721,804	5,007,206	33.0
J39	721,799	5,007,202	33.0
J40	721,794	5,007,198	33.0
J41	721,784	5,007,190	34.3
J42	721,779	5,007,186	34.3
J43	721,774	5,007,182	34.3
J44	721,769	5,007,178	34.3
J45	721,764	5,007,174	34.3
J46	721,753	5,007,165	34.7
J47	721,748	5,007,162	34.9
J48	721,743	5,007,158	35.0
J49	721,738	5,007,154	35.0
J50	721,733	5,007,150	35.0
Boilers			
B1	722,163	5,007,542	33.0
B2	722,165	5,007,539	33.0
B3	722,252	5,007,429	35.0
B4	722,255	5,007,426	35.0
B5	722,115	5,007,213	33.0
B6	722,118	5,007,215	33.0
B7	722,056	5,007,027	42.0
B8	722,059	5,007,023	42.0



Table 3-4 Comparison of Project NO_X Emissions with Federal Emission Limits for New Electricity Generation Facilities

Regulatory Jurisdiction	Substance	Reference	Units	Emission Limits (for each new generating unit)	Project Emission
Federal	NO_X	Environment and Climate Change Canada (ECCC 2016) [a b]	g/kWh	2.7	0.06 [c]

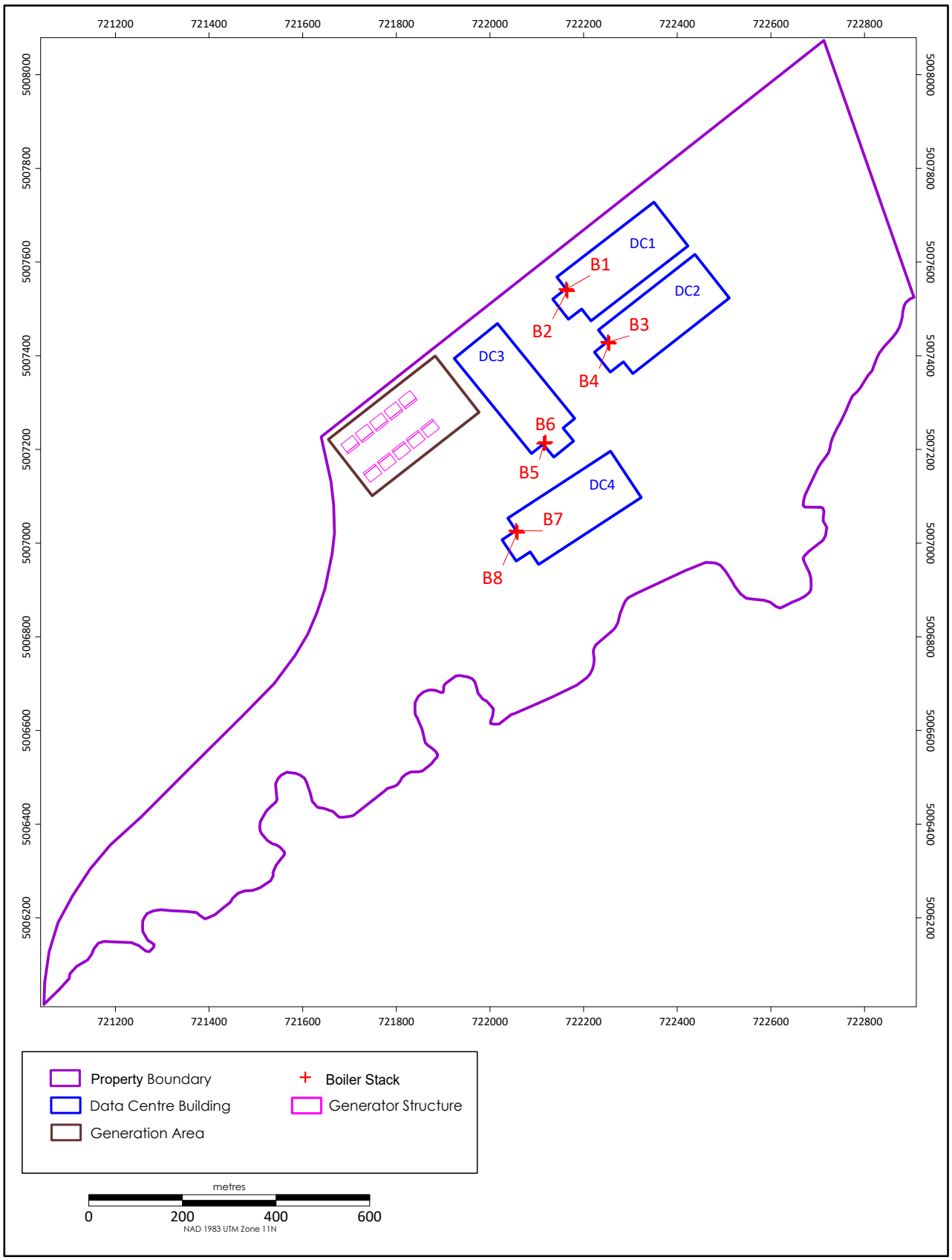
Notes:
[a] ECCC emission limits apply to gross power.
[b] Emission standards for new natural gas fired generating units greater than 75 kW.
[c] Calculated based upon gross electrical power output.

3.3.3.2 Building Downwash Analysis

Downwash effects due to wind interaction with the spatial orientation of the stack and the surrounding buildings are considered in the dispersion modelling. Since building wake effects may influence the predictions, building heights and widths were included in the AERMOD input file using the US EPA Building Profile Input Program (BPIP-PRIME v04274) (US EPA 1997).

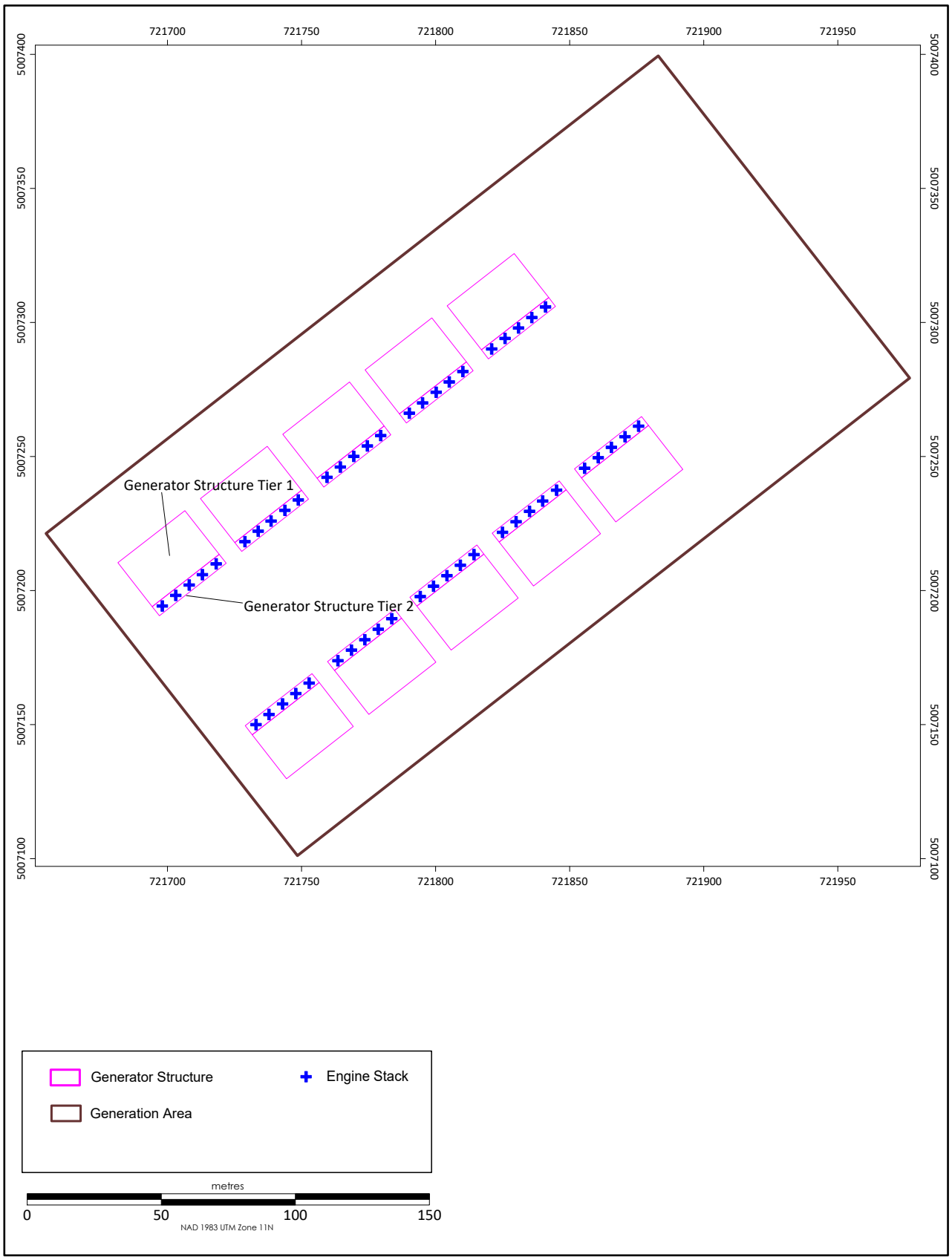
The implementation of the plume rise model referred to as PRIME (Plume Rise Model Enhancements) allows for streamline ascent/descent effects to be considered, as well as the enhanced dilution due to building induced turbulence. PRIME addresses the entire structure of the wake, from the cavity immediately downwind of the building, to the far wake (US EPA 1997). The PRIME module has been incorporated into the latest version of AERMOD. Wind direction-dependent building information such as width and height were generated using the US EPA BPIP-PRIME (Building Profile Input Program).

Figure 3-4 shows the layout of Project buildings, including locations of boiler stacks and generation area. The layout in the generation area is provided in Figure 3-5. Table 3-5 provides the height of buildings and generator modular units (10 units with 5 generators in each unit).



Simplified Plot Plan

Stantec



Generation Area Layout

Table 3-5 Building Heights

Buildings or Structure Name	Height (m)
Data Center Building (DC1)	15.85
Data Center Building (DC2)	15.85
Data Center Building (DC3)	15.85
Data Center Building (DC4)	15.85
Generator Structure Tier 1	15.3
Generator Structure Tier 2	20

3.4 Modelling Scenario

The ADM study assumed the continuous operation of the Project, 24 hours a day, seven days a week, from January 1 to December 31. It used the maximum hourly emission rates at 100% operating load. The modelled emission rates for each of the air contaminants are presented in Table 3-1 and 3-3.

Emissions were modeled continuously over the 5-year period. Although it is understood that the units are not expected to operate continuously at 100% load on a 24/7/365 basis, the modelling was done conservatively by using maximum hourly emissions for engines and boilers.

3.5 Data Review and Quality Procedures

After running the AERMOD model, output files were generated according to specific instructions on the required format as defined in the ADMG (OMECC 2017).

For each air contaminant, with the exception of $PM_{2.5}$, concentration results affected by meteorological anomalies were excluded in accordance with the ADMG (OMECC 2017); for the 24-hour period, the initial highest predicted 24-hour average concentration for each individual meteorological year was excluded, and for the 1-hour averaging period, the top eight hours of predicted concentrations for each meteorological year were also excluded. The maximum predicted GLCs were reported for the annual averaging concentrations.

The $PM_{2.5}$, concentration results were processed in accordance with the CAAQS statistical methods for comparison to the CAAQS criterion. The 24-hour average concentration was calculated using the 3-year average of the annual 98th percentile of the daily 24-hour average concentrations. The annual averaging concentration was calculated using the 3-year average of the daily 24-hour average concentrations to correspond with the CAAQS criterion.

The maximum predicted GLCs for each averaging period (after processing meteorology according to the Guidance), and the background concentrations were added, were compared against relevant standards.



Input file source parameters, building widths and heights, meteorological data, receptor grid, and topographical data were reviewed and verified by Stantec against the raw data prior to running the model. The quality assurance and control checks performed on the model input data were:

- The sources, and buildings and receptor locations were plotted on a map by Stantec to verify that the locations were correct.
- The terrain data were plotted by Stantec for comparison with topographical maps to verify the terrain used in the model.
- The source input information and emission rates were peer reviewed by Stantec
- The meteorological data were checked using the AERMET output files by Stantec, to confirm that the meteorological parameters used for the modelling were acceptable and within allowable limits.

3.6 Background Concentrations

The potential cumulative effects on air quality are typically assessed by adding the background (or baseline) air contaminant concentrations; representative of existing air quality to the model predicted values; representative of the additional contribution from the Project. The sum of these are compared with the regulated ambient air quality standards. Background concentrations are usually based on measured ambient air quality data from a nearby, representative monitoring station.

There is an ambient air monitoring station in Lorneville measuring SO_2 and $PM_{2.5.}$ The Saint John, West Side, NAPS station (NAPS Station ID: 40207) , located approximately 10.3 km northeast, monitors NO_2, $PM_{2.5}$, SO_2, and CO. Stantec conservatively assessed both the Lorneville and Saint John's ambient air quality data for species monitored at both (SO_2 and $PM_{2.5}$) and found that the Saint John station had higher concentrations which were therefore conservatively used to characterize baseline concentrations of SO_2 and $PM_{2.5}$. The Saint John NAPS station was also used to characterize baseline concentrations of NO_2 and CO. In the absence of a detailed Ontario MECP methodology for processing background data, the approach followed the Alberta Air Quality Model Guideline (AEP 2021), which is also recommended in NSECC's guidance (NSECC 2023).).

Ambient concentrations of TSP and PM_{10} were not measured at either of the nearby monitoring stations; therefore, they were estimated using a correlation proposed by Brook et al. (1997). Based on their study of the measured spatial and temporal variations of TSP, PM_{10} and $PM_{2.5}$ concentrations at 19 monitoring sites across Canada, Brook et al. (1997) determined that the average PM_{10} and $PM_{2.5}$ fractions of TSP were 44% and 21.6%, respectively.

CH_2O and NH_3 monitoring data are not available for the Lorneville station. Given the rural characteristics of the surrounding area and the absence of significant nearby emission sources, baseline concentrations of formaldehyde and ammonia were assumed to be negligible. Therefore, the baseline concentration for CH_2O and NH_3 were assumed to be zero for the purposes of this assessment.

The methodologies used and the resulting background concentrations are provided in Table 3-5. The relevant air quality standards are also provided for comparison.

Table 3-6 Background Concentrations

Air Contaminant	Averaging Period	Background Concentration (µg/m^3) [a]	Existing Ambient Air Criteria (µg/m^3) [b]	% of Existing Criteria	Methodology
CO	1-hour	248	35,000	0.7%	3-year average of the annual 1-hour 90th percentile concentration (2023-2025) measured at the Saint John West Side NAPS station.
	8-hour	246	15,000	1.6%	3-year average of the maximum annual 8-hour average concentration after removal of the 90th percentile hourly data (2023-2025) measured at the Saint John West Side NAPS station.
NO_2	1-hour	14.4	400	3.6%	3-year average of the annual 1-hour 90th percentile concentration (2023-2025) measured at the Saint John West Side NAPS station.
	24-hour	11.4	200	5.7%	3-year average of the maximum annual 24-hour average concentration after removal of the 90th percentile hourly data (2023-2025) measured at the Saint John West Side NAPS station.
	Annual	4.2	100	4.2%	3-year average of the annual average concentration after removal of the 90th percentile hourly data (2023-2025) measured at the Saint John West Side NAPS station.
SO_2	10-min [c]	3.2	-	-	Estimated from the 1-hour background concentration.
	1-hour	1.9	450	0.4%	3-year average of the annual 1-hour 90th percentile concentration (2023-2025) measured at the Saint John West Side NAPS station.
	24-hour	1.5	125	1.2%	3-year average of the maximum annual 24-hour average concentration after removal of the 90th percentile hourly data (2023-2025) measured at the Saint John West Side NAPS station.
	Annual	0.3	60	0.5%	3-year average of the annual average concentration after removal of the 90th percentile hourly data (2023-2025) measured at the Saint John West Side NAPS station.

Air Contaminant	Averaging Period	Background Concentration (µg/m³) [a]	Existing Ambient Air Criteria (µg/m³) [b]	% of Existing Criteria	Methodology
$PM_{2.5}$	1-hour	9.7	-	-	3-year average of the annual 1-hour 90th percentile concentration (2023-2025) measured at the Saint John West Side NAPS station.
	24-hour	9.6	27 [d]	35.4%	3-year average of the maximum annual 24-hour average concentration after removal of the 90th percentile hourly data (2023-2025) measured at the Saint John West Side NAPS station.
	Annual	4.7	8.8 [d]	53.4%	3-year average of the annual average concentration after removal of the 90th percentile hourly data (2023-2025) measured at the Saint John West Side NAPS station.
PM_{10} [e]	1-hour	19.7 [e]	-	-	Derived from $PM_{2.5}$ concentrations (Brook et al 1997)
	24-hour	19.5 [e]	-	-	
	Annual	9.6 [e]	-	-	
TSP [e]	1-hour	44.8 [e]	-	-	Derived from $PM_{2.5}$ concentrations (Brook et al 1997)
	24-hour	44.3 [e]	120	36.9%	
	Annual	21.8 [e]	70	31.2%	

Notes:

[a] For 1-hour averaging period, the 90th percentile value from the cumulative frequency distribution of the background monitoring data is calculated for each year. For 24-hour and annual averaging period, the average value is calculated from the reduced dataset (after removing values greater than the 90th percentile) for each year. The background concentrations are calculated as the 3-year average.

[b] Schedule B NB Air Quality Regulation 97-133 – Clean Air Act (NBDELG 2018)

[c] Estimated from 1-hour background concentration (OMECC 2018)

[d] CAAQS

[e] Derived from $PM_{2.5}$ concentrations (Brook et al 1997)

3.7 Conversion of NO to NO_2

Releases of NO_x from the combustion of fuel consist mainly of NO and a small amount of NO_2. In ambient air, NO is oxidized to form NO_2 at rates dependent on atmospheric conditions (primarily driven by the presence of ozone). Since NO_2 has adverse health effects at much lower concentrations than NO, AAQO exist for NO_2 and not NO. To convert the predicted values of NO to NO_2, Stantec applied a published method to the NO_X predictions to estimate the conversion of NO to NO_2.

In the NSECC Guidance, there are four approaches that can be applied for conversion of NO to NO_2:

- Total conversion method (100% conversion of NO to NO_2 is assumed)
- Ambient Ratio Method (ARM)

- Plume Volume Molar Ratio Method (PVMRM)
- Ozone Limiting Method (OLM)

These methods are based on the US EPA three-tiered screening approach for consideration of conversion of NO to NO_2 (US EPA 2017). The US EPA tiered approach is as follows:

- Tier 1 – assume complete conversion of emitted NO to NO_2
- Tier 2 – multiply Tier 1 results by a representative equilibrium NO_2/NO_X ratio (e.g., ambient ratio method - ARM)
- Tier 3 – perform detailed analysis on a case-by-case basis (e.g., OLM or PVMRM)

The Tier 1 approach is the most conservative method (i.e., will overestimate NO_2 in the atmosphere) and was applied in this modelling study, as part of the screening analysis to determine if any predicted values would exceed the applicable air quality criteria.

4 Dispersion Modelling Results and Discussion

Predictions of ground-level concentrations are made at each receptor location for each hour of the five-year period of the meteorological data (2021 to 2025). The maximum predicted GLCs and their locations are presented in Table 4-1.

The ADM study results, as summarized in Table 4-1, indicate that the maximum predicted GLCs of each air contaminant modeled were below the respective existing and proposed regulatory criteria. The predicted GLCs for each contaminant (excluding background) were less than 50% of the existing criteria and occur on the west side on the property boundary.

$PM_{2.5}$ were compared to the Canadian Ambient Air Quality Standards (CAAQS). It is understood that model predictions should not be directly compared to the CAAQS because these are intended to be compared with measured ambient air quality data and are not considered directly applicable to industrial fence-line concentrations. Therefore, the results presented are only presented for comparative purposes. The ambient air quality criteria for $PM_{2.5}$ is 27 µg/m^3 and 8.8 µg/m^3 for the 24-hour and annual averaging period, respectively.

The $PM_{2.5}$ dispersion modelling results were below the 50% of the CAAQS (excluding background concentrations) for the 24-hour and annual averaging period.

Table 3-1 Dispersion Modelling Results

Contaminant	Averaging Period	Existing Ambient Air Criteria ($\mu g/m^3$)	Proposed Ambient Air Criteria ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Maximum Predicted Concentration ($\mu g/m^3$)	Modelled + Background ($\mu g/m^3$)	% of Existing Criteria (Without Background)	% of Existing Criteria (With background)	% of Proposed Criteria (Without Background)	% of Proposed Criteria (With background)
CO	1-hour	35,000	30,000	248	103	351	0.3%	1.0%	0.3%	1.2%
	8-hour	15,000	10,000	248	91.3	339.3	0.6%	2.3%	0.9%	3.4%
NO_2	1-hour	400	200	14.4	53.7	68.1	13.4%	17.0%	26.8%	34.0%
	24-hour	200	-	11.4	36.7	48.1	18.3%	24.1%	-	-
	Annual	100	-	4.2	2.40	6.57	2.4%	6.6%	-	-
SO_2	10-minute [a]	-	178	3.2	12.1	15.3	-	-	6.8%	8.6%
	1-hour	450 [b]	-	1.9	7.30	9.22	1.6%	2.0%	-	-
	24-hour	150 [b]	-	1.5	4.99	6.49	3.3%	4.3%	-	-
	Annual	30 [b]	-	0.3	0.31	0.61	1.0%	2.0%	-	-
$PM_{2.5}$	1-hour	-	47	9.7	13.7	23.4	-	-	29.1%	49.7%
	24-hour	-	23	9.6	9.36	19.0	-	-	40.7%	82.2%
	24-hour [c]	27 [d]	-	9.6	5.65	15.3	20.9%	56.3%	-	-
	Annual [c]	8.8 [e]	-	4.7	0.571	5.27	6.5%	59.9%	-	-
	Annual	-	8	4.7	0.586	5.29	-	-	7.3%	66.1%
PM_{10}	1-hour	-	94	19.7	13.7	33.4	-	-	14.6%	35.5%
	24-hour	-	54	19.5	9.36	28.9	-	-	17.3%	53.4%
	Annual	-	18	9.6	0.586	10.2	-	-	3.3%	56.6%
TSP	1-hour	-	200	44.8	13.7	58.5	-	-	6.8%	29.3%
	24-hour	120	-	44.3	9.36	53.7	7.8%	44.7%	-	-
	Annual	70	-	21.8	0.586	22.4	0.8%	32.0%	-	-



Table 3-1 Dispersion Modelling Results

Contaminant	Averaging Period	Existing Ambient Air Criteria ($\mu g/m^3$)	Proposed Ambient Air Criteria ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Maximum Predicted Concentration ($\mu g/m^3$)	Modelled + Background ($\mu g/m^3$)	% of Existing Criteria (Without Background)	% of Existing Criteria (With background)	% of Proposed Criteria (Without Background)	% of Proposed Criteria (With background)
CH_2O	24-hour	65	34	-	18.7	18.7	28.8%	28.8%	55.0%	55.0%
	Annual	-	4.3	-	1.16	1.16	-	-	27.0%	27.0%
NH_3	24-hour	100	30	-	11.9	11.9	11.9%	11.9%	39.7%	39.7%

Notes:
[a] Derived form 1-hour average (OMECC 2018)
[b] Project falls in Saint John County; the predicted concentrations will be compared to 50% of the SO2 objective
[c] CAAQS
[d] 3-year average of the annual 98th percentile of the daily 24-hour average concentrations
[e] 3-year average of the annual average concentrations

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Appendices

Appendix A Emission Calculations

A.1 Introduction

This appendix outlines the methodologies applied to estimate emissions from the Jenbacher J624 engine and the Clear CFLC-5000 condensing boiler. All calculations follow standard engineering conventions, use ideal gas relationships where applicable, and apply emission factors from manufacturer data or recognized regulatory sources.

A.1.1 Jenbacher J624 Engine

Emission estimates for the Jenbacher J624 engine are based on the manufacturer's technical specifications. Emission rates for CO, NOx, $PM_{2.5}$, and formaldehyde (CH_2O) are taken directly from the specification sheet. The ammonia (NH_3) emission rate is derived using 5 ppm ammonia slip from the SCR system.

NH_3 Emission Rate (g/s) = 5 ppm / 1,000,000 × 6.70 m³/s (engine exhaust flow at standard conditions, 15°C and 101.3 kPa) × 42.2 mol/m³ (molar density at standard conditions) × 17 g/mol (molecular weight of NH_3)

A.1.2 Clear CFLC-5000 Condensing Boiler

Manufacturer specifications indicate the boiler produces clean combustion with ultra-low NOx levels (<20 ppm). For conservatism, the NOx emission rate is calculated using 30 ppmvd @ 3% O_2.

NOx Emission Rate (g/s) = 30 ppm / 1,000,000 × 0.374 m³/s (exhaust flow at standard conditions, 15°C and 101.3 kPa, corrected to 3% O_2) ÷ 23.645 L/mol (molar volume at standard conditions) × 46.01 g/mol × 1000 L/m³.

CO and CH_2O emission rates are derived using AP-42 emission factors (US EPA 1998) for natural-gas-fired external combustion sources.

CO and CH_2O Emission Rate (g/s) = **A** lb/MMBtu (HHV) × 5 MMBtu/hour (fuel heat input) ÷ 2.205 lb/kg × 1000 g/kg ÷ 3600 second/hour

Where **A** is the AP-42 emission factor:

- 0.082 lb/MMBtu for CO
- 0.0000735 lb/MMBtu for CH_2O

$PM_{2.5}$ emissions are calculated using 0.627 g/GJ CEPEI (CEPEI 2017) emission factors for boilers and heaters.

$PM_{2.5}$ Emission Rate (g/s) = 0.627 g/GJ × 5.28 GJ/hour ÷ 3600 s/hour

A.2 Reference

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Appendix C Acoustic Modelling Report

Spruce Lake AI Data Centre Project- Noise Impact Assessment

March 27, 2026

Prepared for:
Beacon AI Centers

Prepared by:
Stantec Consulting Ltd.

Project/File:
121418636

Limitations

This document entitled “Spruce Lake AI Data Centre Project” was prepared by Stantec Consulting Ltd. (“Stantec”) for the account of Beacon AI Centers (the “Client”). The material in it reflects Stantec’s professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Executive Summary

Beacon AI Centers (Beacon) retained Stantec Consulting Ltd. (Stantec) to conduct a noise impact assessment (NIA) for the Spruce Lake AI Data Centre Project (the Project). The Project is located in Lorneville New Brunswick between Lorneville Road and King William Road.

The Project will include a power generation facility, onsite artificial intelligence (AI) high-performance computing (HPC) cloud-compute campus. The power generation facility consists of 50 Jenbacher J624 lean-burn natural gas engines and 4 Clearfire CFLC-5000 condensing boilers. Each engine has a net output of 4.6 megawatts (MW), for a total facility gross power output of 230 MW with 50 engines. The AI HPC campus includes 4 data hall buildings.

Stantec developed this noise impact assessment for the Project in support of the provincial environmental impact assessment. The noise impact assessment includes baseline monitoring of existing noise levels and predicted noise levels from Project operations to assess the impact of the project on the acoustic environment compared to the New Brunswick Noise Complaint Response Guidelines.

The impact of the Project on noise levels was estimated by adding the predicted project-related noise levels to the existing noise levels measured at nearby receptor locations. The Project included power production, boilers for facility heating, chillers for facility cooling, and potential noise from the operation of a new substation to provide additional power.

The cumulative sound levels from the baseline conditions and noise levels from the Project were predicted to comply with provincial noise guideline levels. Low-frequency noise effects are also not predicted to occur at nearby receptors.

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Acronyms / Abbreviations

°C	degrees Celsius
AI	Artificial Intelligence
ASL	Ambient Sound Level
AUC	Alberta Utility Commission
Beacon	Beacon AI Centers
dB	decibel
dBA	A-Weighted Decibel
dBC	C-Weighted Decibel
HPC	high-performance computing
Hz	hertz
ISO	International Organization for Standardization
km	kilometre
LAA	local assessment area
L_{eq}	Energy Equivalent Sound Level
LFN	Low frequency noise
m	metre
m/s	metres per second
MW	megawatt
NIA	Noise Impact Assessment
PDA	Project Development Area
the Project	Beacon AI Centers – Lorneville Project
PSL	Permissible Sound Level
PWL	Sound Power Level re 10^{-12} Watt
R	noise receptor
Rule 012	AUC Rule 012: *Noise Control*
SCR	Selective Catalytic Reduction
SPL	Sound Pressure Level re 20 µPa
Stantec	Stantec Consulting Ltd.
UTM	Universal Transverse Mercator

Glossary

Term	Definition
Ambient Noise	All noises that exist in an area and are not related to a facility. Ambient noise includes sound from other industrial noise not being measured, transportation sources, animals, and nature. Ambient noise is the same as background sound level.
Ambient Sound Level (ASL)	The ASL consists of all noise in an area that is not related to regulated facilities. This noise includes sound from other non-regulated industrial facilities, transportation sources, animals and nature. The ASL does not include any energy-related industrial component and must be measured without it. The ASL can be measured when the sound level in an area is not felt to be represented by the basic sound levels (BSLs). The ASL must be measured under representative conditions. As with comprehensive sound levels, representative conditions do not constitute absolute worst-case conditions (i.e., the quietest day in this case) but conditions that portray typical conditions for the area.
Background Sound Level (i.e., Baseline)	It includes noise from all sources other than the sound of interest (i.e., sound from other industrial noise not being measured, transportation sources, animals, and nature).
Bands (octave, 1/3 octave)	A series of electronic filters separate sound into discrete frequency bands, making it possible to know how sound energy is distributed as a function of frequency. Each octave band has a centre frequency that is double the centre frequency of the octave band preceding it.
Daytime	The hours from 07:00 to 19:00.
dB - Decibel	A logarithmic unit associated with sound pressure levels and sound power levels.
dBA - Decibel, A-Weighted	A logarithmic unit where the recorded sound has been filtered using the A frequency weighting scale. A-weighting somewhat mimics the response of the human ear to sounds at different frequencies. A-weighted sound pressure levels are denoted by the suffix ‘A’ (i.e., dBA), and the term pressure is normally omitted from the description (i.e., sound level or noise level).
dBC - Decibel, C-Weighted	The logarithmic units associated with a sound pressure level, where the sound pressure signals has been filtered using a frequency weighting. The C-weighting approximates the sensitivity of human hearing at industrial noise levels (above about 85 dBA). C-weighted sound pressure levels are denoted by the suffix ‘C’ (i.e., dBC). C-weighted levels are often used in low-frequency noise analysis, as the filtering effect is nearly flat at lower frequencies.

Term	Definition
Decibel Addition	In acoustics, due to the logarithmic nature of the decibel scale, the addition of two or more sound pressure levels (denoted as SPL_1, SPL_2 … SPL_n) is done as follows: $SPL_1 + SPL_2 + \ldots SPL_n = 10 \log (10^{(SPL1/10)} + 10^{(SPL2/10)} + \ldots + 10^{(SPLn/10)})$ As an example: 50 dB + 50 dB = 53 dB
Energy Equivalent Sound Level (L_{eq})	An energy-average sound level taken over a specified period of time. It represents the average sound pressure encountered for the period. The time period is often added as a suffix to the label (e.g., $L_{eq}(24)$ for the 24-hour equivalent sound level). L_{eq} is usually A-weighted. An L_{eq} value expressed in dBA is a good, single value descriptor of the annoyance of noise.
Evening	The hours from 19:00 to 23:00.
Frequency	Number of cycles per unit of time. In acoustics, frequency is expressed in hertz (Hz) (i.e., cycles per second).
Hertz (Hz)	Unit of measurement of frequency, numerically equal to cycles per second.
Low Frequency Noise (LFN)	Noise in the low frequency range (AUC definition), 20 Hz up to 250 Hz, where a clear tone is present below and including 250 Hz and the difference between the overall C-weighted sound level and the overall A-weighted sound level exceeds 20 dB.
Nighttime	The hours from 22:00 to 07:00.
Noise	Unwanted sound.
Noise Level	Same as Sound Level, except applied to unwanted sounds
Sound	A dynamic (fluctuating) pressure.
Sound Pressure Level (SPL)	The logarithmic ratio of the root mean square sound pressure to the sound pressure at the threshold of hearing. The sound pressure level is defined by equation below, where P is the RMS pressure due to a sound and P_0 is the reference pressure. P_0 is usually taken as 2.0×10^{-5} Pascals. $SPL\ (dB) = 20 \log(P_{RMS}/P_0)$
Sound Power Level (PWL)	The logarithmic ratio of the instantaneous sound power of a noise source to that of the reference power. The sound power level is defined by equation below where W is the sound power of the source in watts, and Wo is the reference power of 10^{-12} watts. $PWL\ (dB) = 10 \log(W/W_0)$
Spectrum	The description of a sound wave's resolution into its components of frequency and amplitude.

Term	Definition
Tonal Components	Often industrial facilities exhibit tonal components. Examples of tonal components are transformer hum, sirens, and piping noise. The test for the presence of tonal components consists of two parts (as per tonality prescribed in AUC Rule 012). The first part must demonstrate that the sound pressure level of any one of the slow-response, A-weighted, 1/3-octave bands between 20 kHz and 16 kHz is 10 dBA or more than the sound pressure level of at least one of the adjacent bands within two 1/3-octave bandwidths. In addition, there must be a minimum of a 5 dBA drop from the band containing the tone within two bandwidths on the opposite side. The second part is that the tonal component must be a pronounced peak clearly obvious within the spectrum.

1 Introduction

Beacon AI Centers (Beacon) retained Stantec Consulting Ltd. (Stantec) to conduct a noise impact assessment (NIA) for the Spruce Lake AI Data Centre Project (the Project). The Project is located between King William Road and Lorneville Road.

The Project will include a power generation facility and high-performance computing (HPC) campus. The power generation facility consists of 50 Jenbacher J624 lean-burn natural gas engines. Each engine has a net output of 4.6 megawatts (MW), for a total facility gross power output of 230 MW with 50 engines. The HPC campus includes four data hall buildings requiring approximately 100 MW of power each. The project also includes a substation to provide a connection to the power grid to cover the remaining power requirements for the HPC.

Stantec developed this NIA for the Project in support of the provincial environmental impact assessment. This NIA focuses on the operation of the power generation facility and HPC campus. The assessment methodology and technical details of the assessment are included in this report. The NIA uses manufacturer noise emission data, engineering estimates, and noise propagation modelling calculations to predict the cumulative noise levels in the surrounding environment. The purpose of this NIA is to quantify the noise effects from the Project's design at the residential receptors and assess the compliance with provincial noise guidelines.

2 Project Setting

The Project location is shown in Figure 1. A local assessment area (LAA) is defined by a 1.5 km buffer area from the Project Development Area (PDA) boundary. There are many Points of Reception (PORs) located within the LAA, predominantly to the south and east of the Project, and the project is located to the east from a wind energy facility. The PORs are predominantly single detached homes along Lorneville Road.

3 Regulatory Framework

The New Brunswick Noise Complaint Response Guidelines (NBDELG 2023) provide a procedure to address noise complaints from industrial facilities whose noise impacts off-site PORs. The guidelines only apply to sites regulated by an Approval to Operate issued under the *Clear Air Act* or the *Clean Environment Act*. The guidelines do not supersede existing approval conditions or apply to impulse noise such as blasting. If a regulated facility exceeds the noise levels in the guidelines during a one-hour survey, the facility must self-rectify the noise issue or will be required to conduct a noise impact assessment (NBDELG 2023). The guidelines apply to the cumulative noise level, or the combination of baseline noise conditions and noise emissions from Project-related activities.

The New Brunswick noise guidelines are shown in Table 1.

Table 1 New Brunswick Noise Compliant Response Guidelines

Time of Day	Guideline 1-hour Equivalent Sound Pressure Level (dBA)
Daytime (7 AM to 7 PM)	60
Evening (7 PM to 11 PM)	55
Nighttime (11 PM to 7 AM)	50

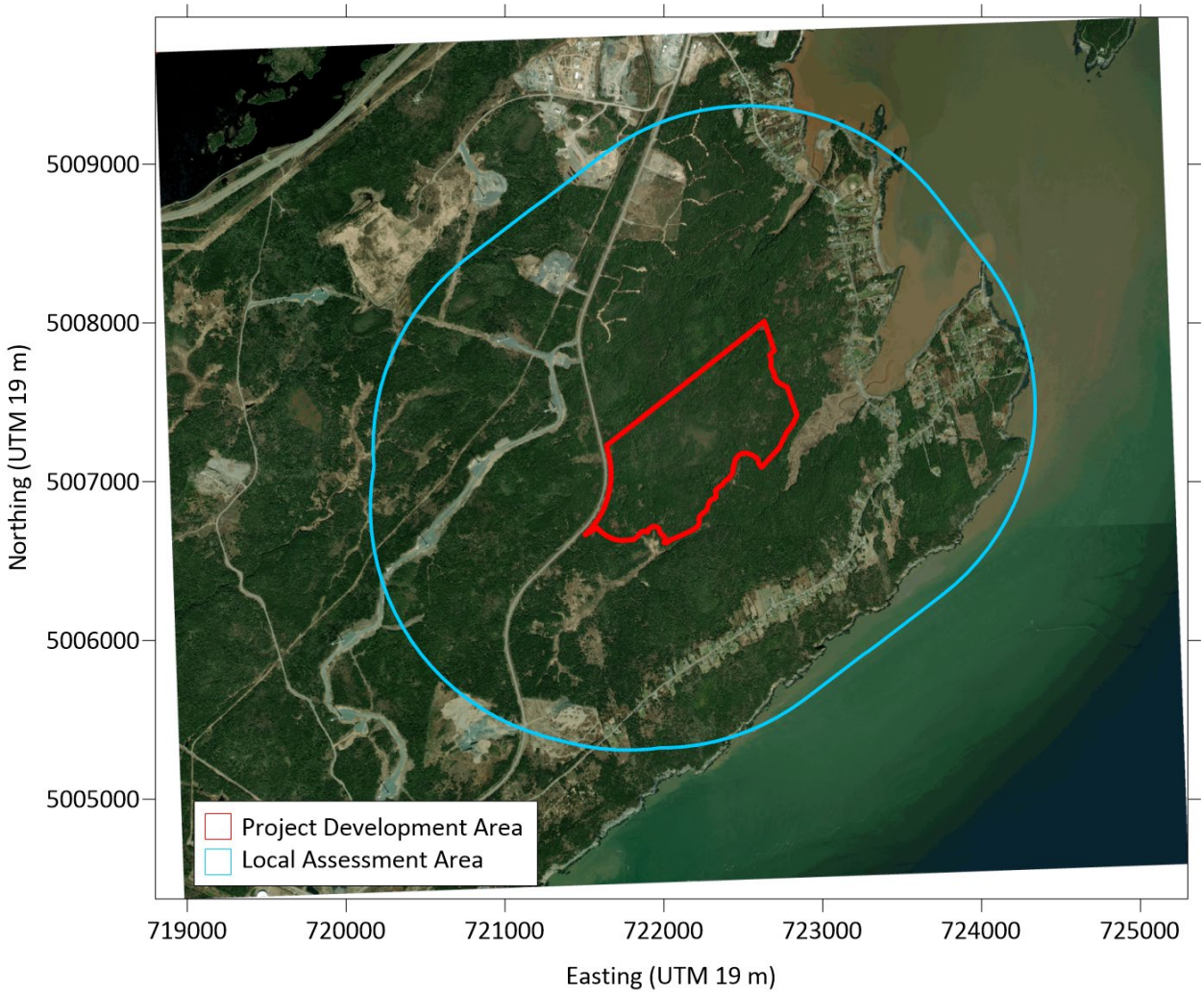


Figure 1 Project Development Area and Local Assessment Area

4 Methodology

Environmental noise typically varies over time. To account for this variation, a single number descriptor (L_{eq}) is used. It is defined as the steady, continuous sound level over the specified time that has the same acoustic energy as the actual varying sound levels over the same time. The unit for L_{eq} is the dBA, which reflects the response of the human ear to different sound frequencies.

The approach used to assess the Project noise effects within the LAA boundary during normal operations of the Project is summarized as follows:

1. Determine existing noise conditions (i.e., baseline) through noise monitoring near the Project.
2. Predict the Project Case sound levels representing the noise effect from the Project only on nearby PORs.
3. Combine the Project Case and the baseline noise conditions to determine the total sound pressure levels at PORs.
4. Assess compliance of the combined case at PORs with provincial noise guidelines.

4.1 Baseline Noise

Baseline noise monitoring was completed February 4, 2026 to characterize existing noise levels at nearby PORs. The baseline sound quality monitoring survey was conducted in accordance with ISO 1996-2:2007. Baseline sound levels were measured using a Type 1 Sound Pressure Level Meter with the microphone positioned on a tripod approximately 1.5 meters above grade. The microphone was equipped with a wind screen to reduce extraneous noise due to the wind. Digital audio recordings were also logged so that the recordings could be reviewed afterward for quality control and assurance. The sound pressure level meters were set up to log one-minute equivalent sound pressure levels values over a period of 24 hours. The noise monitoring location is shown in Figure 2.

The 1-minute sound levels were then used to calculate 1-hour average ($L_{eq,\ 1\text{-}hour}$), daytime (L_d), evening (L_e), and nighttime (L_n) sound levels occurring for nearby PORs.

A summary of the $L_{eq,\ 1\text{-}hour}$ sound levels is provided in Table 2, and a summary of the daytime and nighttime average sound levels is provided in Table 3. A time history plot of the $L_{eq,\ 1\ minute}$, $L_{eq,\ 1\text{-}hour}$, L_d, and L_n values versus time is also shown in Figure 3. Noise near the Project site is characterized predominantly by roadway traffic that occurs along Lorneville Road.

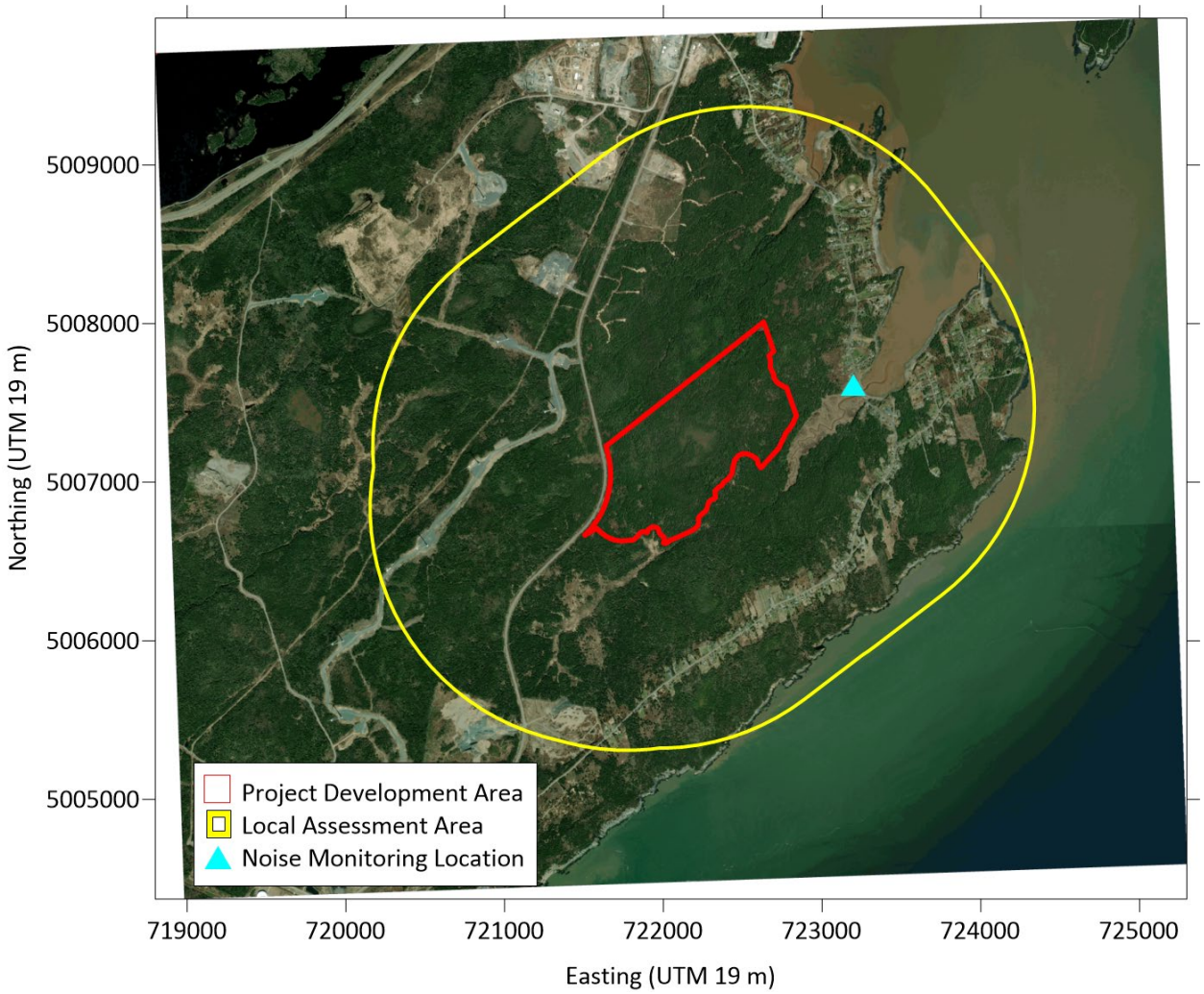


Figure 2 Noise Monitoring Location

Table 2 $L_{eq,\ 1\text{-}hour}$ Sound Pressure Levels Measured during Baseline Monitoring

Hour	$L_{eq,\ 1\text{-}hour}$ Sound Pressure Level (dBA)
0	31.6
1	30.9
2	27.7
3	30.4
4	33.9
5	38.6
6	45.5
7	46.6
8	44.7
9	44.3
10	44.6
11	44.7
12	44.9
13	45.2
14	45.8
15	45.0
16	44.7
17	46.3
18	44.4
19	42.6
20	41.8
21	38.4
22	37.4
23	32.7

Table 3 Average Baseline Sound Pressure Level (dBA) by time Period

Time period	Abbreviation	L_{eq} (dBA)
Daytime (7 AM to 7 PM)	L_d	45.1
Evening (7 PM to 11 PM)	L_e	40.6
Nighttime (11 PM to 7 AM)	L_n	38.5

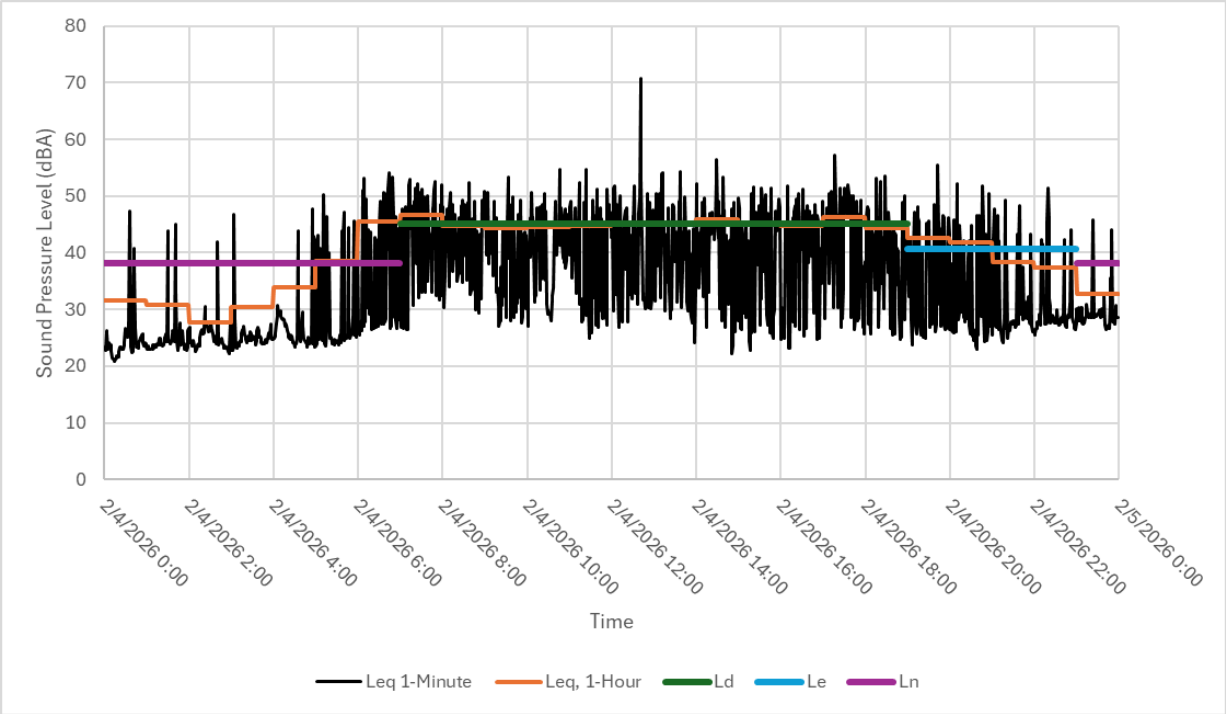


Figure 3 Results from Baseline Monitoring

4.2 Noise Modelling

Noise predictions were conducted using Cadna/A acoustic modeling software (DataKustik 2025), which utilizes the internationally accepted sound propagation algorithms (ISO 9613-1: 1993, ISO 9613-2: 2024). The modelling parameters used in the assessment are summarized in Table 4.

Table 4 Acoustic Modelling Parameters

Item	Model Parameters	Model Setting
1	Temperature	10°C
2	Relative humidity	70%
3	Wind speed	Downwind condition, as per ISO 9613-2 standard downwind setting (wind speed of 1 m/s to 5 m/s)
4	Noise propagation model	CadnaA (DataKustik 2025)
5	Standard	ISO 9613
6	Ground conditions and attenuation factor	Ground absorption (G) of 0.75 (surrounding area) and 0.20 (Project area)
7	Terrain Parameters (terrain resolution)	Ground terrain incorporated at 50 m by 50 m resolution.
9	Reflection parameters	1 order of reflection

Notes:
°C = degrees Celsius; m = metre; m/s = metres per second

Meteorological factors, such as temperature, humidity, and wind speed and direction, affect sound propagation. Effects of wind and atmospheric stability on outdoor sound propagation during various weather conditions can cause large variations in Project-related sound levels when measured at a receptor location. Upwind sound propagation, or propagation during unstable atmospheric conditions, typically results in lower receptor levels, while downwind conditions and stable atmosphere tend to increase receptor levels. The wind speed is based on ISO 9613-2 standard, which assumes 1 metre per second (m/s) to 5 m/s downwind condition from the source to the receptor in the sound propagation calculation.

The Project is set in an area with dense vegetation and loose soil. Correspondingly, the ground absorption constant G was set to 0.75 (soft, absorptive ground) outside of the Project boundary and 0.2 (relatively hard, gravel) within the Project boundary.

Building structures were included in the model to account for the reflective effects and barrier effects of buildings. One order of reflection is also incorporated in the model.

5 Results

Noise modelling considers noise effect from the continuous normal operation of the Project. The following sections discuss noise emission sources and mitigation requirements for operation phase.

5.1 Noise Emission Sources

The Project includes a power generation facility, AI HPC campus, and a substation. The locations of the predominant noise sources from Project operations and nearby receptors are shown in Figure 4.

The power generation facility will consist of 50 Jenbacher J624 lean-burn natural gas engines. Jenbacher’s QPAC is a modular power generation platform which consists of five subunits each housing a Jenbacher J624 gas genset and supporting equipment. Each subunit includes the genset module, engine exhaust system equipped with Selective Catalytic Reduction (SCR) and exhaust silencer, genset module ventilation exhaust outlet, radiator and air filtration module, and other auxiliary modules. In accordance with the manufacturer's specifications, each QPAC noise emission will achieve 65 dBA measured at 10 m from the modular. The power facility will consist of 10 QPAC modules.

The AI HPC campus consists of four data hall buildings housing AI HPC processing equipment, and each data hall also encloses one Clearfire CFLC-5000 condensing boiler with outdoor boiler exhaust outlets. Each data hall is equipped with 100 air-cooled chiller units with 50 associated pump enclosures and water tanks.

The substation is located in the southwestern corner of the PDA.

The sound power levels for operating equipment sources were determined based on manufacturers provided information or from existing sound power level databases for similar equipment when needed. The sound power levels used for project operation are shown in Table 5.

Noise mitigation measures were applied to some equipment shown in Table 5 to help reduce noise levels at nearby receptor locations. Noise mitigation measures and their performance are shown in Table 6.

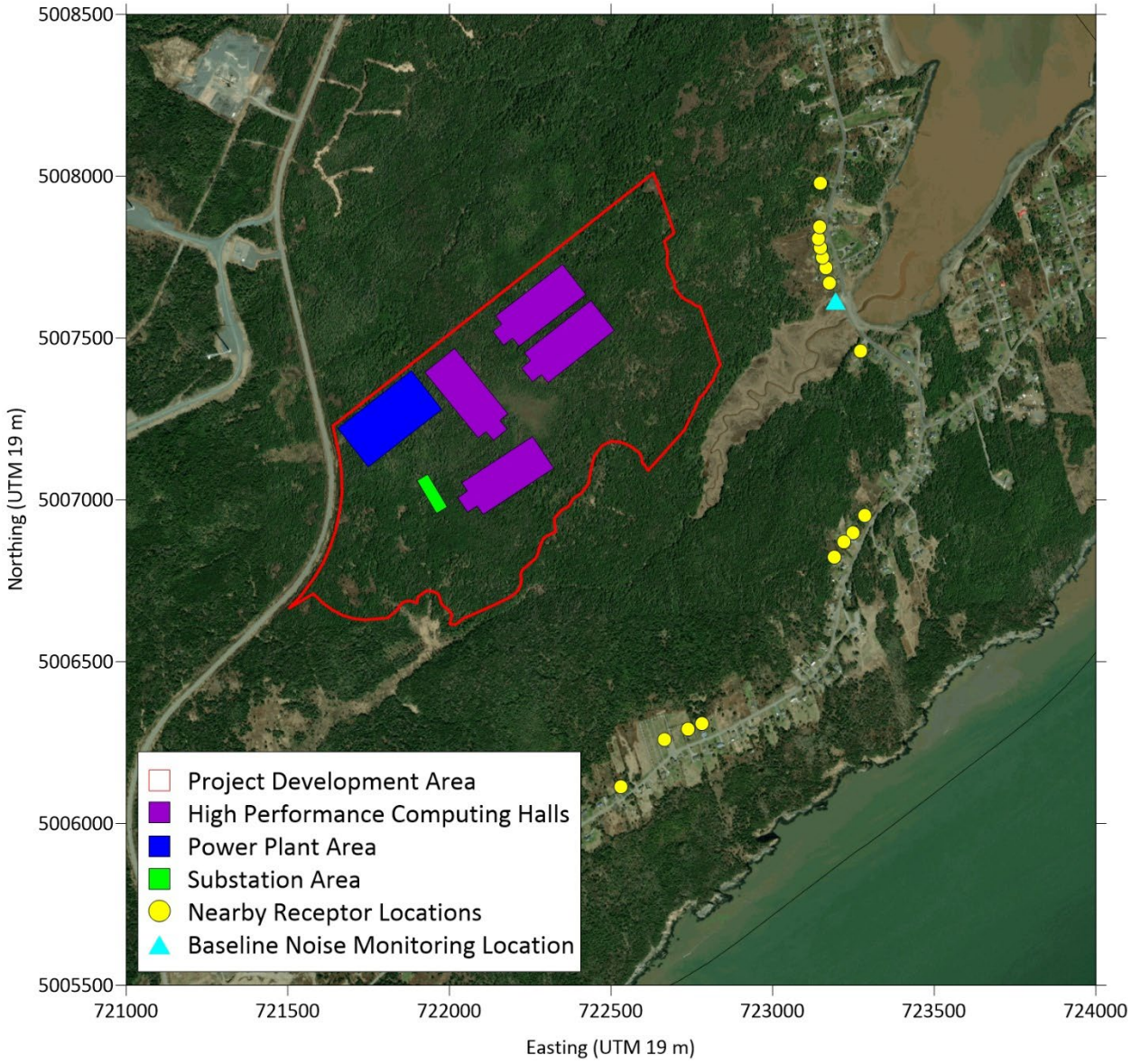


Figure 4 Location of Major Project Activities Relative to Nearby Receptor Locations

Table 5 Summary of Sound Power Levels used for Key Noise Sources during Project Operation

Source	Feature	Quantity	Octave Band Center Frequency (Hz) Sound Power Level (dB) for each Source									Total Sound Power Level for each Source	
			31.5	63	125	250	500	1000	2000	4000	8000	dB	dBA
Power Plant	Power Module Surface	10	87	90	96	94	89	88	87	89	90	101	96
	Exhaust Outlet	50	97	96	101	88	87	83	80	85	85	104	92
	Enclosure Ventilation	10	88	90	90	88	83	82	81	83	84	96	90
Chillers for Data Center	Inlet and Compressor	400	92	92	105	102	99	96	92	86	81	108	101
	Discharge	400	94	94	107	104	101	98	94	88	83	110	103
	Pump Enclosure	200	81	80	83	80	78	76	73	71	66	88	81
Data Hall	Interior Noise	4	81	83	85	83	82	81	79	79	77	91	87
	Boiler Stack Exhaust	4	78	79	81	77	76	75	73	69	66	86	80
Substation	Transformer	1	92	95	97	94	89	89	86	84	78	102	94

Table 6 Acoustic Performance of Noise Mitigation Measures included for the Project

Acoustic Treatment	Sound Power Level Reduction (dB) by Octave Band (Hz)								
	31.5	63	125	250	500	1000	2000	4000	8000
Insertion Loss									
Chiller Inlet Louver	3	6	11	15	18	20	15	10	10
Chiller Discharge Silencer	5	10	12	18	24	24	20	10	8
Transmission Loss									
Data Center Wall Panel	13	17	24	33	39	43	45	45	45

5.2 Noise Modelling Results

The predicted sound levels at nearby receptors are shown in Table 7. The predicted sound level isopleth contours from Project operations are shown in Figure 5. The model assumes all operation equipment run continuously during both the daytime and nighttime periods.

The cumulative noise levels of the baseline and Project-related noise emissions are predicted to comply with applicable noise guidelines in New Brunswick at the nearby receptor locations.

Table 7 Noise Modelling Results for Project-Related Noise Emissions during Operation

Receptor	Receptor Coordinates (UTM 19 m)		Sound Pressure Level from Project Activities (dBA)	Cumulative Sound Pressure Level (Baseline + Project) (dBA)		
	Easting	Northing		Daytime	Evening	Nighttime
POR1	723175	5007670	37.5	45.8	42.3	40.8
POR2	723165	5007716	37.9	45.9	42.5	41.0
POR3	723155	5007749	38.0	45.9	42.5	41.1
POR4	723148	5007779	38.0	45.9	42.5	41.1
POR5	723142	5007806	38.0	45.9	42.5	41.1
POR6	723145	5007843	37.8	45.8	42.4	41.0
POR7	723147	5007978	37.0	45.7	42.2	40.6
POR8	723271	5007460	37.0	45.7	42.2	40.6
POR9	723285	5006951	35.9	45.6	41.9	40.1
POR10	723248	5006898	36.2	45.6	41.9	40.3
POR11	723221	5006870	36.4	45.6	42.0	40.3
POR12	723191	5006822	36.4	45.6	42.0	40.3
POR13	722739	5006291	37.3	45.8	42.3	40.7
POR14	722665	5006258	37.3	45.8	42.3	40.7
POR15	722531	5006113	36.3	45.6	42.0	40.3
POR16	722781	5006309	37.2	45.8	42.2	40.7

Note:
dBA = A-weighted decibel

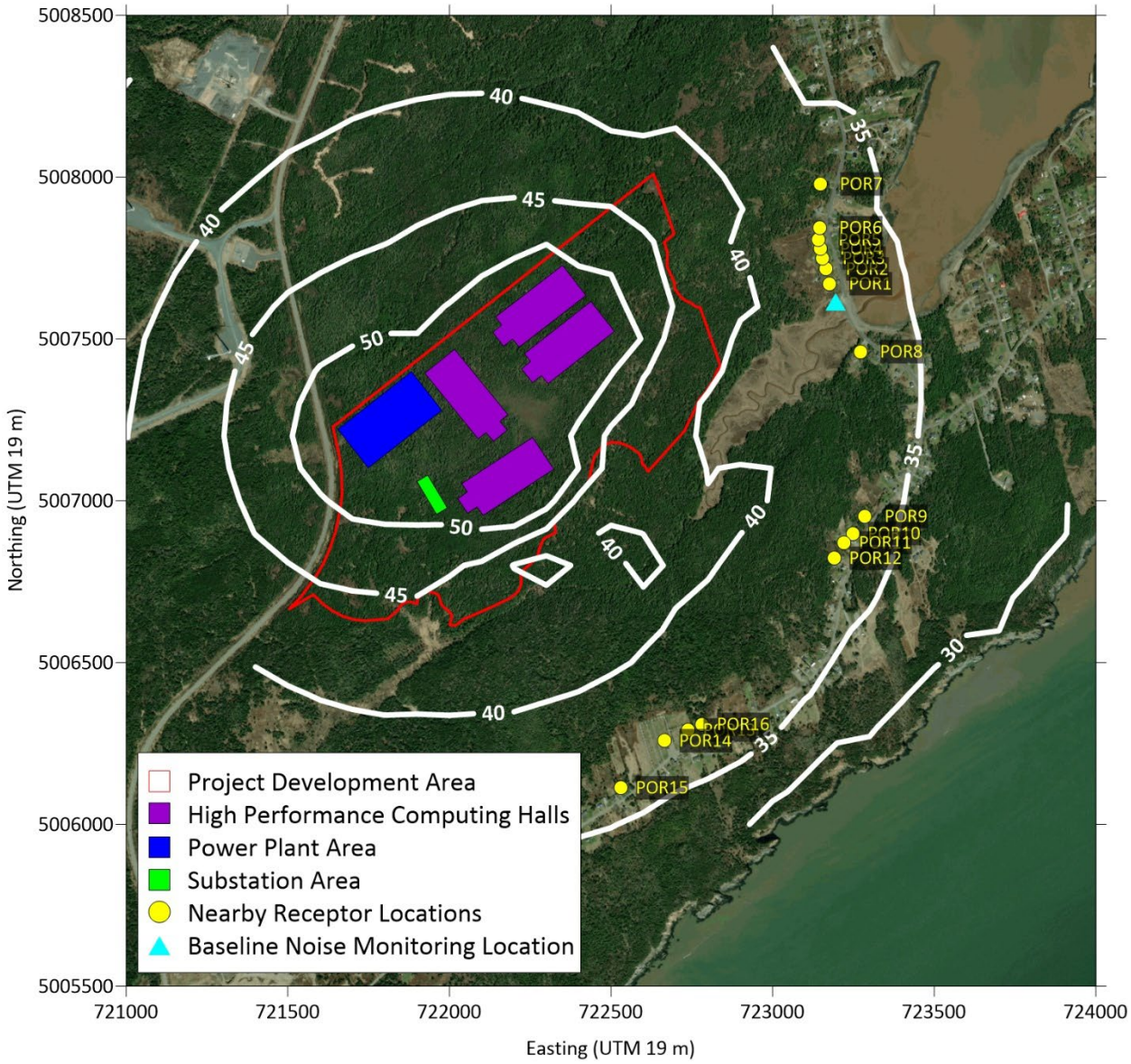


Figure 5 Sound Pressure Level Contours (dBA) from Project Operations

5.3 Low Frequency Noise Analysis

A low frequency noise assessment was completed for the Project. Since there are no low-frequency noise assessment guidelines in New Brunswick, the low frequency noise assessment is based on criteria developed by the Alberta Utility Commission Rule 012, which states that low-frequency noise may be present if there is a clear tone between 20 Hz and 250 Hz, and where the difference between the overall C-weighted sound level and the overall A-weighted sound level is equal to or greater than 20 dB (AUC 2024).

The predicted A-weighted and C-weighted sound levels at the receptors is shown in Table 8. The dBC minus dBA values are all below 20 dB; therefore, Project low frequency noise effects on nearby receptors are predicted to be low.

Table 8 Low Frequency Noise Analysis

Receptor	Receptor Coordinates (UTM 19 m)		Sound Pressure Level from Project Activities		dBC - dBA
	Easting	Northing	dBA	dBC	
POR1	723175	5007670	37.5	53.7	16.2
POR2	723165	5007716	37.9	53.9	16.0
POR3	723155	5007749	38.0	53.9	15.9
POR4	723148	5007779	38.0	53.9	15.9
POR5	723142	5007806	38.0	53.9	15.9
POR6	723145	5007843	37.8	53.8	16.0
POR7	723147	5007978	37.0	53.3	16.3
POR8	723271	5007460	37.0	53.1	16.1
POR9	723285	5006951	35.9	52.2	16.3
POR10	723248	5006898	36.2	52.4	16.2
POR11	723221	5006870	36.4	52.6	16.2
POR12	723191	5006822	36.4	52.6	16.2
POR13	722739	5006291	37.3	53.0	15.7
POR14	722665	5006258	37.3	52.9	15.6
POR15	722531	5006113	36.3	52.1	15.8
POR16	722781	5006309	37.2	53.0	15.8

Notes:
dB = decibel; dBA = A-weighted decibel; dBC = C-weighted decibel

6 Mitigation Measures

The Project requires mitigation measures that are inherent in the designs to achieve compliance with the New Brunswick Noise Guidelines. Standard industry practices and mitigation measures, as well as site-specific mitigation, will be implemented during operation. The assessment results presented in the previous sections include the application of mitigation measures. Mitigation measures for Project Case components are summarized as follows:

- Installation of silencers for the air-cooled chiller outlets
- Installation of acoustic louvers for the air-cooled chiller inlets
- Installation of appropriate wall construction for the Data Halls that achieves transmission losses specified in Table 6.

7 Conclusion

Noise effects from the Project were assessed at nearby receptor locations. Baseline sound levels at the receptors were determined based on noise monitoring. Noise modelling was completed using manufacturers data, owner's engineering specifications and drawings, representative noise emission levels from similar equipment, and acoustic calculations. The cumulative sound levels (i.e., combined Project noise levels and baseline sound levels) were predicted to meet the provincial daytime, evening, and nighttime noise guideline levels. In addition, further analysis indicate low frequency noise effect is not expected at all receptors.

8 References

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ISO. 1996. International Standard ISO 9613-1, ISO 9613-2, Acoustics – Attenuation of sound during propagation outdoors. Part 2: General Method of Calculation. Geneva, Switzerland.

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Appendix D Fish and Fish Habitat Baseline Report

Spruce Lake AI Data Centre Project: 2025 Fish and Fish Habitat Technical Data Report

Baseline fish and fish habitat data to support the development of a data centre

March 26, 2026

Prepared for:
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27th Floor, 112 4 Ave. SW
Calgary, Alberta T2P 3N3

and

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Houston, TX 77095

Prepared by:
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File Number:
121418636

Limitations

The conclusions in the Report titled Spruce Lake AI Data Centre Project: 2025 Fish and Fish Habitat Technical Data Report are Stantec's professional opinion, as of the time of the Report, and concerning the scope described in the Report. The opinions in the document are based on conditions and information existing at the time the scope of work was conducted and do not take into account any subsequent changes. The Report relates solely to the specific project for which Stantec was retained and the stated purpose for which the Report was prepared. The Report is not to be used or relied on for any variation or extension of the project, or for any other project or purpose, and any unauthorized use or reliance is at the recipient's own risk.

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1 Introduction

Stantec Consulting Ltd. (Stantec) was contracted by Beacon New Brunswick Inc. (Beacon), to undertake a fish and fish habitat baseline study in 2025 within a Property (PID 55243596) located within the Spruce Lake Industrial Park, in Lorneville, New Brunswick (Figure 1.1). Beacon identified a study area consisting of approximately 300 acres (120 ha) of the Property for a data centre facility. The Field Study Area includes the portion of the Property which drains south into Marsh Brook and drains north towards Mill Creek, as shown in Figure 1.1. Marsh Brook extends for approximate 3.5 km along the southern extent of the Field Study Area.

The 2025 fish and fish habitat studies were designed to support Project planning, the environmental assessment associated with the development and subsequent permitting, if required. The data from the 2025 field program may be used to support regulatory processes in several ways:

- support the assessment of potential project interactions and environmental effects of the development on fish and fish habitat
- identify fish bearing waters to support planning activities related to locating potential infrastructure to avoid fish habitat, where feasible
- provide part of the supporting documentation for the environmental assessment (EA) required for development
- determine the presence of fish to support the determination of potential harmful alteration, disruption or destruction of fish habitat and the requirement for offsetting under the *Fisheries Act*

The objectives of the 2025 fish and fish habitat field studies are:

1. Identify mapped and potentially unmapped watercourses which flow from the Field Study Area
2. Characterize watercourses located within and immediately downstream of the Field Study Area
3. Assess fish absence/presence and fish communities within and immediately downstream of the Field Study Area





Notes

1. Coordinate System: NAD 1983 CSRS New Brunswick Stereographic
2. Data Sources: Data License with the Government of New Brunswick (GeoNB, NBDNRED, NBHN, NBRN, SNB) and Canada (NRCan CanVec)
3. Background: Esri, USGS

Legend

- Field Study Area

Other Features

- Transmission Line
- Highway
- Collector Road
- Local Road
- Resource / Service Road
- Building
- Contour - 5m

Waterways and Wetlands

- Watercourse
- Waterbody
- Provincially Significant Wetland
- Wetland

0 0.5 1 1.5 km

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Stantec

Project Location
Lorneville,
New Brunswick

Prepared by SC on 2026-01-27
Revised by SC on 2026-03-26

Client/Project
Beacon Data Centres Inc.
Spruce Lake AI Data Centre
Fish and Fish Habitat Technical Data Report

121418636-201

Figure No.
1.1

Title
Project Location

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2 Desktop Watercourse Identification

Desktop watercourse identification was completed to identify mapped and potentially unmapped watercourses in the Property prior to field surveys commencing.

2.1 Methods

Potential watercourses in the Field Study Area were first identified for planning purposes using the 1:10,000 topographic mapping (NBDERD 2024). Additional analyses were undertaken using existing satellite imagery and publicly available LiDAR (light detection and ranging) data prior to commencement of field surveys to identify potentially unmapped watercourses. A LiDAR based flow model was used to delineate flows paths to identify potential unmapped watercourses that were not present in existing provincial mapping layers for watercourses and waterbodies.

The watercourses identified from this analysis were carried forward for subsequent ground-truthing and habitat characterization as applicable.

This study included a review of the data collected to support a previous development in an adjacent Property (Dillon 2024).

2.2 Results

One mapped watercourse, Marsh Brook, was identified to the south of the Field Study Area. Eleven unmapped watercourses were identified through satellite imagery or LiDAR (Figure 2.1). Some watercourses had unmapped branches; in these cases, the main branch was labelled “a” and additional branches were labelled “b”, “c”, etc. All identified watercourses were surveyed in the field in fall of 2025.

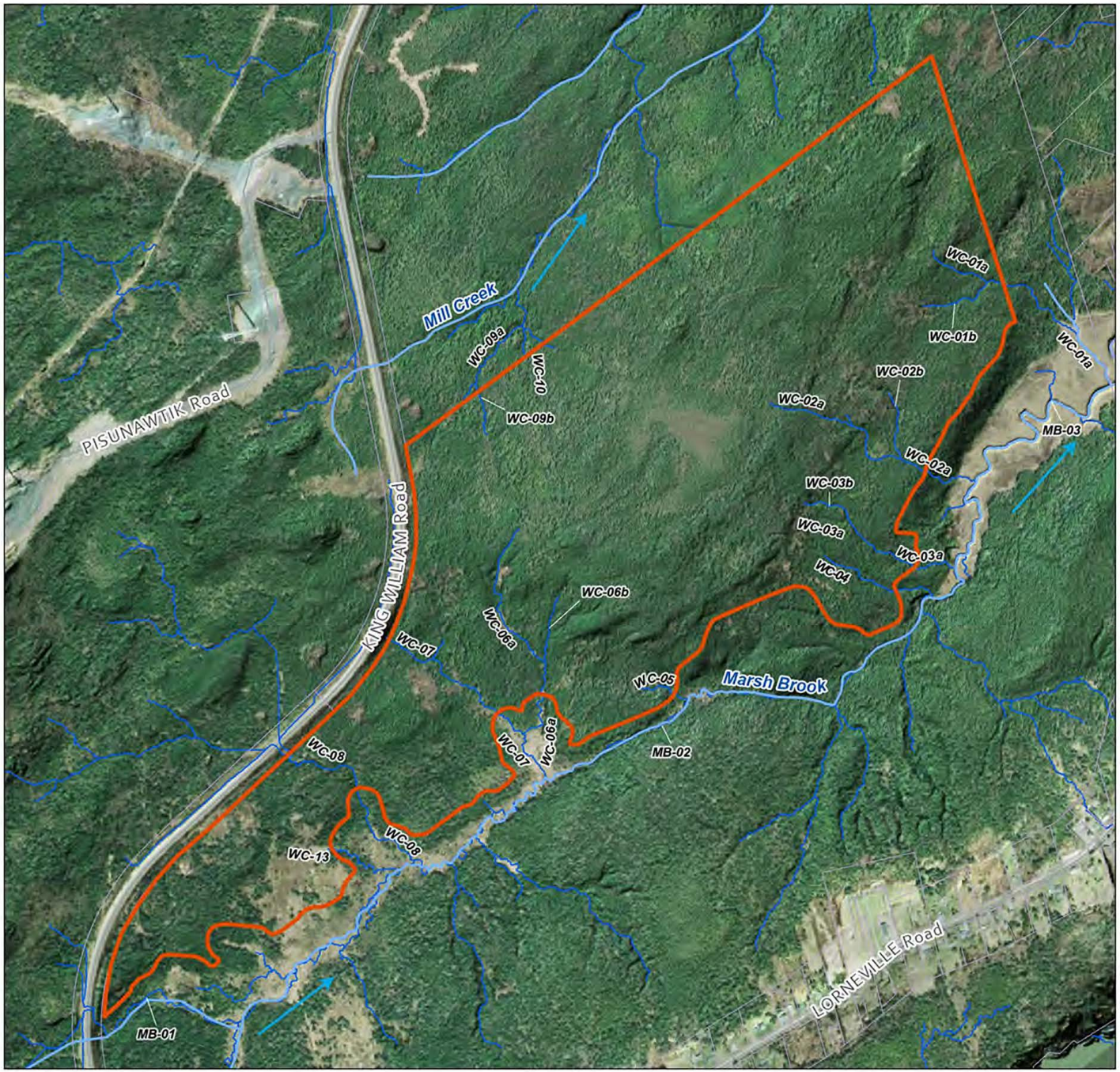


Figure No.
2.1

Title
Mapped and Unmapped Watercourses

Client/Project
Beacon Data Centres Inc
Spruce Lake AI Data Centre
Fish and Fish Habitat Technical Data Report

121418636-202

Project Location
Lorneville, NB

Prepared by SC on 2026-02-02

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Legend

- Field Study Area
- LiDAR Derived Watercourse (Stantec 2025)
- Watercourse (NBHN)
- Watercourse Flow Direction

Other Features

- Local Road
- Property Boundary

Project Location:



Notes

1. Coordinate System: NAD 1983 CSRS New Brunswick Stereographic
2. Data Sources: Service NB; Stantec
3. Background: Vantor, Esri, USGS; GeoNB; NB ELG; NB NRED; NS ECC; NS NRR; NRCan CanVec; Service NB
4. LiDAR derived watercourses are based on a digital elevation model and indicate potential for existing unmapped watercourses. This version of the model did not take culverts into account.

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3 Fish Habitat Characterization

3.1 Methods

This section describes the methods employed for the 2025 fish habitat surveys for watercourses in the vicinity of the Field Study Area. The field surveys for this study were conducted during between September 25 and November 27, 2025.

3.1.1 Physical Habitat Characteristics

Fish habitat surveys were conducted to delineate and characterize watercourses in the Field Study Area. Unmapped watercourses were fully characterized for fish habitat along with three (approximately 100 m long) mapped reaches of Marsh Brook which is located in proximity to the Field Study Area. Of the three reaches characterized in Marsh Brook, one reach was located in freshwater near the upstream extent of the Field Study Area. The second reach sampled was in freshwater approximately 1.8 km downstream (approximately equidistant between the first and third reach). The third reach was in the tidal portion of Marsh Brook.

Fish habitat information, including habitat unit (HU; i.e., riffle, run, pool), substrate composition, bank stability, riparian vegetation, overhead and instream cover, wetted and channel width and depth, and velocity at ¼, ½, and ¾ of the watercourse width, was collected to inform whether watercourses were considered fish habitat. Potential barriers to fish migration were noted, photographed and georeferenced.

As fish habitat was characterized on habitat specific reaches with varying watercourse lengths for each habitat type, the data for each habitat unit were weighted by the length of each habitat unit. The summary of the overall habitat characteristics for each watercourse considers the percentage of each habitat type relative to the overall habitat characteristics of each watercourse to create a weighted average.

3.1.2 Water Quality Sampling

In situ water quality, including water temperature, dissolved oxygen, conductivity, and pH was measured using a YSI ProQuatro, which was calibrated as recommended by the manufacturer for data accuracy.

In addition to in situ water quality measurements, seven surface water grab samples were collected. Four of these samples were collected in freshwater watercourses draining the Project area (WC-04, WC-05, WC-06 and WC-08. Samples were also collected in the freshwater reaches of Marsh Brook (MB-01 and MB-02), the tidal portion of Marsh Brook (MB-03), and in Mill Creek (MC-01). The water sample in Mill Creek was collected following public consultation on November 27, 2025, and results of this sample are included in Appendix A, Table A.2.

Surface water samples were analyzed for general chemistry, trace metals (total), mercury, and turbidity. Samples were analyzed at the Research and Productivity Council (RPC) laboratory in Fredericton, NB, which is an accredited facility under the Canadian Association for Laboratory Accreditation. Surface water quality sample results were compared to the Canadian Council of Ministers of the Environment (CCME) Canadian Water Quality Guidelines for the Protection of Aquatic Life (Freshwater) (CWQG-PAL; CCME 1999), except for the sample collected in the tidal portion of Marsh Brook.

3.2 Results

This section describes the results the 2025 fish habitat surveys. The HUs numbers in the main body of this report correspond with the HU numbers associated with the photos and tables in the appendices.

3.2.1 Physical Habitat Characteristics

In total, three reaches of Marsh Brook, 11 watercourses identified by desktop analysis and two watercourses identified in the field were surveyed in 2025.

The majority of watercourses surveyed are small unmapped headwater tributaries which were generally narrow (<1.5 m wide), shallow (<0.21 m), and had no flow or were slow flowing (<0.2 m/s; Appendix A.3). Many of the watercourses sampled contained tributaries that were ephemeral and/or intermittent. The reaches of Marsh Brook that were surveyed were wider (0.05 to 6.0 m), deeper (0.08 to 0.54 m), and faster flowing (0.001 m/s to 1m/s; Appendix A). No aquatic vegetation was observed in the watercourses at the time of the surveys. A summary of habitat characteristics for watercourses in the Field Study Area is provided in Table 3.1. The complete habitat data is included in Appendix A (Table A.1), while representative photos are included in Appendix B.

Based on the results of the fish habitat surveys and connectivity with adjacent watercourses, WC-01a, WC-05, and WC-08 were determined to potentially contain fish habitat throughout their lengths, whereas tributaries WC-02a, WC-03a, WC-03b, WC-04, WC-06a, WC-07, WC-11, WC-12a, and WC-12b contained reaches with defined banks and pooled water and could potentially support fish seasonally at select locations. The potential for fish habitat was confirmed with fish presence/absence surveys (Section 4.2). Marsh Brook contained fish habitat.

Tributaries WC-01b, WC-02b, WC-06b, WC-09a, WC-09b, and WC-13 were determined to be overland drainage channels not containing fish habitat because the channel was not visible, ephemeral, poorly defined and/or topography prevented access by fish. WC-10 was not fish habitat as no channel was visible within the Field Study Area. Each watercourse surveyed is described in more detail in Table 3.1 below.

Table 3.1 Summary of Habitat Characteristics for Watercourses Surveyed by Tributary in 2025

Stream	Wetted Stream Width (m)	Channel Stream Width	Mean Depth (m)	Mean Velocity (m/s)	Dominant Habitat Type	Dominant Substate Type	Dominant Riparian Vegetation	Average Overhead Cover	Dominant Instream Cover	Comments
MB-01	1.8	2.3	0.37	0.12	Riffle	Sand (31%)	Grass (40%) and Shrubs (40%)	25%	Large Woody Debris (5%)	Mapped second order watercourse. Upstream sampling location. Confirmed fish habitat.
MB-02	4.2	4.6	1.07	0.45	Riffle	Small Boulder (43%)	Grass (45%)	18%	Large Woody Debris (5%)	Mapped second order watercourse. Middle sampling location. Confirmed fish habitat
MB-03	1.2	6.0	0.65	0.1	Run	Fines (95%)	Grass (100%)	5%	None	Mapped second order watercourse. Downstream sampling location. Tidally influenced. Confirmed fish habitat
WC-01a	0.4	1.0	0.07	N/A*	Run	Cobble (32%)	Grass (54%)	9%	Small Woody Debris (11%)	Unmapped watercourse with connectivity to Marsh Brook. Potentially fish habitat.
WC-01b	Dry overland drainage channel that drains into WC-01a. Not fish habitat									
WC-02a	0.2	0.7	0.04	N/A*	Glide	Fines (31%)	Trees (53%)	29%	Small Woody Debris (1%)	Unmapped watercourse with connectivity to Marsh Brook. Potentially fish habitat in downstream reaches (0 to 105 m) until a very steep slope (~40%) poses a barrier to fish passage. Upstream reaches are overland drainage or no visible channel and are not considered fish habitat.
WC-02b	0.4	0.5	0.1	N/A*	Glide	Fines (70%)	Trees (60%)	14%	Small Woody Debris (4%)	Unmapped watercourse with no connectivity to fish-bearing waters. Not fish habitat.
WC-03a	0.5	0.8	0.05	N/A*	Run	Fines (61%)	Grass (55%)	15%	Small and Large Woody Debris (4% each)	Unmapped watercourse with connectivity to Marsh Brook. Potentially fish habitat in downstream reaches (0 to 353 m). Upstream reaches have no visible channel or are overland drainage and are not considered fish habitat (353 to 426 m).
WC-03b	0.2	0.4	0.05	N/A*	Run	Fines (70%)	Trees (55%)	8%	Small Woody Debris (3%)	Unmapped branch of WC-03a. Potentially fish habitat in downstream reach (0 to 76 m). Upstream reaches are either overland drainage or have no visible channel (76 to 144 m).
WC-04	0.4	0.8	0.09	N/A*	Run	Fines (64%)	Grass (60%)	16%	Small and Large Woody Debris (5% each)	Unmapped watercourse with connectivity to Marsh Brook. Potentially fish habitat in lower reaches (0 to 164 m). Upstream reaches (164 to 356 m) are overland drainage and are not considered fish habitat.
WC-05	0.6	0.9	0.08	N/A*	Riffle	Fines (41%)	Grass (57%)	15%	Small and Large Woody Debris (5% each)	Unmapped watercourse with connectivity to Marsh Brook. Potentially fish habitat.
WC-06a	0.1	0.1	0.03	N/A*	Glide	Fines (24%)	Grass (40%) and Trees (40%)	1%	Small Woody Debris (2%)	No connectivity to fish-bearing waters. No defined channel is visible in downstream reaches within a wetland (0 to 115 m). Upstream reaches are an overland drainage channel and are not considered fish habitat (125 to 612 m).
WC-06b	Dry overland drainage channel that drains into WC-06a. Not fish habitat									
WC-07	0.4	0.9	0.18	N/A*	Intermittent-Pool	Fines (48%)	Grass (51%)	13%	Small Woody Debris (7%)	Unmapped watercourse with no connectivity to fish-bearing waters. Downstream reach is an overland drainage channel (0 to 50 m) and then dissipates into a wetland and no defined channel is visible (50 to 130 m). Upstream reaches are an overland drainage channel and are not considered fish habitat.
WC-08	0.6	0.7	0.13	N/A*	Run	Fines (23%)	Grass (40%)	13%	Small Woody Debris (3%)	Unmapped watercourse with connectivity to Marsh Brook. Potentially fish habitat, further assessment is required.
WC-09a	Dry overland drainage channel. Not fish habitat									
WC-09b	The downstream reach is a dry overland drainage channel (0 to 27 m) that dissipates into a wetland and no channel is visible (27 to 71 m). A dry overland drainage channel re-emerges (71 to 106 m) before dissipating into a wetland again.									
WC-10	No visible channel - not fish habitat.									
WC-11	0.4	0.5	0.09	0.09	Run	Fines (48%	Trees (65%)	4%	Small Woody Debris (8%)	Unmapped watercourse with downstream reaches that may potentially be fish habitat as they may be connected to fish-bearing water during periods of high flow (0 to 65 m). Upstream reaches (65 to 136 m) were determined to be overland drainage and lack connectivity and are not fish habitat.
WC-12a	0.7	1.1	0.16	0.13	Run	Fines (37%)	Trees (43%)	9%	Small Woody Debris (5%)	Unmapped watercourse with no connectivity to fish-bearing waters. Downstream reaches dissipate into a wetland. Watercourse is considered to be an overland drainage channel and does not contain fish habitat.

Table 3.1 Summary of Habitat Characteristics for Watercourses Surveyed by Tributary in 2025

Stream	Wetted Stream Width (m)	Channel Stream Width	Mean Depth (m)	Mean Velocity (m/s)	Dominant Habitat Type	Dominant Substate Type	Dominant Riparian Vegetation	Average Overhead Cover	Dominant Instream Cover	Comments
WC-12b	0.5	1.4	0.06	0.001	Run	Cobble (40%)	Trees (50%)	0%	Small Woody Debris and Boulders (5% each)	Unmapped branch of WC-12a. Watercourse dissipates into a wetland downstream and is not considered fish habitat.
WC-13	No visible channel in downstream reaches. Overland drainage channel present upstream that drains from one wetland into another. Not fish habitat.									

*No measurable flow

3.2.2 Water Quality Sampling

In situ water quality measurements were taken in each watercourse between September 25 and November 5, 2025, with the exception of WC-09 and WC-10. No water was present in WC-09 and no channel was visible at WC-10 in the Field Study Area. Water temperatures ranged from 8.4°C to 18.0°C (Appendix A, Table A.2). Dissolved oxygen concentrations ranged from 3.30 to 10.32 mg/L (30-103%). Dissolved oxygen concentrations were below the CWQG PAL recommended value of 6.5 mg/L for other life stages of coldwater fish species for five of 13 measurements collected. Five out of 13 measurements were above the minimum value for other life stages but below the value for early life stages of coldwater fish (9.5 mg/L) and three out of 13 measurements collected were above the value for early life stages of coldwater fish. The pH ranged from 5.65 to 8.48 and was below the CWQG PAL recommended range (6.5 – 9.0) for four of thirteen measurements collected.

Analytical water quality results for many parameters were found to be below the reporting limit (Table A.3, Appendix A). The reporting limits (i.e., lab detection limit) for parameters analyzed in the sample collected in the tidal portion of Marsh Brook were above the CWQG-PAL (marine) and the results could not be compared to the applicable guideline.

In general, surface waters flowing into and within Marsh Brook contained low concentrations of dissolved minerals (i.e., hardness). Alkalinity (as $CaCO_3$) was considered low (range: 13 to 110 mg/L) and hardness (as CaCO*3*) ranged from low to moderate (range: 45.3 to 97.7 mg/L). Laboratory measured conductivity was considered high for freshwater environments (range: 170 to 439 µS/cm). These values overall indicate soft water conditions in freshwater watercourses sampled within the Field Study Area.

Nutrient concentrations in surface waters were generally low, reflective of the relatively undeveloped nature of the surrounding land. Ortho-phosphate (as P) was less than the detection limit in all five samples and nitrogen (ammonia nitrogen) was below the detection limit at three of five sampling locations. Nitrate + nitrite ranged from 0.19 to 0.45 mg/L at four sampling locations and was below the detection limit at two locations.

The following parameters were above the freshwater CWQG PAL at one or more sampling locations (Appendix A):

- Total aluminum (three of five sampling locations)
- Total cadmium (one of five sampling locations)
- Total iron (three of five sampling locations)

4 Presence/Absence Surveys and Fish Community

The field surveys for presence/absence and fish community were conducted between September 25 and 30, 2025 and on November 27, 2025.

4.1 Methods

To further assess the presence or absence of fish in watercourses and species within the fish community, qualitative electrofishing was conducted in ten watercourses (Marsh Brook, WC-01, WC-02, WC-03, WC-04, WC-05, WC-06, WC-07, WC-08, and WC-12). As Marsh Brook flowed along the southern edge of the Field Study Area three reaches were sampled. Two reaches were sampled by electrofishing (MB-01 and MB-02) and one was sampled using minnow traps (MB-03).

Fish sampling was conducted by qualitative electrofishing using a backpack electrofishing unit (Smith Root LR-24). Fishing stations were sampled for a minimum fishing effort of 500 seconds unless sufficient habitat was lacking (i.e., channel ended, intermittent stream). Additional effort was expended to determine if watercourses or portions of watercourse deemed to not be fish habitat were indeed fishless (e.g., overland drainage channels). The time fished for each fishing station was recorded and captured fish were measured, weighed, identified to species, and released alive.

In the tidal portion of Marsh Brook, baited minnow traps were set below the low tide mark to fish overnight and checked the following morning at MB-03.

4.2 Results

Fish were only captured in Marsh Brook. A total of 31 fish were captured comprising brook trout (*Salvelinus fontinalis*) and mummichog (*Fundulus heteroclitus*). Brook trout were captured in the freshwater reaches of Marsh Brook (MB-01 and MB-02) and mummichog were captured in the tidal portion of Marsh Brook (MB-03). Various life stages of brook trout (e.g., young of year, juvenile and adult) were observed in Marsh Brook's freshwater reaches. Juvenile and adult life stages of mummichog were observed in the tidal reach of Marsh Brook. No fish were caught in any of the inflowing unmapped watercourses sampled.

A summary of the catch is provided in Table 4.1. Detailed effort and catch data by watercourse are provided in Appendix C, Tables C.1 and C.2.

Table 4.1 Fish Captured from Watercourses in Proximity to the Field Study Area

Site	Number of Fish Captured		
	Brook trout (*Salvelinus fontinalis*)	Mummichog (*Fundulus heteroclitus*)	Total
MB-01	15	0	15
MB-02	3	0	3
MB-03	0	13	13
WC-01	0	0	0
WC-02	0	0	0
WC-03	0	0	0
WC-04	0	0	0
WC-05	0	0	0
WC-06	0	0	0
WC-07	0	0	0
WC-08	0	0	0
WC-12	0	0	0
Total	**18**	**13**	**31**

A summary of the likelihood of fish presence is included in Figure 4.1. The likelihood of fish presence is categorized as confirmed present via fishing, potentially present based on connectivity, channel present but not fish bearing (based on habitat characteristics and/or fish absence via fishing) or channel not present.

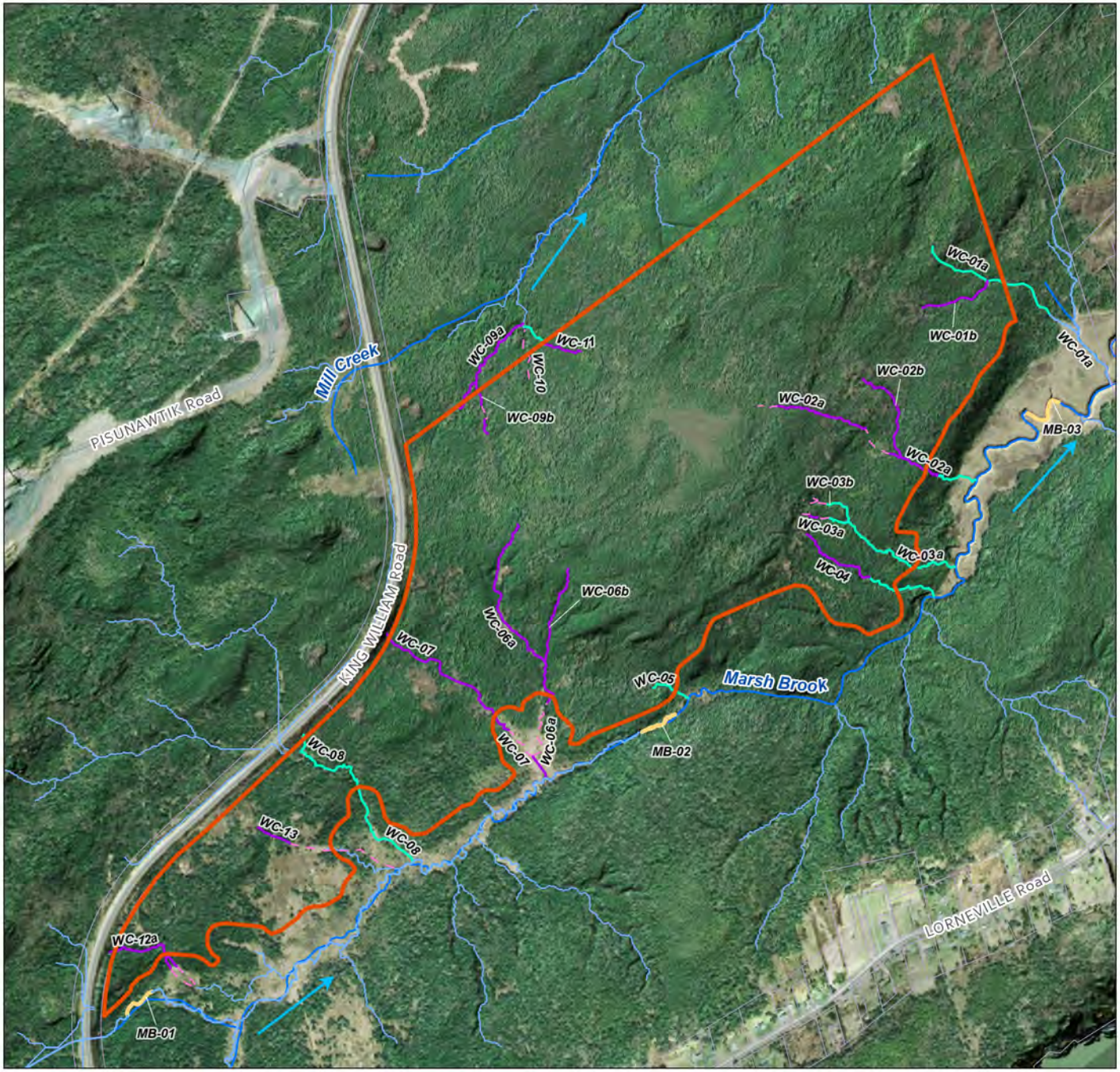


Figure No.
4.1
Title
Fish Bearing Status of Watercourses within the Field Study Area

Client/Project 121418636-203
Beacon Data Centres Inc.
Spruce Lake AI Data Centre
Fish and Fish Habitat Technical Data Report

Project Location
Lorneville, NB

Prepared by SC on 2026-01-27

N

0 200 400 m
(At original document size of 8.5x11)
1:12,500

Legend

- Field Study Area

Fish Bearing Status

- Potentially Fish Bearing
- Channel Not Present - Not Fish Bearing
- Channel Present - Not Fish Bearing
- Confirmed Fish Bearing
- Potential Watercourse - Not Surveyed (DEM Derived)
- Watercourse - Not Surveyed (NBHN)
- Watercourse Flow Direction

Other Features

- Local Road
- Property Boundary

Project Location:



Notes
1. Coordinate System: NAD 1983 CSRS New Brunswick Stereographic
2. Data Sources: Service NB; Stantec
3. Background: Vantor, Esri, USGS; GeoNB; NB ELG; NB NRED; NS ECC; NS NRR; NRCan CanVec; Service NB
4. LiDAR derived watercourses are based on a digital elevation model and indicate potential for existing unmapped watercourses. This version of the model did not take culverts into account.

Stantec

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Disclaimer: This document has been prepared based on information provided by others as cited in the Notes section. Stantec has not verified the accuracy and/or completeness of this information and shall not be responsible for any errors or omissions which may be incorporated herein as a result. Stantec assumes no responsibility for data supplied in electronic format, and the recipient accepts full responsibility for verifying the accuracy and completeness of the data.

5 Summary

The 2025 field work included an identification of watercourses, fish habitat characterization, and fish sampling in watercourses in proximity to the Field Study Area.

Thirteen watercourses in proximity to the Field Study Area were identified from provincial mapping, satellite imagery, LiDAR, or while in the field. Those watercourses as well as three approximately 100 m long reaches of Marsh Brook were surveyed.

The three reaches sampled in Marsh Brook contained fish habitat and seven other watercourses were determined to potentially contain fish habitat throughout the watercourse or within their lower reaches (WC-01, WC-02, WC-03, WC-04, WC-05, WC-08, and WC-11). The remaining six watercourses were determined not to contain fish habitat because they were overland drainage, had no visible channel, no connectivity to fish-bearing water, or a combination of these characteristic (WC-06, WC-07, WC-09, WC-10, WC-12, WC-13).

In situ water quality revealed that water temperatures in watercourses within the Field Study Area are generally suitable for cold water fish species. Dissolved oxygen concentrations were below the CWQG PAL for other life stages of fish in five of thirteen measurements. Five of thirteen measurements of dissolved oxygen were above the minimum value for other life stages but below the value for early life stages of coldwater fish (9.5 mg/L) Three of thirteen measurements were above the value for early life stages of coldwater fish. The pH of surface water in the Study was generally within the recommended CWQG PAL range but was below the guideline in four of thirteen measurements. Total aluminum exceeded the CWQG PAL at three of five sampling locations, total cadmium exceeded the guideline at one sampling location, and total iron exceeded the guideline at three of five sampling locations.

Qualitative electrofishing was conducted Marsh Brook and watercourses draining the Field Study Area to further inform the presence/absence of fish. Brook trout were only captured in two freshwater reaches of Marsh Brook and mummichog were captured in the tidal reach of Marsh Brook. No fish were caught in any of the other watercourses surveyed.

Overall, there were many unmapped watercourses draining the Field Study Area. The upper reaches of many of these watercourses were not considered fish habitat as they were overland drainage channels with no connectivity to fish-bearing waters or sections where no channel was visible. The downstream portion of some unmapped streams were connected to Marsh Brook and may provide habitat for fish seasonally as flows permit.



6 References

CCME. 1999. Canadian Environmental Quality Guidelines Summary Table - Canadian Water Quality Guidelines for the Protection of Aquatic Life. Available online at: https://ccme.ca/en/summary-table. Last accessed on December 17, 2025.

Dillon. 2024. Spruce Lake Industrial Park Expansion – Environmental Impact Assessment. Prepared for the New Brunswick Regional Development Corporation by Dillon Consulting Ltd.

NBDERD (New Brunswick Department of Energy and Resource Development). 2024. New Brunswick Hydrographic Network.

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Appendices

Appendix A Raw Habitat and Water Quality Data

A.1 Raw Fish Habitat Survey Data by Habitat Profile
Spruce Lake AI Data Centre Project: 2025 Fish and Fish Habitat Technical Data Report
Project: 121418636

Site ID	Survey Date	Survey Time (UTC)	Latitude	Longitude	Habitat Unit Number	Dominant Habitat Unit Type	Profile Length (m)	Left Bank Unstable (%)	Left Bank Moderately Stable (%)	Left Bank Stable (%)	Right Bank Unstable (%)	Right Bank Moderately Stable (%)	Right Bank Stable (%)	Left Bank Riparian Vegetation (%)						Right Bank Riparian Vegetation (%)						Substrate (%)								
														Bare	Grass	Shrub	Conifer	Deciduous	Wetland	Bare	Grass	Shrub	Conifer	Deciduous	Wetland	Organics	Fines (<0.06mm)	Sand (0.06 - 2mm)	Small Gravel (2-16mm)	Large Gravel (17-64mm)	Cobble (65-256mm)	Small Boulder (257-1000mm)	Large Boulder (>1000mm)	Bedrock
MB-01	2025-09-26	12:44:39	45.173433	-66.185611	182632	Riffle	68	0	40	10	0	40	10	0	20	20	10	0	0	0	20	20	10	0	0	0	20	30	20	20	10	0	0	0
MB-01	2025-09-26	12:44:39	45.173266	-66.185871	182633	Run (Unclassified)	7	0	40	10	0	40	10	0	20	20	10	0	0	0	20	20	10	0	0	0	20	50	20	10	0	0	0	0
MB-01	2025-09-26	12:44:39	45.173216	-66.185939	182635	Riffle	56	0	40	10	0	40	10	0	20	20	10	0	0	0	20	20	10	0	0	0	20	30	20	20	10	0	0	0
MB-01	2025-09-26	13:14:44	45.173006	-66.186273	182634	Pool (unclassified)	5	0	40	10	0	40	10	0	20	20	10	0	0	0	20	10	20	0	0	0	20	30	10	20	15	0	5	0
MB-02	2025-09-26	16:13:01	45.178534	-66.171863	182106	Riffle	15	0	0	50	0	0	50	0	25	5	20	0	0	0	20	10	20	0	0	0	0	10	10	20	35	20	5	0
MB-02	2025-09-26	16:13:01	45.17851	-66.171957	182101	Run (Unclassified)	22	0	0	50	0	0	50	0	25	5	20	0	0	0	20	10	20	0	0	0	0	0	15	25	30	30	0	0
MB-02	2025-09-26	16:13:01	45.178433	-66.172004	182103	Riffle	10	0	0	50	0	0	50	0	25	5	20	0	0	0	20	10	20	0	0	0	0	0	0	10	30	50	10	0
MB-02	2025-09-26	16:13:01	45.178383	-66.172125	182102	Run (Unclassified)	22	0	0	50	0	0	50	0	25	5	20	0	0	0	20	10	20	0	0	0	0	0	5	15	30	50	0	0
MB-02	2025-09-26	16:13:01	45.178344	-66.172309	182105	Riffle	29	0	0	50	0	0	50	0	25	5	20	0	0	0	20	10	20	0	0	0	0	0	5	15	30	50	0	0
MB-02	2025-09-26	16:13:01	45.17836	-66.172334	182099	Riffle	22	0	15	35	0	15	35	0	25	5	20	0	0	0	20	5	25	0	0	0	0	0	5	15	30	50	0	0
MB-03	2025-09-30	13:21:58	45.184431	-66.161475	184719	Run (Unclassified)	102	0	20	30	0	20	30	0	50	0	0	0	0	0	50	0	0	0	0	0	95	0	0	0	5	0	0	0
WC-01a	2025-09-30	13:51:37	45.186071	-66.161694	184724	Run (Unclassified)	61	0	0	50	0	0	50	0	30	5	15	0	0	0	30	5	15	0	0	0	25	10	15	15	30	5	0	0
WC-01a	2025-09-30	13:51:37	45.186475	-66.162128	184721	Run (Unclassified)	70	0	0	50	0	0	50	0	25	10	15	0	0	0	25	10	15	0	0	0	15	10	15	20	30	10	0	0
WC-01a	2025-09-30	14:19:07	45.186652	-66.16288	184717	Run (Unclassified)	58	0	0	50	0	0	50	0	30	5	15	0	0	0	30	5	15	0	0	0	10	15	15	20	35	5	0	0
WC-01a	2025-09-30	14:19:07	45.186798	-66.163545	184713	Run (Unclassified)	102	0	0	50	0	0	50	0	25	0	20	5	0	0	25	0	20	5	0	0	10	15	15	20	35	5	0	0
WC-01a	2025-09-30	14:40:51	45.187139	-66.164679	184722	Run (Unclassified)	29	0	0	50	0	0	50	0	25	0	20	5	0	0	25	0	20	5	0	0	20	15	20	20	25	0	0	0
WC-01b	2025-09-30	14:59:50	45.186714	-66.16335	144301	Dry	162	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WC-02a	2025-09-29	17:11:23	45.182962	-66.163737	182792	Glide (No Thalweg <0.5 m)	49	0	0	50	0	0	50	0	50	0	0	0	0	0	50	0	0	0	0	0	50	0	5	15	20	10	0	0
WC-02a	2025-09-29	17:22:00	45.183026	-66.164161	182793	Riffle	56	0	0	50	0	0	50	0	10	0	40	0	0	0	10	0	40	0	0	0	0	0	5	20	35	40	0	0
WC-02a	2025-09-29	17:22:00	45.183089	-66.164704	182786	Run (Unclassified)	81	0	0	50	0	0	50	0	10	0	40	0	0	0	10	0	40	0	0	0	0	0	5	20	35	40	0	0
WC-02a	2025-09-29	17:22:00	45.183373	-66.16538	182783	Glide (No Thalweg <0.5 m)	34	0	0	50	0	0	50	0	10	0	40	0	0	0	10	0	40	0	0	0	0	0	5	20	35	40	0	0
WC-02a	2025-09-29	17:22:00	45.183407	-66.165719	182796	Glide (No Thalweg <0.5 m)	26	0	0	50	0	0	50	0	10	0	40	0	0	0	10	0	40	0	0	20	80	0	0	0	0	0	0	0
WC-02a	2025-09-29	18:27:39	45.183481	-66.16594	144251	NVC search Path	82																											
WC-02a	2025-09-29	17:22:00	45.183964	-66.166605	182790	Glide (No Thalweg <0.5 m)	76	0	0	50	0	0	50	0	30	0	20	0	0	0	30	0	20	0	0	0	50	0	0	20	20	10	0	0
WC-02a	2025-09-29	18:46:14	45.184161	-66.167437	182794	Dry	106	0	0	50	0	0	50	0	30	0	20	0	0	0	30	0	20	0	0	0	45	5	10	20	15	5	0	0
WC-02a	2025-09-29	18:46:14	45.184374	-66.168591	182781	Dry	21	0	0	50	0	0	50	0	30	0	20	0	0	0	30	0	20	0	0	0	45	5	10	20	15	5	0	0
WC-02a	2025-09-29	18:54:04	45.184383	-66.168917	144249	NVC search Path	49	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WC-02b	2025-09-29	17:56:11	45.183461	-66.165669	182777	Glide (No Thalweg <0.5 m)	110	0	0	50	0	0	50	0	20	0	30	0	0	0	20	0	30	0	0	0	70	0	5	10	10	5	0	0
WC-02b	2025-09-29	17:56:11	45.184308	-66.165763	182782	Glide (No Thalweg <0.5 m)	50	0	0	50	0	0	50	0	20	0	30	0	0	0	20	0	30	0	0	0	70	0	5	10	10	5	0	0
WC-02b	2025-09-29	18:02:42	45.184706	-66.166115	144254	Dry	66	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WC-03a	2025-09-29	14:42:22	45.181364	-66.164268	182795	Run (Unclassified)	17		50	0	0	50	0	0	40	0	10	0	0	0	40	0	10	0	0	0	70	0	0	10	20	0	0	0
WC-03a	2025-09-29	14:42:22	45.181389	-66.164447	182788	Run (Unclassified)	105	0	0	50	0	0	50	0	30	0	20	0	0	0	35	5	10	0	0	0	70	0	0	10	15	5	0	0
WC-03a	2025-09-29	14:42:22	45.181398	-66.165504	182797	Run (Unclassified)	69	0	0	50	0	0	50	0	30	0	20	0	0	0	35	5	10	0	0	0	70	0	0	10	15	5	0	0
WC-03a	2025-09-29	14:42:22	45.181624	-66.16605	182787	Run (Unclassified)	113	0	0	50	0	0	50	0	30	0	20	0	0	0	15	0	35	0	0	0	50	0	10	15	15	10	0	0
WC-03a	2025-09-29	14:42:22	45.182225	-66.167073	182779	Run (Unclassified)	49	0	0	50	0	0	50	0	30	0	20	0	0	0	15	0	35	0	0	0	50	0	10	15	15	10	0	0
WC-03a	2025-09-29	15:32:25	45.182281	-66.167589	144248	Flow subsurface	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WC-03a	2025-09-29	14:42:22	45.182295	-66.167889	182780	Run (Unclassified)	20	0	0	50	0	0	50	0	20	0	30	0	0	0	15	0	35	0	0	0	60	0	10	10	10	10	0	0
WC-03a	2025-09-29	15:40:55	45.182346	-66.168093	144250	NVC search Path	28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WC-03b	2025-09-29	14:42:22	45.182233	-66.167072	182778	Run (Unclassified)	76	0	0	50	0	0	50	0	30	0	20	0	0	0	15	0	35	0	0	0	70	0	0	10	10	10	0	0
WC-03b	2025-09-29	16:07:51	45.182542	-66.167649	144255	NVC search Path	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WC-03b	2025-09-29	16:10:14	45.182601	-66.16789	144252	Upstream terminus	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WC-04	2025-09-29	13:33:50	45.180808	-66.164815	182784	Run (Unclassified)	100	0	0	50	0	0	50	0	30	0	20	0	0	0	30	0	20	0	0	0	50	0	10	15	20	5	0	0
WC-04	2025-09-29	13:33:50	45.180923	-66.165895	182789	Run (Unclassified)	55	0	0	50	0	0	50	0	30	0	20	0	0	0	30	0	20	0	0	0	70	0	0	10	15	5	0	0
WC-04	2025-09-29	13:56:38	45.181106	-66.166432	144253	Flow subsurface	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WC-04	2025-09-29	13:33:50	45.181166	-66.166514	182791	Run (Unclassified)	130	0	0	50	0	0	50	0	30	0	20	0	0	0	30	0	20	0	0	10	70	0	0	10	10	0	0	0
WC-04	2025-09-29	13:33:50	45.181573	-66.167738	182785	Run (Unclassified)	62	0	0	50	0	0	50	0	30	0	20	0	0	0	30	0	20	0	0	10	70	0	0	10	10	0	0	0
WC-05	2025-09-26	15:01:46	45.179034	-66.171706	182107	Riffle	29	0	0	50	0	0	50	0	30	10	10	0	0	0	35	0	15	0	0	0	20	0	5	30	35	10	0	0
WC-05	2025-09-26	15:20:51	45.179044	-66.171727	182104	Run (Unclassified)	20	0	0	50	0	0	50	0	30	10	10	0	0	0	35	0	15	0	0	0	50	0	0	20	30	0	0	0
WC-05	2025-09-26	15:31:33	45.179132	-66.171824	182100	Riffle	25	0	0	50	0	0	50	0	30	0	20	0	0	0	20	0	30	0	0	0	50	0	0	20	30	0	0	0
WC-05	2025-09-26	15:31:33	45.179172	-66.172154	182098	Run (Unclassified)	25	0	0	50	0	0	50	0	30	0	20	0	0	0	20	0	30	0	0	0	50	0	30	20	0	0	0	0
WC-06a	2025-09-26	17:48:15	45.177819	-66.175475	144258	NVC search Path	94	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WC-06a	2025-09-26	17:48:15	45.178522	-66.1753	144257	NVC search Path	31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WC-06a	2025-09-25	13:07:01	45.178914	-66.175011	143857	Dry	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WC-06a	2025-09-25	13:16:22	45.179077	-66.175128	181250	Glide (No Thalweg <0.5 m)	73	0	15	35	0	15	35	0	20	10	20	0	0	0	20	10	20	0	0	20	20	10	15	15	20	0	0	0
WC-06a	2025-09-25	13:28:09	45.179582	-66.17513	181248	Glide (No Thalweg <0.5 m)	43	0	15	35	0	15	35	0	20	10	20	0	0	0	20	10	20	0	0	0	30	10	15	15	25	5	0	0
WC-06a	2025-09-25	13:31:06	45.179824	-66.175527	143861	Dry	331	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WC-06b	2025-09-25	14:10:37	45.181338	-66.174516	143860	Dry	215	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WC-07	2025-09-26	17:34:40	45.177453	-66.175147	182801	Glide (No Thalweg <0.5 m)	50	0	0	50	0	0	50	0	50	0	0	0	0	0	50	0	0	0	0	0	100	0	0	0	0	0	0	0
WC-07	2025-09-26	18:14:21	45.178269	-66.176058	144256	NVC search Path	79	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WC-07	2025-09-26	18:00:53	45.178348	-66.176253	182798	Glide (No Thalweg <0.5 m)	12	0	10	40	0	10	40	0	20	20	10	0	0	0	25	20	5	0	0	0	100	0	0	0	0	0	0	0
WC-07	2025-09-26	18:00:53	45.178475	-66.176401	182799	Run (Unclassified)	16	0	10	40	0	10	40	0	20	20	10	0	0	0	25	20	5	0	0	0	90	0	0	0	5	5	0	0
WC-07	2025-09-26	18:00:53	45.178608	-66.176492	182800	Run (Unclassified)	17	0	10	40	0	10	40	0	20	20	10	0	0	0	25	20	5	0	0	0	90	0	0	0	5	5	0	0
WC-07	2025-09-25	15:47:36	45.178608	-66.176492	181252	Glide (No Thalweg <0.5 m)	59	0	10	40	0	10	40	0	20	20	10	0	0	0	25	20	5	0	0	0	45	45	0	0	5	5	0	0
WC-07	2025-09-25	16:07:53	45.178972	-66.176869	181254	Glide (No Thalweg <0.5 m)	62	0	10	40	0	10	40	0	20	20	10	0	0	0	20	20	10	0	0	0	35	35	0	0	20	10	0	0
WC-07	2025-09-25	15:47:36	45.179248	-66.17752	181251	Intermittent-Pool	199	0	10	40	0	10	40	0	20	5	20	5	0	0	25	5	20	0	0	0	30	30	15	0	20	5	0	0
WC-08	2025-09-30	17:13:31	45.176431	-66.179781	184720	Run (Unclassified)	119	0	0	50	0	0	50	0	15	30	5	0	0	0	15	30	5	0	0	0	40	20	20	10	10	0	0	0
WC-08	2025-09-25	17:04:56	45.176939	-66.17995	184715	Run (Unclassified)	63	0	0	50	0	0	50	0	20	10	20	0	0	0	25	5	20	0	0	0	10	20	20	15	25	10	0	0
WC-08	2025-09-30	16:55:21	45.177378	-66.180158	184723	Run (Unclassified)	52	0	0	50	0	0	50	0	25	5	20	0	0	0	25	5	20	0	0	0	0	10	15	10	35	30	0	0
WC-08	2025-09-25	18:49:22	45.177402	-66.180158	181247	Pool (unclassified)	2	0	10	40	0	0	50	0	20	0	30	0	0	0	20	0	30	0	0	0	20	30	15	10	15	10	0	0
WC-08	2025-09-25	19:01:35	45.177378	-66.180158	143853	Dry	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WC-08	2025-09-25	19:07:24	45.177769	-66.181348	181249	Glide (No Thalweg <0.5 m)	11	0	10	40	0	0	50	0	40	5	5	0	0	0	40	5	5	0	0	0	40	60	0	0	0	0	0	0
WC-08	2025-09-25		45.177832	-66.181406	143856	Dry	147	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WC-08	2025-09-25	19:19:32	45.177925	-66.18164	181253	Intermittent-Pool	39	0	10	40	0	0	50	0	20	10	20	0	0	0	20	10	20	0	0	0	20	30	15	10	15	10	0	0
WC-09a	2025-09-25	17:50:39	45.184517	-66.177261	143855	Dry	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WC-09b	2025-09-25	17:54:05	45.18465	-66.176868	143858	Dry	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WC-09b	2025-09-25	17:56:40	45.178206	-66.173255	143859	NVC search Path	44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WC-09b	2025-09-25	17:54:05	45.184143	-66.176727	143854	Dry	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WC-10	2025-09-25	17:32:21	45.1853	-66.175501	442916	NVC search Path	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WC-11	2025-11-05	15:38:17	45.185892	-66.175641	184836	Run (Unclassified)	36	0	0	50	0	0	50	0	10	10	20	10	0	0	5	10	30	5	0	10	50	0	0	10	20	5	0	5
WC-11	2025-11-05	15:38:17	45.185688	-66.175335	184834	Riffle	10	0	0	50	0	0	50	0	10	10	20	10	0	0	5	10	30	5	0	10	20	0	0	10	50	5	0	5
WC-11	2025-11-05	15:38:17	45.185663	-66.175239	184838	Run (Unclassified)	19	0	0	50	0	0	50	0	10	10	20	10	0	0	5	10	30	5	0	10	20	0	0	10	50	5	0	5
WC-11	2025-11-05	15:38:17	45.185556	-66.175063	184835	Run (Unclassified)	16	0	0	50	0	0	50	0	10	10	20	10	0	0	5	10	30	5	0	10	65	0	0	10	5	5	0	5
WC-11	2025-11-05	15:38:17	45.18551	-66.174751	184837	Run (Unclassified)	27	0	0	50	0	0	50	0	10	10	20	10	0	0	5	10	30	5	0	10	65	0	0	10	5	5	0	5
WC-11	2025-11-05	16:06:11	45.185437	-66.174474	145073	Dry	28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WC-12a	2025-09-30	18:42:51	45.173865	-66.185123	184714	Run (Unclassified)	46	0	0	50	0	0	50	0	15	10	20	5	0	0	15	10	20	5	0	0	20	0	15	10	40	15	0	0
WC-12b	2025-09-30	18:42:51	45.173905	-66.184951	184718	Run (Unclassified)	34	0	0	50	0	0	50	0	15	10	20	5	0	0	15	10	20	5	0	0	20	0	15	10	40	15	0	0
WC-12a	2025-09-30	19:01:59	45.174244	-66.185305	184716	Run (Unclassified)	60	0	0	50	0	0	50	0	20	10	15	5	0	0	20	10	15	5	0	0	70	0	10	0	20	0	0	0
WC-12a	2025-09-30	19:17:06	45.174182	-66.185929	184725	Run (Unclassified)	69	0	0	50	0	0	50	0	20	10	15	5	0	0	20	10	15	5	0	0	20	20	15	20	20	5	0	0
WC-13	2025-09-30	17:33:25	45.176088	-66.180075	453978	NVC search Path	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
WC-13	2025-09-30	17:45:23	45.176208	-66.181941	144300	Dry	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

A.1 Raw Fish Habitat Survey Data by Habitat Profile
Spruce Lake AI Data Centre Project: 2025 Fish and Fish Habitat Technical Data Report
Project: 121418636

Site ID	Survey Date	Survey Time (UTC)	Latitude	Longitude	Habitat Unit Number	Dominant Habitat Unit Type	Profile Length (m)	Left Bank Unstable (%)	Left Bank Moderately Stable (%)	Left Bank Stable (%)	Right Bank Unstable (%)	Right Bank Moderately Stable (%)	Right Bank Stable (%)	Embed-dedness	COM Habitat Comment	Wet Width (m)	Channel Width (m)	Wet Depth 25% from Left Bank	Wet Depth 50% from Left Bank	Wet Depth 75% from Left Bank	Left Bank Height (m)	Right Bank Height (m)	Velocity 25% from Left Bank	Velocity 50% from Left Bank	Velocity 75% from Left Bank	Transect Comment
MB-01	2025-09-26	12:44:39	45.173433	-66.185611	182632	Riffle	68	0	40	10	0	40	10	Medium embeddedness : 25-50% embedded		1.55	2.05	0.09	0.13	0.09	0.14	0.14	0.25	0.25	0.2	
MB-01	2025-09-26	12:44:39	45.173266	-66.185871	182633	Run (Unclassified)	7	0	40	10	0	40	10	Medium embeddedness : 25-50% embedded		1.92	1.92	0.4	0.36	0.25	0.12	0.14	0.01	0.01	0.01	
MB-01	2025-09-26	12:44:39	45.173216	-66.185939	182635	Riffle	56	0	40	10	0	40	10	Medium embeddedness : 25-50% embedded		2	2.52	0.15	0.08	0.11	0.27	0.21	0.1	0.25	0.2	
MB-01	2025-09-26	13:14:44	45.173006	-66.186273	182634	Pool (unclassified)	5	0	40	10	0	40	10	Medium embeddedness : 25-50% embedded		1.95	2.75	0.11	0.23	0.2	0.2	0.22	0.001	0.2	0.001	
MB-02	2025-09-26	16:13:01	45.178534	-66.171863	182106	Riffle	15	0	0	50	0	0	50	Low embeddedness : <25% embedded		0.05	2.4	0.38	0.41	0.2	0.07	0.5	0.33	0.3	0.5	
MB-02	2025-09-26	16:13:01	45.17851	-66.171957	182101	Run (Unclassified)	22	0	0	50	0	0	50	Low embeddedness : <25% embedded		5.5	5.4	0.47	0.4	0.43	0.05	0.05	0.001	0.33	0.25	
MB-02	2025-09-26	16:13:01	45.178433	-66.172004	182103	Riffle	10	0	0	50	0	0	50	Low embeddedness : <25% embedded		3.5	3.5	0.35	0.32	0.27	0.05	0.03	1	0.9	0.3	
MB-02	2025-09-26	16:13:01	45.178383	-66.172125	182102	Run (Unclassified)	22	0	0	50	0	0	50	Low embeddedness : <25% embedded		5.5	5.5	0.54	0.52	0.42	0.1	0.08	0.2	0.3	0.2	
MB-02	2025-09-26	16:13:01	45.178344	-66.172309	182105	Riffle	29	0	0	50	0	0	50	Low embeddedness : <25% embedded		4.5	4.5	0.1	0.25	0.16	0.08	0.05	1	1	1	
MB-02	2025-09-26	16:13:01	45.17836	-66.172334	182099	Riffle	22	0	15	35	0	15	35	Low embeddedness : <25% embedded		4.15	4.8	0.38	0.53	0.35	0.2	0.22	0.1	0.25	0.5	
MB-03	2025-09-30	13:21:58	45.184431	-66.161475	184719	Run (Unclassified)	102	0	20	30	0	20	30	Very high embeddedness : >75% embedded	Tidal section of marsh brook. Surveyed at low tide	1.2	6	0.2	0.25	0.2	1	1.2	-	0.1	-	Tide going out
WC-01a	2025-09-30	13:51:37	45.186071	-66.161694	184724	Run (Unclassified)	61	0	0	50	0	0	50	High embeddedness : 50-75% embedded	Channel dry in some sections	0.55	1.3	0.05	0.07	0.03	0.15	0.1	-	-	-	No measureable flow
WC-01a	2025-09-30	13:51:37	45.186475	-66.162128	184721	Run (Unclassified)	70	0	0	50	0	0	50	High embeddedness : 50-75% embedded	Channel dry in some sections	0.36	0.9	0.02	0.04	0.05	0.16	0.12	-	-	-	No measureable flow
WC-01a	2025-09-30	14:19:07	45.186652	-66.16288	184717	Run (Unclassified)	58	0	0	50	0	0	50	High embeddedness : 50-75% embedded	Channel dry in some sections	0.48	0.98	0.02	0.02	0.02	0.12	0.15	-	-	-	No measureable flow
WC-01a	2025-09-30	14:19:07	45.186798	-66.163545	184713	Run (Unclassified)	102	0	0	50	0	0	50	High embeddedness : 50-75% embedded	Channel dry in some sections	0.55	1.25	0.02	0	0.01	0.05	0.07	-	-	-	No measureable flow
WC-01a	2025-09-30	14:40:51	45.187139	-66.164679	184722	Run (Unclassified)	29	0	0	50	0	0	50	High embeddedness : 50-75% embedded	Channel dry in some sections	0.56	0.87	0.04	0.06	0.04	0.12	0.13	-	-	-	No measureable flow
WC-01b	2025-09-30	14:59:50	45.186714	-66.16335	144301	Dry	162	-	-	-	-	-	-	-	Branch of WC-01, completely dry	-	-	-	-	-	-	-	-	-	-	
WC-02a	2025-09-29	17:11:23	45.182962	-66.163737	182792	Glide (No Thalweg <0.5 m)	49	0	0	50	0	0	50	High embeddedness : 50-75% embedded	Tidal	1.15	1	0.01	0.03	0.03	0.55	0.45	-	-	-	
WC-02a	2025-09-29	17:22:00	45.183026	-66.164161	182793	Riffle	56	0	0	50	0	0	50	High embeddedness : 50-75% embedded	Dry overland drainage channel	0	1.34	0	0	0	0.25	0.37	-	-	-	
WC-02a	2025-09-29	17:22:00	45.183089	-66.164704	182786	Run (Unclassified)	81	0	0	50	0	0	50	High embeddedness : 50-75% embedded	Dry overland drainage channel	0.3	0.96	0	0.01	0	0.25	0.21	-	-	-	
WC-02a	2025-09-29	17:22:00	45.183373	-66.16538	182783	Glide (No Thalweg <0.5 m)	34	0	0	50	0	0	50	High embeddedness : 50-75% embedded	Dry overland drainage channel	0.84	1	0.13	0.15	0.09	0.18	0.22	-	-	-	
WC-02a	2025-09-29	17:22:00	45.183407	-66.165719	182796	Glide (No Thalweg <0.5 m)	26	0	0	50	0	0	50	Very high embeddedness : >75% embedded	Dry overland drainage channel	0.46	0.46	0.1	0.09	0.09	0.13	0.13	-	-	-	
WC-02a	2025-09-29	18:27:39	45.183481	-66.16594	144251	NVC search Path	82								Dissipates into wetland	-	-	-	-	-	-	-	-	-	-	
WC-02a	2025-09-29	17:22:00	45.183964	-66.166605	182790	Glide (No Thalweg <0.5 m)	76	0	0	50	0	0	50	Medium embeddedness : 25-50% embedded	Dry overland drainage channel	0	0.66	0	0	0	0.05	0.05	-	-	-	
WC-02a	2025-09-29	18:46:14	45.184161	-66.167437	182794	Dry	106	0	0	50	0	0	50	Medium embeddedness : 25-50% embedded	Dry overland drainage channel	0	0.98	0	0	0	0.05	0.05	-	-	-	
WC-02a	2025-09-29	18:46:14	45.184374	-66.168591	182781	Dry	21	0	0	50	0	0	50	Medium embeddedness : 25-50% embedded	Dry overland drainage channel	-	-	-	-	-	-	-	-	-	-	
WC-02a	2025-09-29	18:54:04	45.184383	-66.168917	144249	NVC search Path	49	-	-	-	-	-	-	-	Branch of WC-01, completely dry	-	-	-	-	-	-	-	-	-	-	
WC-02b	2025-09-29	17:56:11	45.183461	-66.165669	182777	Glide (No Thalweg <0.5 m)	110	0	0	50	0	0	50	Medium embeddedness : 25-50% embedded	Overland drainage with standing pools of water		0.65	0.07	0.02	0.08	0.04	0.19	-	0.12	-	
WC-02b	2025-09-29	17:56:11	45.184308	-66.165763	182782	Glide (No Thalweg <0.5 m)	50	0	0	50	0	0	50	Medium embeddedness : 25-50% embedded	Overland drainage with standing pools of water		0.4	0.05	0.04	0.03	0.02	0.13	-	0.07	-	
WC-02b	2025-09-29	18:02:42	45.184706	-66.166115	144254	Dry	66	-	-	-	-	-	-	-	Poorly defined channel	-	-	-	-	-	-	-	-	-	-	
WC-03a	2025-09-29	14:42:22	45.181364	-66.164268	182795	Run (Unclassified)	17			50	0	0	50	0	Medium embeddedness : 25-50% embedded	Dry, standing water, portion subterranean in wetland	0.25	0.58	0.06	0.02	0	0.35	0.37	-	-	-	
WC-03a	2025-09-29	14:42:22	45.181389	-66.164447	182788	Run (Unclassified)	105	0	0	50	0	0	50	Medium embeddedness : 25-50% embedded	Intermittent standing pools of water	0.59	0.96	0.05	0	0.01	0.17	0.2	-	-	-	
WC-03a	2025-09-29	14:42:22	45.181398	-66.165504	182797	Run (Unclassified)	69	0	0	50	0	0	50	Medium embeddedness : 25-50% embedded	Intermittent standing pools of water	1.02	1.02	0	0	0	0.13	0.14	-	-	-	
WC-03a	2025-09-29	14:42:22	45.181624	-66.16605	182787	Run (Unclassified)	113	0	0	50	0	0	50	Medium embeddedness : 25-50% embedded	Intermittent standing pools of water	0.27	0.77	0.04	0.05	0.01	0.18	0.17	-	-	-	
WC-03a	2025-09-29	14:42:22	45.182225	-66.167073	182779	Run (Unclassified)	49	0	0	50	0	0	50	Medium embeddedness : 25-50% embedded	Intermittent standing pools of water	0.12	0.97	0	0.02	0	0.12	0.12	-	-	-	
WC-03a	2025-09-29	15:32:25	45.182281	-66.167589	144248	Flow subsurface	25	-	-	-	-	-	-	-	NVC or subterranean	-	-	-	-	-	-	-	-	-	-	
WC-03a	2025-09-29	14:42:22	45.182295	-66.167889	182780	Run (Unclassified)	20	0	0	50	0	0	50	Medium embeddedness : 25-50% embedded	Intermittent standing pools of water	0.14	0.38	0	0.02	0	0.1	0.1	-	-	-	
WC-03a	2025-09-29	15:40:55	45.182346	-66.168093	144250	NVC search Path	28	-	-	-	-	-	-	-	No visible channel, vegetated slope	-	-	-	-	-	-	-	-	-	-	
WC-03b	2025-09-29	14:42:22	45.182233	-66.167072	182778	Run (Unclassified)	76	0	0	50	0	0	50	Medium embeddedness : 25-50% embedded	Intermittent standing pools of water	0.42	0.75	0.03	0.04	0.03	0.08	0.15	-	-	-	
WC-03b	2025-09-29	16:07:51	45.182542	-66.167649	144255	NVC search Path	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
WC-03b	2025-09-29	16:10:14	45.182601	-66.16789	144252	Upstream terminus	35	-	-	-	-	-	-	-	Poorly/not defined; upstream terminus	-	-	-	-	-	-	-	-	-	-	
WC-04	2025-09-29	13:33:50	45.180808	-66.164815	182784	Run (Unclassified)	100	0	0	50	0	0	50	Medium embeddedness : 25-50% embedded	Isolated pools of standing water.	0.36	0.59	0.05	0.06	0.04	0.12	0.11	-	-	-	
WC-04	2025-09-29	13:33:50	45.180923	-66.165895	182789	Run (Unclassified)	55	0	0	50	0	0	50	Medium embeddedness : 25-50% embedded	Isolated pools of standing water.	0.18	0.7	0	0.01	0	0.15	0.15	-	-	-	
WC-04	2025-09-29	13:56:38	45.181106	-66.166432	144253	Flow subsurface	9	-	-	-	-	-	-	-	Subterranean	-	-	-	-	-	-	-	-	-	-	
WC-04	2025-09-29	13:33:50	45.181166	-66.166514	182791	Run (Unclassified)	130	0	0	50	0	0	50	Medium embeddedness : 25-50% embedded	Isolated pools of standing water.	0.48	1.01	0.03	0.03	0.05	0.08	0.08	-	-	-	
WC-04	2025-09-29	13:33:50	45.181573	-66.167738	182785	Run (Unclassified)	62	0	0	50	0	0	50	Medium embeddedness : 25-50% embedded	Isolated pools of standing water.	0.48	0.7	0.02	0.02	0.01	0.1	0.1	-	-	-	
WC-05	2025-09-26	15:01:46	45.179034	-66.171706	182107	Riffle	29	0	0	50	0	0	50	Low embeddedness : <25% embedded		0.92	1.33	0.04	0.02	0.01	0.09	0.07	-	-	-	
WC-05	2025-09-26	15:20:51	45.179044	-66.171727	182104	Run (Unclassified)	20	0	0	50	0	0	50	Low embeddedness : <25% embedded	Braids and both branches are subterranean	0.42	0.56	0.05	0.02	0.03	0.07	0.06	-	-	-	
WC-05	2025-09-26	15:31:33	45.179132	-66.171824	182100	Riffle	25	0	0	50	0	0	50	Low embeddedness : <25% embedded	End of channel	0.53	0.96	0.02	0.04	0.03	-	-	-	-	-	
WC-05	2025-09-26	15:31:33	45.179172	-66.172154	182098	Run (Unclassified)	25	0	0	50	0	0	50	Low embeddedness : <25% embedded	Poorly defined dissipates through wetland	0.3	0.48	0.02	0.01	0.02	0.07	0.1	-	-	-	
WC-06a	2025-09-26	17:48:15	45.177819	-66.175475	144258	NVC search Path	94	-	-	-	-	-	-	-	Flooded wetland. Hummocky	-	-	-	-	-	-	-	-	-	-	
WC-06a	2025-09-26	17:48:15	45.178522	-66.1753	144257	NVC search Path	31	-	-	-	-	-	-	-	Grassland. NVC	-	-	-	-	-	-	-	-	-	-	
WC-06a	2025-09-25	13:07:01	45.178914	-66.175011	143857	Dry	40	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	
WC-06a	2025-09-25	13:16:22	45.179077	-66.175128	181250	Glide (No Thalweg <0.5 m)	73	0	15	35	0	15	35	High embeddedness : 50-75% embedded	Low water	0.57	0.74	0.01	0.03	0.02	0.1	0.12	-	-	-	No measureable flow
WC-06a	2025-09-25	13:28:09	45.179582	-66.17513	181248	Glide (No Thalweg <0.5 m)	43	0	15	35	0	15	35	High embeddedness : 50-75% embedded		0.75	0.75	0.13	0.1	0.06	0.14	0.12	-	-	-	No measureable flow
WC-06a	2025-09-25	13:31:06	45.179824	-66.175527	143861	Dry	331	-	-	-	-	-	-	-	Channel is dry	-	-	-	-	-	-	-	-	-	-	
WC-06b	2025-09-25	14:10:37	45.181338	-66.174516	143860	Dry	215	-	-	-	-	-	-	-	Dry channel of WC-06	-	-	-	-	-	-	-	-	-	-	
WC-07	2025-09-26	17:34:40	45.177453	-66.175147	182801	Glide (No Thalweg <0.5 m)	50	0	0	50	0	0	50	Very high embeddedness : >75% embedded	Channel in a wetland	0.65	0.7	0.19	0.2	0.18	0.22	0.16	-	0	-	
WC-07	2025-09-26	18:14:21	45.178269	-66.176058	144256	NVC search Path	79	-	-	-	-	-	-	-	Isolated pools of water	-	-	-	-	-	-	-	-	-	-	
WC-07	2025-09-26	18:00:53	45.178348	-66.176253	182798	Glide (No Thalweg <0.5 m)	12	0	10	40	0	10	40	Very high embeddedness : >75% embedded	Connected to upstream via subsurface	1.38	1.55	0.14	0.21	0.19	0.02	0.04	-	0.001	-	
WC-07	2025-09-26	18:00:53	45.178475	-66.176401	182799	Run (Unclassified)	16	0	10	40	0	10	40	Very high embeddedness : >75% embedded	Poorly defined channel. Flow in wetland	-	-	-	-	-	-	-	-	-	-	
WC-07	2025-09-26	18:00:53	45.178608	-66.176492	182800	Run (Unclassified)	17	0	10	40	0	10	40	Very high embeddedness : >75% embedded		0.58	0.71	0.05	0.07	0.06	0.02	0.02	-	0.06	-	
WC-07	2025-09-25	15:47:36	45.178608	-66.176492	181252	Glide (No Thalweg <0.5 m)	59	0	10	40	0	10	40	Very high embeddedness : >75% embedded		1.12	1.03	0.1	0.12	0.11	0.25	0.28	-	-	-	No measureable flow
WC-07	2025-09-25	16:07:53	45.178972	-66.176869	181254	Glide (No Thalweg <0.5 m)	62	0	10	40	0	10	40	Very high embeddedness : >75% embedded		0.8	0.93	0.12	0.16	0.1	0.2	0.22	-	-	-	No measureable flow
WC-07	2025-09-25	15:47:36	45.179248	-66.17752	181251	Intermittent-Pool	199	0	10	40	0	10	40	Very high embeddedness : >75% embedded		0.23	1.25	0.01	0.02	0.01	0.13	0.2	-	-	-	No measureable flow
WC-08	2025-09-30	17:13:31	45.176431	-66.179781	184720	Run (Unclassified)	119	0	0	50	0	0	50	Medium embeddedness : 25-50% embedded		0.32	0.32	0.04	0.05	0.04	0.17	0.17	-	0.09	-	
WC-08	2025-09-25	17:04:56	45.176939	-66.17995	184715	Run (Unclassified)	63	0	0	50	0	0	50	Medium embeddedness : 25-50% embedded		1.02	1.17	0.04	0.13	0.09	0.12	0.18	-	0.001	-	
WC-08	2025-09-30	16:55:21	45.177378	-66.180158	184723	Run (Unclassified)	52	0	0	50	0	0	50	Medium embeddedness : 25-50% embedded	Very shallow and rocky	2.64	2.7	0.1	0.04	0.04	0.15	0.18	-	-	-	No measureable flow
WC-08	2025-09-25	18:49:22	45.177402	-66.180158	181247	Pool (unclassified)	2	0	10	40	0	0	50	Medium embeddedness : 25-50% embedded	One small pool inside PDA	1.3	1.6	0.14	0.14	0.1	0.15	0.1	-	-	-	No measureable flow
WC-08	2025-09-25	19:01:35	45.177378	-66.180158	143853	Dry	24	-	-	-	-	-	-	-	Dry channel	-	-	-	-	-	-	-	-	-	-	
WC-08	2025-09-25	19:07:24	45.177769	-66.181348	181249	Glide (No Thalweg <0.5 m)	11	0	10	40	0	0	50	Medium embeddedness : 25-50% embedded		0.85	1.1	0.07	0.11	0.06	0.4	0.28	-	-	-	No measureable flow
WC-08	2025-09-25		45.177832	-66.181406	143856	Dry	147	-	-	-	-	-	-	-	Dry channel	-	-	-	-	-	-	-	-	-	-	
WC-08	2025-09-25	19:19:32	45.177925	-66.18164	181253	Intermittent-Pool	39	0	10	40	0	0	50	Medium embeddedness : 25-50% embedded		1.1	1.37	0.15	0.14	0.08	0.2	0.25	-	-	-	No measureable flow
WC-09a	2025-09-25	17:50:39	45.184517	-66.177261	143855	Dry	22	-	-	-	-	-	-	-	Dry branch of WC-09	-	-	-	-	-	-	-	-	-	-	
WC-09b	2025-09-25	17:54:05	45.18465	-66.176868	143858	Dry	27	-	-	-	-	-	-	-	WC-09 is dry	-	-	-	-	-	-	-	-	-	-	
WC-09b	2025-09-25	17:56:40	45.178206	-66.173255	143859	NVC search Path	44	-	-	-	-	-	-	-	No visible channel, cedar swamp	-	-	-	-	-	-	-	-	-	-	
WC-09b	2025-09-25	17:54:05	45.184143	-66.176727	143854	Dry	35	-	-	-	-	-	-	-	WC-09 is dry	-	-	-	-	-	-	-	-	-	-	
WC-10	2025-09-25	17:32:21	45.1853	-66.175501	442916	NVC search Path	-	-	-	-	-	-	-	-	No channel for WC-10 inside the PDA	-	-	-	-	-	-	-	-	-	-	
WC-11	2025-11-05	15:38:17	45.185892	-66.175641	184836	Run (Unclassified)	36	0	0	50	0	0	50	Medium embeddedness : 25-50% embedded		0.8	1.25	0.05	0.09	0.03	0.19	0.15	-	0.001	-	
WC-11	2025-11-05	15:38:17	45.185688	-66.175335	184834	Riffle	10	0	0	50	0	0	50	Medium embeddedness : 25-50% embedded		0.6	0.63	0.03	0.04	0.05	0.12	0.14	0.17	0.17	0.17	
WC-11	2025-11-05	15:38:17	45.185663	-66.175239	184838	Run (Unclassified)	19	0	0	50	0	0	50	Medium embeddedness : 25-50% embedded	Interrupted, sometimes subterranean or intermittent	-	-	-	-	-	-	-	-	-	-	
WC-11	2025-11-05	15:38:17	45.185556	-66.175063	184835	Run (Unclassified)	16	0	0	50	0	0	50	Medium embeddedness : 25-50% embedded		0.49	0.55	0.04	0.06	0.03	0.11	0.1	0.17	0.17	0.17	
WC-11	2025-11-05	15:38:17	45.18551	-66.174751	184837	Run (Unclassified)	27	0	0	50	0	0	50	Medium embeddedness : 25-50% embedded	Intermittent	0.37	0.48	0.03	0.05	0.05	0.04	0.05	-	-	-	No measureable flow
WC-11	2025-11-05	16:06:11	45.185437	-66.174474	145073	Dry	28	-	-	-	-	-	-	-	Overland drainage no flow some pooling of water	-	-	-	-	-	-	-	-	-	-	
WC-12a	2025-09-30	18:42:51	45.173865	-66.185123	184714	Run (Unclassified)	46	0	0	50	0	0	50	High embeddedness : 50-75% embedded		0.69	1.21	0.04	0.04	0.09	0.14	0.08	-	0.05	-	
WC-12b	2025-09-30	18:42:51	45.173905	-66.184951	184718	Run (Unclassified)	34	0	0	50	0	0	50	High embeddedness : 50-75% embedded	Branch of main channel	0.54	1.35	0.01	0.02	0.03	0.15	0.1	-	-	-	No measureable flow
WC-12a	2025-09-30	19:01:59	45.174244	-66.185305	184716	Run (Unclassified)	60	0	0	50	0	0	50	High embeddedness : 50-75% embedded		0.75	1.35	0.04	0.05	0.04	0.32	0.28	-	0.001	-	
WC-12a	2025-09-30	19:17:06	45.174182	-66.185929	184725	Run (Unclassified)	69	0	0	50	0	0	50	High embeddedness : 50-75% embedded		0.68	0.8	0.05	0.06	0.06	0.35	0.2	-	0.001	-	
WC-13	2025-09-30	17:33:25	45.176088	-66.180075	453978	NVC search Path	-	-	-	-	-	-	-	-	No visible channel	-	-	-	-	-	-	-	-	-	-	
WC-13	2025-09-30	17:45:23	45.176208	-66.181941	144300	Dry	75	-	-	-	-	-	-	-	Dry drainage channel, no connectivity upstream or downstream	-	-	-	-	-	-	-	-	-	-	

Table A.2 In Situ Water Quality Results
Spruce Lake AI Data Centre Project: 2025 Fish and Fish Habitat Technical Data Report
Project: 121418636

Site ID	Latitude	Longitude	Survey Date	Survey Time (UTC)	Temperature (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (%)	Specific Conductivity (µS/cm)	pH
MB-01	45.172854	-66.186613	2025-09-26	13:42:36	13.05	10.32	98	202	7.06
MB-02	45.178346	-66.17237	2025-09-26	16:51:22	13.69	8.99	87	269	6.34
MB-03	45.184434	-66.161784	2025-09-29	20:05:51	18.00	8.29	100	47,250	8.18
WC-01	45.187269	-66.164813	2025-09-30	14:44:52	12.38	5.14	50	166	6.93
WC-02	45.183272	-66.16521	2025-09-29	17:31:54	13.05	5.06	48	182	5.65
WC-03	45.181433	-66.164759	2025-09-29	14:54:23	11.06	5.19	48	293	6.67
WC-04	45.181066	-66.166413	2025-09-29	13:40:41	11.73	3.30	30	226	5.68
WC-05	45.179158	-66.171979	2025-09-26	15:10:37	12.46	9.74	91	219	6.75
WC-06	45.179191	-66.175161	2025-09-25	14:38:52	9.98	8.23	73	322	7.53
WC-07	45.17928	-66.177666	2025-09-25	16:12:48	10.55	5.54	50	665	8.48
WC-08	45.177378	-66.180158	2025-09-25	18:52:10	12.22	8.79	82	485	7.85
WC-11	45.185525	-66.174927	2025-11-05	15:57:27	8.40	8.40	71	41	6.28
WC-12	45.174181	-66.186149	2025-09-30	19:09:44	13.27	10.00	103	718	7.91

Table A.3 Analytical Surface Water Quality Results
Spruce Lake AI Data Centre Project: 2025 Fish and Fish Habitat Technical Data Report
Project: 121418636

Parameter	Reporting Limit	CWQG PAL Guideline (Marine)	CWQG PAL Guideline (Freshwater)	Sample ID:	WC-05	MB-01	WC-08	WC-06	MB-03	WC-04	MC-01
				Sample Date:	26-Sep-25	26-Sep-25	25-Sep-25	25-Sep-25	29-Sep-25	29-Sep-25	27-Nov-25
				Sample Type	Freshwater	Freshwater	Freshwater	Freshwater	Marine	Freshwater	Freshwater
				Lab ID:	565554-1	565554-2	565554-3	565554-4	565704-1	565704-2	569483-1
Sodium	0.05	-	-	mg/L	16.2	13.9	27.7	16.4	9,870	10.2	19
Potassium	0.02	-	-	mg/L	0.86	0.69	1.7	2.33	377	0.88	3.33
Calcium	0.05	-	-	mg/L	11.4	12.6	43.8	25.4	371	17.7	11.3
Magnesium	0.01	-	-	mg/L	4.08	3.83	9.86	8.32	1210	5.5	3.68
Iron	0.02	-	0.3	mg/L	**1.16**	**0.49**	0.12	**1.24**	< 2	0.12	**1.3**
Manganese	0.001	-	-	mg/L	0.157	0.069	0.374	0.247	< 0.1	0.383	0.04
Copper	0.001	-	0.002	mg/L	0.001	**0.002**	< 0.001	< 0.001	< 0.1	< 0.001	0.002
Zinc	0.001	-	-	mg/L	0.006	0.003	0.002	0.004	< 0.1	0.005	0.011
Ammonia (as N)	0.05	-	0.0698	mg/L	< 0.05	< 0.05	< 0.05	**0.07**	< 0.05	**0.1**	0.05
pH	-	7.0 to 8.7	6.5 to 9.0	units	6.6	7.3	8.1	8.1	8	6.3	7.2
Alkalinity (as $CaCO_3$)	2	-	-	mg/L	13	19	13	110	120	7	17
Chloride	0.5	-	120	mg/L	17.3	21.6	54.9	14.6	16400	13.6	32.9
Sulfate	1	-	-	mg/L	43	33	34	18	2620	63	26
Nitrate + Nitrite (as N)	0.05	-	-	mg/L	0.45	0.35	< 0.05	0.19	< 0.05	0.34	0.08
o-Phosphate (as P)	0.01	-	-	mg/L	< 0.01	< 0.01	< 0.01	< 0.01	0.05	< 0.01	< 0.01
r-Silica (as SiO_2)	0.1	-	-	mg/L	6.6	5.5	6.5	10.4	1.3	10.7	6.4
Carbon - Total Organic	0.5	-	-	mg/L	32	14.2	4.9	3.3	2.1	4.5	25
Turbidity	0.1	-	-	NTU	87.3	36.4	1.9	6.5	30	2.2	19.7
Solids - Total Suspended	5	-	-	mg/L	14	< 5	< 5	< 5	51	< 5	6
Conductivity	1	-	-	µS/cm	182	170	439	276	68900	211	189
Calculated Parameters											
Bicarbonate (as $CaCO_3$)	-	-	-	mg/L	13	19	119	109	119	7	17
Carbonate (as $CaCO_3$)	-	-	-	mg/L	0.005	0.036	1.4	1.29	1.12	0.001	0.025
Hydroxide (as $CaCO_3$)	-	-	-	mg/L	0.002	0.01	0.063	0.063	0.05	0.001	0.008
Cation Sum	-	-	-	meq/L	1.7	1.6	4.27	2.81	557	1.83	1.85
Anion Sum	-	-	-	meq/L	1.68	1.7	4.65	3	520	1.86	1.81
Percent Difference	-	-	-	%	0.74	-3.22	-4.36	-3.31	3.48	-0.79	1.06
Theoretical Conductivity	-	-	-	µS/cm	189	185	440	274	38100	215	204
Hardness (as $CaCO_3$)	0.2	-	-	mg/L	45.3	47.2	150	97.7	5910	66.8	43.4
Ion Sum	-	-	-	mg/L	111	105	252	165	30900	128	115
Saturation pH (5°C)	-	-	-	units	9.4	9.2	7.9	8.2	7	9.5	9.3
Langelier Index (5°C)	-	-	-	-	-2.81	-1.9	0.18	-0.06	1.03	-3.2	-2.09
Aluminum	1	-	5 to 100	µg/L	**973**	**494**	53	62	400	**141**	**1490**
Antimony	0.1	-	-	µg/L	0.1	< 0.1	< 0.1	< 0.1	< 10	0.1	0.2
Arsenic	1	12.5	5	µg/L	< 1	< 1	< 1	2	< 100	< 1	< 1
Barium	1	-	-	µg/L	28	39	16	15	< 100	32	13
Beryllium	0.1	-	-	µg/L	0.1	< 0.1	< 0.1	< 0.1	< 10	< 0.1	< 0.1
Bismuth	1	-	-	µg/L	< 1	< 1	< 1	< 1	< 100	< 1	< 1
Boron	1	-	1500	µg/L	35	15	21	32	4100	22	79
Cadmium	0.01	0.12	0.09	µg/L	0.05	0.03	0.02	0.01	< 1	**0.18**	0.03
Calcium	50	-	-	µg/L	11400	12600	43800	25400	371000	17700	11300
Chromium	1	-	1.5	µg/L	1	< 1	< 1	< 1	< 100	< 1	**2**
Cobalt	0.1	-	-	µg/L	0.7	0.3	0.2	0.6	< 10	1.1	0.5
Copper	1	-	2	µg/L	1	2	< 1	< 1	< 100	< 1	2
Iron	20	-	300	µg/L	**1160**	**490**	120	**1240**	< 2000	120	**1300**
Lead	0.1	-	1	µg/L	1.3	0.7	0.1	0.2	< 10	0.2	**1.2**
Lithium	0.1	-	-	µg/L	1.9	0.7	0.8	0.6	170	0.6	1.9
Magnesium	10	-	-	µg/L	4080	3830	9860	8320	1210000	5500	3680
Manganese	1	-	-	µg/L	157	69	374	247	< 100	383	40
Mercury	0.025	0.16	0.026	µg/L	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025
Molybdenum	0.1	-	73	µg/L	0.3	0.1	1.3	2.4	10	< 0.1	0.2
Nickel	1	-	150	µg/L	2	< 1	< 1	< 1	< 100	1	2
Potassium	20	-	-	µg/L	860	690	1700	2330	377000	880	3330
Rubidium	0.1	-	-	µg/L	1.8	1.5	2	1.7	110	1.8	3
Selenium	1	-	1	µg/L	< 1	< 1	< 1	< 1	< 100	< 1	< 1
Silver	0.1	-	25	µg/L	< 0.1	< 0.1	< 0.1	< 0.1	< 10	< 0.1	< 0.1
Sodium	50	-	-	µg/L	16200	13900	27700	16400	9870000	10200	19000
Strontium	1	-	-	µg/L	59	50	157	124	7200	59	37
Tellurium	0.1	-	-	µg/L	< 0.1	< 0.1	< 0.1	< 0.1	< 10	< 0.1	< 0.1
Thallium	0.1	-	0.8	µg/L	< 0.1	< 0.1	< 0.1	< 0.1	< 10	< 0.1	< 0.1
Tin	0.1	-	-	µg/L	< 0.1	< 0.1	< 0.1	< 0.1	< 10	< 0.1	< 0.1
Uranium	0.1	-	15	µg/L	0.4	< 0.1	0.8	0.2	< 10	< 0.1	0.2
Vanadium	1	-	-	µg/L	4	2	< 1	1	< 100	< 1	5
Zinc	1	-	7	µg/L	6	3	2	4	< 100	5	**11**

Note: Parameters which exceed relevant CWQG PAL are bolded

Appendix B Photos

MB-01 to MB-03 and WC-01 to WC-03	
	
Photo 1 Representative Fish Habitat in MB-03 (HU184719)	**Photo 2** Representative Fish Habitat in MB-02 (HU182106)
	
Photo 3 Representative Fish Habitat in MB-02 (HU182101)	**Photo 4** Representative Fish Habitat in MB-02 (HU182103)

<table>
<tr><th colspan="2">MB-01 to MB-03 and WC-01 to WC-03</th></tr>
<tr><td></td><td></td></tr>
<tr><td>Photo 5 Representative Fish Habitat in MB-02 (HU182102)</td><td>Photo 6 Representative Fish Habitat in MB-02 (HU182105)</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Photo 7 Representative Fish Habitat in MB-02 (HU182099)</td><td>Photo 8 Representative Fish Habitat in MB-01 (HU182632)</td></tr>
</table>

MB-01 to MB-03 and WC-01 to WC-03	
	
Photo 9 Representative Fish Habitat in MB-01 (HU182633)	**Photo 10** Representative Fish Habitat in MB-01 (HU182635)
	
Photo 11 Representative Fish Habitat in MB-01 (HU182634)	**Photo 12** Potential Fish Habitat in WC-01a (HU184724)

MB-01 to MB-03 and WC-01 to WC-03	
	
Photo 13 Potential Fish Habitat in WC-01a (HU184721)	**Photo 14** Potential Fish Habitat in WC-01a (HU184717)
	
Photo 15 Potential Fish Habitat in WC-01a (HU184713)	**Photo 16** Upstream Terminus of WC-01a (HU453974)

MB-01 to MB-03 and WC-01 to WC-03	
	
Photo 17 Overland Drainage Channel in WC-01b (HU144301)	**Photo 18** Potential Fish Habitat in WC-02a (HU182792)
	
Photo 19 Potential Fish Habitat in WC-02a (HU182793)	**Photo 20** Overland Drainage Channel at WC-02a (HU182786)

MB-01 to MB-03 and WC-01 to WC-03	
	
Photo 21 Overland Drainage Channel at WC-02a (HU182783)	**Photo 22** Overland Drainage Channel at WC-02a (HU182796)
	
Photo 23 No Visible Channel at WC-02a (HU144251)	**Photo 24** Overland Drainage Channel at WC-02a (HU182790)

MB-01 to MB-03 and WC-01 to WC-03	
	
Photo 25 Overland Drainage Channel at WC-02a (HU182794)	**Photo 26** Overland Drainage Channel at WC-02a (HU182781)
	
Photo 27 Upstream Terminus of WC-02a (HU182781)	**Photo 28** Overland Drainage Channel at WC-02b (HU182777)

MB-01 to MB-03 and WC-01 to WC-03	
	
Photo 29 Upstream Terminus at WC-02b (HU448235)	**Photo 30** Potential Fish Habitat in WC-03a (HU182795)
	
Photo 31 Potential Fish Habitat in WC-03a (HU182788)	**Photo 32** Potential Fish Habitat in WC-03a (HU182797)

MB-01 to MB-03 and WC-01 to WC-03	
	
Photo 33 Potential Fish Habitat in WC-03a (HU182787)	**Photo 34** Potential Fish Habitat in WC-03a (HU182779)
	
Photo 35 No Visible Channel at WC-03a (HU144248)	**Photo 36** Overland Drainage Channel at WC-03a (HU182780)

MB-01 to MB-03 and WC-01 to WC-03	
	
Photo 37 Upstream Terminus of WC-03a (HU144250)	**Photo 38 Potential Fish Habitat in WC-03b (HU182778)**
	
Photo 39 Upstream Terminus of WC-03b (HU144252)	

WC-04 to WC-09	
	
Photo 1 Potential Fish Habitat in WC-04 (HU182784)	**Photo 2** Potential Fish Habitat in WC-04 (HU182789)
	
Photo 3 Potential Fish Habitat in WC-04 (HU144253)	**Photo 4** Potential Fish Habitat in WC-04 (HU182791)

WC-04 to WC-09	
	
Photo 5 Overland Drainage Channel at WC-04 (HU182785)	**Photo 6** Upstream Terminus of WC-04 (HU448233)
	
Photo 7 Potential Fish Habitat in WC-05 (HU182107)	**Photo 8** Potential Fish Habitat in WC-05 (HU182104)

<table>
<tr><th colspan="2">WC-04 to WC-09</th></tr>
<tr><td></td><td></td></tr>
<tr><td>Photo 9 Potential Fish Habitat in WC-05 (HU182100)</td><td>Photo 10 Potential Fish Habitat in WC-05 (HU182098)</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Photo 11 Upstream Terminus of WC-05 (HU444681)</td><td>Photo 12 No Visible Channel at WC-06a (HU144258)</td></tr>
</table>

WC-04 to WC-09	
	
Photo 13 No Visible Channel at WC-06a (HU144257)	**Photo 14** Overland Drainage Channel at WC-06a (HU143857)
	
Photo 15 Overland Drainage Channel at WC-06a (HU181250)	**Photo 16** Overland Drainage Channel at WC-06a (HU181248)

<table>
<tr><th colspan="2">WC-04 to WC-09</th></tr>
<tr><td></td><td></td></tr>
<tr><td>Photo 17 Overland Drainage Channel at WC-06a (HU143861)</td><td>Photo 18 Upstream Terminus of WC-06a (442911)</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Photo 19 Overland Drainage Channel at WC-06b (HU143860)</td><td>Photo 20 Upstream Terminus of WC-06b (HU442917)</td></tr>
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WC-04 to WC-09	
	
Photo 21 Overland Drainage Channel in a Wetland at WC-07 (HU182801)	**Photo 22** Isolated Pools of Water in a Wetland at WC-07 (HU144256)
	
Photo 23 Overland Drainage Channel at WC-07 (HU182798)	**Photo 24** Overland Drainage Channel at WC-07 (HU182799)

WC-04 to WC-09	
	
Photo 25 Overland Drainage Channel at WC-07 (HU182800)	**Photo 26** Overland Drainage Channel at WC-07 (HU181252)
	
Photo 27 Overland Drainage Channel at WC-07 (HU181254)	**Photo 28** Overland Drainage Channel at WC-07 (HU181251)

WC-04 to WC-09	
	
Photo 29 Potential Fish Habitat in WC-08 (HU184720)	**Photo 30 Potential Fish Habitat in WC-08 (HU184715)**
	
Photo 31 Potential Fish Habitat in WC-08 (HU184723)	**Photo 32 Potential Fish Habitat in WC-08 (HU181247)**

WC-04 to WC-09	
	
Photo 33 Dry Channel at WC-08 (HU143853)	**Photo 34** Potential Fish Habitat in WC-08 (HU181249)
	
Photo 35 Dry Channel at WC-08 (HU143856)	**Photo 36** Potential Fish Habitat in WC-08 (HU181253)

WC-04 to WC-09	
	
Photo 37 Overland Drainage Channel at WC-09a (HU143855)	**Photo 38** Upstream Terminus of Branch of WC-09a (HU442912)
	
Photo 39 Overland Drainage Channel at WC-09b (HU143853)	**Photo 40** No Visible Channel at WC-09b (HU143859)

WC-04 to WC-09	
	
Photo 41 Overland Drainage Channel at WC-09 (HU143854)	**Photo 42** Upstream Terminus of WC-09b (HU442919)

WC-10 to WC-013	
	
Photo 1 No Visible Channel at WC-10	**Photo 2** No Visible Channel at WC-10
	
Photo 3 Potential Fish Habitat in WC-11 (HU184836)	**Photo 4** Potential Fish Habitat in WC-11 (HU184834)

WC-10 to WC-013	
	
Photo 5 Potential Fish Habitat in WC-11 (HU184838)	**Photo 6** No Visible Channel, Subterranean Flow in WC-11
	
Photo 7 Overland Drainage Channel at WC-11 (HU184835)	**Photo 8** No Visible Channel, Subterranean Flow at WC-11

WC-10 to WC-013	
	
Photo 9 Overland Drainage Channel at WC-11 (HU184837)	**Photo 10** Overland Drainage Channel in WC-11 (HU145073)
	
Photo 11 Upstream Terminus of WC-11 (HU455911)	**Photo 12** WC-12a Dissipates into a Wetland Downstream (HU453977)

WC-10 to WC-013	
	
Photo 13 WC-12b Dissipates into a Wetland Downstream (HU453979)	**Photo 14** Overland Drainage Channel at WC-12a (HU184714)
	
Photo 15 Overland Drainage Channel at WC-12b (HU184718)	**Photo 16** Overland Drainage Channel at WC-12a (HU184716)

<table>
<tr><th colspan="2">WC-10 to WC-013</th></tr>
<tr><td></td><td></td></tr>
<tr><td>Photo 17 Overland Drainage Channel at WC-12a (HU184725)</td><td>Photo 18 No Visible Channel at WC-13 (HU453972)</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Photo 19 Overland Drainage Channel at WC-13 (144300)</td><td>Photo 20 Upstream Terminus of Overland Drainage Channel at WC-13 (HU453973)</td></tr>
</table>

Appendix C Raw Fish Data

Table C.1 Electrofishing and Minnow Trap Effort Data
Spruce Lake AI Data Centre Project: 2025 Fish and Fish Habitat Technical Data Report
Project Number: 121418636

Site ID	Station ID	Latitude	Longitude	Fishing Method	Survey Date	Voltage (V)	Duty Cycle (%)	Frequency (Hz)	Pulse Width (ms)	Electrofishing Time (s)	Minnow Trap Hours	Total Catch	Electrofishing CPUE (# fish/100s)	Minnow Trap CPUE (fish/trap hour)	Comment
MB-01	MB01-EF-01	45.173402	-66.185722	Backpack Electrofisher	2025-09-26	375	12	60	2	563	-	15	3		
MB-02	MC-02-EF-01	45.178355	-66.172276	Backpack Electrofisher	2025-09-26	300	12	60	2	504	-	3	1		Poor visibility, high flow
MB-03	MB-03-MT-02	45.184104	-66.161853	Minnow Trap	2025-09-29	-	-	-	-	-	16.9	6	-	0.36	
MB-03	MB-03-MT-01	45.184142	-66.161781	Minnow Trap	2025-09-29	-	-	-	-	-	16.9	7	-	0.41	
WC-01	WC-01-EF-01	45.186218	-66.161926	Backpack Electrofisher	2025-09-30	375	12	60	2	201	-	0	0		
WC-02	WC-02-EF-01	45.183066	-66.164663	Backpack Electrofisher	2025-09-29	-	-	-	-	-	-	0	0		
WC-03	WC-03-EF-01	45.181415	-66.164619	Backpack Electrofisher	2025-09-29	375	12	60	2	479	-	0	0		Fished isolated pools of standing water
WC-03	WC-03-EF-02	45.181415	-66.164619	Backpack Electrofisher	2025-09-29	375	12	60	2	479	-	0	0		Fished isolated pools of standing water
WC-04	WC-04-EF-01	45.180954	-66.165296	Backpack Electrofisher	2025-09-29	220	12	60	2	224	-	0	0		Fished pools of standing water
WC-05	WC-05-EF-01	45.179106	-66.172226	Backpack Electrofisher	2025-09-26	555	12	60	2	328	-	0	0		
WC-06	WC-06-EF-01	45.179145	-66.175152	Backpack Electrofisher	2025-09-25	300	12	60	2	305	-	0	0		
WC-07	WC-07-EF-01	45.178706	-66.176545	Backpack Electrofisher	2025-09-25	300	12	60	2	502	-	0	0		
WC-08	WC-08-EF-03	45.177925	-66.18164	Backpack Electrofisher	2025-09-25	150	12	30	2	124	-	0	0		
WC-08	WC-08-EF-02	45.177765	-66.18133	Backpack Electrofisher	2025-09-25	150	12	30	2	62	-	0	0		
WC-08	WC-08-EF-01	45.177402	-66.180158	Backpack Electrofisher	2025-09-25	300	12	60	2	16	-	0	0		Only one small pool of water inside PDA
WC-12	WC-12-EF-01	45.173892	-66.185128	Backpack Electrofisher	2025-09-30	275	12	60	2	452	-	0	0		

Table C.2 Raw Morphometric Data
Spruce Lake AI Data Centre Project: 2025 Fish and Fish Habitat Technical Data Report
Project Number: 121418636

Site ID	Station ID	Latitude	Longitude	Survey Date	Fishing Method	Species	Fork Length (mm)	Weight (g)	Health
MB-01	MB01-EF-01	45.173402	-66.185722	2025-09-26	Backpack Electrofisher	Brook Trout (*Salvelinus fontinalis*)	113	16.12	released
MB-01	MB01-EF-01	45.173402	-66.185722	2025-09-26	Backpack Electrofisher	Brook Trout (*Salvelinus fontinalis*)	81	6.55	released
MB-01	MB01-EF-01	45.173402	-66.185722	2025-09-26	Backpack Electrofisher	Brook Trout (*Salvelinus fontinalis*)	58	1.93	released
MB-01	MB01-EF-01	45.173402	-66.185722	2025-09-26	Backpack Electrofisher	Brook Trout (*Salvelinus fontinalis*)	117	1.48	released
MB-01	MB01-EF-01	45.173402	-66.185722	2025-09-26	Backpack Electrofisher	Brook Trout (*Salvelinus fontinalis*)	49	1.23	released
MB-01	MB01-EF-01	45.173402	-66.185722	2025-09-26	Backpack Electrofisher	Brook Trout (*Salvelinus fontinalis*)	111	14.88	released
MB-01	MB01-EF-01	45.173402	-66.185722	2025-09-26	Backpack Electrofisher	Brook Trout (*Salvelinus fontinalis*)	70	3.32	released
MB-01	MB01-EF-01	45.173402	-66.185722	2025-09-26	Backpack Electrofisher	Brook Trout (*Salvelinus fontinalis*)	134	22.6	released
MB-01	MB01-EF-01	45.173402	-66.185722	2025-09-26	Backpack Electrofisher	Brook Trout (*Salvelinus fontinalis*)	49	1.14	released
MB-01	MB01-EF-01	45.173402	-66.185722	2025-09-26	Backpack Electrofisher	Brook Trout (*Salvelinus fontinalis*)	114	16.2	released
MB-01	MB01-EF-01	45.173402	-66.185722	2025-09-26	Backpack Electrofisher	Brook Trout (*Salvelinus fontinalis*)	130	19.65	released
MB-01	MB01-EF-01	45.173402	-66.185722	2025-09-26	Backpack Electrofisher	Brook Trout (*Salvelinus fontinalis*)	47	1.16	released
MB-01	MB01-EF-01	45.173402	-66.185722	2025-09-26	Backpack Electrofisher	Brook Trout (*Salvelinus fontinalis*)	95	10.47	released
MB-01	MB01-EF-01	45.173402	-66.185722	2025-09-26	Backpack Electrofisher	Brook Trout (*Salvelinus fontinalis*)	110	10.7	released
MB-01	MB01-EF-01	45.173402	-66.185722	2025-09-26	Backpack Electrofisher	Brook Trout (*Salvelinus fontinalis*)	125	17.12	released
MB-02	MC-02-EF-01	45.178355	-66.172276	2025-09-26	Backpack Electrofisher	Brook Trout (*Salvelinus fontinalis*)	106	12.07	released
MB-02	MC-02-EF-01	45.178355	-66.172276	2025-09-26	Backpack Electrofisher	Brook Trout (*Salvelinus fontinalis*)	103	10.92	released
MB-02	MC-02-EF-01	45.178355	-66.172276	2025-09-26	Backpack Electrofisher	Brook Trout (*Salvelinus fontinalis*)	111	13.5	released
MB-03	MB-03-MT-02	45.184104	-66.161853	2025-09-29	Minnow Trap	Mummichog (*Fundulus heteroclitus*)	40	0.68	released
MB-03	MB-03-MT-02	45.184104	-66.161853	2025-09-29	Minnow Trap	Mummichog (*Fundulus heteroclitus*)	42	86	released
MB-03	MB-03-MT-02	45.184104	-66.161853	2025-09-29	Minnow Trap	Mummichog (*Fundulus heteroclitus*)	73	5.94	released
MB-03	MB-03-MT-02	45.184104	-66.161853	2025-09-29	Minnow Trap	Mummichog (*Fundulus heteroclitus*)	43	0.85	released
MB-03	MB-03-MT-02	45.184104	-66.161853	2025-09-29	Minnow Trap	Mummichog (*Fundulus heteroclitus*)	52	1.46	released
MB-03	MB-03-MT-02	45.184104	-66.161853	2025-09-29	Minnow Trap	Mummichog (*Fundulus heteroclitus*)	45	96	released
MB-03	MB-03-MT-01	45.184142	-66.161781	2025-09-29	Minnow Trap	Mummichog (*Fundulus heteroclitus*)	52	1.7	released
MB-03	MB-03-MT-01	45.184142	-66.161781	2025-09-29	Minnow Trap	Mummichog (*Fundulus heteroclitus*)	72	4.89	released
MB-03	MB-03-MT-01	45.184142	-66.161781	2025-09-29	Minnow Trap	Mummichog (*Fundulus heteroclitus*)	40	0.67	released
MB-03	MB-03-MT-01	45.184142	-66.161781	2025-09-29	Minnow Trap	Mummichog (*Fundulus heteroclitus*)	44	1.14	released
MB-03	MB-03-MT-01	45.184142	-66.161781	2025-09-29	Minnow Trap	Mummichog (*Fundulus heteroclitus*)	53	1.65	released
MB-03	MB-03-MT-01	45.184142	-66.161781	2025-09-29	Minnow Trap	Mummichog (*Fundulus heteroclitus*)	52	1.66	released
MB-03	MB-03-MT-01	45.184142	-66.161781	2025-09-29	Minnow Trap	Mummichog (*Fundulus heteroclitus*)	41	82	released

Appendix E Vegetation Data

Table E.1 Vascular Plant Species Observed During Field Surveys

Scientific Name	Common Name	AC CDC S Rank	Invasive Species
Abies balsamea	Balsam Fir	S5	
Acer rubrum	Red Maple	S5	
Acer spicatum	Mountain Maple	S5	
Agalinis neoscotica	Nova Scotia Agalinis	S3S4	
Agrostis capillaris	Colonial Bent Grass	SNA	
Agrostis perennans	Upland Bent Grass	S5	
Agrostis scabra	Rough Bent Grass	S5	
Agrostis stolonifera	Creeping Bent Grass	S5	
Alisma triviale	Northern Water Plantain	S5	
Alnus alnobetula	Green Alder	S5	
Alnus incana	Speckled Alder	S5	
Amelanchier sp.	a Serviceberry	-	
Aralia nudicaulis	Wild Sarsaparilla	S5	
Aronia melanocarpa	Black Chokeberry	S5	
Athyrium filix-femina	Common Lady Fern	S5	
Avenella flexuosa	Wavy Hairgrass	S5	
Betula alleghaniensis	Yellow Birch	S5	
Betula cordifolia	Heart-leaved Birch	S5	
Betula papyrifera	Paper Birch	S5	
Betula populifolia	Gray Birch	S5	
Calamagrostis canadensis	Bluejoint Reed Grass	S5	
Callitriche heterophylla	Large Water-Starwort	S4S5	
Cardamine pensylvanica	Pennsylvania Bittercress	S5	
Carex billingsii	Billings' Sedge	S4	
Carex brunnescens	Brownish Sedge	S5	
Carex canescens	Silvery Sedge	S5	
Carex crawfordii	Crawford's Sedge	S5	
Carex crinita	Fringed Sedge	S5	
Carex debilis	White-edged Sedge	S5	
Carex disperma	Two-seeded Sedge	S5	
Carex echinata	Star Sedge	S5	
Carex gracillima	Graceful Sedge	S5	
Carex gynandra	Nodding Sedge	S5	
Carex interior	Inland Sedge	S5	
Carex intumescens	Bladder Sedge	S5	
Carex leptalea	Bristly-stalked Sedge	S5	
Carex leptonervia	Finely-Nerved Sedge	S5	
Carex marina	a Sedge	SNA	
Carex novae-angliae	New England Sedge	S5	
Carex projecta	Necklace Sedge	S5	
Carex stipata	Awl-fruited Sedge	S5	
Carex trisperma	Three-seeded Sedge	S5	
Carex wiegandii	Wiegand's Sedge	S3S4	
Chamaedaphne calyculata	Leatherleaf	S5	
Chrysosplenium americanum	American Golden Saxifrage	S5	
Cinna latifolia	Drooping Wood Reed Grass	S5	
Circaea alpina	Small Enchanter's Nightshade	S5	
Claytosmunda claytoniana	Interrupted Fern	S5	
Coptis trifolia	Goldthread	S5	
Cornus canadensis	Bunchberry	S5	
Cornus sericea	Red Osier Dogwood	S5	
Cypripedium acaule	Pink Lady's-Slipper	S5	
Danthonia spicata	Poverty Oat Grass	S5	
Dendrolycopodium dendroideum	Round-branched Tree-clubmoss	S5	
Dennstaedtia punctilobula	Eastern Hay-Scented Fern	S5	
Doellingeria umbellata	Hairy Flat-top White Aster	S5	
Drosera rotundifolia	Round-leaved Sundew	S5	
Dryopteris campyloptera	Mountain Wood Fern	S5	
Dryopteris carthusiana	Spinulose Wood Fern	S5	
Dryopteris cristata	Crested Wood Fern	S5	
Dryopteris intermedia	Evergreen Wood Fern	S5	
Dryopteris x triploidea	a Hybrid Wood-fern	SNA	
Eleocharis tenuis	Slender Spikerush	S4S5	
Empetrum nigrum	Black Crowberry	S5	
Endotropis alnifolia	Alder-leaved Buckthorn	S5	
Epilobium ciliatum	Northern Willowherb	S5	
Epilobium leptophyllum	Bog Willowherb	S5	
Epilobium palustre	Marsh Willowherb	S5	
Epipactis helleborine	Helleborine	SNA	
Equisetum fluviatile	Water Horsetail	S5	
Equisetum sylvaticum	Woodland Horsetail	S5	
Eriophorum vaginatum	Tussock Cottongrass	S5	
Eriophorum virginicum	Tawny Cottongrass	S5	
Eurybia radula	Low Rough Aster	S5	
Euthamia graminifolia	Grass-leaved Goldenrod	S5	
Fallopia cilinodis	Fringed Black Bindweed	S5	
Fragaria virginiana	Wild Strawberry	S5	
Galeopsis tetrahit	Common Hemp-nettle	SNA	
Galium tinctorium	Dyer's Bedstraw	S5	
Galium triflorum	Three-flowered Bedstraw	S5	
Gaultheria hispidula	Creeping Snowberry	S5	
Gaylussacia baccata	Black Huckleberry	S5	
Geum aleppicum	Yellow Avens	S5	
Geum macrophyllum	Large-Leaved Avens	S5	
Glyceria canadensis	Canada Manna Grass	S5	
Glyceria grandis	Common Tall Manna Grass	S5	
Glyceria melicaria	Slender Manna Grass	S5	
Glyceria striata	Fowl Manna Grass	S5	

Table E.1 Vascular Plant Species Observed During Field Surveys

Scientific Name	Common Name	AC CDC S Rank	Invasive Species
Gymnocarpium dryopteris	Common Oak Fern	S5	
Hypericum canadense	Canada St John's-wort	S5	
Hypericum fraseri	Fraser's St. John's-wort	S5	
Hypopitys monotropa	Pinesap	S4	
Ilex mucronata	Mountain Holly	S5	
Ilex verticillata	Common Winterberry	S5	
Iris versicolor	Harlequin Blue Flag	S5	
Jacobaea vulgaris	Tansy Ragwort	SNA	
Juncus brevicaudatus	Narrow-Panicled Rush	S5	
Juncus effusus	Soft Rush	S5	
Juncus pelocarpus	Brown-Fruited Rush	S5	
Kalmia angustifolia	Sheep Laurel	S5	
Kalmia polifolia	Pale Bog Laurel	S5	
Larix laricina	Tamarack	S5	
Leersia oryzoides	Rice Cut Grass	S5	
Linnaea borealis	Twinflower	S5	
Lonicera canadensis	Canada Fly Honeysuckle	S5	
Lonicera villosa	Mountain Fly Honeysuckle	S5	
Lysimachia borealis	Northern Starflower	S5	
Lysimachia terrestris	Swamp Yellow Loosestrife	S5	
Maianthemum canadense	Wild Lily-of-The-Valley	S5	
Maianthemum trifolium	Three-leaved False Soloman's Seal	S5	
Mitella nuda	Naked Bishop's-Cap	S5	
Monotropa uniflora	Convulsion-Root	S5	
Oclemena acuminata	Whorled Wood Aster	S5	
Oclemena x blakei	a hybrid White Panicled American-Aster	SNA	
Onoclea sensibilis	Sensitive Fern	S5	
Osmundastrum cinnamomeum	Cinnamon Fern	S5	
Oxalis montana	Common Wood Sorrel	S5	
Oxalis stricta	European Wood Sorrel	S5	
Packera aurea	Golden Groundsel	S4S5	
Persicaria sagittata	Arrow-leaved Smartweed	S5	
Phegopteris connectilis	Northern Beech Fern	S5	
Picea glauca	White Spruce	S5	
Picea mariana	Black Spruce	S5	
Picea rubens	Red Spruce	S5	
Pinus strobus	Eastern White Pine	S5	
Pilosella caespitosa	Meadow Hawkweed	SNA	
Poa palustris	Fowl Blue Grass	S5	
Populus balsamifera	Balsam Poplar	S5	
Populus tremuloides	Trembling Aspen	S5	
Potentilla simplex	Old Field Cinquefoil	S5	
Prunella vulgaris	Common Self-heal	S5	
Prunus pensylvanica	Pin Cherry	S5	
Prunus virginiana	Chokecherry	S5	
Pteridium aquilinum	Bracken Fern	S5	
Pyrola elliptica	Shinleaf	S5	
Ranunculus acris	Common Buttercup	SNA	
Ranunculus pensylvanicus	Pennsylvania Buttercup	S4	
Ranunculus repens	Creeping Buttercup	SNA	Potentially Invasive
Rhododendron canadense	Rhodora	S5	
Rhododendron groenlandicum	Common Labrador Tea	S5	
Ribes lacustre	Bristly Black Currant	S5	
Rubus canadensis	Smooth Blackberry	S5	
Rubus chamaemorus	Cloudberry	S4	
Rubus hispidus	Bristly Dewberry	S5	
Rubus idaeus	Red Raspberry	S5	
Rubus pubescens	Dwarf Red Raspberry	S5	
Rubus repens	Dewdrop	S5	
Salix bebbiana	Bebb's Willow	S5	
Salix humilis	Upland Willow	S5	
Sarracenia purpurea	Northern Pitcher Plant	S5	
Scirpus atrocinctus	Black-girdled Bulrush	S5	
Scirpus cyperinus	Common Woolly Bulrush	S5	
Scirpus hattorianus	Mosquito Bulrush	S5	
Senecio vulgaris	Common Ragwort	SNA	
Solanum dulcamara	Bittersweet Nightshade	SNA	
Solidago canadensis	Canada Goldenrod	S5	
Solidago puberula	Downy Goldenrod	S5	
Solidago rugosa	Rough-stemmed Goldenrod	S5	
Solidago sempervirens	Seaside Goldenrod	S5	
Sorbus americana	American Mountain Ash	S5	
Sparganium americanum	American Burreed	S5	
Spinulum annotinum	Stiff Clubmoss	S5	
Spiraea alba	White Meadowsweet	S5	
Symphyotrichum lateriflorum	Calico Aster	S5	
Symphyotrichum novi-belgii	New York Aster	S5	
Symphyotrichum puniceum	Purple-stemmed Aster	S5	
Taraxacum officinale	Common Dandelion	SNA	
Thalictrum pubescens	Tall Meadow-Rue	S5	
Thelypteris palustris	Eastern Marsh Fern	S5	
Thuja occidentalis	Eastern White Cedar	S5	
Trichophorum cespitosum	Tufted Clubrush	S4	
Trillidium undulatum	Painted Trillium	S5	
Tussilago farfara	Coltsfoot	SNA	
Typha latifolia	Broad-leaved Cattail	S5	
Vaccinium angustifolium	Late Lowbush Blueberry	S5	

Table E.1 Vascular Plant Species Observed During Field Surveys

Scientific Name	Common Name	AC CDC S Rank	Invasive Species
Vaccinium myrtilloides	Velvet-leaved Blueberry	S5	
Vaccinium oxycoccos	Small Cranberry	S5	
Vaccinium vitis-idaea	Mountain Cranberry	S4S5	
Veronica officinalis	Common Speedwell	SNA	
Viburnum cassinoides	Northern Wild Raisin	S5	
Viburnum lantanoides	Hobblebush	S5	
Viola cucullata	Marsh Blue Violet	S5	
Viola lanceolata	Lance-leaved Violet	S4	
Viola macloskeyi	Small White Violet	S5	

Notes:
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 (AC CDC 2025a)
2 Designations determined by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) codes used: SC = Special Concern; TH = Threatened; VU = Vulnerable; EN = Endangered; NAR = Not at Risk
3 Vascular plant species considered invasive by the New Brunswick Invasive Species Council, the Mersey Tobeatic Research Institute, and the Nature Conservancy of Canada. **Species that are not broadly recognized as currently invasive within the province of New Brunswick are specified to be Potentially Invasive.**
3 Species of conservation concern are in bolded text

Table E.2 Vegetation Communities in the Field Study Area

			Softwood Forest															Mixedwood Forest								Hardwood Forest		Tall Shrub Thicket	Wetlands				
			Eastern White Cedar / Heart-leaved Birch					Balsam Fir / Red Spruce / Heart-leaved Birch (immature)			Balsam Fir / Red Spruce / Heart-leaved Birch (mature)							Balsam Fir / Heart-leaved Birch								Heart-leaved Birch / Paper Birch			Bog	Coniferous Treed Swamp			
Scientific Name	**Common Name**	**Plot #**	**13**	**15b**	**21**	**22**	**24a**	**8**	**15a**	**23a**	**3**	**9**	**16b**	**18**	**19a**	**20**	**24b**	**1**	**6**	**7**	**10**	**11**	**12**	**14**	**25**	**5**	**23b**	**2**	**17**	**4**	**15c**	**16a**	**19b**
Abies balsamea	Balsam Fir		5		30	15		50	50		60	40	50	30	30	10	40	35	40	30	40	35	50	50	30		3	5		70	20	10	15
Acer rubrum	Red Maple									1							8										15						
Betula alleghaniensis	Yellow Birch		1																														
Betula cordifolia	Heart-leaved Birch		5	10	15	25	1	10	15	10	2	5	10	10	15	5	10	20		20	25	20	20	30	20	50	20				5	1	1
Betula papyrifera	Paper Birch																		20							25	10						
Larix laricina	Tamarack										1	5		20								5					1		10	15	15	5
Picea glauca	White Spruce																										2						
Picea mariana	Black Spruce																												15			20	10
Picea rubens	Red Spruce			40			50	20	5	55	15	30	15	10	35	45	20		15	25	20	15			20					5	15		35
Sorbus americana	American Mountain Ash																						10										
Thuja occidentalis	Eastern White Cedar		70	25	20	40	25			5						10	2	15							1							1	
	Total Tree Cover		**81**	**75**	**65**	**80**	**76**	**80**	**70**	**71**	**78**	**80**	**75**	**70**	**80**	**70**	**80**	**70**	**75**	**75**	**85**	**75**	**80**	**80**	**71**	**75**	**50**	**6**	**15**	**85**	**55**	**47**	**66**
Abies balsamea	Balsam Fir		10	10	20	5	10	5	10		5	5	1	5	10	5	10	5	0.5	10	10	15	5	5	0.5			1		20	5	25	20
Acer spicatum	Mountain Maple				10																												
Alnus incana	Speckled Alder																											25					
Betula cordifolia	Heart-leaved Birch						0.5																5			15	10			5			
Chamaedpahne calyculata	Leatherleaf																												2				
Ilex mucronata	Mountain Holly			0.5			2																				2		1			5	5
Kalmia angustifolia	Sheep Laurel			0.5			5									1											1		65		1	15	15
Larix laricina	Tamarack																					1							5		15	1	
Picea glauca	White Spruce																										2						
Picea mariana	Black Spruce																												25		20	15	10
Picea rubens	Red Spruce									15			5			1																	
Rhododendron canadense	Rhodora																												1				
Rhododendron groenlandicum	Common Labrador Tea																												2				
Sorbus americana	American Mountain Ash				15				2									1								15	20						
Spirea alba	White Meadowsweet																											40					
Thuja occidentalis	Eastern White Cedar				5					10																							
Viburnum cassinoides	Northern Wild Raisin																	1										1					
	Total Shrub Cover		**10**	**11**	**50**	**5**	**17.5**	**5**	**12**	**25**	**5**	**5**	**6**	**5**	**10**	**7**	**10**	**7**	**0.5**	**10**	**10**	**16**	**10**	**5**	**0.5**	**30**	**35**	**67**	**101**	**25**	**41**	**61**	**50**
Abies balsamea	Balsam Fir					15					15	5	2		1				20	5	5		10	2	5					0.5				
Aralia nudicaulis	Wild Sarsaparilla		5	2	2		1											15	0.5			2			1	5							
Athyrium felix-femina	Common Lady Fern		10																														
Bazzania spp.	a Moss			5	2	5	3	2	3	0.5		5	10	5	20	2	10			5	10			5	2								
Bazzania trilobata	Three-lobed Whipwort										5																						
Carex intumescens	Bladder Sedge																		0.5							1							
Carex leptalea	Bristly-stalked Sedge		25																														
Carex novae-angliae	New England Sedge																									5							
Carex trisperma	Three-seeded Sedge																		2											1	30	70	30
Circaea alpina	Small Enchanter's Nightshade		1																														
Claytosmunda claytonia	Interrupted Fern																									5							
Cornus canadensis	Bunchberry		10	25	5	30	20	1							5	3		30		0.5		15	10			15	50			0.5	25	2	25
Dicranum spp.	a Moss			2	1	1			2	0.5	5	10	3	2	2	2	2		2	2	5		5	4			2						
Doellingeria umbellata	Hairy Flat-top White Aster		5		1																							15					
Dryopteris campyloptera	Mountain Wood Fern																	15								15							
Dryopteris carthusiana	Spinulose Wood Fern																					10						2		1			

Table E.2 Vegetation Communities in the Field Study Area

			Softwood Forest															Mixedwood Forest								Hardwood Forest		Tall Shrub Thicket	Wetlands				
			Eastern White Cedar / Heart-leaved Birch					Balsam Fir / Red Spruce / Heart-leaved Birch (immature)			Balsam Fir / Red Spruce / Heart-leaved Birch (mature)							Balsam Fir / Heart-leaved Birch								Heart-leaved Birch / Paper Birch			Bog	Coniferous Treed Swamp			
Scientific Name	**Common Name**	**Plot #**	**13**	**15b**	**21**	**22**	**24a**	**8**	**15a**	**23a**	**3**	**9**	**16b**	**18**	**19a**	**20**	**24b**	**1**	**6**	**7**	**10**	**11**	**12**	**14**	**25**	**5**	**23b**	**2**	**17**	**4**	**15c**	**16a**	**19b**
Dryopteris intermedia	Evergreen Wood Fern																									10							
Empetrum nigrum	Black Crowberry																												10				
Equisetum sylvaticum	Woodland Horsetail																														0.5		
Gaultheria hispidula	Creeping Snowberry																														3		
Gymnocarpium dryopteris	Common Oak Fern		2																														
Hylocomium splendens	Stairstep Moss						10	30	2	0.5	25			8		5	2			20		10	20		5								
Ilex mucronata	Mountain Holly																														1		
Linnaea borealis	Twinflower		1		10																	1									2		
Lysimachia borealis	Northern Starflower			2			2																1										
Maianthemum canadense	Wild Lily-of-The-Valley																						5							0.5			
Oxalis montana	Common Wood Sorrel																					5											
Pleurozium schreberi	Red-stemmed Feather Moss			40			70	5	5		50	35	20	10	30	70		5		25	20	15	30	4	5		3						
Polytrichum spp.	a Moss																											5				5	
Ptilium crista-castrensis	Knight's Plume Moss					2		1					0.5		2		5		10	10	5	5		2	3								
Rhytidiadelphus triquetrus	Electrified Cat's-tail Moss		35		15																												
Rubus chamaemorus	Cloudberry																												20				
Rubus hispidus	Bristly Dewberry																											60					
Sarracenia purpurea	Northern Pitcher Plant																												1				
Solidago rugosa	Rough-stemmed Goldenrod																									10		10					
Sphagnum spp.	a Peatmoss				2	30		2			15	5		5		1		10	5	5		20	20	5				90	25	80	90	80
Vaccinium angustifolium	Late Lowbush Blueberry																														0.5		
Vaccinium oxycoccos	Small Cranberry																												2				
	Total Ground Vegetation Cover		**94**	**76**	**38**	**83**	**106**	**41**	**12**	**1.5**	**115**	**60**	**35.5**	**30**	**60**	**83**	**19**	**75**	**40**	**72.5**	**45**	**83**	**101**	**22**	**21**	**66**	**55**	**92**	**123**	**28.5**	**142**	**167**	**135**

Table E.3 Diameter at Breast Height (DBH) of Large Trees in the Field Study Area

Point #	Species	DBH (cm)	Approximate Age	Date Measured	Latitude	Longitude
1	Red Spruce	58.2	180	September 9, 2025	45.177747	-66.178084
2	Red Spruce	51.6	150	September 9, 2025	45.178170	-66.178266
2	Red Spruce	49.9	150	September 9, 2025	45.178170	-66.178266
2	Red Spruce	46.0	135	September 9, 2025	45.178170	-66.178266
3	Tamarack	52.9	215	September 9, 2025	45.179965	-66.178392
4	Red Spruce	42.7	125	September 9, 2025	45.180069	-66.178388
5	Red Spruce	41.8	120	September 9, 2025	45.179985	-66.178554
5	Tamarack	43.0	175	September 9, 2025	45.179985	-66.178554
6	Red Spruce	47.5	140	September 9, 2025	45.180006	-66.177659
6	Red Spruce	41.6	120	September 9, 2025	45.180006	-66.177659
6	Cedar	46.7	205	September 9, 2025	45.180006	-66.177659
7	Red Spruce	51.5	155	September 9, 2025	45.178968	-66.177034
8	Red Spruce	50.2	150	September 9, 2025	45.179019	-66.176228
9	Red Spruce	45.8	135	September 9, 2025	45.179828	-66.175035
10	Tamarack	66.9	285	September 9, 2025	45.179087	-66.172883
11	Tamarack	54.7	230	September 9, 2025	45.179057	-66.173301
11	Tamarack	44.4	180	September 9, 2025	45.179057	-66.173301
12	Cedar	48.8	240	September 9, 2025	45.179934	-66.174265
12	Red Spruce	49.4	150	September 9, 2025	45.179934	-66.174265
13	Red Spruce	45.0	130	September 9, 2025	45.180007	-66.174235
14	Red Spruce	48.6	150	September 9, 2025	45.181728	-66.171162
15	Red Spruce	48.8	150	September 9, 2025	45.182260	-66.170842
16	Red Spruce	42.6	120	September 9, 2025	45.182110	-66.170450
16	Red Spruce	57.5	175	September 9, 2025	45.182110	-66.170450
16	Red Spruce	53.5	165	September 9, 2025	45.182110	-66.170450
17	Red Spruce	66.7	205	September 9, 2025	45.182649	-66.168035
17	Red Spruce	52.0	160	September 9, 2025	45.182649	-66.168035
17	Red Spruce	53.4	160	September 9, 2025	45.182649	-66.168035
18	Red Spruce	48.5	155	September 9, 2025	45.182507	-66.168019
18	Red Spruce	57.5	175	September 9, 2025	45.182507	-66.168019
18	Red Spruce	47.6	140	September 9, 2025	45.182507	-66.168019
19	Red Spruce	41.1	115	September 9, 2025	45.182523	-66.167862
19	Red Spruce	52.3	160	September 9, 2025	45.182523	-66.167862
20	Red Spruce	61.4	185	September 9, 2025	45.182645	-66.167767
21	Cedar	51.5	255	September 9, 2025	45.182744	-66.167481
22	Tamarack	43.7	180	September 10, 2025	45.181575	-66.178530
23	Cedar	42.5	190	September 10, 2025	45.183560	-66.178061
24	Red Spruce	43.5	130	September 10, 2025	45.184132	-66.177048
24	Red Spruce	39.0	115	September 10, 2025	45.184132	-66.177048
24	Red Spruce	43.1	130	September 10, 2025	45.184132	-66.177048
25	Red Spruce	41.8	115	September 10, 2025	45.185650	-66.171337
25	Red Spruce	39.5	115	September 10, 2025	45.185650	-66.171337
25	Red Spruce	46.0	135	September 10, 2025	45.185650	-66.171337
26	Red Spruce	42.0	120	September 10, 2025	45.178118	-66.177061
27	Red Spruce	52.2	155	September 10, 2025	45.189634	-66.165994
27	Red Spruce	42.5	120	September 10, 2025	45.189634	-66.165994
27	Red Spruce	42.7	120	September 10, 2025	45.189634	-66.165994
28	Red Spruce	56.9	175	September 10, 2025	45.189450	-66.167394
28	Red Spruce	53.5	160	September 10, 2025	45.189450	-66.167394
28	Red Spruce	43.5	125	September 10, 2025	45.189450	-66.167394
29	Red Spruce	47.9	145	September 10, 2025	45.189325	-66.167793
30	Red Spruce	61.0	185	September 11, 2025	45.183801	-66.164690
30	Red Spruce	53.0	160	September 11, 2025	45.183801	-66.164690
31	Red Spruce	50.1	150	September 11, 2025	45.181356	-66.165773
32	Cedar	50.0	245	September 16, 2025	45.187917	-66.168580
32	Cedar	50.0	245	September 16, 2025	45.187917	-66.168580
32	Cedar	50.0	245	September 16, 2025	45.187917	-66.168580
32	Cedar	50.0	245	September 16, 2025	45.187917	-66.168580
32	Cedar	50.0	245	September 16, 2025	45.187917	-66.168580
32	Cedar	50.0	245	September 16, 2025	45.187917	-66.168580
33	Unknown	50.0	Unknown	September 18, 2025	45.181064	-66.166740
34	Cedar	44.3	200	September 22, 2025	45.185773	-66.167176
35	Balsam Fir	37.5	175	September 22, 2025	45.185545	-66.167563
36	Red Spruce	53.2	160	September 22, 2025	45.187431	-66.166253
37	Red Spruce	55.7	170	September 23, 2025	45.180763	-66.174420
38	Red Spruce	56.8	170	September 23, 2025	45.181624	-66.174838
39	Red Spruce	55.0	170	September 23, 2025	45.181231	-66.171645
40	Red Spruce	54.5	165	September 23, 2025	45.180081	-66.171665
41	Red Spruce	42.4	125	September 23, 2025	45.180020	-66.171611
42	Red Spruce	54.0	165	September 23, 2025	45.179951	-66.171607
43	Red Spruce	50.0	150	September 23, 2025	45.178082	-66.181603
44	Red Spruce	69.8	225	September 24, 2025	45.173260	-66.186910
45	Red Spruce	50.4	150	October 21, 2025	45.182051	-66.169953
46	Red Spruce	53.0	165	October 21, 2025	45.180233	-66.171402
47	Red Spruce	50.6	150	October 21, 2025	45.181151	-66.169521
47	Red Spruce	43.0	125	October 21, 2025	45.181151	-66.169521
47	Red Spruce	46.9	140	October 21, 2025	45.181151	-66.169521
47	Red Spruce	45.1	130	October 21, 2025	45.181151	-66.169521
48	Red Spruce	58.2	175	October 21, 2025	45.182122	-66.168692
49	Red Spruce	75.4	240	October 21, 2025	45.182424	-66.165959
50	Red Spruce	51.7	155	October 21, 2025	45.182297	-66.166888
50	Red Spruce	52.8	160	October 21, 2025	45.182297	-66.166888
51	Cedar	47.5	225	October 21, 2025	45.186770	-66.166083
51	Cedar	41.3	175	October 21, 2025	45.186770	-66.166083
51	Cedar	41.5	175	October 21, 2025	45.186770	-66.166083
52	Red Spruce	51.5	155	October 21, 2025	45.186772	-66.167203
52	Red Spruce	39.5	115	October 21, 2025	45.186772	-66.167203
53	Red Spruce	41.2	115	October 21, 2025	45.180591	-66.171373
54	Red Spruce	42.5	125	October 21, 2025	45.180727	-66.172170
55	Red Spruce	41.0	115	October 21, 2025	45.180756	-66.172276
56	Red Spruce	42.3	125	October 21, 2025	45.181921	-66.172043
57	Red Spruce	54.6	170	October 22, 2025	45.187963	-66.168635
58	Red Spruce	59.8	185	October 22, 2025	45.189222	-66.167152
59	Red Spruce	44.0	130	October 23, 2025	45.181465	-66.173960
60	Cedar	55.6	280	October 23, 2025	45.181318	-66.175444
61	Red Spruce	50.1	150	October 23, 2025	45.181456	-66.176682
62	Red Spruce	58.9	180	October 23, 2025	45.181453	-66.177361
63	Red Spruce	53.2	160	October 23, 2025	45.181648	-66.177800
64	Red Spruce	36.8	100	October 23, 2025	45.187418	-66.167647
65	Red Spruce	42.9	125	October 23, 2025	45.185733	-66.171849
66	Red Spruce	61.5	185	October 23, 2025	45.181872	-66.170831
67	Red Spruce	54.8	170	October 24, 2025	45.183793	-66.173758

Appendix F Wetland Delineation and Functional Assessment Report

Wetland Delineation and Functional Assessment Report: Spruce Lake AI Data Centre

March 25, 2026

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Limitations

The conclusions in the Report titled Wetland Delineation and Functional Assessment Report: Spruce Lake AI Data Centre are Stantec's professional opinion, as of the time of the Report, and concerning the scope described in the Report. The opinions in the document are based on conditions and information existing at the time the scope of work was conducted and do not take into account any subsequent changes. The Report relates solely to the specific project for which Stantec was retained and the stated purpose for which the Report was prepared. The Report is not to be used or relied on for any variation or extension of the project, or for any other project or purpose, and any unauthorized use or reliance is at the recipient's own risk.

Stantec has assumed all information received from Voltagrid and Beacon New Brunswick Inc. (the "Client") and third parties in the preparation of the Report to be correct. While Stantec has exercised a customary level of judgment or due diligence in the use of such information, Stantec assumes no responsibility for the consequences of any error or omission contained therein.

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Appendix B WESP-AC Summaries of Non-tidal Wetlands

1 Introduction

Beacon New Brunswick Inc. (Beacon), and VoltaGrid LLC (VoltaGrid) (jointly, the “Proponent”), are proposing to develop a portion of a Property (PID 55243596) located within the Lorneville Industrial Park, in Lorneville, New Brunswick. The Project will consist of the construction of the Spruce Lake AI Data Centre Project (the Project). Situated within the city of Saint John, New Brunswick, the facility will house a high-performance data centre designed to support AI cloud computing systems, a natural gas power generating facility, and associated ancillary facilities.

The Project will be developed within the Data Centre Project Development Area (PDA) which occupies a portion of the Property; wetlands were assessed within the Field Study Area, a broader 120 ha portion of the Property between Mill Creek and Marsh Brook (Figure 1).

1.1 Site Description

The Project is in southwest New Brunswick, in Saint John County within the city of Saint John. It is within the Fundy Coast Ecoregion, which is made up of a single ecodistrict (NBDNR 2007). The Fundy Coast Ecoregion extends along the southern coastline of New Brunswick along the Bay of Fundy from east of Passamaquoddy Bay to east of Shepody Bay at Sackville, NB (NBDNR 2007). The most distinguishing features of this region are a maritime climate, and the world’s highest tides (NBDNR 2007).

Figure No.

1

Title

Wetland Types and the Location of Paired Plots in the Field Study Area

Client/Project

Beacon Data Centres Inc.
Spruce Lake AI Data Centre

121418636-409

Project Location

Lorneville,
New Brunswick

Prepared by SC on 2026-03-09
QR by GJ on 2026-03-09

N

0 100 200 metres
(At original document size of 11x17)
1:9,000

Legend

- Project Site (Field Study Area)

Project Development Areas (PDA)

- Data Centre PDA
- Pipeline PDA
- Transmission Line PDA

Wetland Survey Results

- Upland Data Point
- Wetland Data Point
- Inlet
- Outlet
- Wetland Complex Outline

Wetland Type (Stantec)[4]

- Bog
- Treed Bog
- Marsh
- Coniferous Treed Swamp
- Deciduous Treed Swamp
- Mixedwood Treed Swamp
- Tall Shrub Swamp

Other Features

- Road

Wetlands and Waterways

- Wetland Buffer (30 m)
- Watercourse (NBHN)
- Field-Delineated Watercourse (Stantec 2025)
- Provincially Significant Wetland
- Wetland (NBELG)



Notes

1. Coordinate System: NAD 1983 CSRS New Brunswick Stereographic
2. Data Sources: Beacon Data Centres Inc.; Data License with the Government of New Brunswick (NBDELG, NBNRED, Service NB); New Brunswick Power; Stantec
3. Background: Vantor, Esri, CGIAR, USGS, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community
4. Field notes and photos from the field delineation of the wetlands were used with satellite imagery to identify the wetland types of the field-delineated wetland. WL-1 is a combination of field-delineation within the field study area and interpretation outside the field study area using aerial imagery and NBDELG mapped wetlands.

Stantec

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2 Methods

Wetlands within the Field Study Area were field delineated between September 10 and October 21, 2025. All but one wetland was surveyed in September, within a range of weather conditions. Notably, New Brunswick, including the Saint John area, experienced drought conditions during the summer of 2025, and the prolonged heat and lack of rainfall led to drier than normal conditions throughout the province.

Wetland delineations were conducted in accordance with the Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (U.S. Army Corps of Engineers 2012). The location of the wetland boundary within the Field Study Area was recorded using ESRI's ArcGIS FieldMaps app on an iPhone or iPad paired with an external GPS.

Following the *Protocol for Wetland Delineation in New Brunswick* (NBDELG 2024), representative paired three parameter data plots were completed for each of the wetland types that was encountered (Appendix A). These three parameter plots investigated the presence or absence of indicators of hydrophytic vegetation, hydric soils, and hydrology.

2.1 Vegetation

Hydrophytic vegetation occurs in areas where the frequency and duration of inundation or soil saturation produce permanent or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present (Environmental Laboratory 1987). Designations for the affinity of vascular species to wetland habitats are provided in the Northcentral Northeast regional plant list (U.S. Army Corps of Engineers 2020) and based on the approach outlined by the U.S. Fish and Wildlife Service (Reed 1988). Although a wetland indicator designation cannot be equated to species' preference for wetness (USDA 2025), it does provide information on species' relative affinity for wetland versus upland habitat. The wetland indicator status is therefore used here to examine general hydrological changes that result in the promotion of an upland versus wetland vegetative community. Specific wetland indicator status designations used were (from USDA 2025):

- OBL: Obligate Wetland; occurs almost always (estimated probability 99%) under natural conditions in wetlands
- FACW: Facultative Wetland; usually occurs in wetlands (estimated probability 67%-99%), but occasionally found in non-wetlands
- FAC: Facultative; equally likely to occur in wetlands or non-wetlands (estimated probability 34%-66%)
- FACU: Facultative Upland; sometimes occur in wetlands (estimated probability 1%-33%) but more often found in uplands
- UPL: Obligate Upland; rarely occur in wetlands (estimated probability <1%)

To classify an area as ‘wetland’, hydrophytic vegetation should be the dominant plant type. The "50/20 rule" was used to determine the dominant vegetation species at each data point location, by which species are dominant if together in descending order they contribute more than 50% of total cover, or a species by itself provides 20% or more of the total cover. Dominant plant species observed at each data point were classified according to their wetland indicator status. If the majority (greater than 50%) of the dominant vegetation with the assessment area was classified as obligate (OBL), facultative wetland (FACW), or facultative (FAC), then the site was considered to be dominated by hydrophytic vegetation.

2.2 Soils

A hydric soil is formed when soil is saturated, flooded, or experiences ponding over an extended period (minimum two weeks) during the growing season, such that anaerobic conditions develop in the upper soil layer. Some indicators of hydric soil include soil colour (e.g., gleyed soils and soils with bright redox features and/or low matrix chroma), aquic or preaquic moisture regime, reducing soil conditions, sulfidic material (odour), iron and manganese concretions, organic soils (e.g., histosols, histic epipedons), high organic content in surface layer in sandy soils, and organic streaking in sandy soils.

At each data point, a soil pit was excavated to a minimum depth of 50 centimetres (cm), or refusal. The matrix color and redox feature color (if present) of the soil was determined using Munsell Soil Color Charts (Kollmorgen Instruments Company 1990). To establish whether a soil was hydric, the soil was examined for hydric indicators that can be applied within Resource Region R (which includes Maine and most of the New England states) as described in *Field Indicators of the Hydric Soils in the United States*, Version 9.0 (USDA NRCS 2024).

2.3 Hydrology

At each site, the presence of any hydrology indicators (primary and/or secondary) were recorded. Primary indicators of wetland hydrology include, but are not limited to:

- Surface water
- High water table (within 30 cm of soil surface)
- Saturation (within 30 cm of soil surface)
- Water marks (e.g., on trees)
- Sediment deposition
- Water-stained leaves
- Hydrogen sulphide odor

In addition to the primary indicators, there are a variety of secondary wetland hydrology indicators. Secondary indicators include, but are not limited to:

- Soil surface cracks
- Drainage patterns
- Moss trim lines

When no primary indicators of wetland hydrology were observed at a data point, two or more secondary indicators were used to confirm wetland hydrology.

2.4 Functional Assessment

Using the Wetland Ecosystem Services Protocol – Atlantic Canada (WESP-AC) method, 17 wetland functions and additional wetland benefits are assessed for freshwater wetlands; these functions and benefits are described in Table 2.1, which is adapted directly from the Manual for Wetland Ecosystem Services Protocol for Atlantic Canada (WESP-AC): Non-tidal Wetlands (NBDELG 2018). Field and stressor forms of the WESP-AC Version 3.4 functional assessment method were completed in the field for each assessed freshwater wetland encountered within the Field Study Area. Office forms were subsequently completed using publicly available imagery and data. Digital WESP-AC forms will be submitted separately.

Table 2.1 Definitions and Potential Benefits of Wetland Functions

Function	Definition	Potential Benefits
HYDROLOGIC FUNCTIONS:		
Water Storage & Delay	The effectiveness for storing runoff or delaying the downslope movement of surface water for long or short periods.	Flood control, maintain ecological systems.
Stream Flow Support	The effectiveness for contributing water to streams especially during the driest part of a growing season.	Support fish and other aquatic life.
WATER QUALITY MAINTENANCE FUNCTIONS:		
Water Cooling	The effectiveness for maintaining or reducing temperature of downslope waters.	Support coldwater fish and other aquatic life.
Sediment Retention & Stabilisation	The effectiveness for intercepting and filtering suspended inorganic sediments thus allowing their deposition, as well as reducing energy of waves and currents, resisting excessive erosion, and stabilising underlying sediments or soil.	Maintain quality of receiving waters. Protect shoreline structures from erosion.
Phosphorus Retention	The effectiveness for retaining phosphorus for long periods (>1 growing season)	Maintain quality of receiving waters.
Nitrate Removal & Retention	The effectiveness for retaining particulate nitrate and converting soluble nitrate and ammonium to nitrogen gas while generating little or no nitrous oxide (a potent greenhouse gas).	Maintain quality of receiving waters.

Table 2.1 Definitions and Potential Benefits of Wetland Functions

Function	Definition	Potential Benefits
Organic Nutrient Export	The effectiveness for producing and subsequently exporting organic nutrients (mainly carbon), either particulate or dissolved.	Support food chains in receiving waters.
ECOLOGICAL (HABITAT) FUNCTIONS:		
Anadromous Fish Habitat	The capacity to support an abundance and diversity of native anadromous fish species.	Support recreational and ecological values.
Resident Fish Habitat	The capacity to support an abundance and diversity of native resident fish species.	Support recreational and ecological values.
Aquatic Invertebrate Habitat	The capacity to support or contribute to an abundance or diversity of invertebrate animals which spend all or part of their life cycle underwater or in moist soil. Includes dragonflies, midges, clams, snails, water beetles, shrimp, aquatic worms, and others.	Support salmon and other aquatic life. Maintain regional biodiversity.
Amphibian & Turtle Habitat	The capacity to support or contribute to an abundance or diversity of native frogs, toads, salamanders, and turtles.	Maintain regional biodiversity.
Waterbird Feeding Habitat	The capacity to support or contribute to an abundance or diversity of waterbirds that migrate or winter but do not breed in the region.	Support hunting and ecological values. Maintain regional biodiversity.
Waterbird Nesting Habitat	The capacity to support or contribute to an abundance or diversity of waterbirds that nest in the region.	Maintain regional biodiversity.
Songbird, Raptor, & Mammal Habitat	The capacity to support or contribute to an abundance or diversity of native songbird, raptor, and mammal species and functional groups, especially those that are most dependent on wetlands or water.	Maintain regional biodiversity.
Pollinator Habitat	The capacity to support pollinating insects.	Maintain regional biodiversity and food chains.
Native Plant Habitat	The capacity to support or contribute to a diversity of native, hydrophytic, vascular plant species, communities, and/or functional groups.	Maintain regional biodiversity and food chains.
Public Use & Recognition[1]	Prior designation of the wetland, by a natural resource or environmental agency, as some type of special protected area. Also, the potential and actual use of a wetland for low-intensity outdoor recreation, education, or research.	Commercial and social benefits of recreation. Protection of prior public investments.

Note: [1] a benefit rather than a function of wetlands

3 Results

The Project is located within the Fundy Coastal Ecoregion, characterized by a maritime climate, moderated by proximity to the Bay of Fundy, and forests dominated primarily by coniferous species. Variation in geology, soils, and coastal exposure are important ecological gradients driving diversity in forest and wetland types within the ecoregion (NBDNR 2007). The PDA and Field Study Area are located within a landscape which has largely been previously disturbed by a rural community and industrial infrastructure including a Coleson Cove Power generating station, Burchill windfarm, and Spruce Lake Industrial Park.

The PDA is situated in undeveloped forested land and is underlain by two distinct bedrock types and associated mineral soils. Toward the northeast, the PDA sits atop igneous rock mixed with metasedimentary rocks associated with the Irving formation, while the southwestern section of the PDA is underlain by mafic volcanic rock, gabbros and or diorites associated with the Mafic Volcanic formation.

The forested habitat present in the Field Study Area is a mosaic of upland and wetland plant communities. Most of the upland forest is composed of mature softwood forest interspersed with some mature mixedwood forest and two discreet immature hardwood forest stands. Two tall shrub thicket stands are also present near the southern end of the Field Study Area.

Wetland field assessment within the Field Study Area resulted in the delineation of 35 wetlands. In total, 24 wetlands were delineated within the PDA (Table 3.1).

Table 3.1 Wetlands Delineated within the PDA and 30 m Buffer

Wetland ID	Wetland Class and Type	Area in PDA (ha)	Area in the Field Study Area (ha)	WESP-AC completed (Y/N)
*WL-1	Complex - Marsh, Tall Shrub Swamp, Coniferous Treed Swamp	2.74	7.68	Y
[1]WL-2	Tall Shrub Swamp	NA	0.04	Y
[1]WL-3	Tall Shrub Swamp	NA	0.04	Y
[1]WL-4	Coniferous Treed Swamp	NA	0.13	Y
WL-5	Coniferous Treed Swamp	0.01	0.01	Y
WL-6	Coniferous Treed Swamp	0.05	0.05	Y
WL-7	Tall Shrub Swamp	0.04	0.04	Y
*WL-8	Tall Shrub Swamp	0.09	0.09	Y
*WL-9	Coniferous Treed Swamp	0.13	0.13	Y
WL-10	Coniferous Treed Swamp	0.08	0.08	Y
WL-11	Coniferous Treed Swamp	0.05	0.05	Y
WL-12	Coniferous Treed Swamp	0.22	0.22	Y

Table 3.1 Wetlands Delineated within the PDA and 30 m Buffer

Wetland ID	Wetland Class and Type	Area in PDA (ha)	Area in the Field Study Area (ha)	WESP-AC completed (Y/N)
WL-13	Coniferous Treed Swamp	0.28	0.28	Y
[1]WL-14	Coniferous Treed Swamp	NA	0.16	Y
[1]WL-15	Coniferous Treed Swamp	NA	NA	Y
[1]WL-16	Tall Shrub Swamp	NA	0.16	Y
[1]WL-17	Coniferous Treed Swamp	NA	NA	Y
[1]WL-18	Coniferous Treed Swamp	NA	0.02	Y
[1]WL-19	Coniferous Treed Swamp	NA	0.02	Y
WL-20	Coniferous Treed Swamp	0.06	0.35	Y
*WL-21	Complex - Bog, Treed Bog, Coniferous Treed Swamp	20.01	20.01	Y
WL-22	Low Shrub Swamp	0.73	0.79	Y
WL-23	Coniferous Treed Swamp	0.02	0.02	Y
WL-24	Coniferous Treed Swamp	0.15	0.15	Y
WL-25	Coniferous Treed Swamp	0.32	0.32	Y
WL-26	Coniferous Treed Swamp	0.06	0.06	Y
WL-27	Deciduous Treed Swamp	0.03	0.03	Y
WL-28	Coniferous Treed Swamp	0.24	0.24	Y
WL-29	Coniferous Treed Swamp	0.44	0.44	Y
WL-30	Coniferous Treed Swamp	0.09	0.29	Y
WL-31	Coniferous Treed Swamp	0.25	0.25	Y
WL-32	Coniferous Treed Swamp	0.32	0.32	Y
WL-33	Coniferous Treed Swamp	0.38	0.38	Y
[1]WL-34	Tall Shrub Swamp	NA	0.02	Y
[1]WL-35	Treed Bog	NA	0.07	Y

Notes:
[1] Wetland is outside of the PDA, and no direct impacts are expected.
[2] * = representative wetlands for paired data points (Appendix A).

3.1 Bog

The largest area of wetland habitat within the PDA, WL-21, occurs along the northern boundary of the PDA (Figure 2), This wetland is classified as a complex, consisting of hydrologically connected and continuous wetland habitats. A large component of this wetland is both open and treed bog wetland. Treed bog with shallow peat deposits is in the eastern portion of WL-21, with open bog and deeper peat deposits toward the centre. One other bog exists within the PDA, WL-35, a 0.08 ha treed bog.

3.1.1 Vegetation

Tree cover within the open bog component of WL-21 is restricted to stunted black spruce (*Picea mariana*). A diverse and dense shrub layer is present and includes species such as sheep laurel (*Kalmia angustifolia*), young black spruce, young tamarack (*Larix laricina*), leatherleaf (*Chamaedaphne calyculata*), Labrador tea (*Rhododendron groenlandicum*), mountain holly (*Ilex mucronata*), and rhodora (*Rhododendron canadense*) (Photos 1 to 3). The ground vegetation layer consists of a continuous carpet of sphagnum moss that is punctuated by patches of cloudberry (*Rubus chamaemorus*), black crowberry (*Empetrum nigrum*), small cranberry (*Vaccinium oxycoccos*), and northern pitcher plant (*Sarracenia purpurea*).

Treed bog forms a transition zone between the open bog at the center of WL-21 and the treed swamps that occupy the periphery of the wetland. The plant species composition of the treed bog is generally similar to that of the open bog. Tree cover is denser but is less dense than the surrounding forested swamp. The dominant tree species are black spruce and tamarack. The shrub layer is dominated by sheep laurel along with stunted black spruce and tamarack. Immature balsam fir (*Abies balsamaea*), common Labrador tea, and mountain holly are also common. Like the open bog, the ground vegetation layer is composed of a continuous mat of sphagnum; however, the dominant vascular plants include three-seeded sedge (*Carex trisperma*), three-leaved false Solomon's seal (Maianthemum trifolium) and creeping snowberry (*Gaultheria hispidula*).

Four individual powder-tipped antler lichen (*Hypotrachyna catawbiensis),* a nonvascular species which is ranked as S3 by the Atlantic Canada Conservation Data Centre (AC CDC), were recorded within or adjacent to WL-21.



Photo 1 Typical open bog vegetation within the PDA



Photo 2 Typical treed bog vegetation within the PDA



Photo 3 Vegetation in the treed bog component adjacent to the boundary in WL21

In the adjacent upland, the tree layer consists of dense black spruce, red spruce (*Picea rubens*), balsam fir (*Abies balsamea*), tamarack, and white birch (*Betula papyrifera*). The shrub layer is largely open, but contains regenerating black spruce and balsam fir, and velvet-leaved blueberry (*Vaccinium myrtilloides*). The herbaceous layer is often sparse but contains seedling balsam fir, scattered bunchberry (*Cornus canadensis*), starflower (*Lysimachia borealis*), and various upland moss species (Photo 4).



Photo 4 Upland vegetation adjacent to WL-21

3.1.2 Soils

Soils within the bogs vary. The soils within the central open bog portion are typically histosols. Within the wetland but near the upland boundary, a depleted below dark surface (A11) was observed (Photo 5), with 22 cm of fibric to hemic organic soils over 19 cm of 2.5Y 6/1 silty clay with 38% concentrations coloured 7.5YR 5/6 and 2% depletions coloured GLEY1 5/5_G2, over 19+ cm of a silty clay coloured 5 YR 4/3 with 30% concentrations coloured 7.5YR 5/8 and 10% depletions coloured 7.5YR 6/1. No hydric soil indicators were noted in adjacent upland areas (Photo 6).



Photo 5 **A Depleted Below Dark Surface (A11) observed in the wetland plot completed near the edge of WL21. Fibric to hemic organic soils present in the first 22 cm of soil, followed by silty clay mineral soil with concentrations and depletions present from ~22 cm to beyond 60 cm.**



Photo 6 **Soils from the upland plot adjacent to WL21, with no visible indicators of hydric soils**

3.1.3 Hydrology

The bog component of WL-21 demonstrated a single primary hydrology indicator at the time of survey. Near the wetland boundary, saturation (A3), was noted. No hydrology indicators were noted in adjacent upland areas.

3.2 Swamps

Swamps are found throughout the PDA, with coniferous treed swamps the most abundant type of wetland in the PDA. Two types of coniferous treed swamp are present in the PDA, Spruce/Tamarack (*Picea sp./Thuja occidentalis)* swamps and Eastern white cedar (*Thuja occidentalis*). The PDA also supports several tall shrub swamps.

3.2.1 Vegetation

3.2.1.1 Tall Shrub Swamps

Tall shrub swamps are present in several locations but is most abundant along Marsh Brook at the southern boundary of the Field Study Area, outside the PDA. This wetland type is typically found along the margins of streams and has a very sparse tree layer dominated by heartleaf birch (*Betula cordifolia).* The shrub stratum is typically moderately dense and dominated by speckled alder (*Alnus incana*). Other, less abundant shrubs present in tall shrub swamps include white meadowsweet (*Spiraea alba*), northern wild raisin, mountain holly, and young heartleaf paper birch. The ground vegetation layer typically consists of a sphagnum moss carpet and a moderately dense sward of slender manna grass (*Glyceria melicaria*) along with lesser amounts of dwarf red raspberry (*Rubus pubescens*), bristly blackberry (*Rubus hispidus*), rough goldenrod (*Solidago rugosa),* flat-topped white aster (*Doellingeria umbellata*), spinulose woodfern (*Dryopteris carthusiana*) and bunchberry (Photo 7).



Photo 7 Dominant vegetation in WL-8, a tall shrub swamp

In the adjacent upland, the tree layer consists of dense red spruce, balsam fir, and heartleaf birch. The shrub layer is largely open but contains regenerating balsam fir. The herbaceous layer is often sparse but contains seedling balsam fir, scattered bunchberry (*Cornus canadensis*), intermediate wood fern (*Dryopteris intermedia*), twinflower (*Linnaea borealis*) and various upland moss species (Photo 8).



Photo 8 Dominant vegetation in the upland adjacent to WL-8

3.2.1.2 Coniferous Treed Swamps (Spruce/Tamarack)

The most common coniferous treed swamps in the PDA are variously dominated by black spruce and tamarack. Spruce/tamarack swamps are typically found on nutrient poor sites. Within the PDA, the tree canopy of these wetlands is composed of a mixture of spruce, balsam fir, tamarack, and small amounts of heartleaf birch. The shrub layer is well developed in comparison to adjacent upland softwood forest stands, and often includes regenerating balsam fir, tamarack, and black spruce, and shrub species such as mountain holly, and sheep laurel. The ground vegetation layer is characterized by a nearly continuous sphagnum moss carpet punctuated by skunk currant (*Ribes glandulosum*), intermediate wood fern (*Dryopteris intermedia*), bunchberry (*Cornus canadensis*), and three-seeded sedge (Photo 9).

Three powder-tipped antler lichen individuals were recorded within WL-12.



Photo 9 Dominant vegetation in WL-9, a coniferous treed swamp dominated by balsam fir

In the adjacent upland, the tree layer consists of relatively dense black spruce and balsam fir. The shrub layer is largely absent. The herbaceous layer is also sparse but contains scattered upland moss species (Photo 10).



Photo 10 Dominant vegetation in the upland adjacent to WL-9

3.2.1.3 Coniferous Treed Swamp (Cedar)

Cedar swamps are a less common type of coniferous treed swamps within the PDA. The tree canopy in these wetlands is dominated by eastern white cedar interspersed with red spruce and heartleaf paper birch. The shrub layer is often dominated by regenerating species such as eastern white cedar, heartleaf paper birch, and balsam fir, but can also frequently include American honeysuckle (*Lonicera canadensis*) American mountain-ash (*Sorbus americana*) and speckled alder. Common understory species include cinnamon fern (*Osmundastrum cinamomeum*), three-seeded sedge, bunchberry, wild sarsaparilla (*Aralia nudicaulis*) dwarf red raspberry, and wood horsetail (*Equisetum sylvaticum*) (Photo 11).



Photo 11 Dominant vegetation within WL-1, a wetland complex containing cedar swamp

In the adjacent upland, the tree layer consists of relatively dense red spruce, balsam fir, and heartleaf birch. The shrub layer is largely open but contains scattered regenerating balsam fir. The herbaceous layer is relatively sparse but contains scattered bunchberry (*Cornus canadensis*) and is punctuated with various upland moss species (Photo 12).



Photo 12 Dominant vegetation in the upland adjacent to WL-1

3.2.2 Soils

Soils within swamps within the PDA vary. Within WL-9, a spruce/tamarack swamp, a Redox Dark Surface (F6) and Redox Depressions (F8) were observed (Photo 13), with 6 cm of fibric organic soils over 26 cm of 5YR 3/1 silty clay loam with 20% concentrations coloured 5YR 5/8 underlain by more than 28 cm of clay coloured 5YR 4/2 containing 15% concentrations coloured 7.5YR 5/6.

Within WL-1, a cedar swamp, a Histosol (A1) was observed (Photo 14) greater than 120 cm was observed. The soil was hemic in texture and presented the Hydrogen Sulfide (A4) hydric soil indicator.

A hydric soil indicator (Depleted Below Dark Surface [A1]) was observed in the upland area adjacent to WL-9 (Photo 15); however, no hydrology indicators were present. No hydric soil indicators were observed in adjacent uplands at the WL-1 upland pit.



Photo 13 **A Redox Dark Surface (F6) and Redox Depressions (F8) soil observed in the wetland plot completed near the edge of WL-9. Fibric organic soil present in the first 6 cm of soil, followed by silty clay loam with concentrations present from 6-32 cm, and clay with concentrations present from 32 cm to beyond 60 cm**



Photo 14 A Histosol observed in the wetland plot completed near the edge of WL-1



Photo 15 **Soils from the upland plots adjacent to WL-9 showing the Depleted Below Dark Surface (A11) hydric soil indicator**

3.2.3 Hydrology

The spruce/tamarack swamp, WL-9, demonstrated multiple wetland hydrology indicators at the time of survey. Near the wetland boundary, Saturation (A3), Water-Stained Leaves (B9), and Drainage Patterns (B10) were noted. No hydrology indicators were noted in the adjacent upland.

The cedar swamp, WL-1, also demonstrated multiple wetland hydrology indicators at the time of survey including High Water Table (A2), Saturation (A3), and Hydrogen Sulfide Odour (C1). No hydrology indicators were noted in the adjacent upland.

3.3 Marsh

Marsh wetland is found within the wetland complex WL-1 and is associated with Marsh Brook at the southern edge of the Field Study Area, generally distant from its boundaries with the adjacent upland. Marsh is found in areas adjacent to the brook that are subject to seasonal flooding, and these areas are typically free of trees and shrub cover consists mainly of low shrubs such as sweet gale (*Myrica gale*), leatherleaf and white meadowsweet that are tolerant of flooding. The ground vegetation layer is dominated by a dense sward of bluejoint reed grass (*Calamagrostis canadensis*).

3.4 Boundary Determination

Wetlands in the Saint John region are typically well defined by topography. Wetland boundaries were delineated using this topographical change and by keeping most hydrophytic plants and visible hydrology indicators on the wetland side of the boundary and upland plants on the upland side of the boundary. In rare cases where the boundary was relatively indistinct, soils were investigated.

3.5 Functional Assessment

Field and stressor forms of WESP-AC functional assessments were completed in the field and office forms were completed for each upon completion of fieldwork. Appendix B provides function ratings (Table B.1) and benefits ratings (Table B.2) for each wetland assessed. Digital WESP-AC forms will be submitted separately from this report for all assessed wetlands.

Many of the functions and benefits ratings for the various functions are variable among the 35 evaluated wetlands.

WL-21, which accounts for most of the wetland area within the PDA, has high function ratings for Phosphorous Retention, Raptor & Wetland Songbird Habitat, Keystone Mammal Habitat, and Pollinator Habitat functions. All assessed wetlands scored Higher in the Raptor & Wetland Songbird Habitat, and Pollinator Habitat functions. All wetlands scored Lower in Benefits Ratings for the Waterbird Feeding Habitat, Raptor & Wetland Songbird Habitat, Native Plant Habitat, Pollinator Habitat, Wetland Stressors, and the Transition Habitat Summary.

4 References

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Appendices

Appendix A Three Parameter Wetland and Upland Delineation Forms

WETLAND DELINEATION DATA FORM – NEW BRUNSWICK

Project/Site: Lorneville, NB Municipality/County: Saint John Sampling Date: Sept. 23/25

Applicant/Owner: Voltagrid Sampling Point: WL1 - WL

Investigator(s): K. Porter, M. Crowell Affiliation: Stantec

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave

Slope (%): 3 Lat: 45.179759°N Long: 66.173955°W Datum:

Soil Map Unit Name/Type: Wetland Type: Slope Swamp

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✓ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? No Are "Normal Circumstances" present? Yes ____ No ✓

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** Yes ✓ No ____
Hydric Soil Present?	Yes ✓	No ____	If yes, optional Wetland Site ID: ____
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks: (Explain alternative procedures here or in a separate report.)

Area subject to drought

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Thuja occidentalis	40	✓	FACW
2. Picea rubens	15	✓	FACU
3. Betula cordifolia	2		FACU
4.			
5.			
	57	= Total Cover	
Sapling/Shrub Stratum (Plot size: 5m)			
1. Betula cordifolia	15	✓	FACU
2. Abies balsamea	1		FAC
3. Thuja occidentalis	5		FACW
4. Lonicera canadensis	2		FACU
5. Sorbus americana	1		FAC
Acer rubrum 2	26	= Total Cover	FACW
Herb Stratum (Plot size: 2m)			
1. Osmundastrum cinnamomeum	40	✓	FACW
2. Cornus canadensis	20	✓	FAC
3. Carex trisperma	2		OBL
4. Aralia nudicaulis	5		FACU
5. Dulichium arundinaceum	5		FACW
6. Rhytidiadelphus sp. (Bryophytes)	5a		—
7. Sphagnum sp.	20		—
8. Rubus pubescens	10		FACW
9. Equisetum sylvaticum	2		FACW
10.			
	79	= Total Cover	
Woody Vine Stratum (Plot size: NA)			
1.			
2.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	2	x 1 =	2
FACW species	99	x 2 =	198
FAC species	22	x 3 =	66
FACU species	39	x 4 =	156
UPL species	0	x 5 =	0
Column Totals:	162 (A)		422 (B)

Prevalence Index = B/A = 2.6

Hydrophytic Vegetation Indicators:

- ___ Rapid Test for Hydrophytic Vegetation
- ___ Dominance Test is >50%
- ✓ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks: (Include photo numbers here or on a separate sheet.)

Adapted from U.S. Army Corps of Engineers form for North Central and North East Region (Version 2.0), and Field Indicators for Identifying Hydric Soils in New England (Version 4.0) Supplement for use in New Brunswick (2019)

SOIL

Sampling Point: WL1 - WL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (cm)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-120+	organic peat	100					Hemic	Hemic OM

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ✓ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ✓ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surfaces (S7)
- ___ Polyvalue Below Surface (S8)
- ___ Thin Dark Surface (S9)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ 5 c Mucky Peat or Peat (S3)
- ___ Iron-Manganese Masses (F12)
- ___ Piedmont Floodplain Soils (F19)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None

Depth (cm): ___

Hydric Soil Present? Yes ✓ No ___

Remarks:

Soil is deeper than auger; 120cm+

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ✓ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (cm): ___

Water Table Present? Yes ✓ No ___ Depth (cm): ___

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (cm): ___

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Adapted from U.S. Army Corps of Engineers form for North Central and North East Region (Version 2.0), and Field Indicators for Identifying Hydric Soils in New England (Version 4.0) Supplement for use in New Brunswick (2019)

WETLAND DELINEATION DATA FORM – NEW BRUNSWICK

Project/Site: Lorneville, NB Municipality/County: Saint John Sampling Date: Sept. 23/25

Applicant/Owner: Voltagrid Sampling Point: WL1 - UL

Investigator(s): K. Porter, M. Crowell Affiliation: Stantec

Landform (hillslope, terrace, etc.): Slope Local relief (concave, convex, none): None

Slope (%): 60 Lat: 46.180013 °N Long: 66.173941 °W Datum:

Soil Map Unit Name/Type: Wetland Type: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✓ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? No Are "Normal Circumstances" present? Yes ____ No ✓

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** Yes ____ No ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ____	No ✓	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Drought Conditions

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10 m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Abies balsamea	70	✓	FAC
2. Picea rubens	3		FACU
3. Betula cordifolia	2		FACU
4.			
5.			
	= Total Cover		

Sapling/Shrub Stratum (Plot size: 5m)			
1. Abies balsamea	10	✓	FAC
2.			
3.			
4.			
5.			
	10 = Total Cover		

Herb Stratum (Plot size: 2m)			
1. Cornus canadensis	10	✓	FAC
2. Pleurozium schreberi	20		—
3. Dicranum sp	10		—
4. Bazzania trilobata	1		—
5. Hylocomium splendens	5		—
6.			
7.			
8.			
9.			
10.			
	10 = Total Cover		

Bryophytes

Woody Vine Stratum (Plot size: NA)			
1.			
2.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ Rapid Test for Hydrophytic Vegetation
- ✓ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks: (Include photo numbers here or on a separate sheet.)

Adapted from U.S. Army Corps of Engineers form for North Central and North East Region (Version 2.0), and Field Indicators for Identifying Hydric Soils in New England (Version 4.0) Supplement for use in New Brunswick (2019)

SOIL

Sampling Point: WL1 - UL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (cm)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-9	—						organic	organic Fa horizon
9-23	7.5YR 7/2	100					silt	Ae horizon
23-31	7.5YR 5/3	100					silt	B horizon
31-45+	5YR 5/4	95	5YR 5/8	5	C	M	C	C horizon

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surfaces (S7)
- Polyvalue Below Surface (S8)
- Thin Dark Surface (S9)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- Coast Prairie Redox (A16)
- 5 c Mucky Peat or Peat (S3)
- Iron-Manganese Masses (F12)
- Piedmont Floodplain Soils (F19)
- Red Parent Material (F21)
- Very Shallow Dark Surface (F22)
- Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Clay

Depth (cm): 31 cm

Hydric Soil Present? Yes _____ No ✓

Remarks:

Ae horizon has some organic staining. B horizon broken (steep slope likely erosion + past cutting disturbance.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- Surface Water (A1)
- High Water Table (A2)
- Saturation (A3)
- Water Marks (B1)
- Sediment Deposits (B2)
- Drift Deposits (B3)
- Algal Mat or Crust (B4)
- Iron Deposits (B5)
- Inundation Visible on Aerial Imagery (B7)
- Sparsely Vegetated Concave Surface (B8)
- Water-Stained Leaves (B9)
- Aquatic Fauna (B13)
- Marl Deposits (B15)
- Hydrogen Sulfide Odor (C1)
- Oxidized Rhizospheres on Living Roots (C3)
- Presence of Reduced Iron (C4)
- Recent Iron Reduction in Tilled Soils (C6)
- Thin Muck Surface (C7)
- Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- Surface Soil Cracks (B6)
- Drainage Patterns (B10)
- Moss Trim Lines (B16)
- Dry-Season Water Table (C2)
- Crayfish Burrows (C8)
- Saturation Visible on Aerial Imagery (C9)
- Stunted or Stressed Plants (D1)
- Geomorphic Position (D2)
- Shallow Aquitard (D3)
- Microtopographic Relief (D4)
- FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (cm): _____

Water Table Present? Yes _____ No ✓ Depth (cm): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (cm): _____

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Adapted from U.S. Army Corps of Engineers form for North Central and North East Region (Version 2.0), and Field Indicators for Identifying Hydric Soils in New England (Version 4.0) Supplement for use in New Brunswick (2019)

WETLAND DELINEATION DATA FORM – NEW BRUNSWICK

Project/Site: Lorneville, NB Municipality/County: Saint John Sampling Date: Sept. 19/25

Applicant/Owner: Voltagrid Sampling Point: WL 8 - WL

Investigator(s): J.Phelan, K.Porter, H Button Affiliation: Stantec

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Concave

Slope (%): 0 Lat: 45.181244°N Long: 66.176097°W Datum:

Soil Map Unit Name/Type: Wetland Type: TSS

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✓ (If no, explain in Remarks.)

Are Vegetation ____, Soil ✓, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ____	**Is the Sampled Area within a Wetland?** Yes ✓ No ____
Hydric Soil Present?	Yes ✓ No ____	
Wetland Hydrology Present?	Yes ✓ No ____	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Drought Conditions

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10 m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Betula cordifolia	10	✓	FACU
2.			
3.			
4.			
5.			
	10 = Total Cover		
Sapling/Shrub Stratum (Plot size: 5m)			
1. Alnus incana	25	✓	FACW
2.			
3.			
4.			
5.			
	25 = Total Cover		
Herb Stratum (Plot size: 1m)			
1. Doellingeria umbellata	3		FACW
2. Glyceria melicaria	20	✓	OBL
3. Rubus pubescens	2		FACW
4. Cornus canadensis	1		FAC
5.			
6.			
7. Sphagnum spp.	80		
8.			
9.			
10.			
	26 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ____ Rapid Test for Hydrophytic Vegetation
- ✓ Dominance Test is >50%
- ____ Prevalence Index is ≤3.0[1]
- ____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: WL8-WL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (cm)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	Peat	100					hemic	
6-60+	7.5YR 3/2	78	7.5YR 4/1	20	D	M	Silty Clay	
			5YR 4/2	2	C	M	Silty Clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ✓ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ✓ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surfaces (S7)
- ___ Polyvalue Below Surface (S8)
- ___ Thin Dark Surface (S9)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ 5 c Mucky Peat or Peat (S3)
- ___ Iron-Manganese Masses (F12)
- ___ Piedmont Floodplain Soils (F19)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: —

Depth (cm): —

Hydric Soil Present? Yes ✓ No ___

Remarks:

Soils disturbed: broken horizons and wood at depth

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ✓ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (cm): —

Water Table Present? Yes ___ No ✓ Depth (cm): —

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (cm): 0

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Adapted from U.S. Army Corps of Engineers form for North Central and North East Region (Version 2.0), and Field Indicators for Identifying Hydric Soils in New England (Version 4.0) Supplement for use in New Brunswick (2019)

WETLAND DELINEATION DATA FORM – NEW BRUNSWICK

Project/Site: Lorneville, NB Municipality/County: Saint John Sampling Date: Sept. 19/25

Applicant/Owner: J. Phelan, K. Porter, H. Button Sampling Point: WL8 - UL

Investigator(s): Affiliation: Stantec

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): None

Slope (%): 32 Lat: 45.181306°N Long: 66.176003°W Datum:

Soil Map Unit Name/Type: Wetland Type: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✓ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? No Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No ✓	**Is the Sampled Area within a Wetland?** Yes ____ No ✓
Hydric Soil Present?	Yes ____ No ✓	
Wetland Hydrology Present?	Yes ____ No ✓	If yes, optional Wetland Site ID:

Remarks: (Explain alternative procedures here or in a separate report.)

Drought conditions

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Betula cordifolia	40	✓	FACU
2. Abies balsamea	5		FAC
3. Picea rubens	15	✓	FACU
4.			
5.			
	60	= Total Cover	

Sapling/Shrub Stratum (Plot size: 5m)			
1. Abies balsamea	1	✓	FAC
2.			
3.			
4.			
5.			
	1	= Total Cover	

Herb Stratum (Plot size: 1m)			
1. Dryopteris intermedia	5		FAC
2. Cornus canadensis	35	✓	FAC
3. Linnaea borealis	1		FAC
4. Calamagrostis canadensis	0.5		OBL
5.			
6.			
7.			
8.			
9.			
10.			
	41.5	= Total Cover	

Woody Vine Stratum (Plot size: ____)			
1.			
2.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ Rapid Test for Hydrophytic Vegetation

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No ✓

Remarks: (Include photo numbers here or on a separate sheet.)

Early successional stand ~ 15-20 years old.

Adapted from U.S. Army Corps of Engineers form for North Central and North East Region (Version 2.0), and Field Indicators for Identifying Hydric Soils in New England (Version 4.0) Supplement for use in New Brunswick (2019)

SOIL

Sampling Point: WL8-UL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (cm)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7	7.5YR 2.5/1	100					fibric	organic
7-27	10YR 6/3	100					Silt loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surfaces (S7)
- ___ Polyvalue Below Surface (S8)
- ___ Thin Dark Surface (S9)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ 5 c Mucky Peat or Peat (S3)
- ___ Iron-Manganese Masses (F12)
- ___ Piedmont Floodplain Soils (F19)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Root

Depth (cm): 27

Hydric Soil Present? Yes ____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ✓ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✓ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ✓ Depth (cm): —

Water Table Present? Yes ____ No ✓ Depth (cm): —

Saturation Present? (includes capillary fringe) Yes ____ No ✓ Depth (cm): —

Wetland Hydrology Present? Yes ____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Adapted from U.S. Army Corps of Engineers form for North Central and North East Region (Version 2.0), and Field Indicators for Identifying Hydric Soils in New England (Version 4.0) Supplement for use in New Brunswick (2019)

WETLAND DELINEATION DATA FORM – NEW BRUNSWICK

Project/Site: Lorneville, NB Municipality/County: Saint John Sampling Date: Sept. 19/25

Applicant/Owner: Voltagrid Sampling Point: WL9-WL

Investigator(s): J. Phelan, K. Porter, H. Button Affiliation: Stantec

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): None

Slope (%): 0 Lat: 45.180084° N Long: 66.175534° W Datum:

Soil Map Unit Name/Type: Wetland Type: Coniferous treed swamp

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✓ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? No Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** Yes ✓ No ____
Hydric Soil Present?	Yes ✓	No ____	
Wetland Hydrology Present?	Yes ✓	No ____	If yes, optional Wetland Site ID: ____

Remarks: (Explain alternative procedures here or in a separate report.)

Drought conditions

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10 m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Betula cordifolia	5		FACU
2. Picea mariana	10		FACW
3. Abies balsamea	60	✓	FAC
4.			
5.			
	75	= Total Cover	
Sapling/Shrub Stratum (Plot size: 5m)			
1. Abies balsamea	1	✓	FAC
2.			
3.			
4.			
5.			
	1	= Total Cover	
Herb Stratum (Plot size: 1m)			
1. Ribes glandulosum	1	✓	FACW
2. Dryopteris intermedia	0.5	✓	FAC
3. Cornus canadensis	0.5	✓	FAC
4.			
5.			
6.			
7. Sphagnum spp.	50		
8.			
9.			
10.			
	2	= Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ Rapid Test for Hydrophytic Vegetation
- ✓ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks: (Include photo numbers here or on a separate sheet.)

Adapted from U.S. Army Corps of Engineers form for North Central and North East Region (Version 2.0), and Field Indicators for Identifying Hydric Soils in New England (Version 4.0) Supplement for use in New Brunswick (2019)

SOIL

Sampling Point: WL9-WL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (cm)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	peat	100					fibric	
6-32	5YR 3/1	79	5YR 5/8	20	C	M	silty clay loam	Prom. redox conc.
			5YR 5/1	1	D	m	"	
32-60+	5YR 4/2	85	7.5YR 5/6	15	C	m	clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surfaces (S7)
- ___ Polyvalue Below Surface (S8)
- ___ Thin Dark Surface (S9)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ✓ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ✓ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ 5 c Mucky Peat or Peat (S3)
- ___ Iron-Manganese Masses (F12)
- ___ Piedmont Floodplain Soils (F19)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: —

Depth (cm): —

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✓ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ✓ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (cm): —

Water Table Present? Yes ___ No ✓ Depth (cm): —

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (cm): 0

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DELINEATION DATA FORM – NEW BRUNSWICK

Project/Site: Lorneville, NB Municipality/County: Saint John Sampling Date: Sept. 19/25

Applicant/Owner: Voltagrid Sampling Point: WL9 - UL

Investigator(s): J.Phelan, K. Porter, H. Button Affiliation: Stantec

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): None

Slope (%): 5 Lat: 45, 180056'N Long: 66, 17 5518'W Datum:

Soil Map Unit Name/Type: Wetland Type: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✓ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? No Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓ No ____	**Is the Sampled Area within a Wetland?**	**Yes** ____ **No** ✓
Hydric Soil Present?	Yes ✓ No ____	If yes, optional Wetland Site ID:	
Wetland Hydrology Present?	Yes ____ No ✓		

Remarks: (Explain alternative procedures here or in a separate report.)

Drought conditions

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Picea mariana	25	✓	FACW
2. Abies balsamea	60	✓	FAC
3.			
4.			
5.			
	85	= Total Cover	

Sapling/Shrub Stratum (Plot size: 5m)			
1.			
2.			
3.			
4.			
5.			
	0	= Total Cover	

Herb Stratum (Plot size: 1m)			
1.			
2.			
3.			
4.			
5.			
6. Sparse bryophyte cover			
7. on coarse woody debris			
8.			
9.			
10.			
	0	= Total Cover	

Woody Vine Stratum (Plot size: ____)			
1.			
2.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ Rapid Test for Hydrophytic Vegetation
- ✓ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks: (Include photo numbers here or on a separate sheet.)

Early successional stand.

Adapted from U.S. Army Corps of Engineers form for North Central and North East Region (Version 2.0), and Field Indicators for Identifying Hydric Soils in New England (Version 4.0) Supplement for use in New Brunswick (2019)

SOIL

Sampling Point: WL9 - UL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (cm)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7	organic	100					fibric	
7-34	5YR 7/2	95	7.5YR 6/6	5	C	M	silt	
34-39+	5YR 4/4	100					sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ✓ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surfaces (S7)
- ___ Polyvalue Below Surface (S8)
- ___ Thin Dark Surface (S9)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ 5 c Mucky Peat or Peat (S3)
- ___ Iron-Manganese Masses (F12)
- ___ Piedmont Floodplain Soils (F19)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: Rock

Depth (cm): 39cm

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (cm): —

Water Table Present? Yes ___ No ✓ Depth (cm): —

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (cm): —

Wetland Hydrology Present? Yes ___ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Adapted from U.S. Army Corps of Engineers form for North Central and North East Region (Version 2.0), and Field Indicators for Identifying Hydric Soils in New England (Version 4.0) Supplement for use in New Brunswick (2019)

WETLAND DELINEATION DATA FORM – NEW BRUNSWICK

Project/Site: Lorneville, NB Municipality/County: Saint John Sampling Date: Sept. 19/25

Applicant/Owner: Valtogrid Sampling Point: WL 21 - WL

Investigator(s): J. Phelan, K. Porter, H. Betton Affiliation: Stantec

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): Convex

Slope (%): 0 Lat: 45.182346°N Long: 66.172155 Datum:

Soil Map Unit Name/Type: Wetland Type: Bog complex

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No ✓ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? No Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** Yes ✓ No ____
Hydric Soil Present?	Yes ✓	No ____	If yes, optional Wetland Site ID: ____
Wetland Hydrology Present?	Yes ✓	No ____	

Remarks: (Explain alternative procedures here or in a separate report.)

Drought conditions, vegetation partly dessicated.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10)	Absolute % Cover	Dominant Species?	Indicator Status
1. Picea mariana	7	✓	FACW
2. Larix laricina	10	✓	FACW
3.			
4.			
5.			
	17 = Total Cover		
Sapling/Shrub Stratum (Plot size: 5)			
1. Picea mariana	20	✓	FACW
2. Larix laricina	10	✓	FACW
3. Rhododendron groenlandicum	5		OBL
4. Ilex mucronata	2		FAC
5. Kalmia angustifolia	15	✓	FAC
Abies balsamea 1	3		
	55 = Total Cover		FAC
Herb Stratum (Plot size: 1)			
1. Carex trisperma	25	✓	OBL
2. Maianthemum trifolium	15	✓	OBL
3. Gaultheria hispidula	1		FACW
4.			
5.			
6. Sphagnum spp.	95		
7.			
8.			
9.			
10.			
	41 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ Rapid Test for Hydrophytic Vegetation
- ✓ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks: (Include photo numbers here or on a separate sheet.)

Adapted from U.S. Army Corps of Engineers form for North Central and North East Region (Version 2.0), and Field Indicators for Identifying Hydric Soils in New England (Version 4.0) Supplement for use in New Brunswick (2019)

SOIL

Sampling Point: WL 21- WL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (cm)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-9	peat	100					fibric	
9-22	peat	100					hemic	
22-41	2.5Y 6/1	60	7.5YR 5/6	38	C	M	Silty Clay	Prominent redox concentrations
			GLEY1 5/5G 2	2	D	M	Silty Clay	
41-60+	5YR 4/3	60	7.5YR 6/1	10	D	M	Silty Clay	
			7.5YR 5/8	30	C	M	Silty Clay	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ✓ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surfaces (S7)
- ___ Polyvalue Below Surface (S8)
- ___ Thin Dark Surface (S9)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ 5 c Mucky Peat or Peat (S3)
- ___ Iron-Manganese Masses (F12)
- ___ Piedmont Floodplain Soils (F19)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: —

Depth (cm): —

Hydric Soil Present? Yes ✓ No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (cm): —

Water Table Present? Yes ___ No ✓ Depth (cm): —

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (cm): 0

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Adapted from U.S. Army Corps of Engineers form for North Central and North East Region (Version 2.0), and Field Indicators for Identifying Hydric Soils in New England (Version 4.0) Supplement for use in New Brunswick (2019)

WETLAND DELINEATION DATA FORM – NEW BRUNSWICK

Project/Site: Lorneville, NB Municipality/County: Saint John Sampling Date: Sept. 19/25

Applicant/Owner: Voltagrid Sampling Point: WL21 - UL

Investigator(s): J.Phelan, K.Porter, H.Button Affiliation: Stantec Consulting

Landform (hillslope, terrace, etc.): Local relief (concave, convex, none): None

Slope (%): 2 Lat: 45.183281°N Long: 66.172169°W Datum:

Soil Map Unit Name/Type: Wetland Type: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No ✓ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? No Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ✓	No ____	**Is the Sampled Area within a Wetland?** Yes ____ No ✓
Hydric Soil Present?	Yes ____	No ✓	If yes, optional Wetland Site ID: ____
Wetland Hydrology Present?	Yes ____	No ✓	

Remarks: (Explain alternative procedures here or in a separate report.)

Drought conditions

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 10m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Betula papyrifera	35	✓	FACU
2. Abies balsamea	10	✓	FAC
3. Picea mariana	5		FACW
4.			
5.			
	50	= Total Cover	

Sapling/Shrub Stratum (Plot size: 5m)			
1. Abies balsamea	15	✓	FAC
2.			
3.			
4.			
5.			
	15	= Total Cover	

Herb Stratum (Plot size: 1m)			
1. Abies balsamea	0.5	✓	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	0.5	= Total Cover	

Woody Vine Stratum (Plot size: ____)			
1.			
2.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: .75 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

- ___ Rapid Test for Hydrophytic Vegetation
- ✓ Dominance Test is >50%
- ___ Prevalence Index is ≤3.0[1]
- ___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ✓ No ____

Remarks: (Include photo numbers here or on a separate sheet.)

Adapted from U.S. Army Corps of Engineers form for North Central and North East Region (Version 2.0), and Field Indicators for Identifying Hydric Soils in New England (Version 4.0) Supplement for use in New Brunswick (2019)

SOIL

Sampling Point: WL21 - UL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (cm)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 15	Organic	100					Fibric	
15 - 36+	10YR 5/6	100					sandy loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Dark Surfaces (S7)
- ___ Polyvalue Below Surface (S8)
- ___ Thin Dark Surface (S9)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Coast Prairie Redox (A16)
- ___ 5 c Mucky Peat or Peat (S3)
- ___ Iron-Manganese Masses (F12)
- ___ Piedmont Floodplain Soils (F19)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (cm): _____

Hydric Soil Present? Yes _____ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (cm): —

Water Table Present? Yes _____ No ✓ Depth (cm): —

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (cm): —

Wetland Hydrology Present? Yes _____ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Adapted from U.S. Army Corps of Engineers form for North Central and North East Region (Version 2.0), and Field Indicators for Identifying Hydric Soils in New England (Version 4.0) Supplement for use in New Brunswick (2019)

Appendix B WESP-AC Summaries of Non-tidal Wetlands

Table B.1 WESP-AC Function Scores of Non-tidal Wetlands

Wetland	Date	Observer	Wetland Function Rating																		Summary Function Ratings for Grouped Functions				
			WS	SFTS	SR	PR	NR	WFR	CSP	CC	OE	APP	FA	FR	AM	WBF	WBN	RSB	KMH	PH	POL	HYDROLOGIC	W&C PROTECTION	AQ SUPPORT	AQ HABITAT	TR HABITAT
WL-1	9/10/2025	JP	M	H	L	M	L	M	H	M	H	H	M	M	M	L	H	H	M	M	H	M	M	H	H	H
WL-2	9/24/2025	CP	L	M	L	M	L	H	L	H	H	H	L	L	L	L	H	H	H	M	H	L	H	H	H	H
WL-3	9/24/2025	CP	M	L	H	H	H	L	H	H	L	M	L	L	L	L	M	H	M	M	H	M	H	M	M	H
WL-4	9/23/2025	CP	H	L	H	H	H	L	H	M	L	M	L	L	L	L	L	H	M	L	H	H	H	M	L	H
WL-5	9/18/2025	JP	M	H	L	M	L	L	M	L	H	M	L	L	L	L	M	H	L	H	H	M	M	H	M	H
WL-6	9/18/2025	JP	M	H	L	M	L	L	M	M	H	M	L	L	L	L	M	H	M	H	H	M	M	H	M	H
WL-7	9/18/2025	HB	M	M	L	M	L	L	M	H	M	M	L	M	L	L	M	H	M	H	H	M	M	M	M	H
WL-8	9/18/2025	HB	L	M	L	M	L	L	M	H	M	M	L	M	L	L	M	H	M	H	H	L	M	M	M	H
WL-9	9/18/2025	JP	M	H	L	M	L	L	M	M	M	M	L	L	L	L	M	H	M	H	H	M	M	H	M	H
WL-10	9/23/2025	CP	M	M	M	M	L	L	M	M	M	M	L	L	L	L	L	H	M	M	H	M	M	M	L	H
WL-11	9/23/2025	CP	M	M	M	M	L	L	M	M	M	M	L	L	L	L	L	H	M	M	H	M	M	M	L	H
WL-12	9/18/2025	CP	H	L	H	H	H	L	H	M	L	M	L	L	L	L	L	H	M	L	H	H	H	M	L	H
WL-13	9/18/2025	CP	M	M	L	H	L	L	H	M	H	H	L	L	L	L	M	H	M	M	H	M	H	H	M	H
WL-14	9/17/2025	CP	L	H	L	H	L	L	H	H	H	H	L	M	L	L	M	H	M	M	H	L	H	H	M	H
WL-15	9/17/2025	CP	L	H	L	M	L	M	H	H	H	H	L	M	L	L	M	H	M	M	H	L	M	H	M	H
WL-16	9/17/2025	CP	H	M	M	M	L	L	M	L	M	M	L	L	L	L	L	H	L	L	H	H	M	M	L	H
WL-17	9/17/2025	CP	L	H	L	M	L	M	M	H	H	H	L	H	L	L	L	H	M	H	H	L	M	H	H	H
WL-18	9/18/2025	CP	L	H	L	M	L	M	M	H	H	H	L	H	L	L	M	H	M	H	H	L	M	H	H	H
WL-19	9/18/2025	CP	L	H	L	M	L	M	M	H	H	H	L	H	L	L	M	H	M	H	H	L	M	H	H	H
WL-20	9/16/2025	CP	M	H	L	M	L	M	H	H	H	H	L	M	L	L	L	H	M	M	H	M	M	H	M	H
WL-21	9/16/2025	JP	M	M	M	H	L	L	M	L	M	M	L	L	L	L	L	H	H	M	H	M	H	M	L	H
WL-22	9/16/2025	CP	L	H	L	M	L	M	H	H	H	H	L	M	L	L	L	H	M	M	H	L	M	H	M	H
WL-23	9/16/2025	CP	L	H	L	M	L	M	M	H	H	H	L	M	L	L	M	H	M	M	H	L	M	H	M	H
WL-24	10/21/2025	MC	H	L	M	H	H	L	H	H	L	M	L	L	L	L	L	H	M	M	H	H	H	M	L	H
WL-25	9/22/2025	CP	M	M	M	M	L	L	M	M	M	M	L	L	L	L	L	H	M	L	H	M	M	M	L	H
WL-26	9/16/2025	HB	H	L	H	H	H	L	H	L	L	M	L	L	L	L	L	H	M	M	H	H	H	M	L	H
WL-27	9/22/2025	CP	H	M	M	M	M	L	M	M	M	M	L	L	L	L	L	H	M	L	H	H	M	M	L	H
WL-28	9/22/2025	CP	H	M	M	L	L	M	M	M	M	M	L	L	L	L	L	H	M	L	H	H	M	M	L	H
WL-29	9/16/2025	HB	M	M	M	M	L	L	H	L	H	M	L	L	L	L	L	H	M	L	H	M	M	H	L	H
WL-30	9/22/2025	CP	H	M	M	H	L	L	M	M	H	M	L	L	L	L	L	H	M	L	H	H	H	H	L	H
WL-31	9/16/2025	HB	H	L	H	H	H	L	H	L	L	M	L	L	L	L	L	H	M	L	H	H	H	M	L	H

Table B.1 WESP-AC Function Scores of Non-tidal Wetlands

Wetland	Date	Observer	Wetland Function Rating																		Summary Function Ratings for Grouped Functions				
			WS	SFTS	SR	PR	NR	WFR	CSP	CC	OE	APP	FA	FR	AM	WBF	WBN	RSB	KMH	PH	POL	HYDROLOGIC	W&C PROTECTION	AQ SUPPORT	AQ HABITAT	TR HABITAT
WL-32	9/16/2025	HB	H	L	H	H	H	L	H	L	L	M	L	L	L	L	L	H	M	L	H	H	H	M	L	H
WL-33	9/16/2025	HB	H	L	H	H	H	L	H	L	L	M	L	L	L	L	L	H	M	L	H	H	H	M	L	H
WL-34	9/16/2025	HB	H	L	H	H	H	L	H	L	L	M	L	L	L	L	L	H	M	L	H	H	H	M	L	H
WL-35	9/16/2025	HB	H	L	H	H	H	L	H	L	L	M	L	L	L	L	L	H	L	L	H	H	H	M	L	H

Notes

Observer:

HB = Heather Button; CP = Caitlin Porter, JP = Juliana Phelan; MC = Michael Crowell

Ratings Values:

H = Higher, M – Moderate, L = Lower; Higher ratings are highlighted green

Wetland Functions:

WS = Water Storage & Delay; SFTS = Stream Flow & Temperature Support; SR = Sediment &Toxicant Retention & Stabilisation; PR = Phosphorus Retention; NR = Nitrate Removal & Retention; WFR = Wildfire Resistance; CSP = Carbon Stock Preservation; CC = Carbon Capture; OE = Organic Nutrient Export; APP = Aquatic Primary Productivity; FA = Anadromous Fish Habitat; FR = Resident & Other Fish Habitat; AM = Amphibian Habitat; WBF = Waterbird Feeding Habitat; WBN = Waterbird Nesting Habitat; RSB = Raptor & Wetland Songbird Habitat; KMH = Keystone Mammal Habitat; PH = Native Plant Habitat; POL = Pollinator Habitat

Grouped Functions:

HYDROLOGIC = HYDROLOGIC Group (WS); W&C PROTECTION = WATER AND CLIMATE PROTECTION Group (max+avg/2 of SR, PR, NR, CSP); AQ SUPPORT = AQUATIC SUPPORT Group (max+avg/2 of SFTS, OE, APP); AQ HABITAT = AQUATIC HABITAT Group (max+avg/2 of FA, FR, AM, WBF, WBN); TR HABITAT = TRANSITION HABITAT Group (max+avg/2 of RSB, PH, POL)

Table B.2 WESP-AC Benefits Scores of Non-tidal Wetlands

Wetland	Date	Observer	Wetland Benefits Rating																		Summary Benefit Ratings for Grouped Functions				
			WS	SFTS	SR	PR	NR	WFR	APP	FA	FR	AM	WBF	WBN	RSB	KMH	PH	POL	CRI	Sens	STR	HYDROLOGIC	W&C PROTECTION	AQ SUPPORT	AQ HABITAT	TR HABITAT
WL-1	9/10/2025	JP	L	M	L	L	L	M	M	M	L	H	L	H	L	H	L	L	L	H	L	L	M	M	H	L
WL-2	9/24/2025	CP	M	H	M	L	M	M	M	L	L	H	L	H	L	H	L	L	L	L	L	M	M	H	H	L
WL-3	9/24/2025	CP	L	L	L	L	L	M	M	L	L	M	L	H	L	H	L	L	L	M	L	L	M	M	H	L
WL-4	9/23/2025	CP	L	L	L	L	L	M	M	L	L	M	L	L	L	H	L	L	L	M	L	L	M	M	M	L
WL-5	9/18/2025	JP	L	M	L	L	L	M	M	L	L	M	L	H	L	H	L	L	L	M	L	L	M	M	H	L
WL-6	9/18/2025	JP	L	M	L	L	L	M	M	L	L	M	L	H	L	H	L	L	L	M	L	L	M	M	H	L
WL-7	9/18/2025	HB	L	M	L	L	L	M	M	L	L	M	L	H	L	H	L	L	L	L	L	L	M	M	H	L
WL-8	9/18/2025	HB	L	M	L	L	L	M	M	L	L	M	L	H	L	H	L	L	L	L	L	L	M	M	H	L
WL-9	9/18/2025	JP	L	M	L	L	L	M	M	L	L	M	L	H	L	H	L	L	L	L	L	L	M	M	H	L
WL-10	9/23/2025	CP	L	M	L	L	L	M	M	L	L	M	L	L	L	H	L	L	L	L	L	L	M	M	M	L
WL-11	9/23/2025	CP	L	M	L	L	L	M	M	L	L	M	L	L	L	H	L	L	L	M	L	L	M	M	M	L
WL-12	9/18/2025	CP	L	L	L	L	L	M	L	L	L	M	L	L	L	H	L	L	L	M	L	L	M	L	M	L
WL-13	9/18/2025	CP	L	M	L	L	L	M	L	L	L	M	L	H	L	H	L	L	L	M	L	L	M	M	H	L
WL-14	9/17/2025	CP	L	M	L	L	L	H	M	L	M	M	L	H	L	H	L	L	L	H	L	L	H	M	H	L
WL-15	9/17/2025	CP	L	H	L	L	L	H	M	L	L	H	L	H	L	H	L	L	L	L	L	L	H	H	H	L
WL-16	9/17/2025	CP	L	M	L	L	L	H	L	L	L	M	L	L	L	H	L	L	L	M	L	L	H	M	M	L
WL-17	9/17/2025	CP	L	M	M	H	L	H	L	L	M	H	L	L	L	H	L	L	L	M	L	L	H	M	H	L
WL-18	9/18/2025	CP	L	M	L	L	L	H	M	L	M	H	L	H	L	H	L	L	L	L	L	L	H	M	H	L
WL-19	9/18/2025	CP	L	M	L	L	L	H	M	L	M	M	L	H	L	H	L	L	L	L	L	L	H	M	H	L
WL-20	9/16/2025	CP	L	M	L	L	L	H	M	L	M	H	L	L	L	H	L	L	L	M	L	L	H	M	H	L
WL-21	9/16/2025	JP	L	M	L	L	L	M	M	L	L	M	L	L	L	H	L	L	L	M	L	L	M	M	M	L
WL-22	9/16/2025	CP	L	M	L	L	L	H	M	L	M	H	L	L	L	H	L	L	L	M	L	L	H	M	H	L
WL-23	9/16/2025	CP	L	M	L	L	L	H	M	L	M	H	L	H	L	H	L	L	L	L	L	L	H	M	H	L
WL-24	10/21/2025	MC	L	L	L	L	L	H	M	L	L	M	L	L	L	H	L	L	L	H	L	L	H	M	M	L
WL-25	9/22/20225	CP	L	M	L	L	L	H	M	L	L	M	L	L	L	H	L	L	L	M	L	L	H	M	M	L
WL-26	9/16/2025	HB	L	L	L	L	L	M	M	L	L	M	L	L	L	H	L	L	L	H	L	L	M	M	M	L
WL-27	9/22/20225	CP	L	M	L	L	L	H	M	L	L	M	L	L	L	H	L	L	L	M	L	L	H	M	M	L
WL-28	9/22/20225	CP	L	M	L	L	L	H	M	L	L	H	L	L	L	H	L	L	L	M	L	L	H	M	H	L
WL-29	9/16/2025	HB	L	M	L	L	L	H	M	L	L	M	L	L	L	H	L	L	L	M	L	L	H	M	M	L
WL-30	9/22/20225	CP	L	M	L	L	L	H	M	L	L	M	L	L	L	H	L	L	L	M	L	L	H	M	M	L
WL-31	9/16/2025	HB	L	L	L	L	L	H	M	L	L	M	L	L	L	H	L	L	L	M	L	L	H	M	M	L
WL-32	9/16/2025	HB	L	L	L	L	L	H	M	L	L	M	L	L	L	H	L	L	L	M	L	L	H	M	M	L

Table B.2 WESP-AC Benefits Scores of Non-tidal Wetlands

Wetland	Date	Observer	Wetland Benefits Rating																		Summary Benefit Ratings for Grouped Functions				
			WS	SFTS	SR	PR	NR	WFR	APP	FA	FR	AM	WBF	WBN	RSB	KMH	PH	POL	CRI	Sens	STR	HYDROLOGIC	W&C PROTECTION	AQ SUPPORT	AQ HABITAT	TR HABITAT
WL-33	9/16/2025	HB	L	L	L	L	L	H	M	L	L	M	L	L	L	H	L	L	L	M	L	L	H	M	M	L
WL-34	9/16/2025	HB	L	L	L	L	M	H	M	L	L	M	L	L	L	H	L	L	M	L	L	L	H	M	M	L
WL-35	9/16/2025	HB	L	L	L	L	M	H	M	L	L	M	L	L	L	H	L	L	M	M	L	L	H	M	M	L

Notes

Observer:

HB = Heather Button; CP = Caitlin Porter, JP = Juliana Phelan; MC = Michael Crowell

Ratings Values:

H = Higher, M – Moderate, L = Lower; Higher ratings are highlighted green

Wetland Benefits:

WS = Water Storage & Delay; SFTS = Stream Flow & Temperature Support; SR = Sediment &Toxicant Retention & Stabilisation; PR = Phosphorus Retention; NR = Nitrate Removal & Retention; WFR = Wildfire Resistance; APP = Aquatic Primary Productivity; FA = Anadromous Fish Habitat; FR = Resident & Other Fish Habitat; AM = Amphibian Habitat; WBF = Waterbird Feeding Habitat; WBN = Waterbird Nesting Habitat; RSB = Raptor & Wetland Songbird Habitat; KMH = Keystone Mammal Habitat; PH = Native Plant Habitat; POL = Pollinator Habitat ; CRI = Cultural & Recreational Importance; Sens = Wetland Sensitivity; STR = Wetland Stressors (higher score means more stress)

Grouped Functions:

HYDROLOGIC = HYDROLOGIC Group (WS); W&C PROTECTION = WATER AND CLIMATE PROTECTION Group (max+avg/2 of SR, PR, NR, CSP); AQ SUPPORT = AQUATIC SUPPORT Group (max+avg/2 of SFTS, OE, APP); AQ HABITAT = AQUATIC HABITAT Group (max+avg/2 of FA, FR, AM, WBF, WBN); TR HABITAT = TRANSITION HABITAT Group (max+avg/2 of RSB, PH, POL)

Appendix G Wildlife Data

Table G.1 Avian Species Observed within or near the LAA

Common Name	*Scientific Name*	SARA	COSEWIC	NB SARA	AC CDC Rank	Data Source
Alder Flycatcher	*Empidonax alnorum*	-	-	-	S5B	BWP EIA, MBBA, SJC EIA, SLIP EIA
American Black Duck	*Anas rubripes*	-	-	-	S5B,S4N	BWP EIA, eBird, MBBA
American Coot	*Fulica americana*	-	NAR	-	S1B	AC CDC
American Crow	*Corvus brachyrhynchos*	-	-	-	S5	BWP EIA, eBird, MBBA, SLIP EIA, Stantec Incidentals
American Golden-Plover	*Pluvialis dominica*	-	-	-	S2S3M	AC CDC
American Goldfinch	*Spinus tristis*	-	-	-	S5	BWP EIA, eBird, MBBA, SJC EIA, SLIP EIA, Stantec Incidentals
American Goshawk	*Accipiter atricapillus*	-	-	-	S4	BWP EIA, MBBA
American Kestrel	*Falco sparverius*	-	-	-	S4B,S4S5M	BWP EIA, MBBA, SLIP EIA
American Pipit	*Anthus rubescens*	-	-	-	S4M	BWP EIA
American Redstart	*Setophaga ruticilla*	-	-	-	S5B	BWP EIA, eBird, MBBA, SJC EIA, SLIP EIA, Stantec Incidentals
American Robin	*Turdus migratorius*	-	-	-	S5B	BWP EIA, eBird, MBBA, SLIP EIA, Stantec Incidentals
American Scoter	*Melanitta americana*	-	-	-	S1S2N,S5M	AC CDC, BWP EIA, eBird
American Tree Sparrow	*Spizelloides arborea*	-	-	-	S5N	BWP EIA
American Wigeon	*Mareca americana*	-	-	-	S4B,S4S5M	eBird
American Woodcock	*Scolopax minor*	-	-	-	S5B	BWP EIA, MBBA, Stantec Incidentals
Arctic Tern	*Sterna paradisaea*	-	-	-	S1B,SUM	AC CDC
Baird's Sandpiper	*Calidris bairdii*	-	-	-	S1S2M	AC CDC
*Bald Eagle	*Haliaeetus leucocephalus*	-	NAR	EN	S4	AC CDC, BWP EIA, eBird, MBBA, Stantec Incidentals
*Bank Swallow	*Riparia riparia*	TH	TH	EN	S2B	AC CDC
*Barn Swallow	*Hirundo rustica*	TH	SC	TH	S2B	AC CDC, MBBA
Barred Owl	*Strix varia*	-	-	-	S5	BWP EIA
Bay-breasted Warbler	*Setophaga castanea*	-	-	-	S4B,S4S5M	BWP EIA, eBird, SLIP EIA

Table G.1 Avian Species Observed within or near the LAA

Common Name	*Scientific Name*	SARA	COSEWIC	NB SARA	AC CDC Rank	Data Source
Belted Kingfisher	*Megaceryle alcyon*	-	-	-	S5B	BWP EIA, MBBA
Black Guillemot	*Cepphus grylle*	-	-	-	S3B	AC CDC, BWP EIA
Black-and-white Warbler	*Mniotilta varia*	-	-	-	S5B	BWP EIA, eBird, MBBA, SJC EIA, SLIP EIA, Stantec Incidentals
Black-backed Woodpecker	*Picoides arcticus*	-	-	-	S3	Stantec Incidentals
Black-bellied Plover	*Pluvialis squatarola*	-	-	-	S3S4M	AC CDC, eBird
Black-billed Cuckoo	*Coccyzus erythropthalmus*	-	-	-	S3B	AC CDC, MBBA
Blackburnian Warbler	*Setophaga fusca*	-	-	-	S5B	BWP EIA, eBird, MBBA
Black-capped Chickadee	*Poecile atricapillus*	-	-	-	S5	BWP EIA, eBird, MBBA, SJC EIA, SLIP EIA, Stantec Incidentals
Black-crowned Night Heron	*Nycticorax nycticorax*	-	-	-	S1S2B	AC CDC
Black-headed Gull	*Chroicocephalus ridibundus*	-	-	-	S1N,S2M	AC CDC
Blackpoll Warbler	*Setophaga striata*	-	-	-	S3S4B,S5M	AC CDC, BWP EIA, eBird
Black-throated Blue Warbler	*Setophaga caerulescens*	-	-	-	S5B	BWP EIA, MBBA
Black-throated Green Warbler	*Setophaga virens*	-	-	-	S5B	BWP EIA, eBird, MBBA, SJC EIA, SLIP EIA, Stantec Incidentals
Blue Jay	*Cyanocitta cristata*	-	-	-	S5	BWP EIA, eBird, MBBA, Stantec Incidentals
Blue-headed Vireo	*Vireo solitarius*	-	-	-	S5B	BWP EIA, eBird, MBBA, SJC EIA, SLIP EIA, Stantec Incidentals
*Bobolink	*Dolichonyx oryzivorus*	TH	SC	TH	S3B	AC CDC, BWP EIA
Boreal Chickadee	*Poecile hudsonicus*	-	-	-	S3S4	AC CDC, BWP EIA, eBird, MBBA, Stantec Incidentals
Brant	*Branta bernicla*	-	-	-	S1N,S2S3M	AC CDC, BWP EIA
Broad-winged Hawk	*Buteo platypterus*	-	-	-	S5B	BWP EIA, eBird, MBBA, SLIP EIA

Table G.1 Avian Species Observed within or near the LAA

Common Name	*Scientific Name*	SARA	COSEWIC	NB SARA	AC CDC Rank	Data Source
Brown Creeper	*Certhia americana*	-	-	-	S5	BWP EIA, eBird, SJC EIA, SLIP EIA, Stantec Incidentals
Brown Thrasher	*Toxostoma rufum*	-	-	-	S2S3B	AC CDC, MBBA
Brown-headed Cowbird	*Molothrus ater*	-	-	-	S3B	AC CDC
*Buff-breasted Sandpiper	*Calidris subruficollis*	SC	SC	-	SNA	AC CDC
Bufflehead	*Bucephala albeola*	-	-	-	S3N	AC CDC, eBird
Canada Goose	*Branta canadensis*	-	-	-	SUB,S5M	BWP EIA, eBird, MBBA
Canada Jay	*Perisoreus canadensis*	-	-	-	S3S4	AC CDC, BWP EIA, eBird, MBBA, SLIP EIA, Stantec Incidentals
*Canada Warbler	*Cardellina canadensis*	TH	SC	TH	S3S4B	AC CDC, BWP EIA, eBird, MBBA
Cape May Warbler	*Setophaga tigrina*	-	-	-	S3B,S4S5M	BWP EIA, eBird
Cedar Waxwing	*Bombycilla cedrorum*	-	-	-	S5B	BWP EIA, eBird, MBBA, SLIP EIA
Chestnut-sided warbler	*Setophaga pensylvanica*	-	-	-	S5B	BWP EIA
Chipping Sparrow	*Spizella passerina*	-	-	-	S5B	BWP EIA, MBBA
Common Eider	*Somateria mollissima*	-	-	-	S2B,S2N,S4M	AC CDC, BWP EIA, eBird, MBBA
Common Goldeneye	*Bucephala clangula*	-	-	-	S4B,S4N,S5M	eBird
Common Grackle	*Quiscalus quiscula*	-	-	-	S5B	BWP EIA, eBird, MBBA
Common Loon	*Gavia immer*	-	NAR	-	S4B,S4N	BWP EIA
Common Merganser	*Mergus merganser*	-	-	-	S5B,S4N	BWP EIA
Common Murre	*Uria aalge*	-	-	-	S1B	AC CDC
*Common Nighthawk	*Chordeiles minor*	SC	SC	TH	S3B,S4M	BWP EIA
Common Raven	*Corvus corax*	-	-	-	S5	BWP EIA, eBird, MBBA, SJC EIA, SLIP EIA, Stantec Incidentals
Common Yellowthroat	*Geothlypis trichas*	-	-	-	S5B	BWP EIA, eBird, MBBA, SJC EIA, SLIP EIA
Cooper's Hawk	*Accipiter cooperii*	-	NAR	-	S1S2B	AC CDC

Table G.1 Avian Species Observed within or near the LAA

Common Name	*Scientific Name*	SARA	COSEWIC	NB SARA	AC CDC Rank	Data Source
Dark-eyed Junco	*Junco hyemalis*	-	-	-	S5	BWP EIA, eBird, MBBA, SJC EIA, SLIP EIA, Stantec Incidentals
Double-crested Cormorant	*Nannopterum auritum*	-	NAR	-	S5B	BWP EIA, eBird, MBBA
Downy Woodpecker	*Dryobates pubescens*	-	-	-	S5B	BWP EIA, eBird, MBBA, Stantec Incidentals
Dunlin	*Calidris alpina*	-	-	-	S4M	eBird
Eastern Bluebird	*Sialia sialis*	-	NAR	-	S4B	eBird, MBBA
Eastern Kingbird	*Tyrannus tyrannus*	-	-	-	S3S4B	AC CDC, MBBA
*Eastern Wood-Pewee	*Contopus virens*	SC	SC	SC	S3B	AC CDC, eBird, MBBA, SJC EIA
European Starling	*Sturnus vulgaris*	-	-	-	SNA	eBird, MBBA
*Evening Grosbeak	*Coccothraustes vespertinus*	SC	SC	-	S3B,S3S4N,SUM	BWP EIA
Fox Sparrow	*Passerella iliaca*	-	-	-	S4B,S5M	BWP EIA
Gadwall	*Mareca strepera*	-	-	-	S2B,S3M	AC CDC
Glaucous Gull	*Larus hyperboreus*	-	-	-	S2N	AC CDC
Golden-crowned Kinglet	*Regulus satrapa*	-	-	-	S5	BWP EIA, eBird, MBBA, SJC EIA, SLIP EIA, Stantec Incidentals
Great Black-backed Gull	*Larus marinus*	-	-	-	S3	AC CDC, BWP EIA, eBird, MBBA
Great Blue Heron	*Ardea herodias*	-	-	-	S4B	BWP EIA, eBird, MBBA
Great Cormorant	*Phalacrocorax carbo*	-	-	-	S2N	AC CDC
Greater Scaup	*Aythya marila*	-	-	-	S1B,S2N,S4M	AC CDC
Greater Yellowlegs	*Tringa melanoleuca*	-	-	-	S1?B,S4S5M	AC CDC, BWP EIA, eBird
Green-winged Teal	*Anas crecca*	-	-	-	S4B,S5M	BWP EIA
Grey Catbird	*Dumetella carolinensis*	-	-	-	S4B	BWP EIA, eBird, MBBA
Hairy Woodpecker	*Dryobates villosus*	-	-	-	S5	BWP EIA, eBird, MBBA, Stantec Incidentals

Table G.1 Avian Species Observed within or near the LAA

Common Name	*Scientific Name*	SARA	COSEWIC	NB SARA	AC CDC Rank	Data Source
Hermit Thrush	*Catharus guttatus*	-	-	-	S5B	BWP EIA, eBird, MBBA, SJC EIA, SLIP EIA, Stantec Incidentals
Herring Gull	*Larus argentatus*	-	-	-	S5	BWP EIA, eBird, MBBA
Hooded Merganser	*Lophodytes cucullatus*	-	-	-	S4S5B,S5M	eBird
*Horned Grebe - Western population	*Podiceps auritus pop. 2*	SC	-	SC	S3N	AC CDC
Horned Lark	*Eremophila alpestris*	-	-	-	S1B,S4N,S5M	BWP EIA
House Sparrow	*Passer domesticus*	-	-	-	SNA	MBBA
Hudsonian Godwit	*Numenius phaeopus hudsonicus*	-	-	-	S3M	eBird
Iceland Gull	*Larus glaucoides*	-	-	-	S4N	BWP EIA
Indigo Bunting	*Passerina cyanea*	-	-	-	S3B	AC CDC, MBBA
Killdeer	*Charadrius vociferus*	-	-	-	S3B	AC CDC, BWP EIA, eBird, MBBA, SLIP EIA
Lapland Longspur	*Calcarius lapponicus*	-	-	-	S2S3N,SUM	AC CDC
Laughing Gull	*Leucophaeus atricilla*	-	-	-	S1B	AC CDC
Least Flycatcher	*Empidonax minimus*	-	-	-	S4S5B	BWP EIA, MBBA, SJC EIA
Least Sandpiper	*Calidris minutilla*	-	-	-	S4M	BWP EIA, eBird
Lesser Scaup	*Aythya affinis*	-	-	-	S1B,S4M	AC CDC
Lesser Yellowlegs	*Tringa flavipes*	-	TH	-	S3M	AC CDC, eBird
Lincoln's Sparrow	*Melospiza lincolnii*	-	-	-	S3S4B,S4M	BWP EIA, SJC EIA
Long-tailed Duck	*Clangula hyemalis*	-	-	-	S4N	BWP EIA, eBird
Magnolia Warbler	*Setophaga magnolia*	-	-	-	S5B	BWP EIA, eBird, MBBA, SJC EIA, SLIP EIA
Mallard	*Anas platyrhynchos*	-	-	-	S5B,S4N	BWP EIA, eBird
Merlin	*Falco columbarius*	-	NAR	-	S5B	BWP EIA, eBird, MBBA
Mourning Dove	*Zenaida macroura*	-	-	-	S5B,S4N	BWP EIA, eBird, MBBA, SLIP EIA

Table G.1 Avian Species Observed within or near the LAA

Common Name	*Scientific Name*	SARA	COSEWIC	NB SARA	AC CDC Rank	Data Source
Mourning Warbler	*Geothlypis philadelphia*	-	-	-	S4B,S5M	BWP EIA
Nashville Warbler	*Leiothlypis ruficapilla*	-	-	-	S4S5B,S5M	BWP EIA, eBird, MBBA, SJC EIA, SLIP EIA
Nelson's Sparrow	*Ammospiza nelsoni*	-	NAR	-	S4B	BWP EIA, eBird
Northern Cardinal	*Cardinalis cardinalis*	-	-	-	S4	eBird, MBBA
Northern Flicker	*Colaptes auratus*	-	-	-	S5B	BWP EIA, eBird, MBBA, Stantec Incidentals
Northern Gannet	*Morus bassanus*	-	-	-	SHB	AC CDC
Northern Harrier	*Circus hudsonius*	-	NAR	-	S4B,S4S5M	BWP EIA, MBBA, SLIP EIA
Northern Mockingbird	*Mimus polyglottos*	-	-	-	S2B	AC CDC, MBBA
Northern Parula	*Setophaga americana*	-	-	-	S5B	BWP EIA, eBird, MBBA, SJC EIA
Northern Pintail	*Anas acuta*	-	-	-	S3B,S5M	AC CDC
Northern Saw-whet Owl	*Aegolius acadicus*	-	-	-	S5B	BWP EIA, MBBA
Northern Shoveler	*Spatula clypeata*	-	-	-	S3B	AC CDC
Northern Shrike	*Lanius borealis*	-	-	-	S4N	BWP EIA
Northern Waterthrush	*Parkesia noveboracensis*	-	-	-	S4B,S5M	BWP EIA
*Olive-sided Flycatcher	*Contopus cooperi*	SC	SC	EN	S3B	BWP EIA
Osprey	*Pandion haliaetus*	-	-	-	S4S5B,S5M	BWP EIA, eBird, Stantec Incidentals
Ovenbird	*Seiurus aurocapilla*	-	-	-	S5B	BWP EIA, eBird, SJC EIA, SLIP EIA
Palm Warbler	*Setophaga palmarum*	-	-	-	S5B	BWP EIA, eBird, MBBA, SJC EIA, SLIP EIA
Pectoral Sandpiper	*Calidris melanotos*	-	-	-	S3M	AC CDC
Peregrine Falcon	*Falco peregrinus*	-	-	-	S1B,S3M	BWP EIA, eBird, MBBA
*Peregrine Falcon - anatum/tundrius	*Falco peregrinus pop. 1*	-	NAR	EN	S1B,S3M	AC CDC, BWP EIA
Philadelphia Vireo	*Vireo philadelphicus*	-	-	-	S5B	eBird

Table G.1 Avian Species Observed within or near the LAA

Common Name	*Scientific Name*	SARA	COSEWIC	NB SARA	AC CDC Rank	Data Source
Pileated Woodpecker	*Dryocopus pileatus*	-	-	-	S5	BWP EIA, eBird, MBBA, Stantec Incidentals
Pine Grosbeak	*Pinicola enucleator*	-	-	-	S2B,S4S5N,S4S5M	Stantec Incidentals
Pine Siskin	*Spinus pinus*	-	-	-	S3	AC CDC, BWP EIA, eBird, MBBA
Pine Warbler	*Setophaga pinus*	-	-	-	S5B	eBird
*Piping Plover melodus subspecies	*Charadrius melodus melodus*	EN	EN	EN	S1B	AC CDC
Purple Finch	*Haemorhous purpureus*	-	-	-	S4S5B,SUN,S5M	BWP EIA, eBird, MBBA, SJC EIA, SLIP EIA, Stantec Incidentals
Purple Sandpiper	*Calidris maritima*	-	-	-	S3N	AC CDC
Razorbill	*Alca torda*	-	-	-	S1B	AC CDC
Red Crossbill	*Loxia curvirostra*	-	-	-	S3	AC CDC, eBird, Stantec Incidentals
Red Knot	*Calidris canutus*	-	-	-	S2M	eBird
*Red Knot rufa subspecies	*Calidris canutus rufa*	EN	E,SC	EN	S2M	AC CDC
Red-breasted Merganser	*Mergus serrator*	-	-	-	S3B,S4S5N,S5M	AC CDC, BWP EIA
Red-breasted Nuthatch	*Sitta canadensis*	-	-	-	S5	BWP EIA, eBird, MBBA, SJC EIA, SLIP EIA, Stantec Incidentals
Red-eyed Vireo	*Vireo olivaceus*	-	-	-	S5B	BWP EIA, eBird, MBBA, SJC EIA, SLIP EIA
Red-necked Grebe	*Podiceps grisegena*	-	NAR	-	S2N,S3M	AC CDC
Red-tailed Hawk	*Buteo jamaicensis*	-	NAR	-	S4	BWP EIA
Red-throated Loon	*Gavia stellata*	-	-	-	S4N,S5M	BWP EIA
Red-winged Blackbird	*Agelaius phoeniceus*	-	-	-	S4B	BWP EIA, eBird, MBBA
Ring-billed Gull	*Larus delawarensis*	-	-	-	S2S3B,S4N,S5M	AC CDC, BWP EIA, eBird
Rock Pigeon	*Columba livia*	-	-	-	S5	BWP EIA, eBird, MBBA
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	-	-	-	S3B	AC CDC, BWP EIA, MBBA

Table G.1 Avian Species Observed within or near the LAA

Common Name	*Scientific Name*	SARA	COSEWIC	NB SARA	AC CDC Rank	Data Source
Ruby-crowned Kinglet	*Corthylio calendula*	-	-	-	S3M	BWP EIA, eBird, MBBA
Ruby-throated Hummingbird	*Archilochus colubris*	-	-	-	S5B	BWP EIA, MBBA, Stantec Incidentals
Ruddy Duck	*Oxyura jamaicensis*	-	-	-	S1B,S2S3M	AC CDC
Ruddy Turnstone	*Arenaria interpres*	-	-	-	S3M	AC CDC, eBird
Ruffed Grouse	*Bonasa umbellus*	-	-	-	S5	BWP EIA, MBBA, SLIP EIA, Stantec Incidentals
*Rusty Blackbird	*Euphagus carolinus*	SC	SC	SC	S2S3B,S3M	AC CDC
Sanderling	*Calidris alba*	-	-	-	S1N,S3S4M	AC CDC, eBird
Savannah Sparrow	*Passerculus sandwichensis*	-	-	-	S4S5B,S5M	BWP EIA, eBird, MBBA
Semipalmated Plover	*Charadrius semipalmatus*	-	-	-	SNRB,S4S5M	BWP EIA, eBird
Semipalmated Sandpiper	*Calidris pusilla*	-	-	-	S3M	AC CDC, BWP EIA, eBird
Sharp-shinned Hawk	*Accipiter striatus*	-	NAR	-	S4B,S5M	BWP EIA, eBird
Short-billed Dowitcher	*Limnodromus griseus*	-	-	-	S3M	BWP EIA, eBird
Short-billed Dowitcher hendersoni/griseus	*Limnodromus griseus ssp. 1*	-	TH	-	S3M	AC CDC
Solitary Sandpiper	*Tringa solitaria*	-	-	-	S2B,S4S5M	AC CDC
Song Sparrow	*Melospiza melodia*	-	-	-	S5B	BWP EIA, eBird, MBBA, SLIP EIA
Spotted Sandpiper	*Actitis macularius*	-	-	-	S3S4B,S4M	AC CDC, BWP EIA, eBird, Stantec Incidentals
Spruce Grouse	*Canachites canadensis*	-	-	-	S5	SLIP EIA, Stantec Incidentals
Surf Scoter	*Melanitta perspicillata*	-	-	-	S2N,S4M	AC CDC, BWP EIA, eBird
Swainson's Thrush	*Catharus ustulatus*	-	-	-	S4S5B	BWP EIA, eBird, MBBA, SJC EIA, SLIP EIA, Stantec Incidentals
Swamp Sparrow	*Melospiza georgiana*	-	-	-	S5B	BWP EIA, eBird, SJC EIA
Tennessee Warbler	*Leiothlypis peregrina*	-	-	-	S4B,S5M	BWP EIA, MBBA
Tree Swallow	*Tachycineta bicolor*	-	-	-	S4B	BWP EIA, MBBA

Table G.1 Avian Species Observed within or near the LAA

Common Name	*Scientific Name*	SARA	COSEWIC	NB SARA	AC CDC Rank	Data Source
Turkey Vulture	*Cathartes aura*	-	-	-	S4B	BWP EIA, eBird, Stantec Incidentals
Upland Sandpiper	*Bartramia longicauda*	-	-	-	S1B	BWP EIA
Veery	*Catharus fuscescens*	-	-	-	S4B	BWP EIA
Whimbrel	*Numenius phaeopus*	-	-	-	S3M	AC CDC, BWP EIA, eBird
White-crowned Sparrow	*Zonotrichia leucophrys*	-	-	-	S4M	BWP EIA
White-rumped Sandpiper	*Calidris fuscicollis*	-	-	-	S4M	
White-throated Sparrow	*Zonotrichia albicollis*	-	-	-	S5B	BWP EIA, SJC EIA, SLIP EIA
White-winged Crossbill	*Loxia leucoptera*	-	-	-	S5	BWP EIA
White-winged Scoter	*Melanitta deglandi*	-	-	-	S2N,S4M	AC CDC
Wild Turkey	*Meleagris gallopavo*	-	-	-	SNA	
Wilson's Warbler	*Cardellina pusilla*	-	-	-	S4B,S5M	BWP EIA
Winter Wren	*Troglodytes hiemalis*	-	-	-	S5B	BWP EIA, SJC EIA, SLIP EIA
*Wood Thrush	*Hylocichla mustelina*	TH	TH	TH	S1S2B	AC CDC, BWP EIA
Yellow Warbler	*Setophaga petechia*	-	-	-	S5B	BWP EIA
Yellow-bellied Flycatcher	*Empidonax flaviventris*	-	-	-	S4S5B,S5M	BWP EIA, SJC EIA
Yellow-bellied Sapsucker	*Sphyrapicus varius*	-	-	-	S5B	
Yellow-rumped Warbler	*Setophaga coronata*	-	-	-	S5B	BWP EIA, SJC EIA, SLIP EIA
Yellow-throated Vireo	*Vireo flavifrons*	-	-	-	S1?B	AC CDC, MBBA

Table G.1 Avian Species Observed within or near the LAA

Common Name	*Scientific Name*	SARA	COSEWIC	NB SARA	AC CDC Rank	Data Source

Notes:

Asterisks(*) indicate SAR

SARA / COSEWIC / NB ESA codes used:

SC = Special Concern; TH = Threatened; VU = Vulnerable; EN = Endangered; NAR = Not at Risk

S-Rank definitions (AC CDC 2025):

S1 = Critically Imperiled: Critically imperiled in the province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.

S2 = Imperiled: Imperiled in the province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.

S3 = Vulnerable: Vulnerable in the province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.

S4 = Apparently Secure: Uncommon but not rare; some cause for long-term concern due to declines or other factors.

S5 = Secure: Common, widespread, and abundant in the province.

SNA = Not Applicable - A conservation status rank is not applicable because the species is not a suitable target for conservation activities

SNR = Unranked: Nation or state/province conservation status not yet assessed.

SU = Unrankable: Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.