DILLON CONSULTING

NATURAL FORCES DEVELOPMENTS LP

Watercourse and Fish Habitat Appendix 2021-2022

Benjamins Mill Wind Project

December 2022 – 22-4064

December 14, 2022

Natural Forces Developments LP
Benjamins Mill Wind Project
1801 Hollis Street, Suite 1205
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Attention: Megan MacIsaac

Watercourse and Fish Habitat Appendix: 2021-2022 Assessment for the Benjamins Mill Wind Project

Dillon Consulting Limited (Dillon) is pleased to provide you with the final report for the Watercourse and Fish Habitat assessment conducted as part of the environmental assessment for the Benjamins Mill Wind Project.

We trust the following meets your present needs. If you have any questions or comments, please contact the undersigned at (902)-450-4000 ext. 5052 at your convenience.

Sincerely,

DILLON CONSULTING LIMITED

Kelly Regan, M.Sc.
Project Manager, Associate

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Table of Contents

Figures

Tables

Appendices

1.0 Introduction

Dillon Consulting (Dillon) was retained by Natural Forces Developments Limited Partnership (the Proponent) on behalf of the Benjamins Mill Wind Limited Partnership to complete natural environment surveys in support of the development of a Nova Scotia Environmental Assessment Registration Document (EARD) and associated Addendum for the Benjamins Mill Wind Project (the Project). The Project is being developed and will be owned and operated by the Benjamins Mill Wind Limited Partnership, a partnership between Natural Forces Developments Limited Partnership (referred to herein as the Proponent or Natural Forces)and Wskijnu'k Mtmo'taqnuow Agency Limited (the Agency), a corporate body wholly owned by the 13 Mi'kmaw bands in Nova Scotia. Natural Forces acts on behalf of the Westchester Wind Limited Partnership for many aspects of Project development.

The proposed Project consists of up to 28 wind turbine generators (WTGs) capable of producing up to 150 MW of renewable energy that will be connected to the existing Nova Scotia Power transmission grid via an overhead transmission line, as well as a substation (Figure 1). The Project is located in an undeveloped fragmented forested area in Hants County near the communities of Smiths Corner and Falls Lake. The WTGs are proposed to be located in areas that have been previously clear-cut through forestry activities, creating a highly fragmented habitat.

The proposed project is located in an area where watercourses and fish habitat are present. Watercourses and fish habitat are considered important features and valued environmental components (VECs) because they are valued in their relationship with other wildlife and wildlife habitat, including other biological and physical components addressed as VECs in this environmental assessment (EA). Natural environment surveys for the Project were conducted for VECs that were identified based on an understanding of the environmental features of the proposed project area, the nature of the Project, and the potential interactions that may occur between the proposed project and the environment/VECs.

Taking into consideration the objectives of the EARD, this report provides an effects assessment on watercourses and fish habitat, and includes: a summary of the baseline watercourse and fish habitat surveys conducted in support of the Benjamins Mill Wind Project EARD and Addendum, and includes: a brief description of the proposed project; a description of the scope and methodology used for the watercourse and fish habitat surveys, a summary of the survey results, and, an assessment of residual effects (including potential interactions and mitigation) of the proposed project on watercourses and fish habitat.

1.1 Background

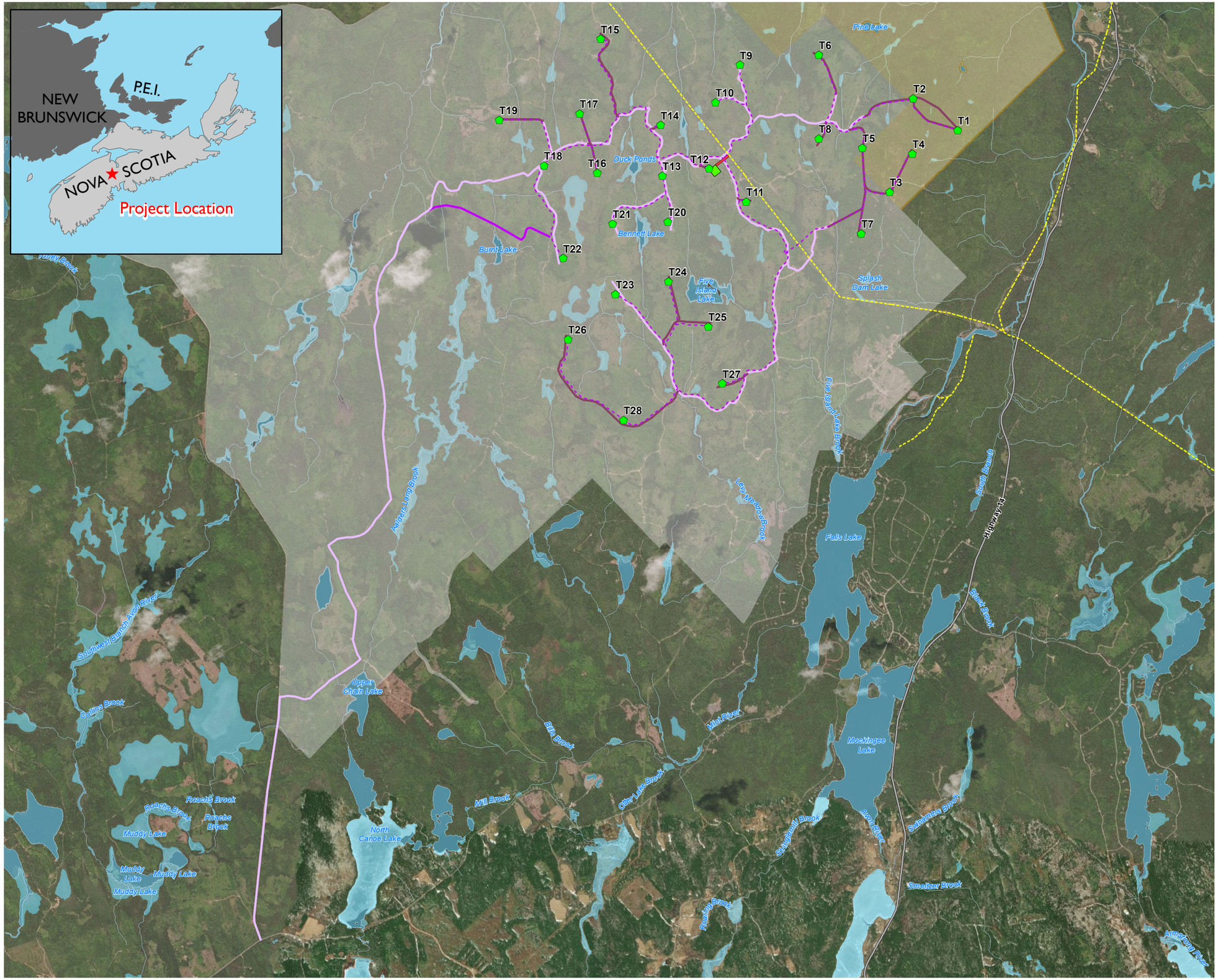
The Project is situated within the Avon River secondary watershed (1DE-2) which encompasses a drainage area of 460 square kilometres (km^2) and includes three main branches of the Avon river (i.e., South, West, and Southwest) (Isaacman 2005). The mapped watercourses that fall within the general vicinity of the proposed Project include the Mint River, Levy Meadow Brook, and Five Island Brook; several unmapped watercourses are also present. Lakes in the general vicinity of the Project (Figure 1) include Five Island Lake, Bennett Lake, Duck Ponds, Pine Lake, and Splash Dam Lake.

Fish and fish habitat are protected through the federal Fisheries Act as well as the Nova Scotia Fisheries and Coastal Resources Act. The federal Fisheries Act provides protection for all fish and fish habitat (DFO 2019). Section 35(1) of the Fisheries Act prohibits the harmful alteration, disruption or destruction (HADD) of fish habitat; Section 34.4(1) prohibits the death of fish by means other than fishing; and Section 36(3) prohibits the release of a deleterious substance into waters frequented by fish. Additionally, aquatic species at risk (SAR) are protected under both the federal Species at Risk Act (SARA) and Nova Scotia Endangered Species Act (NS ESA). Although the Canadian Council of Ministers of Environment's (CCME) Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (CWQG FWAL; CCME 1999) do not have force of law on their own, they provide environmental quality objectives for protecting fish from lethal and sub-lethal effects.

1.2 Purpose and Objectives of the Report

This report provides a summary of the watercourse and fish habitat assessments that were conducted as part of the biophysical surveys undertaken in support of the Project EA registration. The report includes:

- Brief overview of the proposed Project;
- Description of the scope and methods used for the surveys;
- The results of the desktop and field assessment; and
- An assessment of residual effects (including potential interactions and mitigation) of the proposed Project on watercourse and fish habitat.



Natural Forces

BENJAMINS MILL PROJECT

PROJECT LOCATION AND SITE LAYOUT

FIGURE 1

- Proposed Turbine Location
- Proposed Substation Location
- Crown Land
- Privately Owned Land
- Proposed Collector Network
- Roads to be Upgraded
- Proposed Access Road
- Proposed Alternative Access Road
- Proposed Interconnection Line
- Transmission Line
- Highway
- Watercourse
- Waterbodies

0 0.25 0.5 1 km

SCALE 1:50,000

N W E S

MAP DRAWING INFORMATION:
DATA PROVIDED BY DILLON CONSULTING, GEONB, NATURAL FORCES

MAP CREATED BY: DU
MAP CHECKED BY: KB
MAP PROJECTION: NAD 1983 UTM ZONE 20N

DILLON CONSULTING

PROJECT: 21-1329
STATUS: DRAFT
DATE: 2022-12-14

FILE LOCATION: K:\2021\211329\Product\Internal\Benjamin_Mills_Figures_2022\BM_F01_ProjectLocation_SiteLayout_2022.mxd

2.0 Project Description

The following is a high-level summary of the Project. Please refer to the Benjamins Mill Wind Project Environmental Assessment Registration Document Addendum (the Addendum) dated December 2022 for further information.

The Benjamins Mill Wind Project (the Project) is located in Hants County, approximately 10 km southwest of Windsor, Nova Scotia. The Project is proposed to have an installed capacity of up to 150 MW, amounting to up to 28 wind turbine generators and associated infrastructure, including an electrical substation, collector lines, and overhead transmission line (Figure 1).

The Project will be located predominantly on privately-owned land with only four wind turbine generators (WTGs) located on provincial Crown lands near Highway 14. The privately-owned site lands have undergone several generations of wood harvesting and have a network of existing forestry roads. The provincial Crown lands are largely undisturbed with few existing roads that access the property. In addition, the Project site met crucial factors that determined suitability, which included features such as the strength and consistency of the wind resources and its proximity to existing electrical and civil infrastructure. The Project site was selected due to the existing mixed anthropogenic land uses and historical anthropogenic impacts in these areas, in order to minimize impacts to undeveloped lands to the extent feasible.

The purpose of the Project is to contribute to Nova Scotia achieving its renewable electricity targets through the generation of clean and renewable energy. Not only will this have environmental benefits, but will also reduce Nova Scotia's reliance on imported energy sources through the development of a localized renewable energy generation (Renewable Electricity Regulations 2021).

3.0 Scope of Work

The scope of work for the watercourse and fish habitat assessment is based on the recommended approach outlined in the "Guide to Preparing an EA Registration Document for Wind Power Projects in Nova Scotia" (NSECC 2021). Additionally, the information obtained from the watercourse and fish habitat surveys will be available for inclusion in a Nova Scotia Department of Environment and Climate Change (NSECC) Watercourse Alteration Permit, a Department of Fisheries and Oceans (DFO) Request for Review and, if required, a Fisheries Act Authorization. For the purpose of this report, watercourses are defined as, "the bed and shore of every river, stream, lake, creek, pond, spring, lagoon, or other natural body of water, whether it contains water or not, and the water therein, within the jurisdiction of the province" (NSEAB 2021).

The scope of work for the fish and fish habitat surveys included:

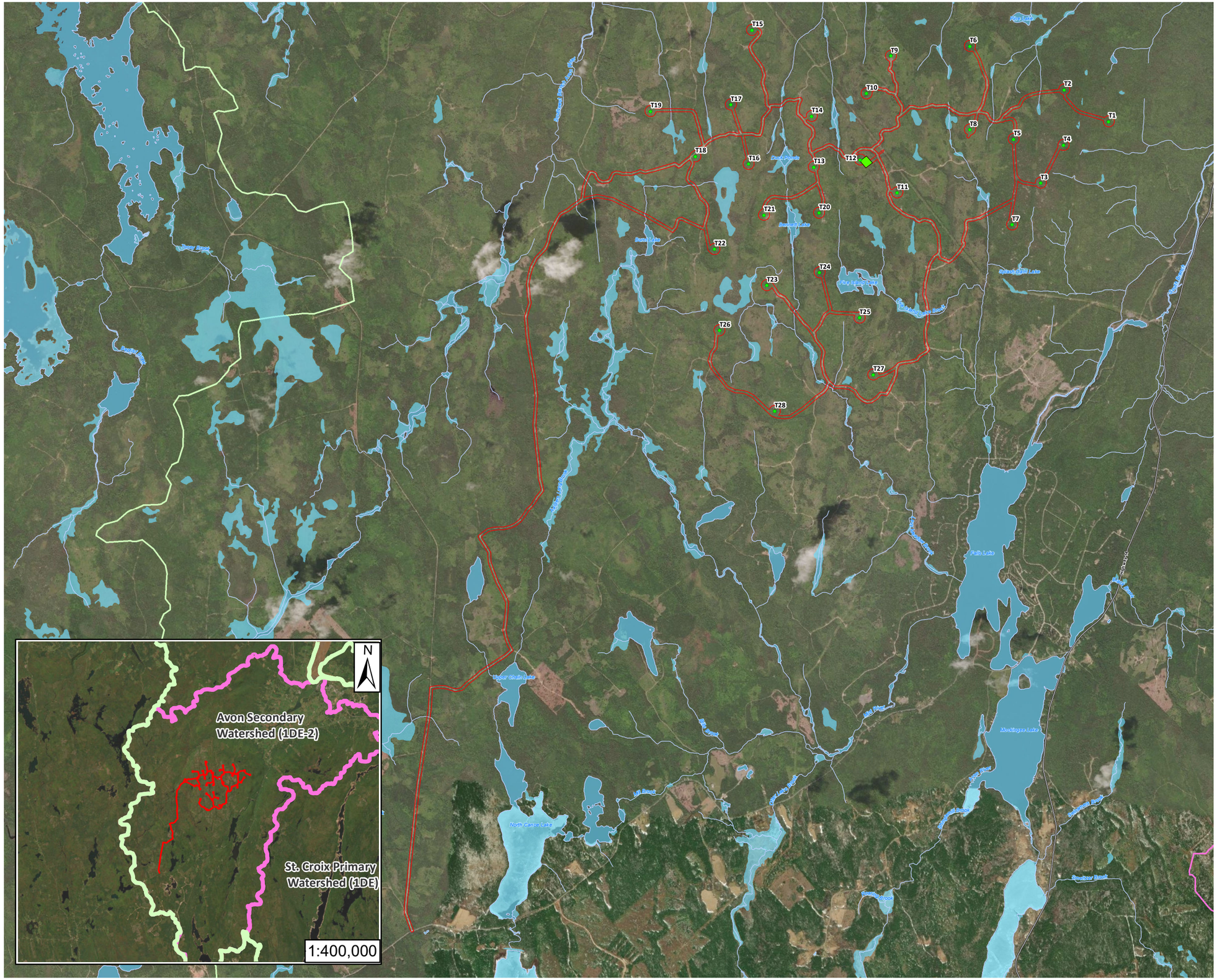
- An initial desktop assessment of watercourses and waterbodies within the secondary watersheds of the Potential Development Area (PDA);
- A desktop assessment of fish species and risk (SAR) and species of conservation concern (SoCC) with the potential to occur within the PDA; and
- Field surveys of watercourses within the PDA to collect information on water quality and their potential for aquatic habitat. Methods used for these field surveys are discussed in **Section 4.**

3.1 Spatial Boundaries

For the purpose of the watercourse and fish habitat surveys conducted as part of the biophysical baseline assessment for the Project, the spatial boundaries include the Potential Development Area (PDA) and the Local Assessment Area (LAA). For the watercourse and fish habitat VEC, the LAA includes watercourses that have the potential for direct and indirect impacts (i.e., watercourses with crossing within 30 m of the PDA) and the watercourses downstream of those crossings. A buffer of 30 m was selected to include watercourses that are adjacent to the PDA and could be impacted by Project activities within their riparian zone. The extent of each spatial boundary and purpose for the assessment of fish and fish habitat is summarized in Table 1 and shown on Figure 2).

Table 1: Spatial Boundaries for the Assessment of Watercourses and Fish Habitat

Spatial Boundary	Definition	Purpose of Boundary
Potential Development Area (PDA)	The PDA encompasses the Project footprint and a buffer of 15 m on either side of shoulders of the roadways (either existing or new) and collector lines and transmission line, a 75 m buffer around the base of each turbine location, and a 25 m buffer around the substation.	Represents the extent of anticipated areas that could undergo physical disturbance associated with the Project. This area encompasses all of the proposed 28 turbine locations and their associated infrastructure.
Study Area	Watercourse crossings within 30 m of the PDA were assessed in the field from 50 m upstream to 100 m downstream from the PDA.	The area covered on foot during surveys. Observations in the study area are applied to understand potential effects of the Project on the LAA
Local Assessment Area (LAA)	Watercourse crossings within 30 m of the PDA and their associated tributaries or distributaries	The maximum area where Project-specific environmental interactions can be predicted and measured with a reasonable degree of accuracy and confidence (i.e., the zone of influence of the Project phases on each VEC).



Natural Forces

BENJAMINS MILL WIND PROJECT

LOCAL ASSESSMENT AREA, SECONDARY WATERSHEDS AND WATERCOURSES

FIGURE 2

- Proposed Turbine Location
- Proposed Substation Location
- Potential Development Area (PDA)
- Highway
- Watercourse
- Waterbodies
- Avon Secondary Watershed (1DE-2)
- St. Croix Primary Watershed (1DE)

0 0.25 0.5 1 km

SCALE 1:50,000

N W E S

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FILE LOCATION: K:\2021\211329\Product\Internal\Benjamin_Mills_Figures_2022\Watercourse Figures 2022\BM_F02_LAA_SecondaryWatershed_Watercourses_2022.mxd

4.0 Methods

4.1 Desktop Assessments

4.1.1 Desktop Watercourse Assessment

A desktop assessment of watercourses and potential aquatic habitat was carried out prior to the onset of the field surveys. While reviewing the resources for the wetland and watercourse surveys, the information was also reviewed to evaluate the potential for aquatic SAR and SoCC within the general area of the proposed Project and to assist in scoping the field programs. The following sources were reviewed:

- Site-specific Atlantic Canada Conservation Data Centre reports (AC CDC 2021; AC CDC 2022);
- Reports from the Committee on the Status of Endangered Wildlife in Canada (COSEWIC);
- Department of Fisheries and Oceans (DFO) Species at Risk Mapping;
- Nova Scotia Natural Resources and Renewables Provincial Landscape Viewer (NSDNRR 2022); and
- Google Earth satellite imagery.

4.1.2 Fish Priority Species Assessment

For the watercourse and fish habitat assessment, as with the other biophysical surveys conducted for the Project environmental assessment (EA), the following definitions of SAR and SoCC apply:

- Species at Risk (SAR): A species that is determined to be Endangered, Threatened, or Vulnerable/Special Concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), Nova Scotia *Endangered Species Act* (NSESA), or the federal *Species at Risk Act* (SARA); and
- Species of Conservation Concern (SoCC): those species that are not SAR but are identified as regionally vulnerable or imperilled by the Atlantic Canada Conservation Data Centre (AC CDC) (i.e., those species with AC CDC S-ranks of S1: Critically imperiled in province; S2: Imperiled in province; and S3: Vulnerable in province of Nova Scotia.

Site-specific AC CDC reports were generated on May 10, 2021 and September 22, 2022, and included historical observations of SAR and SoCC reported within 5 km of the PDA. Due to the size of the PDA, a search of the AC CDC database was requested to include results from a radius of 10 km from the PDA Centre. For information purposes, the AC CDC report included SAR and SoCC observations from 100 km from the PDA centre, therefore it is important to note that some of fish species observed further from the PDA may not have suitable habitat present within the LAA.

An evaluation of the potential habitat for SAR and SoCC fish species included an assessment of the AC CDC screening and the results of the field surveys conducted throughout 2021 and 2022. The results of the fish priority species assessment include a description of suitable habitat for SAR and SoCC fish with

the potential to occur within the LAA, as well as a summary identified potential habitat within watercourses of the PDA for those species.

4.2 Field Assessments

Fish habitat suitability assessments were conducted for watercourses that have crossings within 30 m of the PDA to evaluate the potential for each watercourse to support fish and provide fish habitat. A preliminary assessment was completed in October 2021 and further detailed assessments were completed from October 4 to 21, 2022 and November 1, 2022. Fish habitat suitability assessments included the collection of physical characteristics of each watercourse. Where it was practical to do so, data were collected from watercourses within 30 m of the PDA at a minimum of four locations (e.g., 50 m upstream of the PDA crossing location, within the PDA, and 50 and 100 m downstream from the PDA crossing location). The following assessment criteria were recorded at each assessed location:

- **Dominant substrate type**: Dominant substrate types (e.g., gravel or silt) were described and documented. Substrate type is especially important for fish spawning habitat;
- **Stream channel characteristics**: Stream channel characteristics including average wet width, approximate bankfull width, average wetted depth and maximum wetted depth were measured in the field;
- ***In-situ* water quality parameters**: Water quality parameters (i.e., temperature, pH, dissolved oxygen [DO], specific conductivity) were measured in the field with a calibrated YSI professional plus multi meter; and
- In-stream and bank vegetation.

Representative photos and global positioning system (GPS) points (using a handheld GPS unit and Arc Geographic Information Systems [ArcGIS] applications) were collected for each watercourse during the field assessments.

The presence and/or the potential presence of fish in each aquatic feature was evaluated based on visual confirmation of fish during field surveys, watercourse characterizations conducted during low and mid-stage flow conditions, and the desktop evaluation for fish species potentially present within the Study Area. The biophysical characteristics of each watercourse were evaluated for fish habitat potential based on the habitat requirements for brook trout and other acid-tolerant fish species with the potential to occur within the watercourses that enter the PDA.

Suitable habitat characteristics, along with water quality to support aquatic species and direct observations of fish, were the basis of considerations on the likelihood of watercourses to support fish habitat. Watercourses were classed with the following descriptors:

- Unlikely to provide suitable fish habitat;
- May provide seasonally accessible fish habitat;
- Likely provides fish habitat; or
- Confirmed (i.e., fish observed).

An explanation was provided where fish habitat is possible but unconfirmed. Ephemeral streams and watercourses with barriers to fish passage were typically given a low rating, whereas permanent watercourses with direct observations of fish were given a higher rating for presence of fish habitat. Permanent or intermittent watercourses where fish were not observed that were considered likely to provide fish habitat, and/or contained seasonally-accessible fish habitat are also identified as such.

Water quality parameters were measured in-situ using a hand held YSI Professional Plus water quality meter (e.g., dissolved oxygen (DO), conductivity, temperature and pH). The Canadian Council of Ministers of the Environment (CCME) has published guidelines for pH and DO, which were used as indicators of suitability for aquatic life. Watercourses with pH and DO within the recommended range from the CCME for the protection of aquatic wildlife were considered to have a higher likelihood to provide suitable fish habitat. The CCME freshwater aquatic life (FWAL) range for pH is 5-9 and a minimum DO concentration of 6.5 mg/L is recommended for a watercourse to support cold water biota life stages (excluding early life stages) (CCME 1999).

5.0 Results

5.1 Desktop Assessment

5.1.1 Desktop Watercourse Assessment

Surface water flow across the PDA is expected to be guided by topography. The PDA is situated on ridges that are broken up by steep valleys and surface water flow is directed towards watercourses which are contained within their watersheds by the surrounding topography. Based on topographical mapping, the highest elevations within the PDA are approximately 270 m above mean sea level (m amsl) near the proposed location of Turbine 7 (T7) on the eastern side of the PDA (see Figure 2) and approximately 190 m amsl at several locations in valleys within the southern area of the PDA.

The PDA is located within the Avon River secondary watershed (1DE-2) which is part of the St. Croix (1DE) primary watershed. The Avon River secondary watershed encompasses a drainage area of 460 km^2 and includes three main branches of the Avon River (i.e., South, West, and Southwest) (Isaacman 2005). The watercourses that fall within the general vicinity of the proposed Project include the Mint River, Levy Meadow Brook, and Five Island Brook, although several unmapped watercourses are also present. Lakes in the general vicinity of the Project include Five Island Lake, Bennett Lake, Duck Ponds, Pine Lake, and Splash Dam Lake.

The watercourses and waterbodies with crossings within the LAA eventually flow towards the Avon River either directly or via several large river systems. The main tributaries from the PDA to the Avon River are shown on Figure 2 and discussed below.

- The Avon River forms at the outlet of Falls Lake and receives inputs from some of the tributaries that cross the PDA;
- Levy Mountain Brook, Five Island Brook, and Mint River flow through the PDA and/or receive flow from tributaries within the PDA before flowing to Falls Lake;
- Mint River, which is the main outlet for Burnt Lake, receives water further downstream from Aalders Lang Brook and Mill Brook;
- Mill Brook is an outlet of Little Island Lake which is fed from North Canoe Lake, Chain Lake, Upper Chain Lake and their associated tributaries that have crossings with the PDA;
- Southwest Branch Avon River receives water from several direct tributaries from crossings of the PDA and flows towards the West Branch Avon River; and
- Roaches Brook crosses the PDA and flows to the Southwest Branch Avon River via Muddy Lake and Mud Lake.

Freshwater species that have been documented within the Avon River watershed (Daborn and Brylinsky 2004) are summarized in Table 2 below. Based on the aquatic habitat identified during the 2021 preliminary watercourse assessments and initial measurements of watercourse acidity throughout the Study Area, the dominant fish species expected within the watercourses are likely to be acid-tolerant species, such as white sucker (Lacroix 2011).

Table 2: Summary of Freshwater Fish Species Documented in the Avon River Watershed

Scientific Name	Common Name
Gasterosteus aculeatus	Three Spine Stickleback*
Apeltes quadracus	Four Spine Stickleback
Pungitius pungitius	Nine Spine Stickleback
Fundulus diaphanus	Banded Killifish
Perca flavescens	Yellow Perch*
Micropterus dolomieu	Smallmouth Bass*
Catostomus commersonii	White Sucker*
Chrosomus eos	Northern Redbelly Dace
Couesius plumbeus	Lake Chub*

Notes:
*Indicates an acid-tolerant species

5.1.2 Fish Priority Species Assessment

No fish were reported within 10 km from the PDA centre in the ACCDC (2022) report; however, based on the results of the later AC CDC (2022) report (which superseded the report received in May 2021), seven priority fish species (e.g., SAR and SoCC) were reported with historical observations between 10 and 20 km of the centre of the PDA (AC CDC 2022). Table 3 summarizes the historical observations of fish SAR and SOCC within 20 km of the PDA reported by the AC CDC.

Table 3: Fish SAR and SoCC within 20 km from the PDA Centre (AC CDC 2022)

Common Name	Scientific Name	S-rank and Conservation Status	No. of Historical Observations	Distance from PDA Centre (km)
Brook Trout	Salvelinus fontinalis	AC CDC: S3	67	11.8 ± 0.0
Atlantic Salmon – Inner Bay of Fundy population	Salmo salar pop. 1	AC CDC: S1 SARA: E COSEWIC: E	46	14.4 ± 0.0
Striped Bass – Bay of Fundy population	Morone saxatilis pop. 2	AC CDC: S2S3B, S2S3N COSEWIC: E	5	20.1 ± 1.0
Striped Bass (population not identified)	Morone saxatilis	AC CDC: S2S3B,S2S3N COSEWIC: SC or E	9	16.3 ± 0.0

Common Name	Scientific Name	S-rank and Conservation Status	No. of Historical Observations	Distance from PDA Centre (km)
American Eel	Anguilla rostrata	AC CDC: S3N COSEWIC: T	253	19.8 ± 0.0
Alewife	Alosa pseudoharengus	AC CDC: S3B	18	20.0 ± 0.0
Atlantic Sturgeon	Acipenser oxyrinchus	AC CDC: S2S3N COSEWIC: T	7	20.1 ± 0.0

Notes:
S-rank refers to the Sub-national (Provincial) rank provided by the AC CDC and includes the following: S1 Critically Imperiled, S2 Imperiled, S3 Vulnerable, S4 Apparently Secure, S5 Secure and SU Unrankable. Rankings are frequently paired with the following breeding status qualifiers: B Breeding, N Non-breeding and M Migrant
Conservation Status Categories: E Endangered, T Threatened, V Vulnerable, SC Special Concern

Brook trout is a SoCC that is considered by the AC CDC to be vulnerable in Nova Scotia (ranked S3), but are not currently protected under SARA or NS ESA. Brook trout are freshwater fish with a preference for cool, freshwater environments but spend parts of their life cycle in a variety of habitats from small headwater streams to large lakes (NSDFA 2005). During the habitat assessments carried out in the fall of 2022, a brook trout was the confirmed at WC-5-2022-DS and potential habitat is present for this species within watercourses throughout the PDA.

Atlantic salmon, a SAR, are anadromous species with adults migrating from the ocean to spawn in freshwater rivers, generally in the same river where they were born. Salmon rivers or streams are generally large, clear, and cool, with riverbeds composed of gravel, cobble and boulder substrates (DFO 2010). Atlantic salmon are divided into unique populations based on genetic distinction and range. The Inner Bay of Fundy population of Atlantic salmon are listed under Schedule one of SARA as Endangered (as well as by COSEWIC) and are considered imperiled provincially by the AC CDC (ranked S1). The Inner Bay of Fundy population of Atlantic salmon, have been identified throughout the Avon River watershed (DFO 2022). Inner Bay of Fundy Atlantic salmon are not expected to inhabit watercourses evaluated within the Study Area based on the low pH recorded at the watercourses. The two tributaries of Avon River (WC-2-2022 and WC-3-2022) would be acceptable habitat for Atlantic salmon based on substrate and other habitat factors.

Striped bass (Bay of Fundy Population) is a SAR that is presently considered to be Endangered by COSEWIC and their breeding and non-breeding populations are considered by AC CDC to be in between imperiled and vulnerable (both ranked S2S3). Striped bass are an anadromous species migrating from brackish or salt water to fresh water for spawning (DFO 2014). The Bay of Fundy population is known to travel further upriver than other known populations to find spawning habitat in Nova Scotia. The following larger, faster moving watercourses within the Study Area may provide suitable spanning habitat for striped bass based on their in-situ water quality readings (e.g., dissolved oxygen) and having a moderate current:

- WC-1-2021;
- WC-4-2021; and
- WC-5-2021 (at the downstream location only).

American eel is a SAR that is presently listed as Threatened by COSEWIC and their non-breeding population is considered by AC CDC to be vulnerable in Nova Scotia (ranked S3N). American eel are habitat generalists that can be found in freshwater, estuaries, and coastal marine waters that are accessible to the Atlantic Ocean (COSEWIC 2012). American eel are a catadromous species that spend most of their life cycle in freshwater, returning to the Sargasso Sea to spawn (COSEWIC 2012). The effects of past development activities (e.g., layout of access roads and installation of the culverts) may presently be limiting the productivity of fish and fish habitat. Due to being generalists, these fish could realistically be found in any of the watercourses in the Project area that do not have barriers.

Alewife populations in Nova Scotia are considered by AC CDC to be vulnerable (ranked S3B), thus classifying them as a SoCC. This species is anadromous and spawning usually takes place in lakes or slow moving portions of rivers in the late spring (DFO 2016). The watercourses assessed within the study area are generally fast-flowing due to the steep topography of the site. Although the watercourses within the PDA are unlikely to provide suitable habitat for alewife, however, many of the watercourses are connected to lakes and larger watercourses downstream of the PDA that could support this species.

Atlantic sturgeon is a SAR that is listed as Threatened by COSEWIC and their non-breeding population is considered by AC CDC to be between imperiled and vulnerable (ranked S2S3N). Sturgeon are large, long-lived, late maturing anadromous fish that frequents estuarine environments. They prefer rocky-gravel or hard clay as substrate for spawning and typically choose areas with depth greater than three meters and strong currents (DFO 2014). This rules out all of the watercourses in the Study Area as suitable habitat for sturgeon spawning.

5.2 Field Survey

Throughout the field assessments in 2021 and 2022, 24 watercourses were confirmed or identified and then assessed within the Study Area. A total of 28 watercourse crossings were assessed with potential crossings with linear features of the PDA, noting that four of the 24 watercourses have more than one crossing location with the PDA. The Study Area and the locations of assessed watercourse crossings are shown on Figure 3 and discussed on Table 4. Data collected at watercourse assessment locations are summarized in Appendix A and discussed in the sections below.

An assessment of fish habitat suitability for the watercourse locations in the Study Area is presented in Table 4 below and presented on Figures 3A-3F, which include colour coded rankings of fish habitat suitability for the assessed locations of watercourses. The following assessment took into consideration information obtained through the desktop screening assessment as well as in-situ water quality measurements (presented in Appendix A) and the physical habitat characteristics recorded during assessment of watercourse crossing locations throughout 2021 and 2022.

Table 4: Potential Watercourses Crossings within the PDA and Proposed Alterations

Watercourse ID	Description	Proposed Alterations
WC-1-US (Upstream)	Levy Mountain Brook: A permanent defined channel with gravel/boulder substrate and stable banks. The channel flows through mature mixed forest.	An existing road crosses this tributary in two locations, both have existing bridges which may require upgrades. The upstream crossing location is not aligned with the existing bridge.
WC-1-DS (Downstream)	Levy Mountain Brook: A permanent defined channel with gravel/boulder substrate and stable banks. The channel flows through mature mixed forest.	An existing road crosses this tributary in two locations, both have existing bridges which may require upgrades.
WC-2	Tributary to Levy Mountain Brook: Intermittent, less defined channel with fine substrate and variable banks. The channel flows through shrubs and grasses and feeds into WC-1.	Potential – An existing road to be upgraded is supported by a bridge.
WC-3	Tributary to Levy Mountain Brook: Permanent, defined channel with boulder/gravel substrate and stable banks. The channel flows through mature mixed forest.	Potential – An existing road to be upgraded is supported by a culvert.
WC-4	Tributary to Five Island Lake Brook: Permanent, defined channel with gravel substrate and stable banks. The channel flows through mature mixed forest.	Potential – An existing road to be upgraded is supported by a bridge.
WC-5-US (Upstream)	Upstream Tributary to Five Islands Lake Brook: Intermittent, less defined channel with fine substrate and stable banks. The channel flows through shrubs and grasses. Culvert is too high for fish access.	Potential – An existing road to be upgraded is supported by a raised culvert at crossing.
WC-5-DS (Downstream)	Tributary to Five Islands Lake Brook: Permanent, defined channel with boulder/cobble substrate and stable banks. The channel flows through mature mixed forest.	A proposed new access road would cross this watercourse.
WC-6	Tributary to Avon River: Permanent, defined channel with boulder/cobble substrate and stable banks. The channel flows through mature mixed forest.	Potential – An existing road to be upgraded is supported by a culvert.
WC-8	Tributary to West Branch Avon River via WC-9-2021: Intermittent, defined channel with cobble/gravel substrate and stable banks. The channel flows through mature mixed forest and low marsh area.	Potential – An existing road to be upgraded is supported by a culvert.
WC-9	Tributary to West Branch Avon River: Permanent, defined channel with gravel substrate and stable banks. The channel flows through mature mixed forest.	Potential – An existing road to be upgraded is supported by a culvert.

Watercourse ID	Description	Proposed Alterations
WC-10-US (Upstream and back channel)	Tributary to Burnt Lake: Permanent, defined channel with gravel substrate and stable banks. The channel flows through mature mixed forest. A backchannel of this watercourse is located to the north of the main channel.	Potential – The PDA crosses this tributary in two locations. An existing road to be upgraded is supported by a culvert at the upstream location.
WC-10-DS (Downstream)	Tributary to Burnt Lake: Permanent, defined channel with gravel substrate and stable banks. The channel flows through mature mixed forest.	The PDA crosses this tributary in two locations. A proposed new access road will would cross the downstream crossing, which may require a structure installed when the road is constructed.
WC-11	Tributary to Burnt Lake: Permanent, defined channel with fine substrate and stable banks. The channel flows through mature mixed forest and is embedded by an existing access road, forming ponding in the north side ditch.	Potential – Watercourse is embedded by an existing road to be upgraded.
WC-12	Wetland drainage to WC-11: Intermittent, defined channel with fine substrate and stable banks. The channel flows through mature mixed forest.	Potential – An existing road to be upgraded is supported by a culvert.
WC-13-US (Upstream)	Tributary to Southwest Branch Avon River: Permanent, defined channel with cobble substrate and stable banks. The channel flows through mature mixed forest.	The PDA crosses this tributary in two locations. A proposed new access road would cross the upstream crossing, which may require a structure installed when the road is constructed.
WC-13-DS (Downstream)	Tributary to Southwest Branch Avon River: Permanent, defined channel with cobble substrate and stable banks. The channel flows through mature mixed forest.	The PDA crosses this tributary in two locations. An existing road to be upgraded is supported by a culvert at the downstream location.
WC-14	Tributary to Southwest Branch Avon River: Intermittent, less defined channel with gravel substrate and stable banks. The channel flows through mature mixed forest. High gradient cascades may act as an impediment to upstream fish passage.	Potential – An existing road to be upgraded is supported by a culvert.
WC-15	Ephemeral, less defined channel with cobble/fines substrate. This channel flows through mature mixed forest.	Potential – An existing road to be upgraded is supported by a culvert.
WC-16	Tributary to Aalders Lang Brook: Intermittent less defined channel with gravel substrate and eroding banks. The channel flows through mature mixed forest.	Potential – An existing road to be upgraded is supported by a culvert.
WC-17	Tributary to Aalders Lang Brook: Intermittent, defined channel with cobble/silt substrate and eroding banks. The channel flows through mature mixed forest.	Potential – An existing road to be upgraded is supported by a culvert.
WC-18	Tributary to Chain Lake: Permanent, defined channel with gravel/sand substrate and stable banks. The channel flows through mature mixed forest.	Potential – An existing road to be upgraded is supported by a culvert.

Watercourse ID	Description	Proposed Alterations
WC-19	Roachs Brook: Permanent, defined channel with gravel/sand substrate and stable banks. The channel flows through mature mixed forest.	Potential – An existing road to be upgraded is supported by a culvert.
WC-20	Tributary to Roachs Brook: Intermittent, defined channel with fine substrate and stable banks. The channel flows through mature mixed forest.	Potential – An existing road to be upgraded is supported by a culvert.
WC-21	Tributary to Roachs Brook via WC-22-2021: Intermittent, defined channel with fine substrate and stable banks. The channel flows through mature mixed forest. Drains into WC-22-2022-BM.	Potential – An existing road to be upgraded is supported by a culvert.
WC-22	Tributary to Roachs Brook: Intermittent, defined channel with gravel/sand substrate and stable banks. The channel flows through mature mixed forest.	Potential - An existing road to be upgraded is supported by a culvert.
WC-23	Tributary to Roachs Brook: Intermittent, defined channel with gravel/cobble substrate and stable banks. The channel flows through mature mixed forest.	Potential - An existing road to be upgraded is supported by a culvert.
WC-24	Tributary to Avon River: via WC-6-2021: Permanent, defined channel with gravel substrate and stable banks. The channel flows through mature mixed forest.	A proposed new access road would cross this watercourse to support the interconnection to the transmission line.
WC-25	Tributary to Avon River: via WC-6-2021: Permanent, defined channel with boulder substrate and stable banks. The channel flows through mature mixed forest.	A proposed new access road would cross this watercourse to support the interconnection to the transmission line.

Notes:

1. As previously described, the PDA encompasses all of the proposed 28 turbine locations and their associated infrastructure. As such, this list encompasses all potential watercourse crossings in this secondary watershed within 30 m of the PDA.

The assessed locations of the watercourses within the Study Area had pH levels below the Canadian Council of Ministers of the Environment (CCME) recommended range for the protection of aquatic life (i.e., 6.5-9.0). Watercourses with a pH of 5.0, as was the case with 14 of the assessed watercourses, are expected to have low fish densities and little to no acid-sensitive species (including juvenile salmon and cyprinids) (Lacroix 2011). Based on the aquatic habitat present and watercourse acidity throughout the Study Area, the dominant fish species expected within the watercourses are likely to be acid-tolerant species, such as white sucker (Lacroix 2011).

Table 5 provides an opinion of the suitability of each assessed watercourse to provide suitable fish habitat as well as the range of water quality parameters for DO and pH and potential barriers for fish passage observed during the assessments in 2022. Of the watercourses surveyed within the assessment area, five watercourses are considered unlikely to provide seasonal or permanent direct fish habitat because they either are ephemeral or to contain significant barriers to fish passage. The remaining

assessed watercourses may provide suitable habitat for some freshwater and anadromous species based on the physical watercourse characteristics assessed (see Appendix A for assessed data). Watercourses identified as likely providing fish habitat show dynamic features, including hard substrate, habitat cover and were free of potential barriers for fish passage. Watercourses with pH levels lower than 4.7 could make it difficult for a fish like Atlantic salmon to successfully spawn (DFO 2010); however, acid-tolerant fish could make use of the otherwise suitable habitat conditions.

Natural Forces

BENJAMINS MILL WIND PROJECT

WATERCOURSE AND FISH HABITAT SUITABILITY ASSESSMENT

FIGURE 3 A

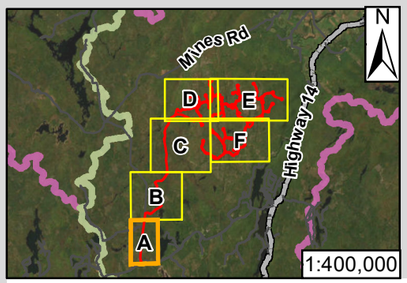
- Proposed Turbine Location
- Proposed Substation Location
- Study Area
- Potential Development Area (PDA)

Watershed

- Avon Secondary Watershed (1DE-2)
- St. Croix Primary Watershed (1DE)

Assessed Watercourse/Fish Suitability

- Confirmed
- Likely
- Seasonal
- Unlikely



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MAP DRAWING INFORMATION:
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MAP CREATED BY: DU
MAP CHECKED BY: KB
MAP PROJECTION: NAD 1983 UTM ZONE 20N

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STATUS: DRAFT

DATE: 2022-12-14

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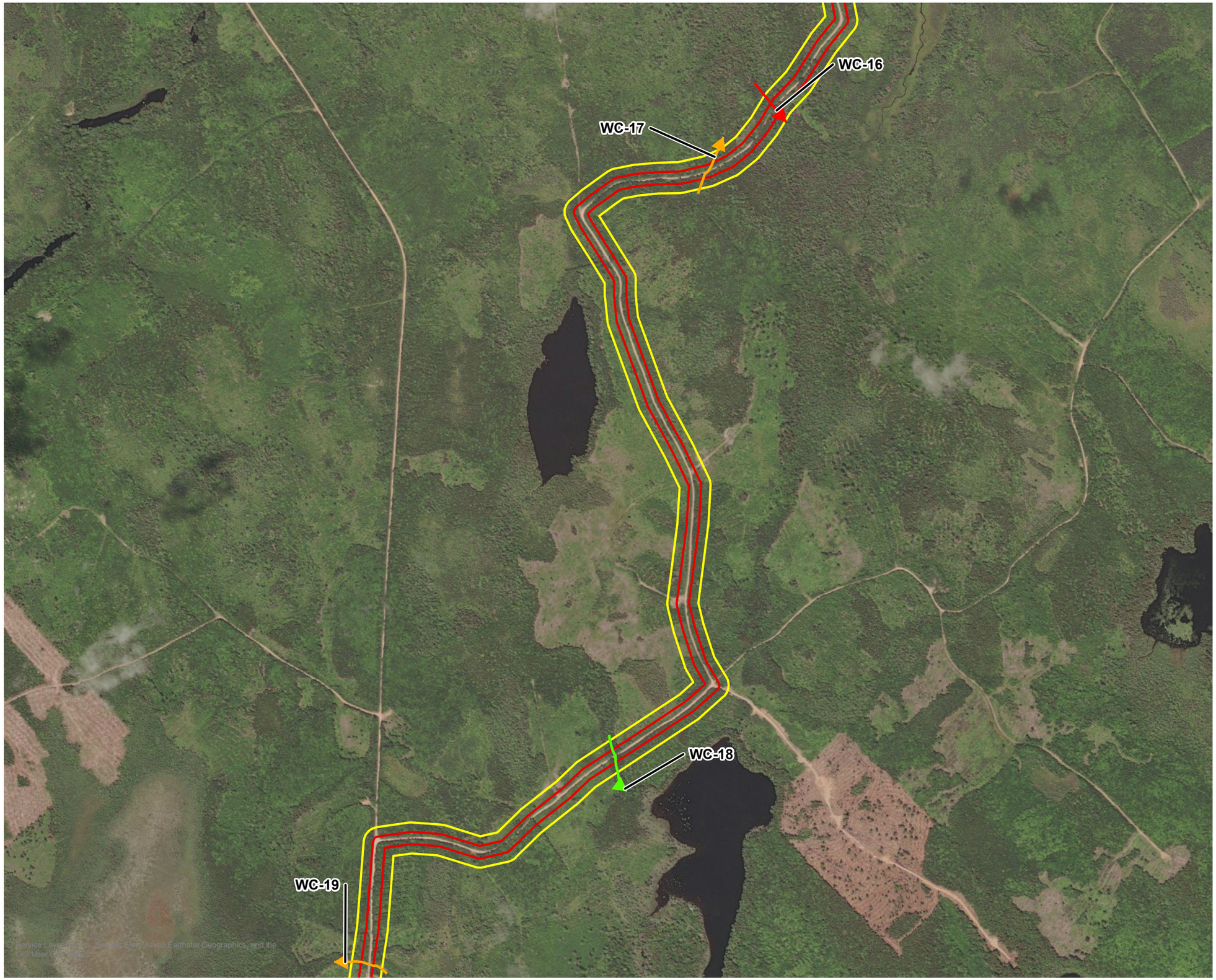


Service Layer Credits: Sources: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Natural Forces

BENJAMINS MILL WIND PROJECT

WATERCOURSE AND FISH HABITAT SUITABILITY ASSESSMENT

FIGURE 3 B

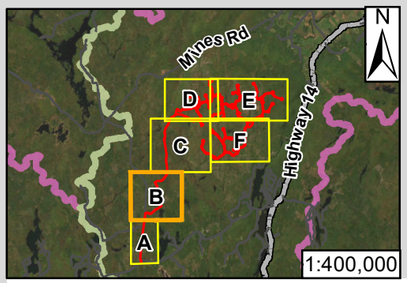
- Proposed Turbine Location
- Proposed Substation Location
- Study Area
- Potential Development Area (PDA)

Watershed

- Avon Secondary Watershed (1DE-2)
- St. Croix Primary Watershed (1DE)

Assessed Watercourse/Fish Suitability

- Confirmed
- Likely
- Seasonal
- Unlikely



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PROJECT: 21-1329

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Natural Forces

BENJAMINS MILL WIND PROJECT

WATERCOURSE AND FISH HABITAT SUITABILITY ASSESSMENT

FIGURE 3 C

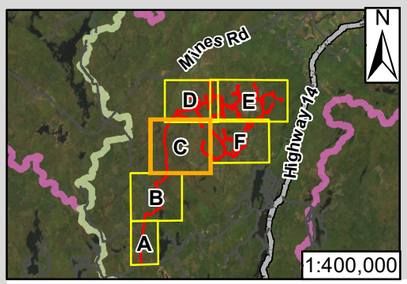
- Proposed Turbine Location
- Proposed Substation Location
- Study Area
- Potential Development Area (PDA)

Watershed

- Avon Secondary Watershed (1DE-2)
- St. Croix Primary Watershed (1DE)

Assessed Watercourse/Fish Suitability

- Confirmed
- Likely
- Seasonal
- Unlikely



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PROJECT: 21-1329

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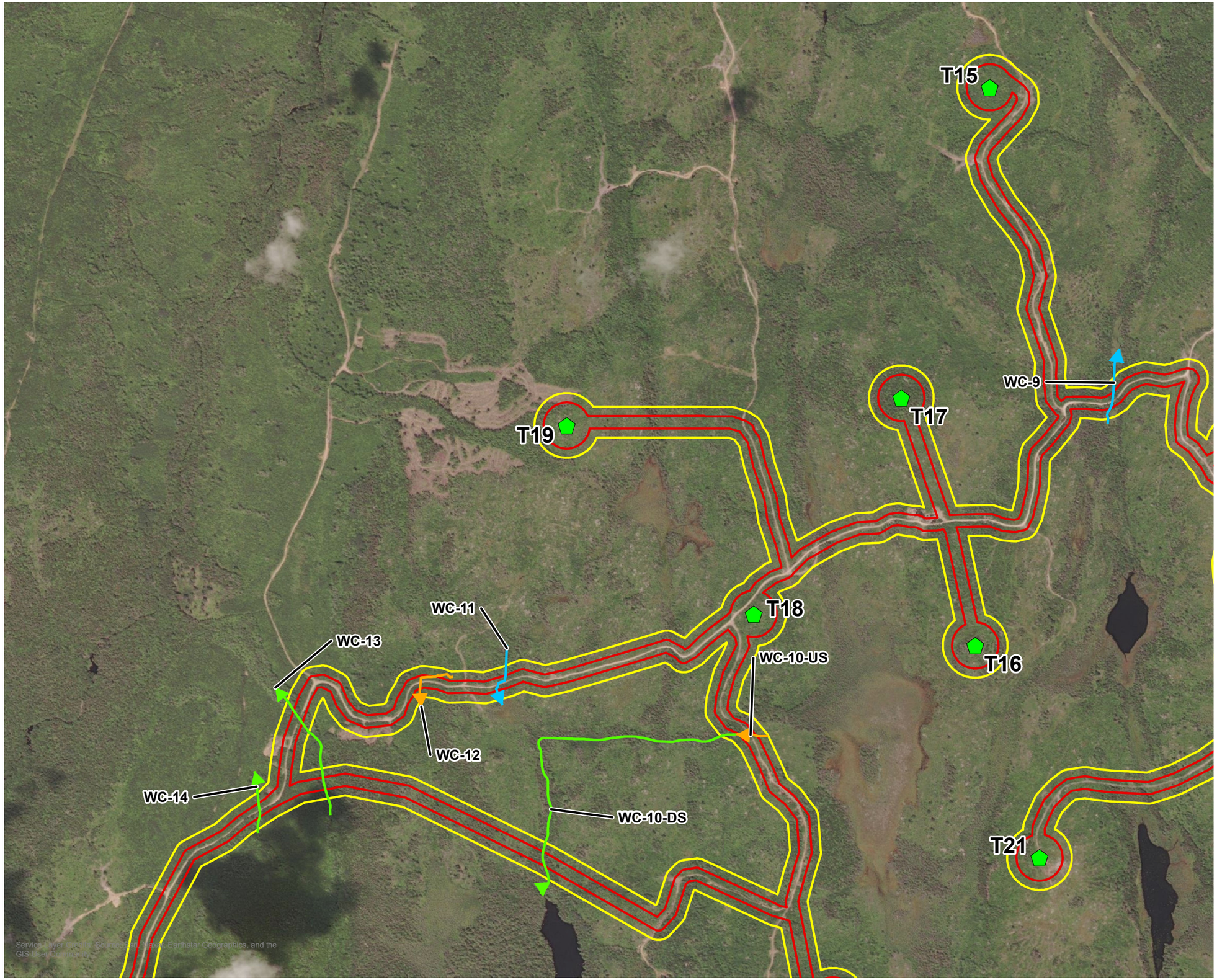


Natural Forces

BENJAMINS MILL WIND PROJECT

WATERCOURSE AND FISH HABITAT SUITABILITY ASSESSMENT

FIGURE 3 D

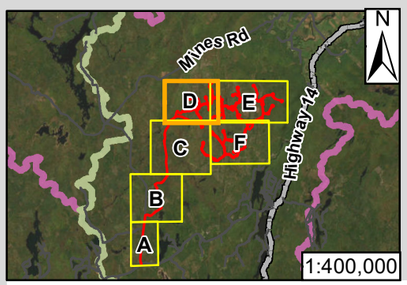
- Proposed Turbine Location
- Proposed Substation Location
- Study Area
- Potential Development Area (PDA)

Watershed

- Avon Secondary Watershed (1DE-2)
- St. Croix Primary Watershed (1DE)

Assessed Watercourse/Fish Suitability

- Confirmed
- Likely
- Seasonal
- Unlikely



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MAP PROJECTION: NAD 1983 UTM ZONE 20N

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PROJECT: 21-1329
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DATE: 2022-12-14

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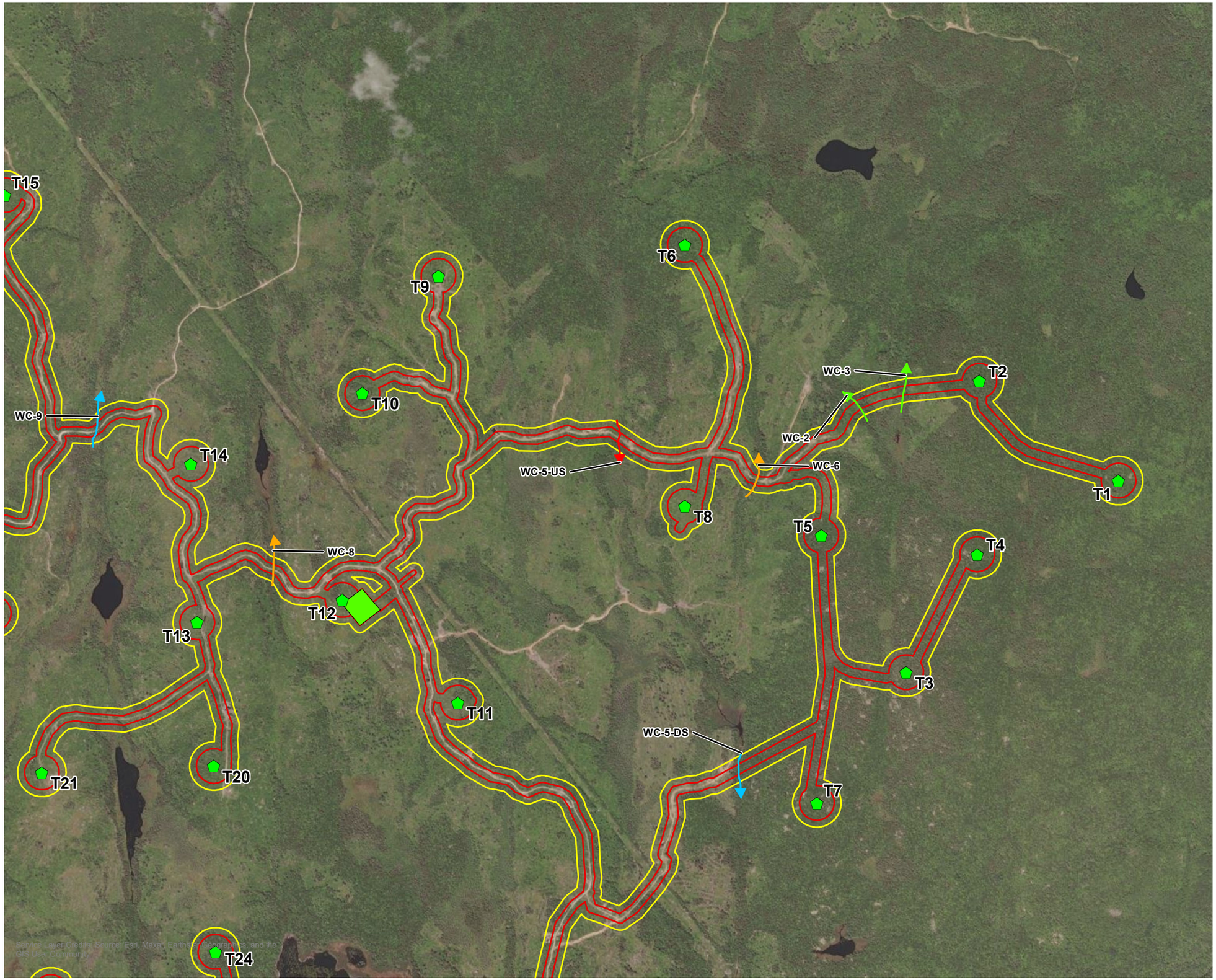


Natural Forces

BENJAMINS MILL WIND PROJECT

WATERCOURSE AND FISH HABITAT SUITABILITY ASSESSMENT

FIGURE 3 E

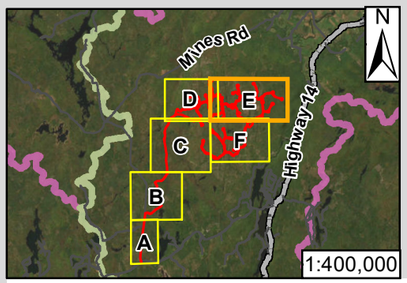
- Proposed Turbine Location
- Proposed Substation Location
- Study Area
- Potential Development Area (PDA)

Watershed

- Avon Secondary Watershed (1DE-2)
- St. Croix Primary Watershed (1DE)

Assessed Watercourse/Fish Suitability

- Confirmed
- Likely
- Seasonal
- Unlikely



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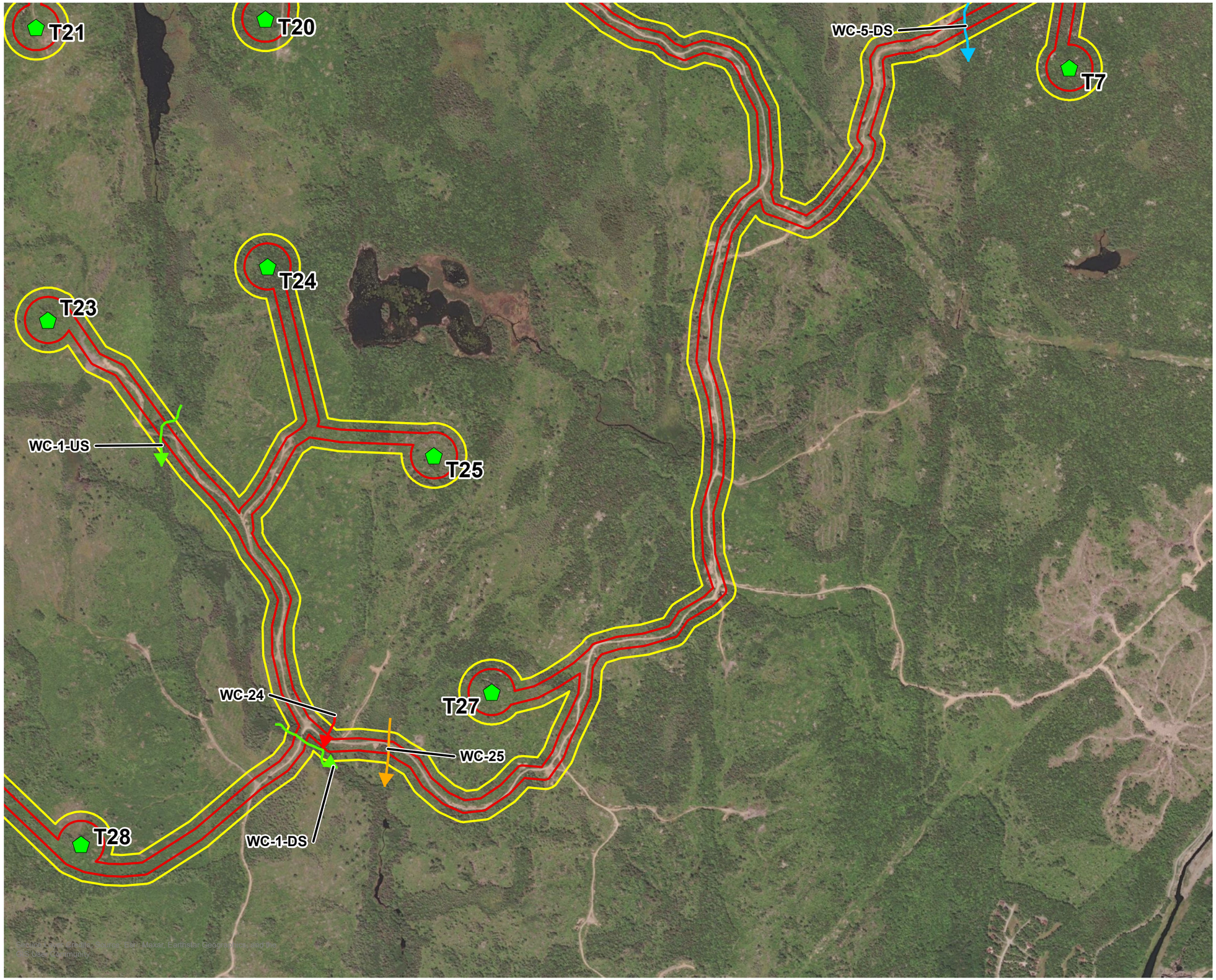


Natural Forces

BENJAMINS MILL WIND PROJECT

WATERCOURSE AND FISH HABITAT SUITABILITY ASSESSMENT

FIGURE 3 F

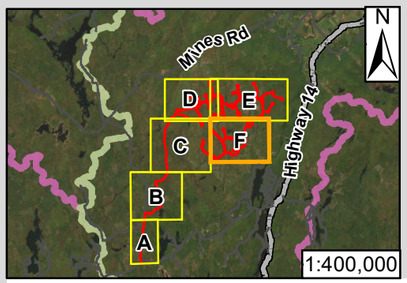
- Proposed Turbine Location
- Proposed Substation Location
- Study Area
- Potential Development Area (PDA)

Watershed

- Avon Secondary Watershed (1DE-2)
- St. Croix Primary Watershed (1DE)

Assessed Watercourse/Fish Suitability

- Confirmed
- Likely
- Seasonal
- Unlikely



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N W E S

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DILLON CONSULTING

PROJECT: 21-1329
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DATE: 2022-12-14

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Table 5: Fish Habitat Suitability of Watercourses Crossing the PDA

Watercourse ID	pH and DO Range[2]	Potential Barriers	Suitability as Fish habitat
WC-1US	pH: 3.84-3.98 DO: 9.55-10.22 mg/L	None observed	Likely provides direct fish habitat
WC-1US	pH: 3.84-3.98 DO: 9.55-10.22 mg/L	None observed	Likely provides direct fish habitat
WC-2	pH: 4.43 DO: 4.49 mg/L	Insufficient water in the upstream reaches	Unlikely to provide fish habitat
WC-3	pH: 3.64-3.83 DO: 7.39-8.35 mg/L	Insufficient water in the upstream reaches	May provide seasonally accessible fish habitat
WC-4	pH: 3.31-3.94 DO: 7.22-10.64 mg/L	None observed	Likely provides direct fish habitat
WC-5-US	pH: 4.55-4.86 DO: 6.05-9.81 mg/L	Raised culvert on downstream side of road crossing	Unlikely to provide fish habitat
WC-5-DS	pH: 3.63-4.07 DO: 6.62-8.79 mg/L	None observed	Confirmed fish habitat
WC-6	pH: 4.34-4.5 DO: 3.76-5.56 mg/L	Insufficient water in the upstream reaches	May provide seasonally accessible fish habitat
WC-8	pH: 3.94-4.5 DO: 3.55-9.04 mg/L	Insufficient water in upstream reaches, beaver dam	May provide seasonally accessible fish habitat
WC-9	pH: 3.37-3.67 DO: 8.84-11.8 mg/L	Insufficient water in upstream reaches, downed tree dam	Confirmed fish habitat
WC-10-US	pH: 3.14-3.53 DO: 5.31-11.55 mg/L	Insufficient water in upstream reaches	The upstream reach and backchannel may only be seasonally accessible for fish
WC-10-DS	pH: 3.14-3.53 DO: 5.31-11.55 mg/L	None Observed	Downstream reach likely provides direct fish habitat.
WC-11	pH: 3.07-3.62 DO: 10.44-11.64 mg/L	Insufficient water in upstream reaches	Confirmed fish habitat
WC-12	pH: 3.8-3.95 DO: 6.89-8.32 mg/L	Insufficient water in upstream reaches	May provide seasonally accessible fish habitat
WC-13-US	pH: 4.39-4.77 DO: 9.76-11.37 mg/L	Downed tree dam	Fish are unlikely to access to the upstream reaches due to insufficient water and a dam caused by downed trees.
WC-13-DS	pH: 4.39-4.77 DO: 9.76-11.37 mg/L	None Observed	Likely provides direct fish habitat
WC-14	pH: 4.21-5.06 DO: 8.47-11.37 mg/L	Insufficient water in upstream reaches	Likely provides direct fish habitat
WC-15	pH: 4.43-4.47 DO: 2.3-3.17 mg/L	Insufficient water in upstream reaches, lacks stable channel	Unlikely to provide fish habitat
WC-16	pH: 4.85-4.96 DO: 7.11-10.6 mg/L	Insufficient water in upstream reaches	Unlikely to provide fish habitat

Watercourse ID	pH and DO Range[2]	Potential Barriers	Suitability as Fish habitat
WC-17	pH: 4.33-4.52 DO: 1.89-5.23 mg/L	Insufficient water in upstream reaches	May provide seasonally accessible fish habitat
WC-18	pH: 3.64-3.99 DO: 3.74-8.84 mg/L	None observed	Likely provides direct fish habitat
WC-19	pH: 4.12-4.28 DO: 4-8.7 mg/L	Insufficient water in upstream reaches	May provide seasonally accessible fish habitat
WC-20	pH: 4.43-4.65 DO: 4.97-7.3 mg/L	Insufficient water in upstream reaches	May provide seasonally accessible fish habitat
WC-21	pH: 5.6-5.9 DO: 1.67-1.71 mg/L	Insufficient water in upstream reaches	Unlikely to provide fish habitat
WC-22	pH: 4.58-5.22 DO: 1.82-3.5 mg/L	Insufficient water in upstream reaches	May provide seasonally accessible fish habitat
WC-23	pH: 4.01-6.86 DO: 1.13-5.71 mg/L	Insufficient water in upstream reaches	May provide seasonally accessible fish habitat
WC-24	pH: 3.35-3.65 DO: 4.79-10.37 mg/L	None observed	Likely provides direct fish habitat
WC-25	pH: 3.44-3.52 DO: 5.32-10.31 mg/L	Insufficient water in upstream reaches	Likely provides direct fish habitat

Notes:

1. As previously described, the PDA encompasses all of the proposed 28 turbine locations and their associated infrastructure. The Project would consist of up to 28 of those locations and their associated infrastructure. As such, this list encompasses all watercourse in this secondary watershed within 30 m of the PDA.
2. Range report for pH and DO is based on readings taken in 2022 using a YSI Professional Plus meter, additional parameters are included in Appendix A.

5.3 Assessment Conclusions

The watercourse and fish habitat valued environmental component (VEC) includes aquatic life such as freshwater fish, benthic invertebrate species, and the habitat that supports them, as well as aquatic species at risk (SAR). Watercourses and fish habitat are considered a VEC because of their importance in supporting aquatic life; as a fisheries resource; as a food source for humans, other fish, and wildlife; for providing recreational opportunities; and because they are of importance to the public, stakeholders, and Indigenous communities.

According to DFO SAR mapping review, Atlantic salmon, Inner Bay of Fundy population (Salmo salar) are identified throughout the Avon River watershed (DFO 2021). Although suitable Atlantic salmon habitat was not identified during initial field studies, watercourses that may be impacted by the final design will undergo additional detailed assessments to ensure that potential impacts to the species are considered and appropriately mitigated.

The proposed WTG locations were selected to avoid encroachment of watercourses and are not within 30 m of a watercourse. However, 28 watercourse crossings with linear features of the PDA were identified for 24 watercourses, and four of the watercourses have more than one crossing location with

the PDA. Of the 28 watercourse crossings with the PDA, 23 are associated with existing access roads, many of which have existing culverts or bridges. Consultation with NSECC will be conducted prior to development as part of the watercourse alteration permit process. Alteration of watercourses with the potential to provide suitable fish habitat will be done so in consultation with DFO and avoided to the extent feasible.

Species at risk with the potential to be present in the LAA include Atlantic salmon, striped bass, and American eel. Atlantic salmon, however, are not expected to inhabit watercourses evaluated within the Study Area based on the low pH recorded at the watercourses, with the potential exception of two tributaries of Avon River (WC-2-2022 and WC-3-2022) based on substrate and other habitat factors. Striped bass (Bay of Fundy Population) have the potential to occur in larger, faster moving watercourses within the Study Area, including WC-1-2021, WC-4-2021, and the downstream crossing location of WC-5-2021. American eel are habitat generalists and could realistically be found in any of the watercourses in the Study Area.

Species of conservation concern with the potential to be present within the PDA are brook trout and alewife. These are fish that are considered by AC CDC to be vulnerable in Nova Scotia (ranked S3), but are not currently protected under SARA or NS ESA. Brook trout were confirmed at Five Islands Lake Brook location (WC-5-DS) and potential suitable habitat was identified for brook trout within watercourses throughout the PDA (identified above in Table 5). Alewife are not likely to reside within the PDA; however, they do have the potential to be present in downstream watercourses and lakes.

As discussed above, the majority of watercourse crossings with linear features in the PDA (i.e., 23 out of 28 crossings) are associated with existing access roads, many of which have existing culverts or bridges that are likely to not require alterations or instream work. The proposed WTG locations, which were selected to avoid encroachment of watercourses, and do no intersect or are not within 30 m of a watercourse The information obtained from the watercourse assessment will be taken under consideration by the proponent when finalizing the Project footprint and selecting the final turbine layout. Consultation with NSECC will be conducted prior to development as part of the watercourse alteration permit process. Alteration of watercourses with the potential to provide suitable fish habitat will be done so in consultation with DFO and where feasible, the design of the Project will be finalized in a way to interact with as few watercourses as possible.

6.0 Effects Assessment and Mitigation Recommendations

6.1 Identification of Project Interactions

The PDA was selected to minimize interactions with watercourse crossings by avoiding development in locations with watercourses to the extent possible. The proposed layout utilizes existing road infrastructure where possible to minimize disturbance of the local environment and the proposed WTG locations were carefully selected in locations more than 30 m from watercourses.

6.1.1 Approach to Project Components

The Project has three main distinct phases during each of which the potential interactions with the surrounding environment are considered distinct. Unplanned events are considered separately from the phases.

The phases of the Project include:

1. Planning, Site Preparation, and Construction Phase;
2. Operation Phase; and
3. Decommissioning Phase.

The Project interaction matrix in Table 6 is used as an initial screening to assist in determining if an interaction is possible between the activities being carried out in each phase of the Project and watercourses and fish habitat.

Table 6: Project Interactions with Environmental Components

Valued Environmental Component	Project Phases			
	Planning, Site Preparation, and Construction Phase	Operation Phase	Decommissioning Phase	Unplanned Events
Fish and Fish Habitat	✓	✓	✓	✓

Legend: ✓ = Potential interaction identified

Those Project phases for which a checkmark is provided indicates that the Project may interact with watercourses and fish habitat, and thus an environmental effects assessment is warranted. In this case, it is possible that interactions could occur during each phase of the Project, as well as unplanned events (including but not limited to accidents, malfunctions, and severe weather events), which are all discussed below.

6.1.2 Identification of Potential Environmental Effects

Without mitigation, watercourses with crossings within the PDA have the potential to be impacted during the construction and decommissioning phases of the proposed Project. Interaction may primarily occur during clearing and grubbing and access road widening, as well as during eventual infrastructure removal and site reclamation activities in the decommissioning phase. Potential interactions include increasing sediment load during earth works, altering surface water drainage patterns.

While the construction and decommissioning phases present potential for negative impacts to watercourses within 30 m of Project-related activities, impacts are reversible once the decommissioning phase has started and land reclamation activities restore the Project site to its previous state.

Though some studies exist (DFO 1998; DFO 2018), potential effects of sounds and vibrations associated with the construction (e.g., blasting) and daily operation of the proposed project to fishes occurring within the LAA and the impacts of seismic vibrations and anthropogenic sounds on the behavior and health of fishes (and other wildlife) are not entirely clear. Best Management Practises for Pile Driving and Related Operations (DFO 2018) state that peak underwater pressures in excess of 30 kilopascals (kPa) are likely to adversely affect fish. Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters (DFO 1998) state that the detonation of explosives in or near water produces post-detonation compressive shock waves that can damage the swimbladders of fish and may kill or damage fish eggs and larvae when pressures exceed of 100 kPa (DFO 1998). The construction and decommissioning phases of the project are expected to temporarily increase noise and vibration due to potential blasting and an increase in heavy vehicle traffic on the Project site.

Studies on offshore wind energy turbines have indicated that underwater sound can be generated at levels that are detectable by fish (Mooney 2020). It remains unclear whether onshore WTGs generate underwater noise that has the potential to affect fish health and behaviours. Although not included as a study for the proposed Project, ambient underwater noise in the watercourses located near the PDA is expected to be present as a result of pre-existing site activity and the turbulent nature of the watercourses caused by the steep terrain. None of the proposed WTG locations have been sited within 250 m of watercourses with a high potential for fish to be present. Therefore, impacts to watercourses, fish habitat, and fish during operation are not expected and they are not discussed further.

During the operational phase, the generation of noise and vibration is not anticipated to affect fish. The PDA is situated on ridges that are broken up by steep valleys; and as a result, the flow regime in the watercourses of the PDA included reaches with natural turbulence and riffles, which would be likely to mask the noise generated during operations.

6.1.3 Standard Mitigation of Potential Environmental Effects

Standard mitigation has been identified for the anticipated interaction and/or effect in relation to watercourse and fish habitat in an attempt to prevent the interaction from occurring if possible, or to reduce the magnitude, geographic extent, frequency, duration, reversibility, or ecological/socioeconomic context of the interaction. Best management practices (based on industry guidelines and regulatory guidance documents) have been proposed as mitigation measures. In addition, several acts, codes, regulations and guidelines may require appropriate actions be conducted to mitigate impacts prior to or during the interaction.

The federal and provincial legislation and codes that could apply to the Project include (but may not be limited to):

- Fisheries Act (FA 1985);
- Canadian Environmental Protection Act and regulations (ECCC 1999);
- Species at Risk Act (ECCC 2002);
- Transportation of Dangerous Goods Act, and regulations (TC 1992);
- Nova Scotia *Environment Act* and regulations (NSG 1994-95);
- Nova Scotia *Water Resources Protection Act*, and regulations (NSG 2000);
- Nova Scotia Fisheries and Costal Resources Act (NSG 1996);
- Nova Scotia *Endangered Species Act*, and regulations (NSG 1998a);
- Nova Scotia *Wilderness Areas Protection Act* (NSG 1998b), and regulations; and
- Contingency Planning Guidelines (NSECC 2021).

The potential interactions of the Project on watercourses and fish habitat and the proposed mitigation measures are summarized in Table 7.

Table 7: Potential Interactions and Proposed Mitigation for Watercourses and Fish Habitat

Potential Interactions with Watercourses and Fish Habitat	Proposed Mitigation Measures
Short-term, reversible disturbance to watercourses and fish habitat due to clearing, grubbing, and/or access road widening during construction and decommissioning.	1. Limit the removal of riparian zone vegetation; 2. Minimize the use of heavy equipment within 30 m of a watercourse to the extent possible; 3. Minimize the use of blasting within 30 m of a watercourse to the extent possible and blasting will adhere to the Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters (DFO, 1998); 4. Construction activities near watercourses will comply with the applicable regulations and guidelines such as the Fisheries Act and will be carried out strictly in accordance with NSECC and DFO Approvals, Terms and Conditions, and Letters of Advice; 5. Where possible, watercourse crossings will be located in areas that exhibit a stable soil type where grades approaching the crossings will not be too steep, and will span the watercourse where possible; 6. Proper erosion and sediment control measures will be installed and checked regularly during the construction phase and prior to, and after, storm events to ensure they are continuing to operate properly to minimize potential effects to adjacent habitat; 7. Sufficient staff and equipment to manage erosion and sediment control during storm events and other emergencies will be provided; 8. In stream work will be timed to occur in the dry season and not during significant rainfall. Culverts will be designed and installed to prevent the creation of barriers to fish movement and maintain bankfull channel functions and habitat functions to the extent possible; 9. Prior to in-stream work, fish-outs will be completed to ensure no harm to resident fish species. Captured fish will be released outside of the work area; 10. Runoff will be controlled, and sediment will be prevented from leaving the Site at all times; 11. Equipment shall be kept in good working order and maintained to avoid noise disturbances; 12. All workers will be familiarized identified and potential aquatic SAR and will adhere to mitigation measures for the protection of aquatic SAR as outlined within the Adaptive Management Plan; and 13. All workers will be familiarized and will adhere to the provincial Nova Scotia Endangered Species Act and federal Species at Risk Acts; Mitigation Measures for Unplanned Events 1. Equipment shall be kept in good working order and maintained so as to reduce risk of spills/leaks and to avoid water contamination; 2. Spill response kits must be readily available for each piece of equipment, on site workers are required be knowledgeable on emergency spill response protocols and initiate corrective measures immediately to minimize any impacts to the surrounding environment;

Potential Interactions with Watercourses and Fish Habitat	Proposed Mitigation Measures
	3. Where applicable, secondary containment and limited quantities of chemicals and fuels required to be store on site shall be in an area away from the surrounding terrestrial environment, or direct pathways (i.e., ditches) to the surrounding environment, all chemicals and fuels will be stored in appropriate containers designed for the reduction of potential spills or leaks; 4. Refueling, oiling, and maintenance of equipment will be completed in specifically designated areas located at least 30 m away from any watercourse, wetland, or well to minimize potential effects that could arise in the event of a spill; 5. If contaminated soil or water is encountered, it will be reported to NSE and managed utilizing the Nova Scotia Contaminated Site Regulations; 6. Visual monitoring of silt or sedimentation within watercourses will occur during construction after heavy weather events; and 7. Chemicals and petroleum products will be managed in accordance to manufacturer specifications and stored more than 30 m from a watercourse or wetland.

6.2 Residual Environmental Effects

A residual environmental effect is an environmental effect of a project that remains, or is predicted to remain, after mitigation measures have been implemented (GOC 2022). The Project will be developed in such a way as to avoid disturbance to watercourses where avoidance is not possible, and minimize the area of disturbance within the Project site. Avoidance through site design has been completed to the extent possible (i.e., avoiding watercourses where possible, spanning watercourses using overhead collection lines, and use of existing roads). In addition, following the construction and decommissioning phases of the Project, natural revegetation with native species will be promoted in consultation with the landowners to minimize the potential for habitat loss and invasive species spread.

Short-term, reversible disturbance to watercourses and fish habitat due to clearing, grubbing, and/or access road widening during construction and decommissioning were assessed above as a potential intersection between the Project and the watercourse and fish habitat VEC. After employing the proposed mitigation strategies in Table 7 (above), these potential effects are anticipated to be temporary, of small magnitude and contained.

During construction and decommissioning, a direct release of a contaminating substance (e.g., fuel or sediment) into environment could result in a negative effect of the Project on the watercourse and fish habitat VEC. The mitigation measures for unplanned events listed above in Table 7 are anticipated to limit the potential effect as a result of an unplanned event, such as a spill, to be of a small magnitude, of short duration and localized.

In consideration of the above and planned mitigation, the residual environmental effects of the Project on watercourses and fish habitat during all phases including unplanned events are rated not significant. No follow-up or monitoring is proposed to monitor environmental interactions with the watercourses and fish habitat, unless required under permit from NSECC.

6.3 Cumulative Environmental Effects

Cumulative effects are changes to the environment that are caused by an action in combination with other past, present and future human actions (GOC 2022). Specific to the nature of the undertaking, cumulative effects are combined impacts that may occur when wind power projects or other types of projects are located in the same region (NSECC 2021). The South Canoe Lake Wind Energy Project is a 34-turbine project located approximately 8 km south-southwest of the Project. The Martock Ridge Wind Project (3 turbines) and the Ellershouse Wind Project (10 turbines) are located 8.6 km and 16 km east-northeast of the Project, respectively. The distances between these projects and the Project (i.e., outside of the LAAs for all VECs) suggests the potential for interaction between the residual effects of the combined projects to watercourse and fish habitats are low.

Without the above proposed mitigation measures, cumulative impacts to watercourses and fish could result from the increased number of vehicles and use of site access roads in addition to the existing site uses. The above mitigation measures were carefully developed to prevent residual impacts to watercourse and fish habitat as a result of the Project. Therefore, in consideration of the above and planned mitigation, the residual cumulative environmental effects of the Project in combination with past, present, or reasonably foreseeable projects or activities on watercourses and fish habitat during all phases including unplanned events are rated not significant.

7.0 Summary and Conclusions

This report has been prepared for the Environmental Assessment of the Benjamins Mill Wind Project. The Project is expected to provide renewable electricity to Nova Scotia and support Nova Scotia Power in attaining their future renewable energy targets. The information provided in this document is based on the currently available design/planning information and existing environment information obtained during focused field surveys conducted throughout 2021 and 2022. As previously discussed, the Project layout was designed to attempt to minimize interactions with watercourses and fish habitat. Care will be taken to avoid watercourses, and all attempts will be made to span watercourses with poles and to develop with the existing access road network. Up to 23 watercourse crossings with the PDA are located where existing access roads are present and up to six watercourse crossings are anticipated with proposed new access road development.

In order to mitigate risk to watercourses, fish, and fish habitat, all WTGs were set back at least 30 m from watercourses. Best management practices for erosion and sediment control will be implemented to monitor potential impacts to watercourses. Overall, transitioning to renewable energy will help reduce the effects of climate change. This may have a positive impact on the long term population growth and viability of fish populations in Nova Scotia.

8.0 Closure

This report was prepared by Dillon Consulting Limited (Dillon) for Natural Forces Developments Limited Partnership (the Proponent) on behalf of the Benjamins Mill Wind Limited Partnership, in support of the Benjamins Mill Wind Project Addendum (2022). Dillon has used the degree of care and skill ordinarily exercised under similar circumstances at the time the work was performed by reputable members of the environmental consulting profession practicing in Canada. Dillon assumes no responsibility for conditions which were beyond its scope of work. There is no warranty expressed or implied by Dillon.

The material in the report reflects Dillon's best judgment in light of the information available to Dillon at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. Dillon accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

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Appendix A

Fish Habitat Suitability Assessment Data

DILLON CONSULTING

Watercourse Name	Assessment Location	Assessment Date	Time	Collectors	Weather
WC-1-2021	T1	1-11-2022	10:49:00	Tyler Sims	Overcast
WC-1-2021	T2	1-11-2022	11:25:00	Tyler Sims	Rain
WC-1-2021	T3	1-11-2022	12:50:00	Tyler Sims	Overcast
WC-1-2021	T4	1-11-2022	12:18:00	Tyler Sims	Overcast
WC-2-2021	T1	1-11-2022	13:24:00	Tyler Sims	Rain
WC-3-2021	T1	20-10-2022	13:57:00	Tyler Sims	Sun
WC-3-2021	T2	20-10-2022	14:24:00	Tyler Sims	Sun
WC-3-2021	T3	20-10-2022	14:49:00	Tyler Sims	Sun & Cloud
WC-4-2021	T1	20-10-2022	10:26:00	Tyler Sims	Sun
WC-4-2021	T2	20-10-2022	11:02:00	Tyler Sims	Sun
WC-4-2021	T3	20-10-2022	11:37:00	Tyler Sims	Sun
WC-4-2021	T4	20-10-2022	11:58:00	Tyler Sims	Sun & Cloud
WC-5-2021-DS	T1	1-11-2022	14:30:00	Tyler Sims	Overcast
WC-5-2021-DS	T2	19-10-2022	14:40:00	Tyler Sims	Overcast
WC-5-2021-DS	T3	19-10-2022	15:10:00	Tyler Sims	Overcast
WC-5-2021-DS	T4	19-10-2022	15:30:00	Tyler Sims	Rain
WC-6-2021	T1	19-10-2022	12:22:00	Tyler Sims	Rain
WC-6-2021	T2	19-10-2022	12:57:00	Tyler Sims	Rain
WC-6-2021	T3	19-10-2022	13:30:00	Tyler Sims	Rain
WC-5-2021-US	T1	19-10-2022	11:41:00	Tyler Sims	Rain
WC-5-2021-US	T2	14-10-2022	14:28:00	Katie Couvrette, Tyler Sims	Sun
WC-8-2021	T1	14-10-2022	12:08:00	Katie Couvrette, Tyler Sims	Overcast
WC-8-2021	T2	14-10-2022	12:29:00	Katie Couvrette, Tyler Sims	Overcast
WC-8-2021	T3	14-10-2022	12:52:00	Katie Couvrette, Tyler Sims	Overcast
WC-8-2021	T4	14-10-2022	13:10:00	Katie Couvrette, Tyler Sims	Overcast
WC-9-2021	T1	13-10-2022	15:00:00	Katie Couvrette, Tyler Sims	Sun
WC-9-2021	T2	13-10-2022	15:30:00	Katie Couvrette, Tyler Sims	Sun
WC-9-2021	T3	14-10-2022	10:57:00	Katie Couvrette, Tyler Sims	Overcast
WC-9-2021	T4	14-10-2022	11:25:00	Katie Couvrette, Tyler Sims	N/A
WC-10-2021	T1	12-10-2022	13:55:00	Katie Couvrette, Zach Simai	Sun
WC-10-2021	T2	12-10-2022	15:30:00	Katie Couvrette, Zach Simai	Sun
WC-10-2021	T3	21-10-2022	10:47:00	Tyler Sims, Zach Simai	Overcast
WC-10-2021	T4	21-10-2022	10:57:00	Tyler Sims, Zach Simai	Overcast
WC-10-2021	T5	21-10-2022	11:15:00	Tyler Sims, Zach Simai	Overcast
WC-11-2021	T1	12-10-2022	12:00:00	Katie Couvrette, Zach Simai	Sun
WC-11-2021	T2	12-10-2022	12:30:00	Katie Couvrette, Zach Simai	Sun
WC-12-2021	T1	07-10-2022	14:51:00	Katie Couvrette, Zach Simai	Sun & Cloud
WC-12-2021	T2	07-10-2022	15:19:00	Katie Couvrette, Zach Simai	Sun
WC-13-2021	T1	07-10-2022	12:43:00	Katie Couvrette, Zach Simai	Overcast

Watercourse Name	Assessment Location	Assessment Date	Time	Collectors	Weather
WC-13-2021	T2	07-10-2022	15:04:00	Katie Couvrette, Zach Simai	Rain
WC-13-2021	T3	07-10-2022	13:06:00	Katie Couvrette, Zach Simai	Overcast
WC-13-2021	T4	07-10-2022	13:25:00	Katie Couvrette, Zach Simai	Overcast
WC-14-2021	T1	07-10-2022	10:58:00	Katie Couvrette, Zach Simai	Overcast
WC-14-2021	T2	07-10-2022	11:16:00	Katie Couvrette, Zach Simai	Overcast
WC-14-2021	T3	07-10-2022	11:34:00	Katie Couvrette, Zach Simai	Overcast
WC-14-2021	T4	07-10-2022	12:00:00	Katie Couvrette, Zach Simai	Overcast
WC-15-2021	T1	06-10-2022	14:15:00	Katie Couvrette, Zach Simai	Rain
WC-15-2021	T2	06-10-2022	14:36:00	Katie Couvrette, Zach Simai	Rain
WC-16-2021	T1	06-10-2022	12:13:00	Katie Couvrette, Zach Simai	Rain
WC-16-2021	T2	06-10-2022	12:30:00	Katie Couvrette, Zach Simai	Rain
WC-17-2021	T1	06-10-2022	10:41:00	Katie Couvrette, Zach Simai	Rain
WC-17-2021	T2	05-10-2022	15:07:00	Tyler Sims, Zach Simai	Overcast
WC-17-2021	T3	06-10-2022	11:09:00	Katie Couvrette, Zach Simai	Rain
WC-17-2021	T4	06-10-2022	11:31:00	Katie Couvrette, Zach Simai	Rain
WC-18-2021	T1	05-10-2022	13:32:00	Tyler Sims, Zach Simai	Overcast
WC-18-2021	T2	05-10-2022	13:53:00	Tyler Sims, Zach Simai	Overcast
WC-18-2021	T3	05-10-2022	14:12:00	Tyler Sims, Zach Simai	Overcast
WC-18-2021	T4	05-10-2022	14:33:00	Tyler Sims, Zach Simai	Overcast
WC-19-2021	T1	05-10-2022	11:25:00	Tyler Sims, Zach Simai	Sun & Cloud
WC-19-2021	T2	05-10-2022	11:42:00	Tyler Sims, Zach Simai	Sun & Cloud
WC-19-2021	T3	05-10-2022	12:01:00	Tyler Sims, Zach Simai	Overcast
WC-19-2021	T4	05-10-2022	12:19:00	Tyler Sims, Zach Simai	Overcast

Watercourse Name	Assessment Location	Assessment Date	Time	Collectors	Weather
WC-20-2021	T1	05-10-2022	10:37:00	Tyler Sims, Zach Simai	Overcast
WC-20-2021	T2	05-10-2022	10:43:00	Tyler Sims, Zach Simai	Overcast
WC-20-2021	T3	05-10-2022	10:59:00	Tyler Sims, Zach Simai	Sun & Cloud
WC-21-2021	T1	04-10-2022	15:21:00	Tyler Sims, Zach Simai	Sun
WC-21-2021	T2	04-10-2022	14:57:00	Tyler Sims, Zach Simai	Sun
WC-22-2021	T1	04-10-2022	13:26:00	Tyler Sims, Zach Simai	Sun & Cloud
WC-22-2021	T2	04-10-2022	13:43:00	Tyler Sims, Zach Simai	Sun & Cloud
WC-22-2021	T3	04-10-2022	14:01:00	Tyler Sims, Zach Simai	Sun & Cloud
WC-22-2021	T4	04-10-2022	14:33:00	Tyler Sims, Zach Simai	Sun
WC-23-2021	T1	04-10-2022	11:39:00	Tyler Sims, Zach Simai	Sun & Cloud
WC-23-2021	T2	04-10-2022	11:43:00	Tyler Sims, Zach Simai	Sun & Cloud
WC-23-2021	T3	04-10-2022	12:23:00	Tyler Sims, Zach Simai	Sun & Cloud
WC-23-2021	T4	04-10-2022	12:42:00	Tyler Sims, Zach Simai	Sun & Cloud
WC-1-2022	T1	12-10-2022	14:38:00	Katie Couvrette, Zach Simai	Sun
WC-1-2022	T2	12-10-2022	14:58:00	Katie Couvrette, Zach Simai	Sun
WC-2-2022	T1	21-10-2022	13:35:00	Tyler Sims, Zach Simai	Sun & Cloud
WC-2-2022	T2	21-10-2022	13:20:00	Tyler Sims, Zach Simai	Overcast
WC-2-2022	T3	21-10-2022	13:02:00	Tyler Sims, Zach Simai	Sun & Cloud
WC-2-2022	T4	21-10-2022	12:25:00	Tyler Sims, Zach Simai	Sun & Cloud
WC-3-2022	T1	21-10-2022	14:00:00	Tyler Sims, Zach Simai	Sun & Cloud
WC-3-2022	T2	21-10-2022	14:18:00	Tyler Sims, Zach Simai	Sun & Cloud
WC-3-2022	T3	21-10-2022	14:32:00	Tyler Sims, Zach Simai	Sun & Cloud

Watercourse Name	Temperature (°C)	GPS Coordinates	Surrounding Land Use	Sources of Pollution
WC-1-2021	13	20T 399368 4969654	Forestry	Logging activities
WC-1-2021	14	20T 399438 4969612	Forestry	Logging activities
WC-1-2021	13	20T 399502 4969551	Forestry	Logging activities
WC-1-2021	14	20T 399548 4969524	Forestry	Logging activities
WC-2-2021	14	20T 399512 1969610	Forestry	Logging activities
WC-3-2021	12	20T 399714 4969581	Forestry	Logging activities
WC-3-2021	13	20T 399713 4969537	Forestry	Logging activities
WC-3-2021	13	20T 399709 4969486	Forestry	Logging activities
WC-4-2021	9	20T 400732 4970546	Forestry	Logging activities
WC-4-2021	10	20T 400778 4970570	Forestry	Logging activities
WC-4-2021	11	20T 400834 4970565	Forestry	Logging activities
WC-4-2021	11	20T 400875 4970538	Forestry	Logging activities
WC-5-2021-DS	14	20T 401598 4972030	Forestry	Logging activities
WC-5-2021-DS	16	20T 401584 4971928	Forestry	Logging activities
WC-5-2021-DS	16	20T 401601 4971994	N/A	N/A
WC-5-2021-DS	16	20T 401598 4971888	Forestry	Logging activities
WC-6-2021	N/A	20T 401649 4973189	Forestry	Logging activities
WC-6-2021	17	20T 401671 4973232	Forestry	Logging activities
WC-6-2021	17	20T 401682 4973284	Forestry	Logging activities
WC-5-2021-US	N/A	20T 401068 4973363	Forestry	Logging activities
WC-5-2021-US	14	20T 401067 4973324	Forestry, homes, agriculture	Unknown
WC-8-2021	14	20T 399571 4972746	Forestry, homes, agriculture	Unknown
WC-8-2021	14	20T 399576 4972808	Forestry, homes, agriculture	Unknown
WC-8-2021	15	20T 399577 4972869	Forestry, homes, agriculture	Unknown
WC-8-2021	14	20T 399578 4972916	Forestry, homes, agriculture	Unknown
WC-9-2021	19	20T 398797 4973345	Forestry, homes, agriculture	Unknown
WC-9-2021	19	20T 398808 4973389	Forestry, homes, agriculture	Unknown
WC-9-2021	15	20T 398816 4973509	Forestry, homes, agriculture	Unknown
WC-9-2021	N/A	20T 398825 4973552	Forestry, homes, agriculture	Unknown
WC-10-2021	14	20T 397681 4972321	Forestry, homes, agriculture	Unknown
WC-10-2021	13	20T 397622 4972320	Forestry, homes, agriculture	Unknown
WC-10-2021	6	20T 397556 4972331	Forestry	Logging activities
WC-10-2021	9	20T 397514 4972312	Forestry	Logging activities
WC-10-2021	9	20T 397466 4972293	Forestry	Logging activities
WC-11-2021	11	20T 396846 4972538	Forestry, homes, agriculture	Unknown
WC-11-2021	11	20T 396817 4972487	Forestry, homes, agriculture	Unknown
WC-12-2021	N/A	20T 396612 4972508	Forestry, homes, agriculture	Unknown
WC-12-2021	N/A	20T 396572 4972482	Forestry, homes, agriculture	Unknown
WC-13-2021	N/A	20T 396200 4972332	Forestry, homes, agriculture	Unknown

Watercourse Name	Temperature (°C)	GPS Coordinates	Surrounding Land Use	Sources of Pollution
WC-13-2021	N/A	20T 396167 4972380	Forestry, homes, agriculture	Unknown
WC-13-2021	N/A	20T 396136 4972424	Forestry, homes, agriculture	Unknown
WC-13-2021	N/A	20T 396103 4972459	Forestry, homes, agriculture	Unknown
WC-14-2021	N/A	20T 396642 4972020	Forestry, homes, agriculture	Unknown
WC-14-2021	N/A	20T 396043 4972076	Forestry, homes, agriculture	Unknown
WC-14-2021	N/A	20T 396047 4972132	Forestry, homes, agriculture	Unknown
WC-14-2021	N/A	20T 396031 4972177	Forestry, homes, agriculture	Unknown
WC-15-2021	N/A	20T 395561 4971403	N/A	N/A
WC-15-2021	N/A	20T 395553 4971462	Forestry, homes, agriculture	Unknown
WC-16-2021	N/A	20T 395337 4967952	Forestry, homes, agriculture	Unknown
WC-16-2021	N/A	20T 395362 4967908	Forestry, homes, agriculture	Unknown
WC-17-2021	N/A	T20 395116 4967651	Forestry, homes, agriculture	Unknown
WC-17-2021	16	20T 395144 4967704	Forestry	Logging Activities
WC-17-2021	N/A	20T 395135 4967749	Forestry, homes, agriculture	Unknown
WC-17-2021	N/A	20T 395141 4967798	Forestry, homes, agriculture	Unknown
WC-18-2021	16	20T 394827 4965852	Forestry	Logging Activities
WC-18-2021	16	20T 394843 4965808	Forestry	Logging Activities
WC-18-2021	16	20T 394850 4965758	Forestry	Logging Activities
WC-18-2021	16	20T 394866 4965708	Forestry	Logging Activities
WC-19-2021	12	20T 394082 4965116	Forestry	Logging Activities
WC-19-2021	11	20T 394036 4965132	Forestry	Logging Activities
WC-19-2021	14	20T 393994 4965145	Forestry	Logging Activities
WC-19-2021	16	20T 393946 4965137	Forestry	Logging Activities

Watercourse Name	Temperature (°C)	GPS Coordinates	Surrounding Land Use	Sources of Pollution
WC-20-2021	11	20T 393948 4964247	Forestry	Logging Activities
WC-20-2021	11	20T 393904 4964236	Forestry	Logging Activities
WC-20-2021	12	20T 393855 4964212	Forestry	Logging Activities
WC-21-2021	16	20T 393867 4963893	Forestry	Logging Activities
WC-21-2021	16	20T 393821 4963897	Forestry	Logging Activities
WC-22-2021	14	20T 393902 4963792	Forestry	Logging Activities
WC-22-2021	14	20T 393856 4963791	Forestry	Logging Activities
WC-22-2021	15	20T 393814 4963852	Forestry	Logging Activities
WC-22-2021	15	20T 393779 4963916	Forestry	Logging Activities
WC-23-2021	10	20T 393828 4963473	Forestry	Logging activities
WC-23-2021	13	20T 393807 4963508	Forestry	Logging Activities
WC-23-2021	13	20T 393782 4963524	Forestry	Logging Activities
WC-23-2021	13	20T 393762 4963570	Forestry	Logging Activities
WC-1-2022	14	20T 397639 4972368	Forestry, homes, agriculture	Unknown
WC-1-2022	13	20T 397600 4972342	Forestry, homes, agriculture	Unknown
WC-2-2022	13	20T 402166 4973472	Forestry	Logging activities
WC-2-2022	13	20T 402131 4973515	Forestry	Logging activities
WC-2-2022	N/A	20T 402118 4973563	Forestry	Logging activities
WC-2-2022	11	20T 402069 4973573	Forestry	Logging activities
WC-3-2022	14	20T 402292 4973578	Forestry	Logging activities
WC-3-2022	14	20T 402294 4973615	Forestry	Logging activities
WC-3-2022	14	20T 402304 4973663	Forestry	Logging activities

Watercourse Name	Existing Structure Type	Size (wxh) (cm)	Section Type	Reach Length (m)	Run %
WC-1-2021	N/A	N/A	Stream/River	20	40
WC-1-2021	Bridge	400x150	Stream/River	30	30
WC-1-2021	N/A	N/A	Stream/River	30	40
WC-1-2021	N/A	N/A	Stream/River	40	30
WC-2-2021	Bridge	400x150	Intermittent	10	0
WC-3-2021	CSP	N/A	N/A	N/A	0
WC-3-2021	N/A	N/A	Stream/River	20	10
WC-3-2021	N/A	N/A	Stream/River	20	60
WC-4-2021	N/A	N/A	Stream/River	30	20
WC-4-2021	Bridge	360x180	Stream/River	20	20
WC-4-2021	N/A	N/A	Stream/River	30	0
WC-4-2021	N/A	N/A	Stream/River	50	0
WC-5-2021-DS	N/A	N/A	Stream/River	N/A	20
WC-5-2021-DS	N/A	N/A	Stream/River	40	40
WC-5-2021-DS	N/A	N/A	Stream/River	N/A	100
WC-5-2021-DS	N/A	N/A	Stream/River	20	10
WC-6-2021	CSP	45x45	Intermittent	30	0
WC-6-2021	N/A	N/A	Permanent	40	0
WC-6-2021	N/A	N/A	Permanent	20	0
WC-5-2021-US	CSP	30x30	Intermittent	20	0
WC-5-2021-US	N/A	N/A	Intermittent	100	0
WC-8-2021	N/A	N/A	Intermittent	150	0
WC-8-2021	CSP	50x50	Intermittent	150	0
WC-8-2021	N/A	N/A	Intermittent	150	0
WC-8-2021	N/A	N/A	Intermittent	150	0
WC-9-2021	N/A	N/A	Intermittent	N/A	50
WC-9-2021	N/A	N/A	Intermittent	150	0
WC-9-2021	N/A	N/A	Permanent	150	0
WC-9-2021	N/A	N/A	Permanent	150	100
WC-10-2021	N/A	N/A	Intermittent	N/A	0
WC-10-2021	CSP	50x50	Intermittent	150	0
WC-10-2021	N/A	N/A	Permanent	15	40
WC-10-2021	N/A	N/A	Permanent	20	40
WC-10-2021	N/A	N/A	Stream/River	20	60
WC-11-2021	N/A	N/A	Intermittent	150	0
WC-11-2021	N/A	N/A	Intermittent	N/A	100
WC-12-2021	N/A	N/A	Intermittent	150	N/A
WC-12-2021	CSP	50x50	Intermittent	150	N/A
WC-13-2021	N/A	N/A	Stream/River	150	30

Watercourse Name	Existing Structure Type	Size (wxh) (cm)	Section Type	Reach Length (m)	Run %
WC-13-2021	CSP	70x70	Permanent	150	0
WC-13-2021	N/A	N/A	Stream/River	150	100
WC-13-2021	N/A	N/A	Stream/River	150	40
WC-14-2021	N/A	N/A	Intermittent	N/A	0
WC-14-2021	CSP	30x30	Intermittent	150	0
WC-14-2021	N/A	N/A	Intermittent	150	50
WC-14-2021	N/A	N/A	Intermittent	150	0
WC-15-2021	CSP	50x50	Ephemeral	100	0
WC-15-2021	N/A	N/A	Ephemeral	100	0
WC-16-2021	N/A	N/A	Intermittent	150	0
WC-16-2021	CSP	70x70	Intermittent	150	40
WC-17-2021	N/A	N/A	Intermittent	N/A	N/A
WC-17-2021	CSP	60x60	Channelized	20	10
WC-17-2021	N/A	N/A	Intermittent	N/A	0
WC-17-2021	N/A	N/A	Intermittent	N/A	0
WC-18-2021	N/A	N/A	Permanent	30	0
WC-18-2021	CSP	60x60	Channelized	20	0
WC-18-2021	N/A	N/A	Channelized	30	10
WC-18-2021	N/A	N/A	Channelized	30	45
WC-19-2021	N/A	N/A	Intermittent	20	0
WC-19-2021	CSP	60x60	Permanent	20	30
WC-19-2021	N/A	N/A	Intermittent	20	0
WC-19-2021	N/A	N/A	Permanent	30	50

Watercourse Name	Existing Structure Type	Size (wxh) (cm)	Section Type	Reach Length (m)	Run %
WC-20-2021	N/A	N/A	Intermittent	15	0
WC-20-2021	CSP	70x70	Intermittent	20	0
WC-20-2021	N/A	N/A	Intermittent	30	0
WC-21-2021	CSP	60x60	Ephemeral	10	0
WC-21-2021	N/A	N/A	Permanent	20	0
WC-22-2021	N/A	N/A	Ephemeral	15, scattered pools	0
WC-22-2021	CSP	60x60	Intermittent	15	0
WC-22-2021	N/A	N/A	Permanent	20	0
WC-22-2021	N/A	N/A	Intermittent	20	0
WC-23-2021	N/A	N/A	Intermittent	12	0
WC-23-2021	CSP	60x60	Permanent	12	0
WC-23-2021	N/A	N/A	Intermittent	3, small pools	0
WC-23-2021	N/A	N/A	Ephemeral	15, Dry w/ some small pools	0
WC-1-2022	N/A	N/A	Intermittent	150	100
WC-1-2022	CSP	70x70	N/A	N/A	33
WC-2-2022	N/A	N/A	Stream/River	30	30
WC-2-2022	N/A	N/A	Stream/River	20	60
WC-2-2022	N/A	N/A	Stream/River	30	40
WC-2-2022	N/A	N/A	Stream/River	20	40
WC-3-2022	N/A	N/A	Channelized	15	40
WC-3-2022	N/A	N/A	Channelized	20	60
WC-3-2022	N/A	N/A	Channelized	30	25

Watercourse Name	Pool %	Riffle %	Flat %	Substrate % Bedrock	Substrate % Boulder	Substrate % Cobble	Substrate % Gravel
WC-1-2021	10	50	0	0	20	0	70
WC-1-2021	30	40	0	0	25	60	15
WC-1-2021	20	40	0	20	30	0	30
WC-1-2021	10	60	0	50	30	0	20
WC-2-2021	0	0	100	0	10	10	0
WC-3-2021	10	90	0	0	50	40	0
WC-3-2021	15	75	0	0	40	50	0
WC-3-2021	10	30	0	0	40	40	0
WC-4-2021	20	60	0	20	30	30	10
WC-4-2021	0	80	0	30	30	30	0
WC-4-2021	0	100	0	30	40	30	0
WC-4-2021	10	90	0	30	40	30	0
WC-5-2021-DS	30	50	0	0	30	20	20
WC-5-2021-DS	30	30	0	5	20	45	20
WC-5-2021-DS	0	0	0	0	10	60	20
WC-5-2021-DS	20	70	0	0	30	40	20
WC-6-2021	90	10	0	0	60	0	10
WC-6-2021	90	10	0	0	10	40	10
WC-6-2021	100	0	0	0	0	10	20
WC-5-2021-US	100	0	0	0	0	30	0
WC-5-2021-US	100	0	0	0	0	48	4
WC-8-2021	0	0	100	0	40	30	30
WC-8-2021	0	0	100	0	10	40	50
WC-8-2021	0	0	100	0	0	0	0
WC-8-2021	0	0	100	0	0	0	0
WC-9-2021	0	0	50	0	0	0	50
WC-9-2021	0	100	0	0	0	33	33
WC-9-2021	0	100	0	0	0	50	0
WC-9-2021	0	0	0	0	0	50	0
WC-10-2021	100	0	0	0	0	40	0
WC-10-2021	0	0	100	25	25	25	25
WC-10-2021	30	30	0	0	5	0	10
WC-10-2021	30	30	0	0	0	0	20
WC-10-2021	0	40	0	0	10	0	20
WC-11-2021	0	0	100	0	15	10	0
WC-11-2021	0	0	0	45	0	30	25
WC-12-2021	N/A	N/A	N/A	80	0	0	0
WC-12-2021	N/A	N/A	N/A	0	0	0	0
WC-13-2021	0	0	70	0	0	40	30

Watercourse Name	Pool %	Riffle %	Flat %	Substrate % Bedrock	Substrate % Boulder	Substrate % Cobble	Substrate % Gravel
WC-13-2021	50	50	0	0	0	60	20
WC-13-2021	0	0	0	20	0	30	0
WC-13-2021	60	0	0	0	20	30	0
WC-14-2021	100	0	0	0	15	0	0
WC-14-2021	50	50	0	0	0	0	33
WC-14-2021	0	50	0	30	0	0	70
WC-14-2021	50	50	0	20	20	40	40
WC-15-2021	0	0	100	0	0	0	0
WC-15-2021	100	0	0	0	0	80	0
WC-16-2021	100	0	0	0	30	30	40
WC-16-2021	60	0	0	0	30	0	30
WC-17-2021	N/A	N/A	N/A	0	20	0	0
WC-17-2021	0	30	60	0	0	60	25
WC-17-2021	80	20	0	0	0	20	0
WC-17-2021	100	0	0	0	80	0	0
WC-18-2021	0	0	100	0	0	0	0
WC-18-2021	0	0	100	0	0	0	0
WC-18-2021	60	30	0	0	0	10	60
WC-18-2021	20	35	0	0	0	35	50
WC-19-2021	0	0	100	0	0	0	0
WC-19-2021	30	100	0	0	0	0	60
WC-19-2021	100	0	0	0	0	15	15
WC-19-2021	30	20	0	0	0	0	60

Watercourse Name	Pool %	Riffle %	Flat %	Substrate % Bedrock	Substrate % Boulder	Substrate % Cobble	Substrate % Gravel
WC-20-2021	100	0	0	0	0	20	0
WC-20-2021	100	0	0	0	0	15	20
WC-20-2021	100	0	0	0	5	10	15
WC-21-2021	100	0	0	0	0	0	0
WC-21-2021	0	0	100	0	0	15	30
WC-22-2021	100	0	0	0	0	10	5
WC-22-2021	100	0	0	0	0	0	35
WC-22-2021	100	0	0	0	0	0	35
WC-22-2021	0	0	100	0	0	0	40
WC-23-2021	0	5	95	0	0	40	40
WC-23-2021	0	0	100	0	0	30	20
WC-23-2021	100	0	0	0	0	0	20
WC-23-2021	100	0	0	0	0	35	30
WC-1-2022	0	0	0	80	0	5	0
WC-1-2022	33	33	0	30	0	0	70
WC-2-2022	60	10	0	0	0	0	20
WC-2-2022	30	10	0	0	10	0	30
WC-2-2022	40	20	0	0	5	0	30
WC-2-2022	10	50	0	0	15	0	35
WC-3-2022	40	20	0	0	50	0	10
WC-3-2022	0	40	0	0	50	0	30
WC-3-2022	25	50	0	0	50	0	20

Watercourse Name	Substrate % Sand	Substrate % Silt	Substrate % Clay	Substrate % Muck	Substrate % Detritus	Mean Wetted Width (m)	Mean Wetted Depth (m)	Mean Bankful Width (m)
WC-1-2021	10	0	0	0	0	2.24	0.3	3.06
WC-1-2021	0	0	0	0	0	3.55	0.3	3.72
WC-1-2021	10	0	0	0	10	2.31	0.3	2.35
WC-1-2021	0	0	0	0	0	3.18	0.37	3.82
WC-2-2021	0	0	0	0	80	0.6	0.07	0.94
WC-3-2021	0	0	0	0	10	1.7	N/A	2.06
WC-3-2021	0	0	0	0	10	1.74	0.14	2.03
WC-3-2021	0	0	0	0	20	1.75	0.45	2.6
WC-4-2021	10	0	0	0	0	2.7	0.18	4.5
WC-4-2021	5	0	0	0	5	3.61	0.28	4.01
WC-4-2021	0	0	0	0	0	2.88	0.32	3.2
WC-4-2021	0	0	0	0	0	3.61	0.5	4.1
WC-5-2021-DS	20	0	0	0	10	2.6	0.19	3.7
WC-5-2021-DS	5	0	0	0	5	2	0.15	2.3
WC-5-2021-DS	10	0	0	0	0	3.3	0.25	3.5
WC-5-2021-DS	10	0	0	0	0	0.9	0.18	1.6
WC-6-2021	10	10	0	0	0	1.11	0.15	1.3
WC-6-2021	10	10	0	0	20	0.61	0.12	1.09
WC-6-2021	30	20	0	10	10	1.09	0.08	2.3
WC-5-2021-US	0	0	0	0	70	0.64	0.25	0.8
WC-5-2021-US	0	.	.	.	48	0.44	0.02	0.74
WC-8-2021	0	0	0	0	0	1.62	0.12	1.7
WC-8-2021	0	0	0	0	0	1.85	0.33	2.05
WC-8-2021	0	0	0	0	100	0.8	0.21	N/A
WC-8-2021	0	0	0	0	100	0.58	0.12	8
WC-9-2021	50	0	0	0	0	2.15	0.29	3.16
WC-9-2021	33	0	0	0	0	0.56	0.2	0.73
WC-9-2021	0	0	0	0	50	1.65	0.24	2
WC-9-2021	0	0	0	0	50	0.87	0.19	1.76
WC-10-2021	0	0	0	0	60	0.35	0.05	0.8
WC-10-2021	0	0	0	0	0	1.2	0.2	1.35
WC-10-2021	10	25	0	25	25	0.5	0.23	0.7
WC-10-2021	20	10	0	20	30	1	0.15	1.8
WC-10-2021	20	20	0	0	30	1.5	0.2	1.85
WC-11-2021	0	0	0	0	75	0.55	0.05	0.9
WC-11-2021	0	0	0	0	0	0.08	0.7	0.2
WC-12-2021	0	0	0	0	20	0.8	0.04	1.15
WC-12-2021	0	100	0	0	0	1.8	0.1	0.25
WC-13-2021	30	0	0	0	0	1.4	0.25	1.7

Watercourse Name	Substrate % Sand	Substrate % Silt	Substrate % Clay	Substrate % Muck	Substrate % Detritus	Mean Wetted Width (m)	Mean Wetted Depth (m)	Mean Bankful Width (m)
WC-13-2021	20	0	0	0	0	2.8	0.15	2.9
WC-13-2021	50	0	0	0	0	4.95	0.15	5.25
WC-13-2021	0	50	0	0	0	4.45	0.2	4.75
WC-14-2021	0	0	0	0	85	0.25	0.04	0.45
WC-14-2021	33	0	33	0	0	1.15	0.1	1.2
WC-14-2021	0	0	0	0	0	0.25	0.16	0.35
WC-14-2021	0	0	0	0	0	0.6	0.45	0.8
WC-15-2021	0	0	0	100	0	0.35	0.05	0.65
WC-15-2021	0	0	0	20	0	0.35	0.1	0.6
WC-16-2021	0	0	0	0	0	1.1	0.25	1.2
WC-16-2021	40	0	0	0	0	1.1	0.05	1.25
WC-17-2021	0	80	0	0	0	0.7	0.18	0.9
WC-17-2021	5	0	0	0	10	1.2	0.1	1.9
WC-17-2021	0	80	0	0	0	1.55	0.12	1.82
WC-17-2021	0	20	0	0	0	0.55	0.25	1.05
WC-18-2021	25	20	0	30	25	3.2	0.25	3.55
WC-18-2021	25	25	0	30	20	3.1	0.25	3.2
WC-18-2021	25	0	0	0	5	2	0.2	2.8
WC-18-2021	10	0	0	0	5	2.6	0.15	2.9
WC-19-2021	0	0	0	50	50	1.55	0.18	2.55
WC-19-2021	30	0	0	0	10	2.3	0.03	2.8
WC-19-2021	30	20	0	0	20	1.3	0.1	1.5
WC-19-2021	20	10	0	0	10	0.9	0.07	1.55

Watercourse Name	Substrate % Sand	Substrate % Silt	Substrate % Clay	Substrate % Muck	Substrate % Detritus	Mean Wetted Width (m)	Mean Wetted Depth (m)	Mean Bankful Width (m)
WC-20-2021	10	0	0	35	35	0.65	0.03	0.85
WC-20-2021	35	0	0	0	30	0.75	0.03	1.1
WC-20-2021	40	0	0	0	30	0.4	0.18	0.5
WC-21-2021	35	0	0	35	30	0.6	0.05	1.1
WC-21-2021	30	0	0	0	25	1.1	0.08	1.5
WC-22-2021	30	0	0	30	25	0.69	0.02	0.99
WC-22-2021	35	0	0	0	30	0.6	0.05	1.4
WC-22-2021	35	0	0	0	30	1.2	0.1	1.35
WC-22-2021	40	0	0	0	20	1	0.11	1.25
WC-23-2021	0	0	0	0	20	0.86	0.09	1.55
WC-23-2021	20	15	0	0	15	1.4	0.22	1.4
WC-23-2021	20	0	0	10	50	0.89	0.13	1.19
WC-23-2021	0	0	0	0	35	0.2	0.03	1.6
WC-1-2022	5	0	0	0	10	0.55	0.15	0.7
WC-1-2022	0	0	0	0	0	0.9	0.2	1.3
WC-2-2022	20	0	0	0	60	1.7	0.35	2.05
WC-2-2022	30	0	0	0	30	1.7	0.28	2.4
WC-2-2022	20	10	0	0	35	1.25	0.28	1.6
WC-2-2022	20	0	0	0	30	2.75	0.4	3.05
WC-3-2022	10	0	0	0	30	0.5	0.1	0.8
WC-3-2022	0	0	0	0	20	0.9	0.07	1.3
WC-3-2022	5	0	0	0	25	0.8	0.1	1.6

Watercourse Name	Mean bankful Depth (m)	Bank Stability Left Upstream Bank	Bank Stability Right Upstream Bank	In Stream Cover - Undercut Banks %	In Stream Cover - Boulders %	In Stream Cover - Cobble %	In Stream Cover - Instream Woody Debris %
WC-1-2021	0.17	Vulnerable	Vulnerable	5	20	0	10
WC-1-2021	0.29	Vulnerable	Vulnerable	20	10	30	5
WC-1-2021	0.24	Vulnerable	Vulnerable	5	30	0	0
WC-1-2021	0.38	Protected	Protected	1	30	0	0
WC-2-2021	0.08	Vulnerable	Vulnerable	0	10	10	0
WC-3-2021	N/A	Vulnerable	Vulnerable	5	10	20	20
WC-3-2021	0.03	Vulnerable	Vulnerable	0	20	20	20
WC-3-2021	0.08	Vulnerable	Vulnerable	10	30	30	20
WC-4-2021	0.15	Protected	Protected	5	30	20	20
WC-4-2021	0.16	Protected	Protected	5	20	20	10
WC-4-2021	0.1	Protected	Protected	10	40	30	10
WC-4-2021	0.12	Vulnerable	Vulnerable	10	40	20	10
WC-5-2021-DS	0.15	Protected	Protected	0	30	20	0
WC-5-2021-DS	0.16	Protected	Protected	0	20	50	10
WC-5-2021-DS	0.15	Vulnerable	Vulnerable	5	5	50	0
WC-5-2021-DS	0.12	Vulnerable	Protected	10	20	30	0
WC-6-2021	0.15	Vulnerable	Vulnerable	0	60	5	0
WC-6-2021	0.1	Vulnerable	Vulnerable	10	10	5	0
WC-6-2021	0.1	Vulnerable	Deposition Zone	0	1	10	20
WC-5-2021-US	0.06	Vulnerable	Vulnerable	5	5	20	5
WC-5-2021-US	0.17	Eroding	Eroding	10	0	48	15
WC-8-2021	0.31	Eroding	Eroding	10	40	30	15
WC-8-2021	0.4	Vulnerable	Vulnerable	0	10	40	20
WC-8-2021	N/A	Vulnerable	Vulnerable	0	0	0	0
WC-8-2021	0.17	Vulnerable	Vulnerable	0	0	0	0
WC-9-2021	0.44	Vulnerable	Vulnerable	0	0	0	2
WC-9-2021	0.17	Vulnerable	Vulnerable	5	0	33	10
WC-9-2021	0.37	Vulnerable	Vulnerable	0	0	50	3
WC-9-2021	0.27	Vulnerable	Vulnerable	0	0	50	0
WC-10-2021	0.1	Vulnerable	Vulnerable	0	0	40	10
WC-10-2021	0.2	Vulnerable	Vulnerable	0	25	25	2
WC-10-2021	0.15	Vulnerable	Vulnerable	5	5	0	20
WC-10-2021	0.3	Vulnerable	Vulnerable	10	0	0	20
WC-10-2021	0.15	Protected	Protected	10	10	0	5
WC-11-2021	0.15	Vulnerable	Vulnerable	5	15	10	5
WC-11-2021	0.9	Protected	Protected	0	0	30	0
WC-12-2021	0.15	Vulnerable	Vulnerable	0	0	0	10
WC-12-2021	2.35	Vulnerable	Vulnerable	0	0	0	0
WC-13-2021	0.25	Eroding	Eroding	30	0	40	30

Watercourse Name	Mean bankful Depth (m)	Bank Stability Left Upstream Bank	Bank Stability Right Upstream Bank	In Stream Cover - Undercut Banks %	In Stream Cover - Boulders %	In Stream Cover - Cobble %	In Stream Cover - Instream Woody Debris %
WC-13-2021	0.5	Eroding	Eroding	60	10	60	5
WC-13-2021	0.2	Protected	Protected	1	20	30	20
WC-13-2021	0.35	Protected	Protected	0	20	30	5
WC-14-2021	0.3	Vulnerable	Vulnerable	0	15	0	0
WC-14-2021	0.05	Protected	Protected	0	10	0	0
WC-14-2021	0.05	Vulnerable	Vulnerable	0	20	0	10
WC-14-2021	0.1	Eroding	Eroding	20	20	40	10
WC-15-2021	0.12	Deposition Zone	Deposition Zone	0	0	0	1
WC-15-2021	0.2	Eroding	Eroding	10	10	80	20
WC-16-2021	0.25	Eroding	Eroding	10	20	20	5
WC-16-2021	0.3	Eroding	Eroding	10	40	0	10
WC-17-2021	0.25	Eroding	Eroding	30	30	0	10
WC-17-2021	0.15	Vulnerable	Vulnerable	0	0	20	0
WC-17-2021	0.2	Eroding	Eroding	20	20	20	35
WC-17-2021	0.6	Eroding	Eroding	40	60	0	15
WC-18-2021	0.2	Vulnerable	Vulnerable	5	0	0	10
WC-18-2021	0.3	Vulnerable	Vulnerable	0	0	0	15
WC-18-2021	0.2	Eroding	Vulnerable	10	0	0	5
WC-18-2021	0.2	Vulnerable	Vulnerable	0	5	0	20
WC-19-2021	0.1	Vulnerable	Vulnerable	0	0	0	5
WC-19-2021	0.3	Eroding	Vulnerable	5	0	0	30
WC-19-2021	0.25	Vulnerable	Vulnerable	5	0	15	15
WC-19-2021	0.25	Eroding	Eroding	20	0	0	10

Watercourse Name	Mean bankful Depth (m)	Bank Stability Left Upstream Bank	Bank Stability Right Upstream Bank	In Stream Cover - Undercut Banks %	In Stream Cover - Boulders %	In Stream Cover - Cobble %	In Stream Cover - Instream Woody Debris %
WC-20-2021	0.15	Vulnerable	Vulnerable	0	0	30	10
WC-20-2021	0.15	Vulnerable	Vulnerable	5	0	5	10
WC-20-2021	0.18	Vulnerable	Vulnerable	10	5	0	0
WC-21-2021	0.15	Vulnerable	Vulnerable	0	0	0	10
WC-21-2021	0.25	Vulnerable	Vulnerable	10	5	2	15
WC-22-2021	0.15	Eroding	Eroding	10	0	0	40
WC-22-2021	0.1	Vulnerable	Vulnerable	0	0	0	10
WC-22-2021	0.35	Vulnerable	Vulnerable	0	5	0	20
WC-22-2021	0.48	Vulnerable	Vulnerable	10	2	0	20
WC-23-2021	0.21	Vulnerable	Vulnerable	0	1	40	5
WC-23-2021	0.37	Vulnerable	Vulnerable	2	0	30	2
WC-23-2021	0.2	Vulnerable	Vulnerable	0	0	0	5
WC-23-2021	0.25	Vulnerable	Vulnerable	10	5	20	5
WC-1-2022	0.2	Protected	Protected	0	0	5	5
WC-1-2022	0.1	Eroding	Eroding	5	0	0	10
WC-2-2022	0.15	Vulnerable	Vulnerable	10	10	0	20
WC-2-2022	0.15	Protected	Protected	5	10	0	20
WC-2-2022	0.2	Vulnerable	Vulnerable	5	5	0	20
WC-2-2022	0.18	Protected	Protected	10	20	0	15
WC-3-2022	0.15	Protected	Protected	10	50	0	0
WC-3-2022	0.15	Protected	Protected	0	30	0	5
WC-3-2022	0.15	Protected	Protected	15	40	0	20

Watercourse Name	In Stream Cover - Overhanging Woody Debris %	In Stream Cover - Organic Debris %	In Stream Cover - Instream Vascular Macrophytes %	In Stream Cover - Overhanging Vascular Macrophytes %	Shore Cover
WC-1-2021	5	5	15	5	30-1%
WC-1-2021	15	0	10	0	30-1%
WC-1-2021	0	1	0	0	30-1%
WC-1-2021	0	0	0	0	30-1%
WC-2-2021	10	40	20	10	30-1%
WC-3-2021	10	10	20	0	60-30%
WC-3-2021	0	10	10	0	30-1%
WC-3-2021	0	10	10	0	30-1%
WC-4-2021	10	10	5	0	60-30%
WC-4-2021	10	5	0	0	30-1%
WC-4-2021	10	0	0	0	30-1%
WC-4-2021	0	0	0	0	30-1%
WC-5-2021-DS	0	5	10	10	30-1%
WC-5-2021-DS	0	0	0	0	30-1%
WC-5-2021-DS	0	10	0	0	30-1%
WC-5-2021-DS	0	10	0	0	60-30%
WC-6-2021	0	10	0	10	60-30%
WC-6-2021	30	10	0	0	60-30%
WC-6-2021	20	30	5	0	60-30%
WC-5-2021-US	0	5	0	0	30-1%
WC-5-2021-US	15	60	0	0	90-60%
WC-8-2021	30	45	0	0	60-30%
WC-8-2021	10	30	0	0	60-30%
WC-8-2021	10	10	10	10	30-1%
WC-8-2021	0	20	40	15	30-1%
WC-9-2021	1	35	25	25	30-1%
WC-9-2021	10	10	2	2	60-30%
WC-9-2021	3	15	5	2	30-1%
WC-9-2021	0	15	10	20	30-1%
WC-10-2021	5	15	30	0	30-1%
WC-10-2021	2	75	0	2	60-30%
WC-10-2021	10	10	0	0	30-15
WC-10-2021	10	30	0	0	30-1%
WC-10-2021	0	20	0	0	30-1%
WC-11-2021	5	75	4	4	90-60%
WC-11-2021	0	15	0	0	60-30%
WC-12-2021	10	80	0	0	60-30%
WC-12-2021	0	80	50	40	30-1%
WC-13-2021	35	40	20	5	60-30%

Watercourse Name	In Stream Cover - Overhanging Woody Debris %	In Stream Cover - Organic Debris %	In Stream Cover - Instream Vascular Macrophytes %	In Stream Cover - Overhanging Vascular Macrophytes %	Shore Cover
WC-13-2021	20	30	0	0	90-60%
WC-13-2021	30	20	10	5	90-60%
WC-13-2021	15	40	0	0	90-60%
WC-14-2021	10	95	0	0	100-90%
WC-14-2021	0	40	0	0	60-30%
WC-14-2021	10	20	5	5	90-60%
WC-14-2021	10	35	15	10	90-60%
WC-15-2021	1	60	20	80	60-30%
WC-15-2021	20	70	0	0	90-60%
WC-16-2021	10	20	0	0	None
WC-16-2021	10	5	1	3	90-60%
WC-17-2021	40	35	0	0	90-60%
WC-17-2021	0	15	0	0	60-30%
WC-17-2021	10	65	0	0	90-60%
WC-17-2021	15	20	0	0	90-60%
WC-18-2021	10	20	10	0	60-30%
WC-18-2021	5	15	5	0	60-30%
WC-18-2021	10	15	0	0	60-30%
WC-18-2021	5	10	0	0	60-30%
WC-19-2021	0	25	20	0	30-1%
WC-19-2021	10	5	0	0	60-30%
WC-19-2021	0	10	10	0	60-30%
WC-19-2021	10	10	0	0	60-30%

Watercourse Name	In Stream Cover - Overhanging Woody Debris %	In Stream Cover - Organic Debris %	In Stream Cover - Instream Vascular Macrophytes %	In Stream Cover - Overhanging Vascular Macrophytes %	Shore Cover
WC-20-2021	20	10	5	0	60-30%
WC-20-2021	5	20	5	0	90-60%
WC-20-2021	15	15	5	5	60-30%
WC-21-2021	0	20	20	0	60-30%
WC-21-2021	0	20	0	0	90-60%
WC-22-2021	10	30	0	0	90-60
WC-22-2021	0	50	0	0	90-60
WC-22-2021	5	30	0	0	90-60
WC-22-2021	5	10	0	0	90-60
WC-23-2021	0	5	0	0	90-60
WC-23-2021	0	20	0	0	90-60
WC-23-2021	0	10	1	1	90-60
WC-23-2021	5	5	5	0	90-60
WC-1-2022	25	20	5	0	30-1%
WC-1-2022	2	5	0	0	60-30%
WC-2-2022	10	30	0	0	60-30%
WC-2-2022	20	20	0	0	30-1%
WC-2-2022	10	20	0	0	30-1%
WC-2-2022	15	10	0	0	60-30%
WC-3-2022	10	20	0	0	30-1%
WC-3-2022	10	20	0	0	30-1%
WC-3-2022	10	15	0	0	30-1%

Watercourse Name	Vegetation Type	Migratory Obstructions - Seasonal/Temporary
WC-1-2021	30% submergent grasses, 5% emergent grasses	None
WC-1-2021	50% submergent mosses	None
WC-1-2021	40% submergent moss	None
WC-1-2021	40% submergent moss	Low water level
WC-2-2021	80% emergent grasses	Low water level
WC-3-2021	20% submergent moss	None
WC-3-2021	80% submergent moss	Low water level
WC-3-2021	70% submergent moss	None
WC-4-2021	25% submergent moss, 10% emergent grasses	None
WC-4-2021	None	None
WC-4-2021	None	None
WC-4-2021	None	None
WC-5-2021-DS	40% emergent grasses	None
WC-5-2021-DS	None	None
WC-5-2021-DS	None	None
WC-5-2021-DS	None	None
WC-6-2021	None	Low water level
WC-6-2021	None	Low water level
WC-6-2021	None	Low water level
WC-5-2021-US	40% emergent grasses	Low water level
WC-5-2021-US	None	None
WC-8-2021	None	Low water level
WC-8-2021	None	Low water level
WC-8-2021	10% submergent grass	Low water level
WC-8-2021	40% submergent moss/sphagnum	Low water level
WC-9-2021	25% submergent grass	Low water level
WC-9-2021	2% submergent grass	Low water level
WC-9-2021	15% submergent grass	Low water level
WC-9-2021	15% submergent grass	Low water level
WC-10-2021	30% submergent moss	Low water level
WC-10-2021	None	Low water level
WC-10-2021	None	Low water level
WC-10-2021	20% submergent mosses	Low water level
WC-10-2021	30% submergent mosses	Low water level
WC-11-2021	None	Low water level
WC-11-2021	None	Low water level
WC-12-2021	None	Low water level
WC-12-2021	100% emergent grass	Low water level
WC-13-2021	20% Submergent watercress, 1% emergent grass	None

Watercourse Name	Vegetation Type	Migratory Obstructions - Seasonal/Temporary
WC-13-2021	None	Low water level
WC-13-2021	10% submergent watercress, 2% emergent grass	None
WC-13-2021	None	None
WC-14-2021	None	Low water level
WC-14-2021	20% submergent moss	None
WC-14-2021	20% submergent moss	Low water level
WC-14-2021	15% submergent moss	Low water level
WC-15-2021	40% emergent glyceria striata, 20% submergent grass	Low water level
WC-15-2021	None	Low water level
WC-16-2021	None	Low water level
WC-16-2021	None	Low water level
WC-17-2021	None	Low water level
WC-17-2021	30% submergent pond weed	None
WC-17-2021	None	Low water level
WC-17-2021	None	Low water level
WC-18-2021	30% submergent mosses, 20% emergent grasses	None
WC-18-2021	40% emergent grasses	None
WC-18-2021	None	None
WC-18-2021	None	None
WC-19-2021	gent mosses, 50% emergent grasses and assorted herbs	Low water level
WC-19-2021	None	None
WC-19-2021	25% emergent grasses	Low water level
WC-19-2021	None	Low water level

Watercourse Name	Vegetation Type	Migratory Obstructions - Seasonal/Temporary
WC-20-2021	None	Low water level
WC-20-2021	50% emergent grasses	Low water level
WC-20-2021	20% submergent mosses, 20% emergent grasses	Low water level
WC-21-2021	60% emergent grasses	Low water level
WC-21-2021	None	Low water level
WC-22-2021	None	Low water level
WC-22-2021	None	Low water level
WC-22-2021	None	Low water level
WC-22-2021	None	Low water level
WC-23-2021	None	Low water level
WC-23-2021	None	Low water level
WC-23-2021	None	Low water level
WC-23-2021	50% emergent grasses	Low water level
WC-1-2022	5% submergent moss	Low water level
WC-1-2022	None	Low water level
WC-2-2022	60% submergent moss	None
WC-2-2022	60% submergent moss	None
WC-2-2022	40% submergent moss	None
WC-2-2022	None	None
WC-3-2022	20% submergent moss	Low water level
WC-3-2022	30% submergent moss	Low water level
WC-3-2022	40% submergent moss	Low water level

Watercourse Name	Migratory Obstructions - Permanent	Potential Critical Habitat Limiting
WC-1-2021	None	None
WC-1-2021	None	None
WC-1-2021	None	None
WC-1-2021	None	None
WC-2-2021	None	None
WC-3-2021	None	sible spawning habitat - not much gravel, good cover
WC-3-2021	None	None
WC-3-2021	None	None
WC-4-2021	None	None
WC-4-2021	None	None
WC-4-2021	None	None
WC-4-2021	None	None
WC-5-2021-DS	None	None
WC-5-2021-DS	None	None
WC-5-2021-DS	None	None
WC-5-2021-DS	None	None
WC-6-2021	Disconnected channel	None
WC-6-2021	Disconnected channel	None
WC-6-2021	Disconnected channel	none
WC-5-2021-US	Culvert too high	None
WC-5-2021-US	Low water level	no spawning habitat observed
WC-8-2021	Undefined Channel	Possible spawing habitat
WC-8-2021	Downstream beaver dam	Beaver dam
WC-8-2021	Undefined channel	no spawning habitat observed
WC-8-2021	Soft bottom, lack of channelization	no spawning habitat observed
WC-9-2021	None	Possible spawing habitat
WC-9-2021	None	Possible spawing habitat
WC-9-2021	Downed trees daming river	Possible spawing habitat
WC-9-2021	None	Flows through a fen so likely not
WC-10-2021	Undefined Channel	None
WC-10-2021	Undefined Channel	Possible spawing habitat
WC-10-2021	None	None
WC-10-2021	None	None
WC-10-2021	None	None
WC-11-2021	undefined channel, low velocity	no spawning habitat observed
WC-11-2021	None	Possible spawing habitat
WC-12-2021	None	None
WC-12-2021	None	Not good habitat
WC-13-2021	High Riffle System	High DO, clear water, deep pools, gravel substrate

Watercourse Name	Migratory Obstructions - Permanent	Potential Critical Habitat Limiting
WC-13-2021	None	potential habitat
WC-13-2021	Downed trees daming river	stream, good fish habitat, evidence of groundwater
WC-13-2021	None	Good habitat for spawning
WC-14-2021	None	None
WC-14-2021	None	None
WC-14-2021	None	Good substrate, water level may affect this
WC-14-2021	None	Water flows fully underground
WC-15-2021	Not channelized	None
WC-15-2021	Not channelized	None
WC-16-2021	None	None
WC-16-2021	None	None
WC-17-2021	None	None
WC-17-2021	None	None
WC-17-2021	None	None
WC-17-2021	Not channelized	None
WC-18-2021	None	None
WC-18-2021	None	None
WC-18-2021	None	None
WC-18-2021	None	None
WC-19-2021	None	None
WC-19-2021	None	None
WC-19-2021	None	None
WC-19-2021	None	None

Watercourse Name	Migratory Obstructions - Permanent	Potential Critical Habitat Limiting
WC-20-2021	None	None
WC-20-2021	None	None
WC-20-2021	None	None
WC-21-2021	None	None
WC-21-2021	None	None
WC-22-2021	None	None
WC-22-2021	None	None
WC-22-2021	None	None
WC-22-2021	None	None
WC-23-2021	None	None
WC-23-2021	None	None
WC-23-2021	None	None
WC-23-2021	None	None
WC-1-2022	Fallen wood	Possible spawing habitat
WC-1-2022	Fallen wood	Possible spawing habitat
WC-2-2022	None	None
WC-2-2022	None	None
WC-2-2022	None	None
WC-2-2022	None	None
WC-3-2022	None	None
WC-3-2022	None	None
WC-3-2022	None	None

Watercourse Name	Riparian Community Left Upstream Bank - 1.5-10 m	Riparian Community Left Upstream Bank - 10-30 m	Riparian Community Left Upstream Bank - 30+ m	Riparian Community Right Upstream Bank - 1.5-10 m	Riparian Community Right Upstream Bank - 10-30 m
WC-1-2021	Forest	Forest	Forest	Forest	Forest
WC-1-2021	Forest	Forest	Forest	Forest	Forest
WC-1-2021	Forest	Forest	Forest	Forest	Forest
WC-1-2021	Forest	Forest	Forest	Forest	Forest
WC-2-2021	Forest	Forest	Forest	Forest	Forest
WC-3-2021	Forest	Forest	Forest	Forest	Forest
WC-3-2021	Forest	Forest	Forest	Forest	Forest
WC-3-2021	Forest	Forest	Forest	Forest	Forest
WC-4-2021	Forest	Forest	Forest	Forest	Forest
WC-4-2021	Forest	Forest	Forest	Forest	Forest
WC-4-2021	Forest	Forest	Forest	Forest	Forest
WC-4-2021	Forest	Forest	Forest	Forest	Forest
WC-5-2021-DS	Scrubland	Forest	Forest	Scrubland	Forest
WC-5-2021-DS	Forest	Forest/Scrubland	Forest/Scrubland	Forest	Forest/Scrubland
WC-5-2021-DS	Forest	Forest	Forest	Forest	Scrubland
WC-5-2021-DS	Forest	Forest	Forest	Forest	Forest
WC-6-2021	Forest	Forest	Forest	Forest	Forest
WC-6-2021	Forest	Forest	Forest	Forest	Forest
WC-6-2021	Forest	Forest	Forest	Forest	Forest
WC-5-2021-US	Scrubland	Scrubland	Forest	Scrubland	None/Road
WC-5-2021-US	Forest	Forest	Forest	Forest	Forest
WC-8-2021	Forest	Forest	Forest	Forest	Forest
WC-8-2021	Forest	Forest	Forest	Forest	Forest
WC-8-2021	Forest	Forest	Forest	Forest	Forest
WC-8-2021	Forest	Forest	Forest	Forest	Forest
WC-9-2021	Forest	Forest	Forest	Forest	Forest
WC-9-2021	Forest	Forest	Forest	Forest	Forest
WC-9-2021	Forest	Forest	Forest	Forest	Forest
WC-9-2021	Forest	Forest	Forest	Forest	Forest
WC-10-2021	Forest	Forest	Forest/Scrubland	Forest	Forest
WC-10-2021	Forest	Forest	Scrubland	Forest	Forest
WC-10-2021	Forest	Forest	Forest	Forest	Forest
WC-10-2021	Forest	Forest	Forest	Forest	Forest
WC-10-2021	Forest	Forest	Forest	Forest	Forest
WC-11-2021	Forest	Forest	Forest	Forest	Forest
WC-11-2021	Forest	Forest	Forest	Forest	Forest
WC-12-2021	Forest	Forest	Forest	Forest	Forest
WC-12-2021	Forest	Forest	Forest	Forest	Forest
WC-13-2021	Forest	Forest	Forest	Forest	Forest

Watercourse Name	Riparian Community Left Upstream Bank - 1.5-10 m	Riparian Community Left Upstream Bank - 10-30 m	Riparian Community Left Upstream Bank - 30+ m	Riparian Community Right Upstream Bank - 1.5-10 m	Riparian Community Right Upstream Bank - 10-30 m
WC-13-2021	Forest	Forest	Forest	Forest	Forest
WC-13-2021	Forest	Forest	Forest	Forest	Forest
WC-13-2021	Forest	Forest	Forest	Forest	Forest
WC-14-2021	Forest	Forest	Forest	Forest	Forest
WC-14-2021	Forest	Forest	Forest	Forest	Forest
WC-14-2021	Forest	Forest	Forest	Forest	Forest
WC-14-2021	Forest	Forest	Forest	Forest	Forest
WC-15-2021	Forest	Forest	Forest	Forest	Forest
WC-15-2021	Forest	Forest	Forest	Forest	Forest
WC-16-2021	Forest	Forest	Forest	Forest	Forest
WC-16-2021	Forest	Forest	Forest	Forest	Forest
WC-17-2021	Forest	Forest	Forest	Forest	Forest
WC-17-2021	Forest	Forest	Forest	Forest	Forest
WC-17-2021	Forest	Forest	Forest	Forest	Forest
WC-17-2021	Forest	Forest	Forest	Forest	Forest
WC-18-2021	Forest	Forest	Forest	Forest	Forest
WC-18-2021	Forest	Forest	Forest	Forest	Forest
WC-18-2021	Forest	Forest	Forest	Forest	Forest
WC-18-2021	Forest	Forest	Forest	Forest	Forest
WC-19-2021	Meadow	Forest	Forest	Scrubland/Forest	Forest
WC-19-2021	Forest	Forest	Forest	Forest	Forest
WC-19-2021	Forest	Forest	Forest	Forest	Forest
WC-19-2021	Forest	Forest	Forest	Forest	Forest

Watercourse Name	Riparian Community Left Upstream Bank - 1.5-10 m	Riparian Community Left Upstream Bank - 10-30 m	Riparian Community Left Upstream Bank - 30+ m	Riparian Community Right Upstream Bank - 1.5-10 m	Riparian Community Right Upstream Bank - 10-30 m
WC-20-2021	Forest	Forest	Forest	Forest	Forest
WC-20-2021	Forest	Forest/Road	Forest	Forest	Forest
WC-20-2021	Forest	Forest	Forest	Forest	Forest
WC-21-2021	Forest	Forest	Forest	Forest	Forest/Road
WC-21-2021	Forest	Forest	Forest	Forest	Forest
WC-22-2021	Forest	Forest	Forest	Forest	Forest
WC-22-2021	Forest	Forest	Forest	Forest	Forest
WC-22-2021	Forest	Forest	Forest/Road	Forest	Forest
WC-22-2021	Forest	Forest	Forest	Forest	Forest
WC-23-2021	Forest	Forest	Forest	Forest	Forest/Road
WC-23-2021	Forest	Forest	Forest	Forest	Forest
WC-23-2021	Forest	Forest	Forest	Forest	Forest
WC-23-2021	Forest	Forest	Forest	Forest	Forest
WC-1-2022	Forest	Scrubland	Scrubland	Forest	Scrubland
WC-1-2022	Forest	Forest	Forest	Forest	Forest
WC-2-2022	Forest	Forest	Forest	Forest	Forest
WC-2-2022	Forest	Forest	Forest	Forest	Forest
WC-2-2022	Forest	Forest	Forest	Forest	Forest
WC-2-2022	Forest	Forest	Forest	Forest	Forest
WC-3-2022	Forest	Forest	Forest	Forest	Forest
WC-3-2022	Forest	Forest	Forest	Forest	Forest
WC-3-2022	Forest	Forest	Forest	Forest	Forest

Watercourse Name	Riparian Community Right Upstream Bank - 30+ m	Water Temperature (°C)	Dissolved Oxygen %	Dissolved Oxygen mg/L	Conductivity (µS/cm)	Total Dissolved Solids (mg/L)	pH
WC-1-2021	Forest	8.9	84.2	9.55	33.6	22	3.98
WC-1-2021	Road/Forest	9.2	86.7	9.77	29.6	19	3.86
WC-1-2021	Forest	10	92.6	10.22	28.7	19	3.84
WC-1-2021	Forest	9.7	90.8	10.1	29.3	19	3.88
WC-2-2021	Forest	9.1	39.8	4.49	23.2	15	4.43
WC-3-2021	Forest	12.3	70.6	7.39	40.2	26	3.64
WC-3-2021	Forest	12.3	79.6	8.35	39.7	26	3.75
WC-3-2021	Forest	12.3	78.4	8.25	39.1	25.35	3.83
WC-4-2021	Forest	12.1	69.1	7.22	39.5	25.35	3.31
WC-4-2021	Forest	12.1	82.3	8.62	39.1	25.35	3.7
WC-4-2021	Forest	12.1	100.9	10.64	39	25.35	3.85
WC-4-2021	Forest	12.2	100.9	10.57	37.9	24.7	3.94
WC-5-2021-DS	Forest	10	77.2	8.51	32.7	21	4.07
WC-5-2021-DS	Forest/Scrubland	14.7	67.7	6.62	35.7	23.4	3.7
WC-5-2021-DS	Scrubland	14.7	77.6	7.65	34.8	22.75	3.71
WC-5-2021-DS	Forest	14.7	89	8.79	35.4	22.75	3.63
WC-6-2021	Forest	12.4	36.3	3.76	27.2	17.55	4.34
WC-6-2021	Forest	12.7	54.1	5.56	26.6	17.55	4.36
WC-6-2021	Forest	13.2	43.8	4.46	28.1	18.2	4.5
WC-5-2021-US	Scrubland	13	59.2	6.05	28.7	18.85	4.86
WC-5-2021-US	Forest	10.2	88.7	9.81	27.4	17.55	4.55
WC-8-2021	Forest	10.1	8.9	9.04	25.4	16.25	3.94
WC-8-2021	Forest	10.2	72.4	8.01	25.8	16.9	4.5
WC-8-2021	Forest	10.6	32.4	3.55	26.4	16.9	4.1
WC-8-2021	Forest	10.5	38.1	4.19	25.9	16.9	4.09
WC-9-2021	Forest	11.9	83.3	8.84	31.4	20.15	3.59
WC-9-2021	Forest	12.4	103.5	10.82	31.4	20.15	3.64
WC-9-2021	Forest	11.7	103.8	11.8	31	20.15	3.37
WC-9-2021	Forest	11.6	91.2	9.74	31.4	20.15	3.67
WC-10-2021	Forest	10.7	48.8	5.31	51.7	33.8	3.49
WC-10-2021	Scrubland	9.3	66.1	7.42	46.4	29.9	3.53
WC-10-2021	Forest	11	106.2	11.55	55.9	36.4	3.14
WC-10-2021	Forest	11	84.6	9.19	54.9	35.75	3.38
WC-10-2021	Forest	11.1	83.2	8.98	53.1	34.45	3.42
WC-11-2021	Forest	9.1	92.1	10.44	33.2	21.45	3.07
WC-11-2021	Forest	10.4	106.6	11.64	31.7	20.8	3.62
WC-12-2021	Forest	12.8	66.7	6.89	30.1	N/A	3.8
WC-12-2021	Forest	12.9	86.6	8.32	28.9	18.89	3.95
WC-13-2021	Forest	11.8	106.9	11.37	26.8	17.56	4.65

Watercourse Name	Riparian Community Right Upstream Bank - 30+ m	Water Temperature (°C)	Dissolved Oxygen %	Dissolved Oxygen mg/L	Conductivity (µS/cm)	Total Dissolved Solids (mg/L)	pH
WC-13-2021	Forest	11.2	93.1	9.99	27.4	17.55	4.77
WC-13-2021	Forest	11.9	104.6	11.11	26.8	17.55	4.39
WC-13-2021	Forest	12	92	9.76	26.9	17.55	4.64
WC-14-2021	Forest	11.6	79.5	8.47	25.3	16.25	4.21
WC-14-2021	Forest	11.9	92.3	9.78	26.5	16.9	4.67
WC-14-2021	Forest	12	107.3	11.37	26.8	17.55	5.06
WC-14-2021	Forest	11.9	100.1	10.53	26.8	17.55	5.06
WC-15-2021	Forest	12	31.6	3.17	48.2	31.2	4.43
WC-15-2021	Forest	11.6	21.3	2.3	38.3	24.7	4.47
WC-16-2021	Forest	11.1	66.5	7.11	31.6	20.8	4.96
WC-16-2021	Forest	10.9	98.4	10.6	31	20.15	4.85
WC-17-2021	Forest	11	48.6	5.23	31.1	20.15	4.52
WC-17-2021	Forest	10.9	41.9	4.54	29	18.85	4.33
WC-17-2021	Forest	11.2	17.8	1.89	31.6	20.15	4.49
WC-17-2021	Forest	11	27.6	2.96	31.3	20.15	4.42
WC-18-2021	Forest	10.8	57.7	6.25	31.8	20.8	3.64
WC-18-2021	Forest	10.6	34.4	3.74	33.2	21.45	3.99
WC-18-2021	Forest	10.9	67.4	7.29	31.4	20.15	3.81
WC-18-2021	Forest	11.1	82.1	8.84	31.2	20.15	3.82
WC-19-2021	Forest	10.8	44.9	4.86	36.9	24.05	4.28
WC-19-2021	Forest	10.1	38.8	4.28	35.2	22.75	3.82
WC-19-2021	Forest	10.4	36.5	4	34.8	22.75	4.26
WC-19-2021	Forest	10.4	79.5	8.7	33.4	21.45	4.12

Watercourse Name	Riparian Community Right Upstream Bank - 30+ m	Water Temperature (°C)	Dissolved Oxygen %	Dissolved Oxygen mg/L	Conductivity (µS/cm)	Total Dissolved Solids (mg/L)	pH
WC-20-2021	Forest	10.2	45.2	4.97	33	21.45	4.43
WC-20-2021	Forest	10.3	55	6.03	28.1	18.2	4.65
WC-20-2021	Forest	10	65.9	7.3	26.7	17.55	4.57
WC-21-2021	Forest	11	15.4	1.67	37.5	N/A	5.9
WC-21-2021	Forest	9.2	15.2	1.71	30	N/A	5.6
WC-22-2021	Forest	10.8	26.6	2.89	26.7	N/A	4.95
WC-22-2021	Forest	9.7	16.3	1.82	31.4	N/A	4.58
WC-22-2021	Forest	9	19	2.16	27.4	N/A	4.79
WC-22-2021	Forest	9.7	31.2	3.5	27.3	N/A	5.22
WC-23-2021	Forest	9.1	45.1	5.13	35.1	N/A	4.01
WC-23-2021	Forest	9	49.6	5.71	31.5	N/A	4.36
WC-23-2021	Forest	10	10.4	1.13	31.1	N/A	6.86
WC-23-2021	Forest	9.2	41.9	4.74	29.9	N/A	4.64
WC-1-2022	Scrubland	10.2	99.2	N/A	50.4	32.5	3.19
WC-1-2022	Forest	10.1	94.6	10.51	50	32.5	3.38
WC-2-2022	Forest	11	44.4	4.79	45.2	29.25	3.65
WC-2-2022	Forest	10.9	57.6	6.24	49.9	32.5	3.57
WC-2-2022	Forest	10.8	85.8	9.33	49.7	32.5	3.46
WC-2-2022	Forest	10.7	96	10.37	49.5	32.5	3.35
WC-3-2022	Forest	10.9	49.2	5.32	52.3	33.8	3.52
WC-3-2022	Forest	10.9	70.2	7.62	51.8	33.8	3.49
WC-3-2022	Forest	10.9	95.1	10.31	49.9	32.5	3.44

Watercourse Name	ORP (mV)	Velocity (m/s)
WC-1-2021	379.6	0.155
WC-1-2021	431.3	0.302
WC-1-2021	448.4	0.327
WC-1-2021	446.1	0.418
WC-2-2021	424.1	N/A
WC-3-2021	414.5	0.588
WC-3-2021	413.1	0.4
WC-3-2021	416.6	0.25
WC-4-2021	378.9	0.909
WC-4-2021	371.7	0.838
WC-4-2021	376.1	0.833
WC-4-2021	374.2	0.5
WC-5-2021-DS	416.6	0.388
WC-5-2021-DS	387.6	0.909
WC-5-2021-DS	384.9	0.833
WC-5-2021-DS	392.7	0.909
WC-6-2021	328.4	0.07
WC-6-2021	355.8	0
WC-6-2021	355.5	0
WC-5-2021-US	310.4	N/A
WC-5-2021-US	375.7	N/A
WC-8-2021	399.8	N/A
WC-8-2021	364.8	N/A
WC-8-2021	349.5	N/A
WC-8-2021	315.2	0.07
WC-9-2021	386.4	0.08
WC-9-2021	393.2	0.43
WC-9-2021	404.3	0.41
WC-9-2021	357.8	0.0337
WC-10-2021	386.4	N/A
WC-10-2021	393.9	N/A
WC-10-2021	430	0.376
WC-10-2021	416.4	0.303
WC-10-2021	414.7	0.351
WC-11-2021	430	0.5
WC-11-2021	368.2	0.19
WC-12-2021	394	0.36
WC-12-2021	377.9	0.2
WC-13-2021	356.9	0.185

Watercourse Name	ORP (mV)	Velocity (m/s)
WC-13-2021	303.4	0.333
WC-13-2021	351.9	0.211
WC-13-2021	335.9	0.09
WC-14-2021	384.9	N/A
WC-14-2021	342.3	0.094
WC-14-2021	339.2	0.1
WC-14-2021	345.3	0.11
WC-15-2021	278.5	N/A
WC-15-2021	292.9	N/A
WC-16-2021	312.7	N/A
WC-16-2021	333.3	N/A
WC-17-2021	293.2	<0.05
WC-17-2021	335.7	N/A
WC-17-2021	293.4	N/A
WC-17-2021	311.8	N/A
WC-18-2021	352.6	N/A
WC-18-2021	281.4	N/A
WC-18-2021	339.8	N/A
WC-18-2021	359.1	N/A
WC-19-2021	281.2	N/A
WC-19-2021	337.7	N/A
WC-19-2021	295.4	N/A
WC-19-2021	329.6	N/A

Watercourse Name	ORP (mV)	Velocity (m/s)
WC-20-2021	283.2	N/A
WC-20-2021	271.3	N/A
WC-20-2021	295.9	N/A
WC-21-2021	123.7	N/A
WC-21-2021	150.4	N/A
WC-22-2021	173.9	N/A
WC-22-2021	181.5	N/A
WC-22-2021	181.3	N/A
WC-22-2021	168	N/A
WC-23-2021	223.3	0
WC-23-2021	212.5	N/A
WC-23-2021	110.6	N/A
WC-23-2021	202.1	N/A
WC-1-2022	437.8	0.17
WC-1-2022	423.7	0.226
WC-2-2022	411	0.18
WC-2-2022	415.6	0.191
WC-2-2022	417.9	0.366
WC-2-2022	431.6	0.389
WC-3-2022	433.8	0.352
WC-3-2022	447.3	0.32
WC-3-2022	449	0.42

Table A-3: Watercourse Quality Parameters measured *in-situ* for the Benjamins Mill Wind Project

Watercourse Name	Assessed Location	Date	Temp. °C	DO mg/L	pH	Cond. µS/cm	TDS mg/L	ORP mV
WC-1-2021	T1	1-11-2022	8.9	9.55	3.98	33.6	22	379.6
WC-1-2021	T2	1-11-2022	9.2	9.77	3.86	29.6	19	431.3
WC-1-2021	T3	1-11-2022	10	10.22	3.84	28.7	19	448.4
WC-1-2021	T4	1-11-2022	9.7	10.1	3.88	29.3	19	446.1
WC-2-2021	T1	1-11-2022	9.1	4.49	4.43	23.2	15	424.1
WC-3-2021	T1	20-10-2022	12.3	7.39	3.64	40.2	26	414.5
WC-3-2021	T2	20-10-2022	12.3	8.35	3.75	39.7	26	413.1
WC-3-2021	T3	20-10-2022	12.3	8.25	3.83	39.1	25.35	416.6
WC-4-2021	T1	20-10-2022	12.1	7.22	3.31	39.5	25.35	378.9
WC-4-2021	T2	20-10-2022	12.1	8.62	3.7	39.1	25.35	371.7
WC-4-2021	T3	20-10-2022	12.1	10.64	3.85	39	25.35	376.1
WC-4-2021	T4	20-10-2022	12.2	10.57	3.94	37.9	24.7	374.2
WC-5-2021-DS	T1	1-11-2022	10	8.51	4.07	32.7	21	416.6
WC-5-2021-DS	T2	19-10-2022	14.7	6.62	3.7	35.7	23.4	387.6
WC-5-2021-DS	T3	19-10-2022	14.7	7.65	3.71	34.8	22.75	384.9
WC-5-2021-DS	T4	19-10-2022	14.7	8.79	3.63	35.4	22.75	392.7
WC-6-2021	T1	19-10-2022	12.4	3.76	4.34	27.2	17.55	328.4
WC-6-2021	T2	19-10-2022	12.7	5.56	4.36	26.6	17.55	355.8
WC-6-2021	T3	19-10-2022	13.2	4.46	4.5	28.1	18.2	355.5
WC-5-2021-US	T1	19-10-2022	13	6.05	4.86	28.7	18.85	310.4
WC-5-2021-US	T2	14-10-2022	10.2	9.81	4.55	27.4	17.55	375.7
WC-8-2021	T1	14-10-2022	10.1	9.04	3.94	25.4	16.25	399.8
WC-8-2021	T2	14-10-2022	10.2	8.01	4.5	25.8	16.9	364.8
WC-8-2021	T3	14-10-2022	10.6	3.55	4.1	26.4	16.9	349.5
WC-8-2021	T4	14-10-2022	10.5	4.19	4.09	25.9	16.9	315.2
WC-9-2021	T1	13-10-2022	11.9	8.84	3.59	31.4	20.15	386.4
WC-9-2021	T2	13-10-2022	12.4	10.82	3.64	31.4	20.15	393.2
WC-9-2021	T3	14-10-2022	11.7	11.8	3.37	31	20.15	404.3
WC-9-2021	T4	14-10-2022	11.6	9.74	3.67	31.4	20.15	357.8
WC-10-2021	T1	12-10-2022	10.7	5.31	3.49	51.7	33.8	386.4
WC-10-2021	T2	12-10-2022	9.3	7.42	3.53	46.4	29.9	393.9
WC-10-2021	T3	21-10-2022	11	11.55	3.14	55.9	36.4	430
WC-10-2021	T4	21-10-2022	11	9.19	3.38	54.9	35.75	416.4
WC-10-2021	T5	21-10-2022	11.1	8.98	3.42	53.1	34.45	414.7
WC-10 backchannel	T1	12-10-2022	10.2	N/A	3.19	50.4	32.5	437.8
WC-10 backchannel	T2	12-10-2022	10.1	10.51	3.38	50	32.5	423.7
WC-11-2021	T1	12-10-2022	9.1	10.44	3.07	33.2	21.45	430
WC-11-2021	T2	12-10-2022	10.4	11.64	3.62	31.7	20.8	368.2

Watercourse Name	Assessed Location	Date	Temp. °C	DO mg/L	pH	Cond. µS/cm	TDS mg/L	ORP mV
WC-12-2021	T1	07-10-2022	12.8	6.89	3.8	30.1	N/A	394
WC-12-2021	T2	07-10-2022	12.9	8.32	3.95	28.9	18.89	377.9
WC-13-2021	T1	07-10-2022	11.8	11.37	4.65	26.8	17.56	356.9
WC-13-2021	T2	07-10-2022	11.2	9.99	4.77	27.4	17.55	303.4
WC-13-2021	T3	07-10-2022	11.9	11.11	4.39	26.8	17.55	351.9
WC-13-2021	T4	07-10-2022	12	9.76	4.64	26.9	17.55	335.9
WC-14-2021	T1	07-10-2022	11.6	8.47	4.21	25.3	16.25	384.9
WC-14-2021	T2	07-10-2022	11.9	9.78	4.67	26.5	16.9	342.3
WC-14-2021	T3	07-10-2022	12	11.37	5.06	26.8	17.55	339.2
WC-14-2021	T4	07-10-2022	11.9	10.53	5.06	26.8	17.55	345.3
WC-15-2021	T1	06-10-2022	12	3.17	4.43	48.2	31.2	278.5
WC-15-2021	T2	06-10-2022	11.6	2.3	4.47	38.3	24.7	292.9
WC-16-2021	T1	06-10-2022	11.1	7.11	4.96	31.6	20.8	312.7
WC-16-2021	T2	06-10-2022	10.9	10.6	4.85	31	20.15	333.3
WC-17-2021	T1	06-10-2022	11	5.23	4.52	31.1	20.15	293.2
WC-17-2021	T2	05-10-2022	10.9	4.54	4.33	29	18.85	335.7
WC-17-2021	T3	06-10-2022	11.2	1.89	4.49	31.6	20.15	293.4
WC-17-2021	T4	06-10-2022	11	2.96	4.42	31.3	20.15	311.8
WC-18-2021	T1	05-10-2022	10.8	6.25	3.64	31.8	20.8	352.6
WC-18-2021	T2	05-10-2022	10.6	3.74	3.99	33.2	21.45	281.4
WC-18-2021	T3	05-10-2022	10.9	7.29	3.81	31.4	20.15	339.8
WC-18-2021	T4	05-10-2022	11.1	8.84	3.82	31.2	20.15	359.1
WC-19-2021	T1	05-10-2022	10.8	4.86	4.28	36.9	24.05	281.2
WC-19-2021	T2	05-10-2022	10.1	4.28	3.82	35.2	22.75	337.7
WC-19-2021	T3	05-10-2022	10.4	4	4.26	34.8	22.75	295.4
WC-19-2021	T4	05-10-2022	10.4	8.7	4.12	33.4	21.45	329.6
WC-20-2021	T1	05-10-2022	10.2	4.97	4.43	33	21.45	283.2
WC-20-2021	T2	05-10-2022	10.3	6.03	4.65	28.1	18.2	271.3
WC-20-2021	T3	05-10-2022	10	7.3	4.57	26.7	17.55	295.9
WC-21-2021	T1	04-10-2022	11	1.67	5.9	37.5	N/A	123.7
WC-21-2021	T2	04-10-2022	9.2	1.71	5.6	30	N/A	150.4
WC-22-2021	T1	04-10-2022	10.8	2.89	4.95	26.7	N/A	173.9
WC-22-2021	T2	04-10-2022	9.7	1.82	4.58	31.4	N/A	181.5
WC-22-2021	T3	04-10-2022	9	2.16	4.79	27.4	N/A	181.3
WC-22-2021	T4	04-10-2022	9.7	3.5	5.22	27.3	N/A	168
WC-23-2021	T1	04-10-2022	9.1	5.13	4.01	35.1	N/A	223.3
WC-23-2021	T2	04-10-2022	9	5.71	4.36	31.5	N/A	212.5
WC-23-2021	T3	04-10-2022	10	1.13	6.86	31.1	N/A	110.6
WC-23-2021	T4	04-10-2022	9.2	4.74	4.64	29.9	N/A	202.1
WC-24-2022	T1	21-10-2022	11	4.79	3.65	45.2	29.25	411

Watercourse Name	Assessed Location	Date	Temp. °C	DO mg/L	pH	Cond. µS/cm	TDS mg/L	ORP mV
WC-24-2022	T2	21-10-2022	10.9	6.24	3.57	49.9	32.5	415.6
WC-24-2022	T3	21-10-2022	10.8	9.33	3.46	49.7	32.5	417.9
WC-24-2022	T4	21-10-2022	10.7	10.37	3.35	49.5	32.5	431.6
WC-25-2022	T1	21-10-2022	10.9	5.32	3.52	52.3	33.8	433.8
WC-25-2022	T2	21-10-2022	10.9	7.62	3.49	51.8	33.8	447.3
WC-25-2022	T3	21-10-2022	10.9	10.31	3.44	49.9	32.5	449

Appendix B

Photographs

WC-1-2021

T1 November 1, 2022 at upstream edge of PDA

T2 November 1, 2022 at road crossing (bridge) of PDA

T3 November 1, 2022 at downstream edge of PDA

T4 November 1, 2022 50m downstream from edge of PDA

WC-2-2021

T1 November 1, 2022 at road crossing (bridge) of PDA

October 20, 2022 upland of T1 flooded wetland, no channel

Inlet of WC-2-2021 into WC-1-2021 November 1, 2022 inside PDA

Close-up of inlet of WC-2-2021 into WC-1-2021 November 1, 2022 inside PDA

WC-3-2021

Upland edge of PDA October 20, 2022 no channelization

T1 October 20, 2022 at road crossing (culvert) of PDA

T2 October 20, 2022 at downstream edge of PDA

T3 October 20, 2022 50m downstream from edge of PDA

WC-4-2021

T1 October 20, 2022 at upstream edge of PDA

T2 October 20, 2022 at road crossing (bridge) of PDA

T3 October 20, 2022 at downstream edge of PDA

T4 October 20, 2022 50m downstream from edge of PDA

WC-5-2021-DS (Downstream)*map features do not line up with the road structure actually on the ground

T1 November 1, 2022 at upstream edge of PDA

T2 October 19, 2022 at road crossing (no structure) of PDA

T3 October 19, 2022 at downstream edge of PDA

T4 October 19, 2022 50m downstream from edge of PDA

WC-5-2021-DS (continued)

T1 November 1, 2022 upstream at bottom of pond

T2 October 19, 2022 upstream at road crossing (no structure) of PDA

T2 October 19, 2022 left upstream bank

T2 October 19, 2022 right upstream bank

WC-6-2021

October 19, 2022 upland edge of PDA (wetland, no channel)

T1 October 19, 2022 upstream at road crossing (culvert) of PDA

T2 October 19, 2022 downstream edge of PDA

T3 October 19, 2022 downstream 50m of PDA

WC-5-2021-US (Upstream)

October 14, 2022 upstream of road crossing (wetland, no channel)

T1 October 19, 2022 raised culvert at road crossing

T1 October 19, 2022 small channel produced from culvert

T2 October 14, 2022 downstream at edge of PDA

WC-8-2021

T1 October 14, 2022 at upstream edge of PDA

T2 October 14, 2022 at road crossing (culvert) of PDA

T3 October 14, 2022 at downstream edge of PDA

T4 October 14, 2022 50m downstream from edge of PDA

WC-9-2021

T1 October 13, 2022 at upstream edge of PDA

T2 October 13, 2022 at road crossing of PDA

T3 October 14, 2022 at downstream edge of PDA

T4 October 14, 2022 50m downstream from edge of PDA

WC-10-2021

T2 October 12, 2022 at upstream edge of crossing in PDA

T3 October 21, 2022 at downstream edge of crossing in PDA

T4 October 21, 2022 at downstream edge of PDA

T5 October 21, 2022 50m downstream from edge of PDA

WC-10-2021 Back Channel

T1 October 12, 2022 at upstream edge of PDA

T1 October 12, 2022 substrate of watercourse

T2 October 12, 2022 near road crossing of PDA

T2 October 12, substrate of watercourse

WC-11-2021

T1 October 12, 2022 at upstream edge of PDA

T2 October 12, 2022 at road crossing of PDA

T2 October 12, 2022 at road crossing of PDA

T4 October 14, 2022 50m downstream from edge of PDA

WC-12-2021

October 7, 2022 upland edge of PDA (wetland, no channel)

T1 October 7, 2022 halfway between edge of PDA and road crossing

T2 October 7, 2022 at road crossing (culvert) of PDA

T2 October 7, 2022 at road crossing (culvert)of PDA

WC-13-2021

T1 October 7, 2022 at upstream edge of PDA

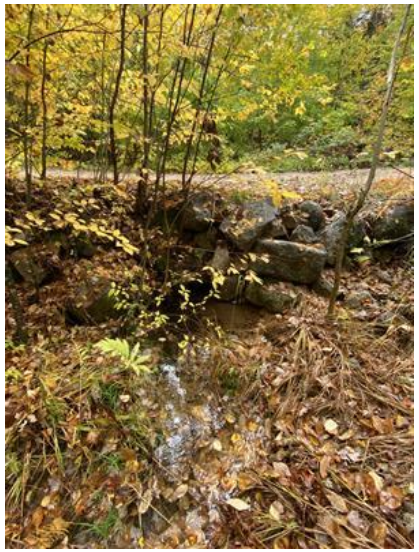
T2 October 7, 2022 at road crossing of PDA

T3 October 7, 2022 at downstream edge of PDA

T4 October 7, 2022 50m downstream from edge of PDA

WC-14-2021

T1 October 7, 2022 at upstream edge of PDA



T2 October 7, 2022 at road crossing of PDA

T3 October 7, 2022 at downstream edge of PDA

T4 October 7, 2022 50m downstream from edge of PDA

WC-15-2021 & WC-16-2021

WC-15-T1 October 6, 2022 at road crossing of PDA

WC-15-T2 October 6, 2022 at downstream edge of PDA

WC-16-T1 October 6, 2022 at upstream edge of PDA

WC-16-T2 October 6, 2022 at road crossing of PDA

WC-17-2021

T1 October 6, 2022 at upstream edge of PDA

T2 October 5, 2022 at road crossing of PDA

T3 October 6, 2022 at downstream edge of PDA

T4 October 6, 2022 50m downstream from edge of PDA

WC-18-2021

T1 October 5, 2022 at upstream edge of PDA

T2 October 5, 2022 at road crossing of PDA

T3 October 5, 2022 at downstream edge of PDA

T4 October 5, 2022 50m downstream from edge of PDA

WC-19-2021

T1 October 5, 2022 at upstream edge of PDA

T2 October 5, 2022 at road crossing of PDA

T3 October 5, 2022 at downstream edge of PDA

T4 October 5, 2022 50m downstream from edge of PDA

WC-20-2021

T1 October 5, 2022 at upstream edge of PDA

T2 October 5, 2022 at road crossing of PDA

T3 October 5, 2022 at downstream edge of PDA

October 5, 2022 channel drains and dissipates into wetland

WC-21-2021

T1 October 4, 2022 at road crossing of PDA

T1 October 4, 2022 substrate of watercourse

T2 October 4, 2022 at downstream edge of PDA

T2 October 4, 2022 substrate of watercourse

WC-22-2021

T1 October 4, 2022 at upstream edge of PDA

T2 October 4, 2022 at road crossing of PDA

T3 October 4, 2022 at downstream edge of PDA

T4 October 4, 2022 50m downstream from edge of PDA

WC-23-2021

T1 October 4, 2022 upstream (not at edge of PDA), fed ephemerally

T2 October 4, 2022 at road crossing of PDA

T3 October 4, 2022 at downstream edge of PDA

T4 October 4, 2022 50m downstream from edge of PDA

WC-2-2022

T1 October 21, 2022 at upstream edge of PDA

T2 October 21, 2022 at proposed road crossing of PDA

T3 October 21, 2022 at downstream edge of PDA

T4 October 21, 2022 50m downstream from edge of PDA

WC-3-2022

October 21, 2022 wetland at upstream edge of PDA (no channel)

T1 October 21, 2022 at proposed road crossing of PDA

T2 October 21, 2022 at downstream edge of PDA

T3 October 21, 2022 50m downstream from edge of PDA