



MORDEN ROAD SAND PIT EXPANSION PROJECT

Environmental Assessment Registration

Kenneth Lutz Trucks Ltd.

October 7, 2025

October 7, 2025

Anthony Heggelin

Environmental Assessment Officer
Policy Division, EA Branch
1903 Barrington Street, Suite 2085
PO Box 442, Halifax, NS B3J 2P8

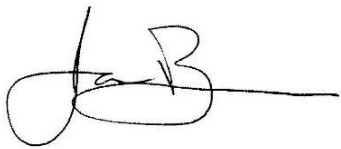
Re: Morden Road Sand Pit Expansion Project – EA Submission

Dear Mr. Heggelin,

On behalf of Kenneth Lutz Trucks Limited, Fraxinus Environmental & Geomatics Limited is pleased to submit this Environmental Assessment Registration Document for the Morden Road Sand Pit Expansion Project in Kings County, Nova Scotia, for your review and consideration.

Please contact us should you require any additional information.

Sincerely,

A handwritten signature in black ink, appearing to read 'I. Bryson', with a long horizontal line extending to the right.

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LIST OF ACRONYMS

ACCDC	Atlantic Canada Conservation Data Centre
ACPF	Atlantic Coastal Plain Flora
ARIA	Archaeological Resource Impact Assessment
CEA	Cumulative effects assessment
CEPA	Canadian Environmental Protection Act
CHSP	Canadian Housing Statistics Program
CH ₄	Methane
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CO	Carbon monoxide
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
EA	Environmental assessment
EPP	Environmental Protection Plan
ESA	Endangered Species Act
FBP	Function-Benefit Product
GHG	Greenhouse Gas
ha	Hectares
IBA	Important Bird Area
KMKNO	Kwilmu'kw Maw-klusuaqn Negotiation Office
LAA	Local Assessment Area
LABO	Eastern red bat
LACI	Hoary bat
LANO	Silver-haired bat
Lpm	Litres per minute
masl	Metres above sea level
MBBA	Maritimes Breeding Bird Atlas
MYOT	<i>Myotis</i> species
NGO	Non-governmental organization
NO	Nitrogen monoxide
NO _x	Nitrogen oxides
NO ₂	Nitrogen dioxide
NO ₃	Nitrate
NSCCTH	Nova Scotia Communities, Culture, Tourism, and Heritage

NSECC	Nova Scotia Environment and Climate Change
NSNRR	Nova Scotia Natural Resources and Renewables
NS OLA	Nova Scotia Office of L'nu Affairs
OHS	Occupational health and safety
O ₃	Ozone
PM	Particulate matter
PM _{2.5}	Fine particulate matter (particles ≤2.5 µm)
PM ₁₀	Coarse particulate matter (particles ≤10 µm)
RAA	Regional Assessment Area
SAR	Species at risk
SARA	Species at Risk Act
SOCI	Species of conservation interest
SO ₂	Sulfur dioxide
TDS	Total dissolved solids
TSS	Total suspended solids
µm	Micrometres
USACE	U.S. Army Corps of Engineers
VEC	Valued ecosystem component
VOC	Volatile organic compound
WESP-AC	Wetland Ecosystem Services Protocol
WMP	Wildlife Management Plan
WNS	White-nose syndrome
WSS	Wetlands of Special Significance

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Appendix A: Nova Scotia Registry of Joint Stocks

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CHAPTER 1: EXECUTIVE SUMMARY

Fraxinus Environmental & Geomatics Limited has prepared this Environmental Assessment (EA) Registration Document on behalf of Kenneth Lutz Trucks Limited (the Proponent) for the proposed expansion of an existing sand pit off Morden Road in Auburn, Kings County, Nova Scotia. The expansion is intended to meet growing demand for high-quality construction sand in the region, support local employment, and continue operations in compliance with provincial environmental standards. The Project will be privately funded and is proposed adjacent to the currently approved operations under Industrial Approval No. 2019-2616742-00.

The proposed expansion will add approximately 1.46 hectares (ha) to the existing 4 ha pit, for a total operational area of about 5.46 ha. The annual extraction from the expansion area is estimated at 10,000 tonnes per year. The expansion will occur directly adjacent to the current pit and will not involve the construction of new access roads or major infrastructure. The site will be progressively reclaimed to ensure environmental integrity and long-term compatibility with the surrounding landscape.

As the expansion will exceed 4 ha, the Project requires registration as a Class I Undertaking under the *Environment Act*, S.N.S. 1994-94, c. 1, and associated Environmental Assessment Regulations. The EA Registration Document has been prepared in accordance with applicable guidance documents, including the *Guide to Preparing an EA Registration Document for Pit and Quarry Developments in Nova Scotia* (NSE, 2009b) and *A Proponent's Guide to Environmental Assessment* (NSECC, 2025).

The EA evaluates potential effects on a range of valued ecosystem components (VECs), including surface water and groundwater, wetlands, terrestrial and aquatic habitats, climate and air quality, soil and geology, economy and employment, land use, transportation, noise, dust, and human health. Cultural and heritage resources, including Mi'kmaq traditional land use, were also considered. A combination of desktop review, field assessments, and consultation with regulatory databases informed the analysis.

Engagement activities were carried out with adjacent property owners, the Mi'kmaq of Nova Scotia, relevant government departments and regulatory agencies, and local non-governmental organizations and stakeholder groups. Written permissions were secured from neighbouring landowners regarding property line setbacks, and no concerns were raised by adjacent property owners. Feedback from other stakeholders raised considerations related to habitat, hydrology, groundwater protection, site management, and rehabilitation. These issues have been assessed in this document, and mitigation measures are described where appropriate.

The assessment concluded that the Project is not expected to result in significant adverse environmental effects. Minor residual effects may occur for some VECs, such as localized noise or dust, but these will be limited in extent and duration and will be managed through established mitigation and monitoring measures. The

cumulative effects assessment determined that the Project will not meaningfully contribute to regional environmental impacts when considered alongside other existing and foreseeable activities.

With the implementation of proposed mitigation and monitoring, the Project is expected to proceed in an environmentally responsible manner that aligns with regional development priorities while minimizing environmental impact and supporting community interests.

CHAPTER 2: INTRODUCTION

2.1 PROJECT TITLE

The Project is titled the Morden Road Sand Pit Expansion Project (the Project).

2.2 PROJECT PROPONENT

The Proponent for this Project is Kenneth Lutz Trucks Limited (the Proponent), a company with experience in aggregate extraction and land rehabilitation. The Proponent is committed to environmentally responsible practices and ensuring compliance with all relevant environmental regulations and standards in Nova Scotia.

The Nova Scotia Registry of Joint Stocks information is provided in Appendix A. Contact information is provided below.

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2.3 PROJECT LOCATION

The Project is located on Morden Road, in the community of Auburn, Kings County, Nova Scotia, approximately 10.5 km west of the town of Berwick, Nova Scotia (Drawing 2.3.1). The Project lies within the Annapolis Valley ecodistrict (Ecodistrict 610) within an oak and pine ecoelement area. The Project Site spans approximately 10.68 ha and is situated in a suburban area with mixed land use, including residential, agricultural, and forested areas (Drawing 2.3.2).

The PIDs associated with the Project are as follows:

- 55090187
- 55545354



Drawing 2.3.1: Project Location



Drawing 2.3.2: Project Properties

2.4 PROJECT OBJECTIVE AND SCOPE

The primary objective of the Project is to increase the extraction of sand to support local and regional construction and infrastructure projects. The scope of the Project includes site preparation, sand extraction, processing (e.g., sifting and grading), stockpiling, and site reclamation to minimize long-term environmental impact.

The Project aims to:

- Meet the growing demand for sand in the construction sector.
- Operate in compliance with provincial environmental standards.
- Implement best practices for minimizing environmental impacts.
- Reclaim the site to ensure safety and maintain environmental integrity compatible with the surrounding environment.

2.5 PROJECT NEED AND JUSTIFICATION

The demand for high-quality sand has increased significantly due to ongoing infrastructure development in Nova Scotia. The Project is justified based on the following factors:

- Availability of a high-quality sand deposit at the Project location.
- Proximity to major markets, reducing transportation emissions and costs.
- Contribution to the local economy through job creation and business opportunities.

This Project aligns with regional development goals while prioritizing local employment opportunities, environmental stewardship, and community engagement.

2.6 REGULATORY CONTEXT

The Project is subject to the environmental assessment (EA) requirements outlined in the *Environment Act*, S.N.S. 1994-94, c. 1. The assessment follows the guidelines set out in *A Proponent's Guide to Environmental Assessment* (NSE, 2018), the *Guide to Preparing an EA Registration Document for Pit and Quarry Developments in Nova Scotia* (NSE, 2009b), *A Proponent's Guide to Environmental Assessment* (NSECC, 2025), and the *Pit and Quarry Guidelines* (NSEL, 2003) to ensure thorough evaluation and transparency, as well as compliance with the Province of Nova Scotia's EA requirements.

The regulatory context that is specific to each valued ecosystem component (VEC) will be discussed in subsequent sections.

2.7 STRUCTURE OF THE ENVIRONMENTAL ASSESSMENT

This EA is structured to provide a detailed evaluation of the potential impacts of the Project, including proposed mitigation measures, as well as residual and cumulative environmental effects. The document is organized as follows:

- **Chapter 1 - Executive Summary:** Summary of key findings
- **Chapter 2 - Introduction:** Overview of the Project and its context.
- **Chapter 3 - Proponent Information:** A description of the Proponent.
- **Chapter 4 - Description of the Undertaking:** A detailed description of the Project and associated activities during the different phases of development, including site preparation, extraction, and reclamation activities.
- **Chapter 5 - Valued Ecosystem Component Identification:** Identification of key VECs for consideration.
- **Chapter 6 - Engagement:** Summary of engagement activities with the public and key stakeholders, including the Mi'kmaq and regulatory agencies.
- **Chapter 7 - Existing Environment:** Baseline data on the VECs, including biophysical, socioeconomic, cultural and heritage resources, and human health and well-being.
- **Chapter 8 - Environmental Effects and Mitigation Measures:** Analysis of environmental effects, description of mitigation measures, identification of cumulative and residual effects, description of reclamation measures, and adaptive management. The spatial and temporal boundaries and criteria by which environmental effects will be assessed will be described further in Chapter 8 and will be specific to each VEC.
- **Chapter 9 - Cumulative Effects:** Assessment of whether the Project's residual environmental effects may interact with those of other past, present, or reasonably foreseeable projects or activities, potentially resulting in cumulative impacts on the VECs.
- **Chapter 10 - Effects of the Environment on the Project:** Analysis of potential environmental effects and risks, including climate change considerations and mitigation measures.
- **Chapter 11 - Emergency and Risk Management and Contingency Measures:** Identification of risks and descriptions of emergency response plans, mitigation measures, and contingency response plans.
- **Chapter 12 - Additional Approvals, Authorizations, and Funding Sources:** Summary of additional approvals and authorizations required to proceed with the Project, such as amendments to existing permits or approvals. This chapter also identifies the source of funding for the Project.

- **Chapter 13 - Conclusions and Recommendations:** Final conclusions and recommendations.
- **Chapter 14 - Closure:** Closure and Project Team.

2.8 SPATIAL AND TEMPORAL BOUNDARIES

Spatial and temporal boundaries that will be used throughout this assessment are defined below:

Spatial Boundaries and Terms

- **Project Site** - The areas owned or leased by the Proponent to develop the Project (i.e., PIDs 55090187 and 55545354).
- **Project Area** - The area immediately surrounding the Project Site, including portions of neighbouring properties.
- **Project Footprint** - The area of ground disturbance associated with the Project.
- **Project Region** - The broader area of the Project (i.e., the Annapolis Valley from Berwick to Middleton).
- **Existing Pit Area** - The area of the existing pit operations.
- **Expansion Area** - The area of the proposed expansion Project.
- **Local Assessment Area (LAA)** - The area used in the environmental effects assessment where the Project has a direct impact. This will be specific to each VEC identified.
- **Regional Assessment Area (RAA)** - The area used in the environmental effects assessment where the Project has an indirect impact. This will be specific to each VEC identified.

Temporal Boundaries and Terms

- **Land Preparation** - The pre-operational phase of the Project, during which land is prepared for Project operations. This includes vegetation clearing and any necessary site preparation.
- **Operation** - The operational phase of the Project, which includes activities such as aggregate extraction, processing, and stockpiling.
- **Decommissioning and Reclamation** - The post-operational phase of the Project, which includes decommissioning and land reclamation activities such as land grading, topsoil dispersion, and revegetation.
- **Post-Reclamation** - The phase after all Project activities have been completed.

CHAPTER 3: PROPONENT INFORMATION

3.1 DESCRIPTION OF THE PROPONENT

Kenneth Lutz Trucks Limited is a company with extensive experience in aggregate extraction, land rehabilitation, and related services for the trucking and construction industries. Based in Auburn, Kings County, Nova Scotia, the Proponent is committed to environmentally responsible practices and regulatory compliance. The Proponent has operated the Morden Road Sand Pit for over 20 years and received approval from Nova Scotia Environment and Climate Change (NSECC) in 2019 to expand the pit beyond 2 ha in area (under Approval No. 2019-2616742-00), which allowed the Proponent to meet growing demands for aggregate products such as topsoil, septic filter sand, cable-burying material, and animal bedding. The Proponent now seeks to further expand the sand pit beyond 4 ha to extend its lifespan, supporting aggregate markets in Kings County and other parts of Nova Scotia. This expansion will contribute to the regional economy by creating jobs and enhancing the availability of essential materials for infrastructure and agricultural needs, while maintaining a focus on environmentally responsible practices. The Proponent also offers services including the sale and installation of Bibeau dump bodies, truck and equipment sales across the country, emissions cleaning services for heavy-duty engines, and supplies Annaite heavy truck tires since 2021. These services demonstrate the company's integrated approach to supporting the trucking and construction sectors.

3.2 PROPONENT'S COMMITMENT TO ENVIRONMENTAL MANAGEMENT

The Proponent is committed to environmental stewardship and regulatory compliance. The Proponent integrates practical expertise with best practices to ensure safety, minimal environmental impact, and full regulatory compliance. This commitment includes implementing proactive measures to mitigate potential impacts, developing ongoing monitoring programs, and employing adaptive management strategies to address unforeseen challenges. The Proponent also conducts regular consultations with neighbouring landowners to ensure open communication and collaboration. The Proponent prioritizes transparency and collaboration with stakeholders, including Mi'kmaq communities, adjacent property owners, and nearby community members, to foster shared environmental goals and address concerns effectively.

3.3 ORGANIZATIONAL STRUCTURE AND RESOURCES

Kenneth Lutz Trucks Limited employs two full-time and two seasonal staff members and operates under the leadership of Kenneth Lutz, the company's President. The organizational structure follows a linear model, enabling clear communication and efficient decision-making.

The Proponent is well-equipped to execute the Project, delivering it in an environmentally responsible manner with a focus on sustainable land use and regulatory compliance. To support environmental survey services, the

Proponent has retained the expertise of Fraxinus Environmental & Geomatics Limited (Fraxinus) and DeWolfe & Morse Surveying Limited, ensuring thorough and professional environmental assessments for the Project.

CHAPTER 4: DESCRIPTION OF THE UNDERTAKING

4.1 OVERVIEW

The proposed undertaking involves the development and operation of the Project, a sand extraction facility located in Auburn, Nova Scotia. The Project aims to supply high-quality sand for construction and infrastructure projects in the Annapolis Valley region and around Nova Scotia. This operation will provide the necessary materials to support economic growth and community development while maintaining a commitment to environmental stewardship. The existing pit began operations in June 2003 and received approval from NSECC in 2019 to expand the pit beyond 2 ha in area (under Approval No. 2019-2616742-00). These operations were contained within PID 55090187. The proponent acquired the adjacent property (PID 55545354) in February 2022 and is seeking EA approval to expand the pit beyond 4 ha to approximately 5.46 ha. The proposed expansion is expected to support an annual production rate of approximately 10,000 tonnes.

4.2 LOCATION AND SITE DETAILS

The Project Site spans approximately 10.86 ha centred at approximately 352944 m E, 4987107 m N (UTM zone 20T), or 45.0222° N, 64.8666° W. The Project Site contains the existing pit area (3.995 ha) as well as the proposed pit expansion area (1.46 ha). The Project site is situated in a suburban area with mixed land use, including residential, agricultural, and forested areas. The Project is located on Morden Road, in the community of Auburn, Kings County, Nova Scotia, approximately 10.5 km west of the town of Berwick and 17.3 km east of the town of Middleton. Highway 101 lies approximately 480 m north of the Project Site, and Highway 1 (the Evangeline Trail) lies approximately 330 m to the south. The Project Site is accessed via a private driveway from Highway 361 (Morden Road) to the Project Site's immediate west. The Project lies within the Annapolis Valley ecodistrict (Ecodistrict 610) within an oak and pine ecoelement area. The Project is entirely contained within the Annapolis River Watershed. McGee Brook, a tributary to the Annapolis River, borders the eastern boundary of the Project Site and flows from north to south, discharging into the Annapolis River approximately 1.75 km to the south of the Project Site. Wetland habitat exists in the eastern extent of the Project Site within the floodplain of McGee Brook.

4.3 PROJECT COMPONENTS

Key components of the undertaking include:

- **Extraction Areas:** Defined zones for sand extraction. Existing and planned extraction areas are shown on Drawing 4.3.1.
- **Processing:** On-site equipment for screening and sorting materials, including mobile aggregate processing plants, conveyors, and screening drums.

- **Site Equipment:** The site inventory includes the following:
 - Mobile processing plants
 - Conveyor belts (stackers)
 - Front-end loader
 - Excavators
 - Dump trucks
 - Storage containers
 - Mobile screening units
 - A water truck
- **Product Stockpiling Areas:** Dedicated areas for the temporary storage of sand piles and small rock piles, as well as native topsoil stockpiles harvested during initial site preparation.
- **Reclamation Material Stockpiling Areas:** Dedicated areas for stockpiling native topsoil, organic material, and seed bank material harvested during initial site preparation, and to be used for reclamation activities. Grubbings and woody debris are also stockpiled and burnt to enrich topsoil stockpiles.
- **Access Roads:** Existing access roads connecting the site to the public road network (via Morden Road) will be maintained and, where necessary, upgraded to support Project operations.
- **Water Management Systems:** All stormwater stays on site and drains through the sand to the water table below. Current pit operations do not extend to within 1 m of the water table. Erosion and sediment controls are implemented to manage runoff and prevent erosion. Where possible, disturbed areas are reinstated using native topsoil and seed stock to stabilize exposed soils. No excavation below the water table will be conducted as part of the Project.
- **Environmental Protection Measures:** A 30 m vegetated buffer is maintained between the Project footprint and McGee Brook. A wetland exists on site that is entirely contained within the 30 m buffer of McGee Brook; as such, wetland habitats will be avoided. Berms are constructed around the existing pit area and will be incorporated in the expansion where the Project abuts neighbouring property lines for safety and noise abatement. Erosion and sediment controls are implemented where appropriate, and areas are re-vegetated once Project activity permits using native topsoil and seed stock. Dust control measures are in place, which include the application of lignin-based solutions and chloride mixtures on roads and processing areas.

A detailed illustration of the Project footprint and proposed operational layout, including the expansion area, is provided in Appendix B (Reclamation Plan).



Drawing 4.3.1: Project Components

4.4 ACTIVITIES

The primary activities associated with the Project include:

- **Site Preparation:** Clearing trees and vegetation and grading land within the proposed expansion area.
- **Extraction Operations:** Using mechanical equipment such as excavators, trucks, and loaders to extract sand and transport it to mobile processing units.
- **Processing:** Sorting and screening extracted materials to meet aggregate product specifications using mobile processing equipment. Sand is filtered and graded, and any small quantities of rock from screening are stockpiled. The sand products are noted to be extremely pure; as such, no washing of sand is needed.
- **Stockpiling:** Temporary storage of processed materials on-site, organized into sand piles and small rock piles from screening.
- **Aggregate Quantification:** Sand is weighed using a loader scale to determine product volume for sales.
- **Transportation:** Hauling materials to local and regional markets using dump trucks or semi-trucks and trailers.
- **Site Reclamation:** Grading slopes, distributing stockpiled overburden, seedbank and organic materials, and re-vegetating exposed areas.

4.5 ALTERNATIVES CONSIDERED

The Project involves the expansion of an existing sand pit rather than the construction of a new pit at another location. The Proponent has determined that expanding the existing operation is the most viable and sustainable approach due to several key factors:

- **Established Processing Infrastructure:** The existing site is already an operational processing plant, eliminating the need for constructing new facilities and reducing the environmental footprint associated with new development.
- **Geological Suitability:** The presence of compatible overburden deposits at the site makes it an optimal location for continued extraction. Finding an alternate location with similar geological conditions would require extensive site evaluation and potential land disturbance.
- **Existing Equipment and Operational Efficiency:** The Project Site is equipped with the necessary extraction and processing equipment, allowing seamless integration of the expansion without the need for significant additional investment.

- **Proximity to Major Transportation Routes:** The site's strategic location near Highway 1 and Highway 101 provides efficient transportation of materials to market, minimizing fuel use and transportation-related emissions.

4.6 PROJECT TIMELINE

The Project is proposed to be developed in stages over an anticipated lifespan of approximately 10 to 15 years. The existing pit area is currently in operation and will continue to operate for an estimated three to five more years. Site preparation for the expansion area has already begun, with extraction anticipated to begin once the existing pit nears depletion. The expansion area will add 10+ years of operation, extending the Project's overall lifespan. Progressive reclamation will occur throughout the life of the Project, ensuring that disturbed areas are restored in a phased manner. Once pit operations cease, decommissioning activities will be completed within two years (approximately 2035 to 2037). Reclamation activities may extend beyond decommissioning as the site undergoes monitoring, with final completion anticipated within five years of closure (approximately 2040 to 2042).

4.7 RECLAMATION AND CLOSURE

Reclamation activities will be implemented concurrently with extraction to ensure the site is restored to a stable and naturalized state. The final land use plan includes a designated laydown area at the western end of the Project Site to support the Proponent's other business operations. The majority of the site will be re-naturalized and allowed to grow into a forested environment, promoting biodiversity and habitat restoration. Suitable areas of the Project Site may be developed into residential real estate plots after closure has been completed. Closure activities will include the removal of equipment, re-vegetation of disturbed areas, and monitoring to ensure successful rehabilitation. Additional details regarding these measures will be provided in subsequent VEC and mitigation chapters.

4.8 SOCIOECONOMIC AND ENVIRONMENTAL BENEFITS

The Project will provide numerous benefits, including:

- **Economic Contributions:** The Project currently employs four staff members, providing stable employment opportunities. Additionally, the Project supports local businesses through the procurement of goods and services required for operations, such as equipment maintenance, fuel supply, and transportation. The Project will also seek to create employment opportunities for Mi'kmaq communities, fostering inclusive economic participation and strengthening relationships with Indigenous partners.
- **Material Supply:** The Project supplies high-quality sand essential for construction and infrastructure projects. The availability of these materials supports regional growth and development.

- **Environmental Stewardship:** The Proponent, through their execution of the Project, aims to implement best practices to mitigate environmental impacts. The Project is committed to regulatory compliance, ensuring all activities adhere to provincial and federal environmental standards. Additionally, the Project will integrate biodiversity conservation measures, such as habitat preservation and progressive reclamation, to support local ecosystems. Sustainable development practices will be incorporated to balance economic growth with environmental responsibility, ensuring long-term resource stewardship and minimal ecological disruption.
- **Community Support:** Positive contributions to the local economy and infrastructure development. The Project will also seek to create employment opportunities for Mi'kmaq communities, fostering inclusive economic participation and strengthening relationships with Indigenous partners.

4.9 COMPLIANCE AND ENVIRONMENTAL PROTECTION MEASURES

To ensure compliance with environmental regulations, the Project will incorporate:

- **Environmental Monitoring and Management Plans:** Regular monitoring of environmental conditions, including air, water, and soil, will be conducted. Mitigations, including contingency plans for emergencies and erosion and sediment control maintenance, will be developed and implemented to ensure compliance with regulatory standards.
- **Water Resource Protection:** Measures will be taken to manage water conditions and prevent contamination, including property stormwater management systems, an environmental contingency plan, and adherence to all applicable water quality protection requirements.
- **Dust and Noise Management:** Dust suppression techniques, including the application of lignin-based solutions and chloride mixtures, will be utilized on roads and processing areas. Operational controls such as berms and buffer zones will ensure compliance with noise level guidelines.
- **Regulatory Compliance:** All activities will be conducted in accordance with Nova Scotia's environmental regulations and permitting requirements, including the terms and conditions of operations and EA approvals.

Additional details on specific mitigation, monitoring, and management strategies will be provided in subsequent chapters.

4.10 ALIGNMENT WITH PROVINCIAL PRIORITIES

The Project aligns with provincial priorities for sustainable resource development, economic growth, housing development, renewable energy, and employment creation, including opportunities for Mi'kmaq communities. It

supports Nova Scotia's goals for responsible resource management and contributes to the long-term well-being of local communities.

The Project provides direct economic benefits by employing four staff members and supporting local businesses through the procurement of goods and services such as equipment maintenance, fuel supply, and transportation. The Project also contributes to housing and infrastructure development by supplying high-quality sand used in applications such as burying municipal plumbing and electrical lines, filter sand for septic systems, and other general construction uses. The availability of these materials supports ongoing and future housing developments.

Furthermore, the Project supports the renewable energy sector by providing high-quality aggregate materials required for the construction of wind and solar energy infrastructure. These materials are essential for building stable foundations, access roads, and site grading for renewable energy projects, aligning with Nova Scotia's climate and sustainability goals.

In addition to economic and infrastructure contributions, the Project is committed to sustainable environmental practices. It integrates biodiversity conservation measures, regulatory compliance, and sustainable development strategies to balance economic growth with long-term environmental responsibility. By adhering to strict environmental management practices, the Project ensures that resource development is conducted responsibly and sustainably, supporting both economic progress and ecological integrity.

CHAPTER 5: VALUED ECOSYSTEM COMPONENT IDENTIFICATION

VECs refer to environmental, socioeconomic, cultural, and human health features that may be affected, positively or negatively, by a proposed undertaking. These components are identified based on their ecological, economic, social, and cultural significance, including their importance to local communities, regulatory agencies, and the Mi'kmaq. The following VECs have been identified based on the Project's anticipated environmental interactions:

BIOPHYSICAL ENVIRONMENT: The following VECs have been identified:

- **Surface Water and Groundwater:** The quality, quantity, and hydrological functions of water resources within and around the Project area.
- **Wetlands:** The presence, function, and potential impact on wetland ecosystems.
- **Flora, Fauna, and Terrestrial Habitat:** The diversity and abundance of plant and animal species, including any species at risk (SAR) and their habitats.
- **Fish and Aquatic Habitat:** Water bodies supporting aquatic life and the potential impacts of the Project on fish populations and their habitats.
- **Climate Change, Air Quality, and Atmospheric Conditions:** The potential effects of the Project on climate change, air quality, and the atmospheric environment, including greenhouse gas (GHG) emissions, dust and other emissions, and other airborne contaminants.
- **Soil and Geology:** Potential impacts on soil stability, erosion, sedimentation, and the geological environment.

SOCIOECONOMIC ENVIRONMENT: The following VECs have been identified:

- **Local Economy, Labour Force, and Employment:** Economic benefits and potential impacts on local businesses and workforce.
- **Land Use and Property Values:** Potential changes to land use patterns and property values in the surrounding area.
- **Transportation and Infrastructure:** Impacts on local and regional road networks, traffic volume, and infrastructure.
- **Recreation and Tourism:** Effects on outdoor recreational activities and local tourism attractions.

CULTURAL & HERITAGE RESOURCES: The following VECs have been identified:

- **Archaeological Resources and Historical Sites:** The presence of significant cultural heritage resources and features, as well as potential impacts on these sites.
- **Mi'kmaq Cultural Resources:** Areas of importance to Mi'kmaq communities, including traditional land use, cultural resources and cultural practices.

HUMAN HEALTH & WELL-BEING: The following VECs have been identified:

- **Noise Levels:** Noise levels generated by the Project and their effect on local populations.
- **Dust and Emissions:** Dust levels and other emissions generated by the Project and their effect on local populations.
- **Safety and Community Well-Being:** Potential disruptions to local communities and public safety, including quality of life and access to essential services.

Each VEC will be assessed in detail. Baseline conditions for each VEC will be described in Chapter 7, while Chapter 8 will apply the environmental effects assessment framework to determine potential environmental effects, identify mitigation measures, and establish monitoring protocols.

5.1 ASSESSMENT OF WILDLIFE SPECIES

Wildlife species, including birds, mammals, fish and other aquatic species, and plants, were assessed following the *Guide to Addressing Wildlife Species and Habitat in an EA Registration Document* (NSE, 2009a). Particular attention was given to SAR, as listed under the *Species at Risk Act* (SARA) and/or the *Endangered Species Act*, S.N.S. 1998, c. 11 (ESA), as well as species of conservation interest (SOCl). In this EA Registration Document, SOCl refers to species that meet the following criteria:

- Designated as 'Endangered', 'Threatened', or 'Special Concern' by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) but not yet listed under SARA; and/or
- Assigned a subnational rank (S-Rank) in Nova Scotia of 'S3', 'S2', or 'S1', and variants thereof (i.e., S1S3, S3S4) by the Atlantic Canada Conservation Data Centre (ACCDC). For this assessment, species assigned an S-Rank of S3S4 are treated as SOCl.

SAR and their habitats receive legal protection under SARA as well as the ESA and the *Biodiversity Act*, S.N.S. 2021, c. 3, if provincially listed.

Priority species are SAR that were observed to occur on the Project Site, or that have a high potential of occurring on the Project Site based on the presence of habitat that directly supports SAR (e.g., breeding habitat, nesting habitat, foraging habitat, etc.).

CHAPTER 6: ENGAGEMENT

6.1 ENGAGEMENT WITH THE MI'KMAQ OF NOVA SCOTIA

Engagement has been initiated with Mi'kmaq First Nations communities and provincial regulatory bodies to provide information about the proposed Project and to offer opportunities for feedback during Project planning. Communications have been focused on providing transparency, sharing the Project Description, and inviting questions, concerns, or requests for further discussion.

Between April 15 and 16, 2025, formal letters introducing the Project were distributed via email to the Chiefs of 13 Mi'kmaq First Nations in Nova Scotia, the Native Council of Nova Scotia, and the Kwi'mu'kw Maw-klusuaqn Negotiation Office (KMKNQ). These communications invited feedback, outlined the purpose and scope of the proposed Project, and offered to arrange meetings to discuss the Project further.

Table 6.1 summarizes engagement activities conducted to date with Mi'kmaq First Nations.

Table 6.1: Summary of Engagement to Date with Mi'kmaq First Nations and Organizations

First Nation / Organization	Contacted Parties	Stakeholder Category	Summary
Acadia (Wasoqopa'q) First Nation	Chief Deborah Robinson	Mi'kmaq First Nation	April 15, 2025 Project Description and cover letter sent via email to introduce the Project and invite feedback.
Annapolis Valley First Nation	Chief Gerald B. Toney	Mi'kmaq First Nation	April 15, 2025 Project Description and cover letter sent via email to introduce the Project and invite feedback. May 20, 2025 Project Team called Band Office and left a voicemail for reception to confirm April 15 th email was received and to see if any questions had come up.
Bear River (L'sitkuk) First Nation	Chief Carol Dee Potter	Mi'kmaq First Nation	April 16, 2025 Project Description and cover letter sent via email to introduce the Project and invite feedback. May 20, 2025 Project Team called Band Office and left a voicemail to confirm April 16 th email was received and to see if any questions had come up.

First Nation / Organization	Contacted Parties	Stakeholder Category	Summary
Eskasoni First Nation	Chief Leroy D.C. Denny	Mi'kmaq First Nation	April 16, 2025 Project Description and cover letter sent via email to introduce the Project and invite feedback.
Glooscap First Nation	Chief Sidney Peters	Mi'kmaq First Nation	April 16, 2025 Project Description and cover letter sent via email to introduce the Project and invite feedback. May 20, 2025 Project Team called Band Office and left a voicemail for Administrative Coordinator to confirm April 16 th email was received and to see if any questions had come up.
Millbrook First Nation	Chief Bob Gloade	Mi'kmaq First Nation	April 16, 2025 Project Description and cover letter sent via email to introduce the Project and invite feedback.
Membertou First Nation	Chief Terrance Paul	Mi'kmaq First Nation	April 16, 2025 Project Description and cover letter sent via email to introduce the Project and invite feedback.
Paqtnkek Mi'kmaw Nation	Chief Cory Julian	Mi'kmaq First Nation	April 16, 2025 Project Description and cover letter sent via email to introduce the Project and invite feedback.
Pictou Landing First Nation	Chief Tamara Young	Mi'kmaq First Nation	April 16, 2025 Project Description and cover letter sent via email to introduce the Project and invite feedback.
Potlotek First Nation	Chief Wilbert Marshall	Mi'kmaq First Nation	April 16, 2025 Project Description and cover letter sent via email to introduce the Project and invite feedback.
Sipekne'katik First Nation	Chief Michelle Glasgow	Mi'kmaq First Nation	April 16, 2025 Project Description and cover letter sent via email to introduce the Project and invite feedback.
Wagmatcook First Nation	Chief Norman Bernard	Mi'kmaq First Nation	April 16, 2025 Project Description and cover letter sent via email to introduce the Project and invite feedback.
We'koqma'q First Nation	Chief John L. Bernard	Mi'kmaq First Nation	April 16, 2025 Project Description and cover letter sent via email to introduce the Project and invite feedback.

First Nation / Organization	Contacted Parties	Stakeholder Category	Summary
Native Council of Nova Scotia	Chief and President Lorraine Augustine	First Nations Organization	April 16, 2025 Project Description and cover letter sent via email to introduce the Project and invite feedback.
KMKNO	Director of Consultation Twila Gaudet	First Nations Organization	April 16, 2025 Project Description and cover letter sent via email to introduce the Project and invite feedback.

Follow-up with First Nations communities will continue to confirm receipt of Project information, arrange meetings, and address any questions or concerns. All feedback received will be carefully considered and integrated into the planning and development of the Project.

Summary of Comments and Issues Raised: None received at time of writing.

6.2 ENGAGEMENT WITH GOVERNMENT DEPARTMENTS AND REGULATORY AGENCIES

Engagement has been initiated with provincial government departments and municipal governments near the Project Site to provide information about the proposed Project and to solicit feedback. Communications have focused on transparency and providing opportunities for comments prior to EA registration.

On March 19, 2025, Fraxinus met virtually with NSECC and the Nova Scotia Office of L'nu Affairs (NS OLA) to provide an overview of the Project. On April 16, 2025, project information was distributed via email to representatives of the Municipality of the County of Kings, the Town of Berwick, the Village of Greenwood, and the Village of Kingston. These communications included a project description and a cover letter inviting questions and feedback.

Table 6.2 summarizes engagement activities conducted to date with government departments and regulatory agencies.

Table 6.2: Summary of Engagement to Date with Government Departments and Regulatory Agencies

Organization	Contacted Parties	Stakeholder Category	Summary
Nova Scotia Environment and Climate Change, Environmental Assessment Division	Brent Jackson (Environmental Officer)	Provincial Government	June 12, 2024 Initial email confirmation of EA Registration requirements.

Organization	Contacted Parties	Stakeholder Category	Summary
Nova Scotia Environment and Climate Change, Environmental Assessment Division	Jeremy Higgins (Environmental Assessment Officer)	Provincial Government	<p>June 13, 2024 Email from EA Division requesting Project Description.</p> <p>March 19, 2025 Virtual meeting with EA Division and Office of L'nu Affairs. Project Description and EA summary were presented, and feedback solicited on assessment and stakeholder/Mi'kmaq engagement approach. Follow-up email received, including contact list for Mi'kmaq Chiefs and Councils.</p>
Nova Scotia Office of L'nu Affairs	Melissa Slauenwhite, Consultation Advisor	Provincial Government	<p>March 19, 2025 Virtual meeting with Office of L'nu Affairs and EA Division of NSECC. Project Description and EA summary were presented, and feedback solicited on assessment and Mi'kmaq/stakeholder engagement approach.</p>
Municipality of the County of Kings	Mayor Dave Corkum	Municipal Government	<p>April 16, 2025 Project Description and cover letter sent via email to introduce the Project and invite feedback.</p>
Town of Berwick	Mayor Mike Trinacty	Municipal Government	<p>April 16, 2025 Project Description and cover letter sent via email to introduce the Project and invite feedback.</p> <p>April 28, 2025 Response received via email indicating Council did not have any concerns about the proposed Project.</p>
Village of Greenwood	Chair Brian Banks	Municipal Government	<p>April 16, 2025 Project Description and cover letter sent via email to introduce the Project and invite feedback.</p>
Village of Kingston	Chair Wayne Fowler	Municipal Government	<p>April 16, 2025 Project Description and cover letter sent via email to introduce the Project and invite feedback.</p>

Engagement with relevant regulatory agencies and municipal governments will continue throughout Project planning and development. All feedback received will be reviewed and considered by the proponent.

Summary of Comments and Issues Raised: None received at time of writing.

6.3 ENGAGEMENT WITH THE PUBLIC AND OTHER STAKEHOLDERS

Engagement with the public and other stakeholders is an important part of the EA process. Engagement has been initiated to inform community members, non-governmental organizations (NGOs), and other stakeholders about the proposed Project and to provide opportunities for input during the planning phase.

Adjacent Property Owners: Two landowners with properties adjacent to the proposed expansion area (PIDs 55090435 and 55090120) were contacted directly by the Proponent. Both landowners agreed to the proposed setback adjustments and provided written permission to allow pit expansion and material extraction up to their shared property boundaries.

Other Organizations: On April 16, 2025, project information was distributed via email to local NGOs and recreational trail organizations. These communications included a project description and a cover letter inviting questions, feedback, or further discussion.

Mail-out Information for Local Area Residents: In addition, a project information mail-out was sent to residents and businesses in the vicinity of the Project Site area using Canada Post's Neighbourhood Mail. The distribution area was selected to include routes coming within 5 km of 47 Morden Road, Kings County. Rural route delivery areas RR0102 (Aylesford) and RR0006 (Kingston) were chosen to ensure coverage of the LAA and nearby communities. A total of 1,277 pieces were delivered. Each mail-out included an overview of the Project, a map of the Project Site, and a QR code linking to a dedicated Project website. This website provides a detailed project description and overview of the EA process, along with a form for submitting comments, questions, or concerns directly to the Proponent. The website is publicly accessible until January 2026 at: <https://www.fraxinusenviro.com/engagement>. A copy of the mail-out is included in Appendix C.

At the time of writing, no concerns or issues had been received through the Project email. A small number of responses were received, indicating that recipients had no comments or feedback to provide.

Table 6.3 summarizes engagement activities conducted to date with the public and other stakeholders.

Table 6.3: Summary of Engagement to Date with Community Members, Community Groups, NGOs, and Other Stakeholders

Organization	Contacted Parties	Stakeholder Category	Summary
Clean Annapolis River Project	Executive Director Levi Cliche	NGO	April 16, 2025 Project Description and cover letter sent via email to introduce the Project and invite feedback.
Blomidon Naturalists Society	N/A	NGO	April 16, 2025 Project Description and cover letter sent via email to introduce the Project and invite feedback.

Organization	Contacted Parties	Stakeholder Category	Summary
			<p>April 17, 2025 Acknowledgement of receipt received via email.</p> <p>April 24, 2025 Comments and questions received via email. Complete details in Table 6.4 below.</p>
Kings County Wildlife Association	N/A	NGO	<p>April 16, 2025 Project Description and cover letter sent via email to introduce the Project and invite feedback.</p>
Annapolis County ATV & Multiuse Trails Society	President Ron Guest	Trail Society	<p>April 16, 2025 Project Description and cover letter sent via email to introduce the Project and invite feedback.</p>
Kings County Trails Society	Chair John Weir	Trail Society	<p>April 16, 2025 Project Description and cover letter sent via email to introduce the Project and invite feedback.</p> <p>April 25, 2025 Response received via email indicating the organization had no questions arising from the project proposal.</p>
General Public (mail-out recipients)	Nearby residents and businesses	Public	<p>April 14-18, 2025 Canada Post Neighbourhood Mail-out including a notice about the Project, a map of the Project site, and a QR code linking to a dedicated Project website with a comment form.</p>

Engagement with public stakeholders will continue throughout the EA and permitting process. All feedback received will be reviewed and considered in the development of the Project.

Summary of Comments and Issues Raised: Feedback submissions emphasized the importance of a comprehensive EA process and raised several considerations related to hydrogeology, site management, rehabilitation practices, and ecological values. Specific topics included groundwater protection, noise and proximity to residences, potential environmental risks from spills, seasonal water table fluctuations, site reclamation practices, and the protection of migratory birds and local biodiversity. The topics raised in preliminary responses have been considered during the development of this EA.

A summary of the Society's specific questions and comments, along with responses from the Proponent, is provided in Table 6.4 below.

Table 6.4: Stakeholder Comment and Response Table

Comment / Question	Response
Blomidon Naturalists Society	
There is no monitoring data included in the report to indicate that the existing project has had no adverse effect on groundwater quality.	Sections 7.1.1 and 8.1.1 discuss groundwater conditions and potential impacts. While no historical monitoring data is available, groundwater protection measures are detailed and designed to prevent adverse impacts.
There is no information regarding the location and use of abstraction bores in the area. Where are the municipal water supply wells (if any), domestic wells, and their respective static water levels?	Section 7.1.1 summarizes known wells in the area and their static water levels based on available Nova Scotia Groundwater Atlas data.
At what distance and direction from the proposed expansion are currently sited dwellings? Have there been noise complaints?	Section 7.4.1 maps local dwellings and evaluates potential noise effects. Section 8.4.1 discusses mitigation and monitoring strategies to mitigate noise.
There is no indication of groundwater flow direction beneath the existing excavation.	Section 7.1.1 provides an estimated groundwater flow direction of approximately 207° from North (southwestward), derived from a weighted analysis of nearby well water levels. Groundwater monitoring requirements will be determined through the approval process.
There is no description of the depth to groundwater beneath the site or seasonal variation. A 1 m separation is minimal.	Section 7.1.1 estimates water table elevation at the site centroid (weighted mean: 25.56 metres above sea level). A minimum 1 m separation will be maintained between the excavation areas and the water table. A Groundwater Monitoring Plan will be developed and used to inform excavation activities.
No management plan has been supplied for treating spills or addressing low groundwater levels.	Spill prevention measures are outlined in relevant sections, and an Emergency Response Plan and Contingency Plan will be developed prior to operations. Section 8.1.1 discusses mitigation and monitoring strategies.
No cross-section is provided showing volume of sand above groundwater.	Groundwater monitoring, including the creation of a groundwater monitoring plan, and mitigations are included in Section 8.1.1.
Is the deposit pure sand, or a mixture of sand, gravel, and clay?	The deposit is predominantly fine to medium sand, as described in Section 7.1.9, with some gravel content. No significant clay layers are present.
No evidence is presented of past successful rehabilitation.	Chapter 4 discusses reclamation activities. All rehabilitation will be done in accordance with NSECC's requirements in the <i>Pit and Quarry Guidelines</i> .

Comment / Question	Response
Stockpiled soil may have reduced capacity to support vegetation growth.	Site rehabilitation plans that are consistent with NSECC's requirements for site rehabilitation will be developed and submitted to NSECC as part of the industrial approval process.
What is the composition of the seed stock to be used for rehabilitation: native or exotic?	Native topsoil and seed stock will be used, as discussed in Chapter 4.
The timing of any land clearance should avoid migratory bird breeding periods. What environmental assessment has been done on birds and other life forms?	Section 7.1 discusses the baseline biophysical environment, including desktop reviews and field studies. Vegetation clearing will be scheduled outside of the peak breeding season where possible.

CHAPTER 7: BASELINE ENVIRONMENTAL CONDITIONS

This Chapter provides a thorough description of the baseline environmental conditions within the Project Area, covering key VECs, including the biophysical environment, socioeconomic factors, cultural and heritage resources, and human health and well-being. The baseline conditions will be described using a combination of desktop research, review of existing data sources, and literature, as well as targeted field programs conducted in the Project Area.

7.1 BIOPHYSICAL ENVIRONMENT

7.1.1 SURFACE WATER AND GROUNDWATER

REGULATORY CONTEXT

Several federal and provincial laws and regulations are relevant to the operations of the Project with respect to surface water and groundwater.

FEDERAL

- ***Fisheries Act (R.S.C., 1985, c. F-14)*** - This Act prohibits the deposit of harmful substances into waters frequented by fish and protects fish habitat. Specifically, Section 35 prohibits the harmful alteration, disruption, or destruction (HADD) of fish habitat, and Section 36 prohibits the deposit of deleterious substances into waters frequented by fish, both of which are highly relevant to sedimentation control measures and stormwater discharge.
- ***Canadian Environmental Protection Act (S.C. 1999, c. 33)*** - The *Canadian Environmental Protection Act* (CEPA) regulates the release of pollutants and hazardous substances that could contaminate surface or groundwater. Sand pit operations may involve activities such as fuel storage, vehicle maintenance, or the use of chemicals, all of which could introduce contaminants into the environment.

PROVINCIAL

- ***Environment Act (S.N.S. 1994-95, c. 1)*** - This Act provides the legal framework to prevent harm to surface water or groundwater. It mandates environmental assessments, pollution prevention measures, and compliance with regulatory standards for water quality. Project operators must implement measures to prevent sedimentation, control erosion, and manage potential contaminants to comply with the Act.

- ***Activities Designation Regulations (N.S. Reg. 47/95)*** - These regulations list pits and quarries as designated activities that require environmental approvals from NSECC. Sand pit operations that involve watercourse alterations, groundwater withdrawal, or stormwater discharge must obtain the necessary permits. Compliance ensures that the Project adheres to best management practices for water protection and environmental management.
- ***Pit and Quarry Guidelines (1999, Revised 2003)*** - These guidelines establish specific requirements for protecting surface water and groundwater at excavation sites. They set minimum separation distances from watercourses, mandate sedimentation control measures, and regulate effluent discharge to prevent contamination. Sand pit operators must follow these guidelines to ensure that operations do not negatively impact nearby water bodies or groundwater supplies.
- ***NS Industrial Approval No. 2019-2616742-00*** - This approval for existing pit operations for the Project includes several requirements related to water resources, such as protections for surface and groundwater, site management and spill prevention measures, and provisions for reclamation and long-term water management.

DESKTOP REVIEW : METHODOLOGY

The desktop review was completed through a review of the following resources:

- Aerial imagery and topography
- Nova Scotia Hydrographic Network (Government of NS, 2022)
- Nova Scotia Groundwater Atlas (NSNRR, 2025a)
- Nova Scotia Well Logs Database (NSNRR, 2025b)
- Nova Scotia Wet Areas Mapping and Flow Accumulation Channel (NSNRR, n.d.-e)
- Site-specific LiDAR-based Wet Areas Mapping and Flow Channel models (Proprietary modelling completed by Fraxinus based on NSNRR's LiDAR datasets) (GeoNova, n.d.)
- Technical papers (Carsel & Parrish, 1988; Rawls et al., 1983)

DESKTOP REVIEW : RESULTS

SURFACE WATER: The Project Site is located within the Annapolis Primary Watershed (1DC) and the Annapolis River Secondary Watershed (1DC-3) and is situated near the lower extent of two tertiary watersheds (1DC-3-ZZ and 1DC-3-AAA). Watercourses within and near the Project Area primarily drain south through these watersheds, eventually connecting to the Annapolis River, which discharges into the Bay of Fundy.

The sole watercourse running through the Project Site is McGee Brook, which flows along the northeasternmost edge of the Project. There is a natural buffer between the Project footprint and McGee Brook, providing a protective distance from the watercourse. McGee Brook is approximately 6 km long and is fed by several

unnamed tributaries. It flows from Welton's Corner to Auburn, eventually discharging into the Annapolis River, approximately 1 km southeast of the Project. The Annapolis River is approximately 120 km long, flowing southwest through the Annapolis Valley from Aylesford to Annapolis Royal, where it discharges into the Annapolis Basin.

Local topography and historical excavation activities influence surface water flow within the Project Site. While no mapped watercourses or significant flow accumulation features are present within the site (based on the Nova Scotia Flow Accumulation dataset and proprietary modelling completed by Fraxinus), the terrain suggests that water generally moves southward where elevation allows. Excavated pit depressions may temporarily retain water, leading to ponding or infiltration. Additionally, a potential surface water pathway in the northwestern portion of the Project Site may direct flow westward toward roadside drainage features. The site is underlain by sand, which is highly permeable, and a large proportion of surface water likely drains into the sand rather than off-site.

Further information on flow direction and infiltration rates are discussed in the groundwater section below.

GROUNDWATER: The Project Site is located within the Sedimentary bedrock groundwater region, as identified in the provincial Groundwater Atlas (Drawing 7.1.1.1). Additionally, the Project lies within two surficial groundwater regions: the Glaciolacustrine/Till Plains/Colluvial region to the northwest and the Glaciofluvial/Alluvial region to the southeast and northeast. These groundwater systems influence local recharge, flow, and potential interactions with nearby wells and surface water features. Further, the Project is situated within a glaciofluvial aquifer (ID 61), which spans approximately 27 km² (Drawing 7.1.1.2). Information regarding the estimated aquifer thickness is detailed later in this section.

According to the Nova Scotia Well Logs Database, the nearest municipal well is approximately 2.5 km east of the Project, and 54 well records are located within 500 m of the Project Site. Of these, 45 are designated for domestic use, one for industrial use, one for other purposes, and seven have unspecified uses. Based on short-term driller yield estimates, the average yield for wells within 500 m of the Project Site is 74.52 litres per minute (Lpm), with an average well depth of 29.65 m (Table 7.1). These values represent short-term yields estimated by the driller after well construction.

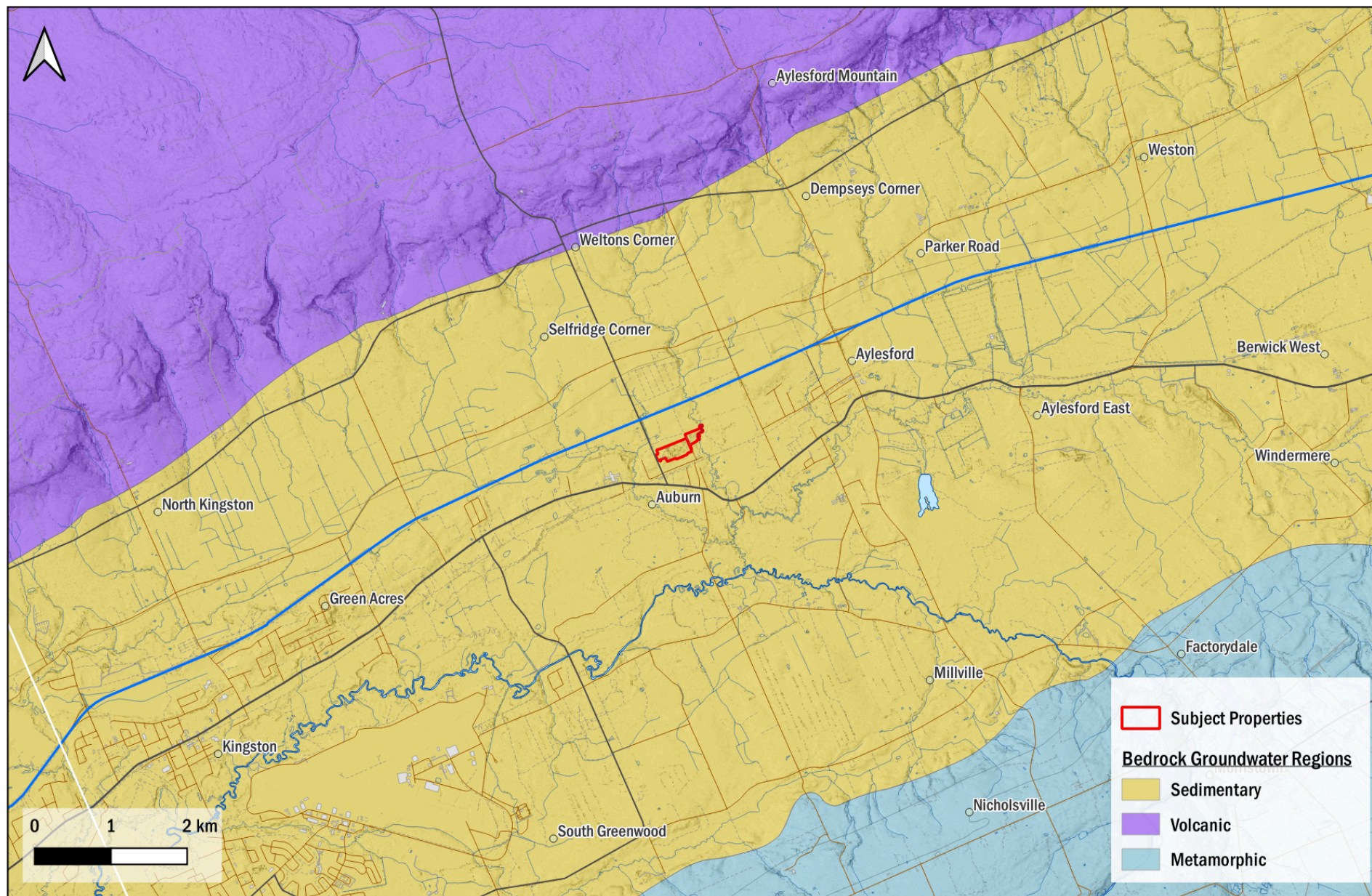
Table 7.1: Summary of Well Records Within 500 m of the Project Site

	Drilled Date (year)	Well Depth (m)	Casing Length (m)	Depth to Bedrock (m)	Depth to Static Water Levels (m)	Estimated Yield (Lpm)
Minimum	1964	10.05	5.79	5.79	2.44	22.70
Maximum	2018	83.74	41.72	41.11	20.40	544.80
Average	N/A	29.65	20.56	20.93	5.11	74.52

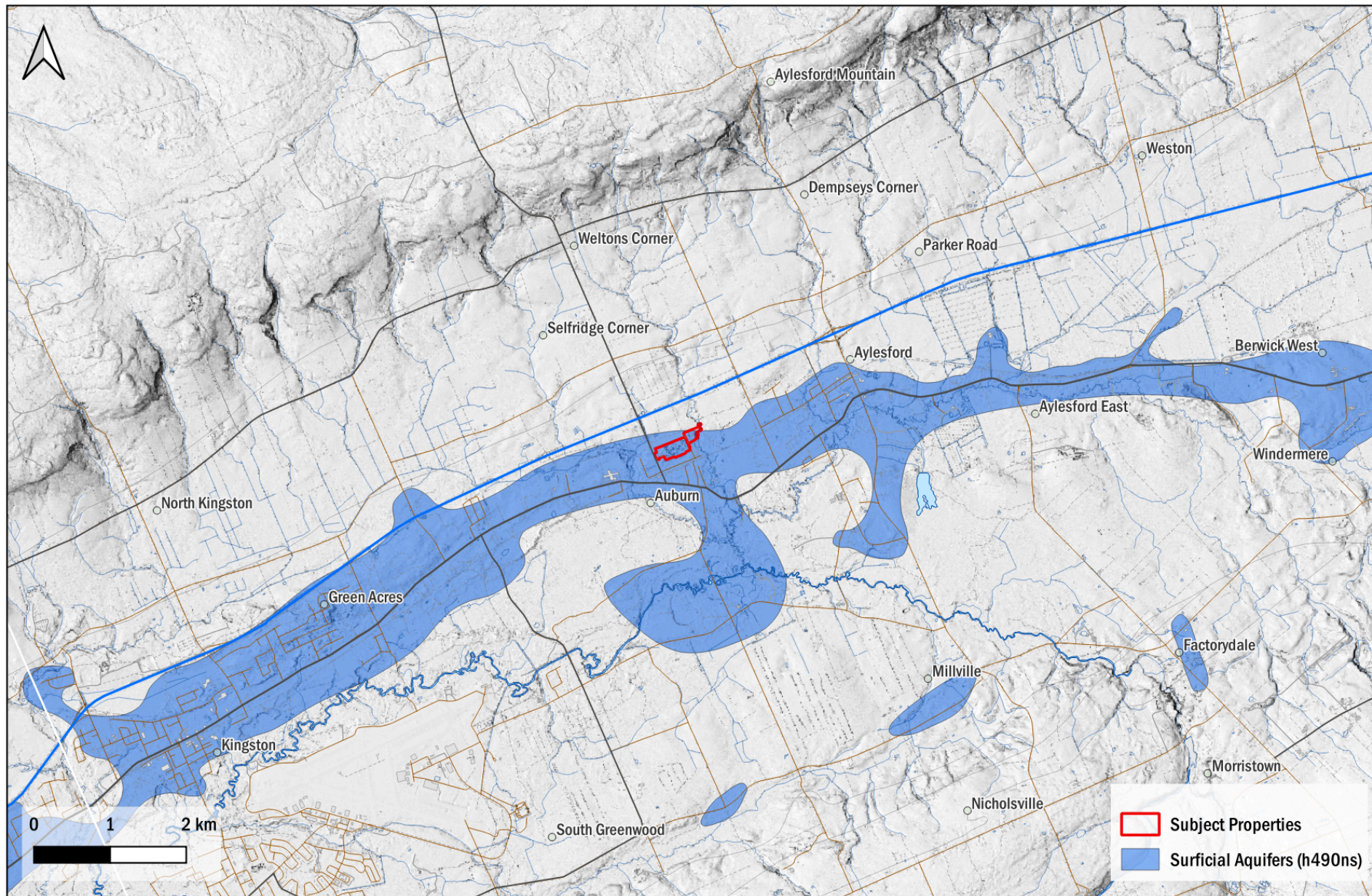
Source: NSNRR (2025b)

The Nova Scotia Well Logs Database records two wells within the Project Site (wells 000067 and 641020), one labelled as a domestic well, which supplies water to the residence on the Project Site, and the other as an industrial well, which supplies water to the Kenneth Lutz Trucks Limited operations building. Groundwater conditions in the area are characterized through test pit excavations.

A review of the Well Water Chemistry in Nova Scotia layer identified water quality data for one location within the Project Site (Sample ID: Reg4933, sampled on 2005-02-22). The data includes various parameters such as alkalinity, sulfate, calcium, pH, and total dissolved solids (TDS). A summary of the water quality parameters is provided in Table 7.2.



Drawing 7.1.1.1: Nova Scotia Groundwater Atlas: Bedrock Groundwater Regions



Drawing 7.1.1.2: Nova Scotia Groundwater Atlas: Surficial Aquifers. Project overlaps surficial aquifer ID#61.

Table 7.2: Water Quality Parameters for Sample Reg4933

Parameter	Value
Sample ID	Reg4933
Date Sampled	2005-02-22
Alkalinity (mg/L)	55.0
Bicarbonate (mg/L)	54.6
Carbonate (mg/L)	0.4
Sodium (mg/L)	18.0
Potassium (mg/L)	2.0
Calcium (mg/L)	10.1
Magnesium (mg/L)	1.0
Fluoride (mg/L)	0.2
Sulphate (mg/L)	8.9
Chloride (mg/L)	11.0
Hardness (mg/L)	29.3
Total Dissolved Solids (mg/L)	96.0
pH	7.9
Nitrate - Nitrite (mg/L)	0.3
Arsenic (ug/L)	1.0
Uranium (ug/L)	1.0
Iron (ug/L)	105.0
Manganese (ug/L)	39.0

Source: NSNRR (2025b)

Groundwater Flow Direction: To estimate the direction of groundwater flow, water level elevation data were derived from the Nova Scotia Well Logs Database for wells located within a 1 km radius of the Project Site. Water level elevation was calculated by subtracting the recorded static water level from the well elevation. Wells lacking either elevation or static water level data were excluded from the analysis. Each well's spatial position was defined relative to the project centroid (UTM Zone 20T: 353079.21 E, 4987214.14 N) by computing Cartesian offsets (ΔX and ΔY) from its UTM coordinates. These spatial offsets, along with the corresponding water level elevations, were used to perform a weighted least squares regression to fit a planar surface representing the regional water table. Weighting factors were applied to assign greater influence to wells that were closer to the Project Site and had more recent measurement dates, thereby reducing the impact of spatially or temporally outlying data. The horizontal gradient of the fitted surface was used to identify the direction of steepest descent, which was interpreted as the groundwater flow direction. The resulting flow

vector indicates a predominant flow direction of approximately 207° from North, suggesting a southwestward trend in groundwater movement across the site.

Aquifer Thickness: Aquifer thickness was assessed using well log data from the Nova Scotia Well Logs Database for wells located within a 1 km radius of the Project Site centroid (defined above). Aquifer thickness was defined as the vertical interval between the water table and the top of bedrock, both referenced to sea level. Specifically, the elevations of the water table and bedrock were calculated by subtracting the recorded static water level and bedrock depth, respectively, from the reported ground surface elevation at each well. The difference between these two elevations was taken as the aquifer thickness. Wells lacking valid static water level or bedrock depth values were excluded from the analysis.

Two approaches were used to summarize aquifer thickness: an unweighted method, which treated all valid wells within 1 km of the Project Site equally, and a weighted method that prioritized wells based on spatial and temporal relevance. In the weighted analysis, each well's contribution was determined by the inverse of the product of its distance to the project centroid and the number of days since its measurement, thereby giving greater influence to wells that are both geographically close and recently logged. Summary statistics for each analysis are presented in Table 7.3.

Table 7.3: Summary of Aquifer Thickness Estimates for Wells Within 1 km of the Project Site

Analysis Type	Mean (m)	Median (m)	Minimum (m)	Maximum (m)
Unweighted	17.98	15.68	3.35	37.76
Weighted	24.35	24.36	---	---
Top 25% Highest-Weighted	---	---	3.96	36.54

The mean and median values in the weighted analysis reflect a stronger influence from wells that are most representative of current local groundwater conditions. The top 25% highest-weighted subset represents the most reliable wells within 1 km of the project centroid, providing a focused view of aquifer thickness based on the highest-quality data. These results suggest a moderately thick, saturated unconsolidated zone above bedrock in the vicinity of the Project Site, and based on the weighting of more recent data from proximal wells, suggest that the aquifer thickness on the Project Site is higher than the average for the larger area within 1 km.

Water Table Elevation: Water table elevation at the Project Site centroid (defined above) was estimated using static water level and well elevation data from the Nova Scotia Well Logs database. Water table elevation at each well location was calculated by subtracting the static water level depth from the ground surface elevation. Wells with missing or invalid data were excluded from analysis. To characterize regional groundwater elevation, two summary statistics were generated: an unweighted mean and a proximity- and age-weighted mean.

For the unweighted approach, all valid wells were treated equally to provide an overall average groundwater elevation within a 1 km radius of the site. For the weighted approach, each well was assigned a weighting factor based on the inverse of the product of its distance to the project centroid and the number of days since the measurement was taken. This method emphasized wells that were both geographically proximate and recently measured, aligning the analysis with current local hydrogeological conditions.

Using this methodology, the unweighted mean groundwater elevation was calculated to be 23.43 metres above sea level (masl). The weighted mean, incorporating distance and age factors, was estimated at 25.56 masl. This suggests that the water table at the Project Site is slightly higher than the regional average within 1 km, possibly due to influence from McGee Brook.

Hydrogeological Characteristics: The proposed sand pit is situated within a deposit of clean, well-sorted glaciofluvial sand, characterized by high permeability and rapid infiltration capacity. Published infiltration rates for clean sand typically range from 2.0 to 11.0 cm/hr (approximately 0.5 to 3.0×10^{-5} m/s) depending on compaction, grain size distribution, and moisture conditions (Carsel & Parrish, 1988; Rawls et al., 1983).

FIELD PROGRAMS : METHODOLOGY

Surface water field assessments were conducted at McGee Brook, the primary watercourse within the Project Site, to evaluate water quality, flow characteristics, and potential sources of disturbance. Water quality parameters, including pH, conductivity, and TDS, were measured at five designated sampling locations on November 8, 2024. Additional data on channel morphology, riparian conditions, and fish habitat suitability were also collected and are further discussed in Section 7.1.6.

FIELD PROGRAMS : RESULTS

McGee Brook is a small, permanent watercourse with a bankful width ranging from 7 to 8 m and a bankfull height between 1.25 and 1.75 m. The wetted width also varied between 7 and 8 m, with flow velocities measured at 0.136 m/s at one location. Wetted depths at various locations along the stream ranged from 0.15 m to 1.6 m.

The pH values measured across the five sampling locations ranged from 7.3 to 7.64, indicating neutral to slightly alkaline conditions, which fall within the typical range for freshwater systems (6.5 to 9.0) (CCME, 1987). Conductivity values ranged from 171 $\mu\text{S}/\text{cm}$ to 175 $\mu\text{S}/\text{cm}$, which is within the normal range for freshwater systems. TDS values ranged from 70 mg/L to 72 mg/L, indicating no significant concerns with dissolved solid concentrations that would impact water quality. Additional results on channel morphology, riparian conditions, and fish habitat suitability are further discussed in Section 7.1.6.

7.1.2 WETLANDS

REGULATORY CONTEXT

Several federal and provincial laws and regulations are relevant to the operations of the Project with respect to wetlands.

FEDERAL

- **The Federal *Policy on Wetland Conservation* (1991)** - Although not enforceable, this policy provides guiding principles for wetland conservation in Canada and encourages incorporating wetland protection into project planning and decision-making processes. Adherence to this policy ensures the preservation of wetland functions, such as water filtration and flood attenuation, during Project operations.

PROVINCIAL

- **Nova Scotia *Wetland Conservation Policy* (2019)** - This policy aims to achieve the goal of no loss of Wetlands of Special Significance (WSS) and no net loss in area or function for other wetlands. WSS are wetlands that support significant species or species assemblages, support high wildlife biodiversity, have significant hydrologic value, or have high social or cultural importance. The following are considered WSS under this policy:
 - All salt marshes.
 - Wetlands that are within or partially within a designated Ramsar site, Provincial Wildlife Management Area (Crown and Provincial lands only), Provincial Park, Nature Reserve, Wilderness Area, or lands owned or legally protected by non-government charitable conservation land trusts.
 - Intact or restored wetlands that are project sites under the North American Waterfowl Management Plan and secured for conservation through the Nova Scotia Eastern Habitat Joint Venture program.
 - Wetlands that are known to support at-risk species, as designated under SARA or the ESA.
 - Wetlands in designated protected water areas as described within Section 106 of the *Environment Act*, S.N.S. 1994-95, c. 1, s. 1.
 - A wetland that scores as a WSS based on functional characteristics using the Wetland Ecosystem Services Protocol for Atlantic Canada (WESP-AC).

Under this policy, wetland alterations require permit approval from NSECC, and as part of the permit approval, compensation activities must be included to compensate for the area of wetland habitat lost through the alteration activity.

- ***Activities Designation Regulations (N.S. Reg. 47/95)*** - These regulations list pits and quarries as designated activities that require environmental approvals from NSECC. Sand pit operations that involve wetland or watercourse alterations must obtain the necessary permits. Compliance ensures that the Project adheres to best management practices for wetland protection and environmental management.

DESKTOP REVIEW : METHODOLOGY

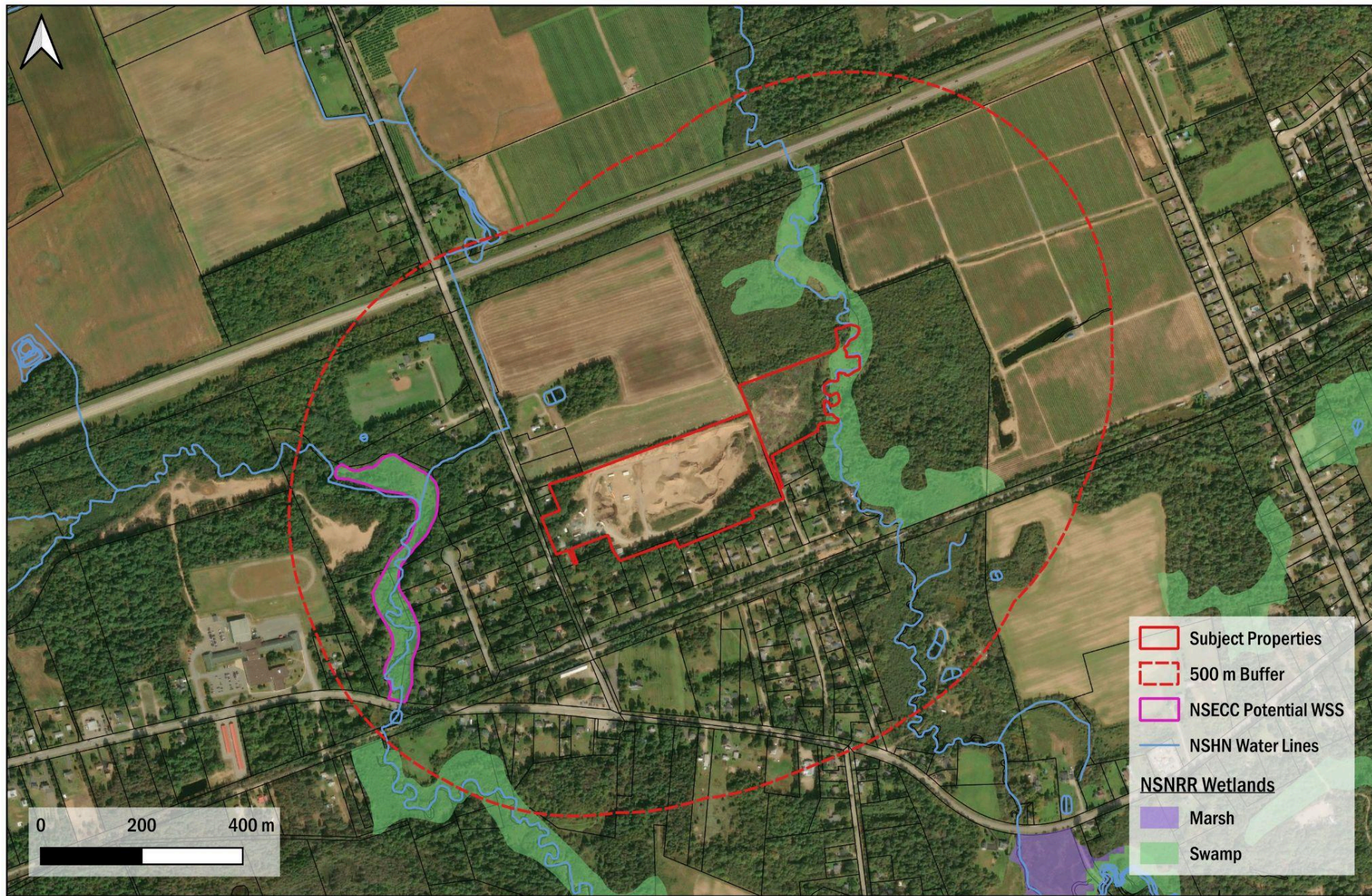
The desktop review was completed through a review of the following resources:

- Aerial imagery and topography
- Canadian National Wetlands Inventory (CNWI) (ECCC, 2024)
- Nova Scotia Natural Resources and Renewables (NSNRR) Wetland Inventory (NSNRR, 1999)
- Nova Scotia Wet Areas Mapping and Flow Accumulation Channel (NSNRR, n.d.-e)
- Provincial Landscape Viewer (NSNRR, n.d.-d)

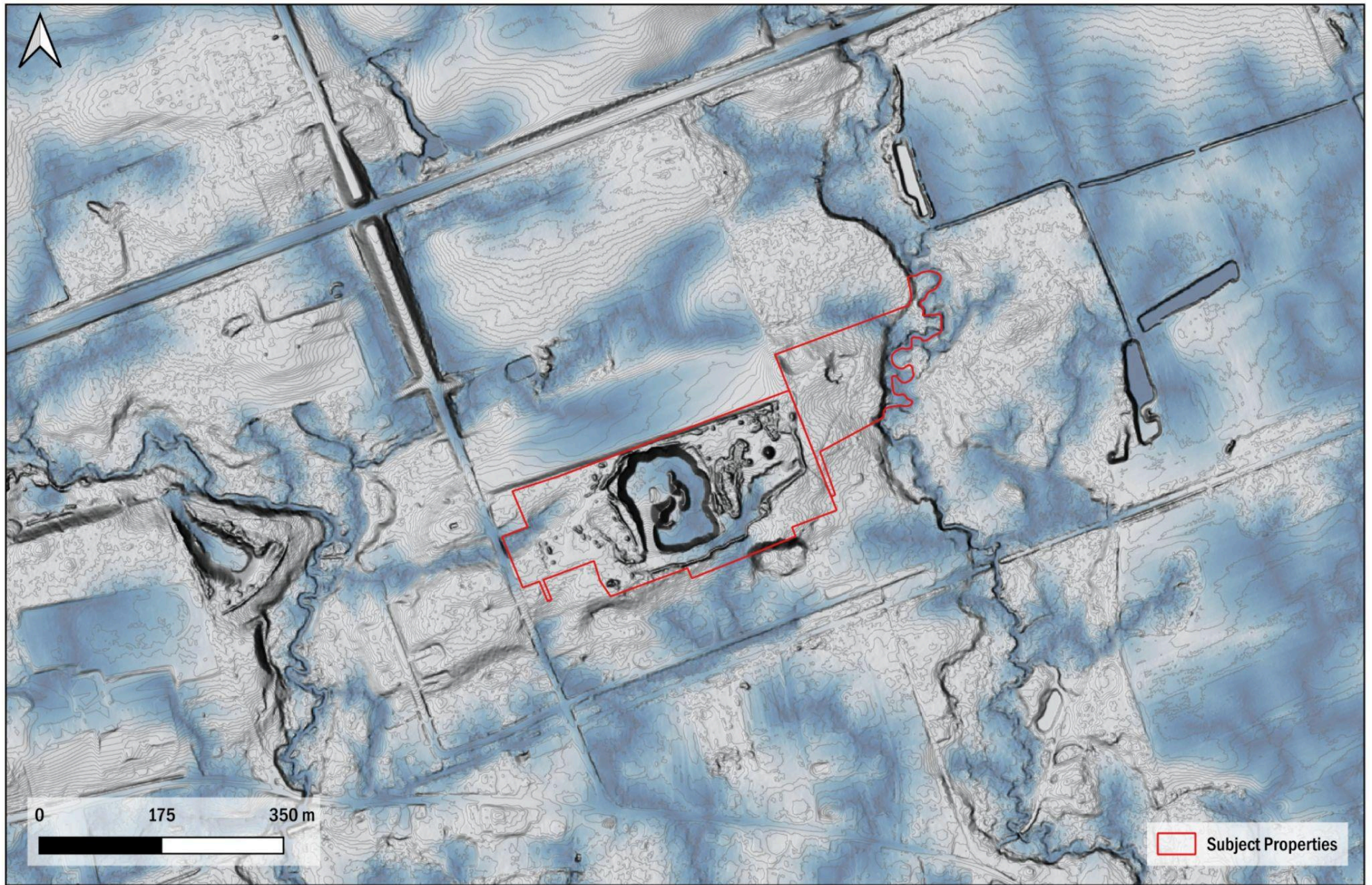
DESKTOP REVIEW : RESULTS

The NSNRR Wetland Inventory identified one wetland within the Project Site - a 7 ha shrub swamp located along the northeastern edge of the Project (Drawing 7.1.2.1). This wetland is associated with the McGee Brook floodplain surrounding the watercourse. This wetland may be hydrologically connected to an adjacent wetland southeast of the Project, identified by the CNWI as 'unknown' and located on the opposite side of the Kingston Rail Trail. While this feature was not classified as a wetland by NSNRR, it is mapped as a potential wet area, and flow accumulation data suggest water movement through this location.

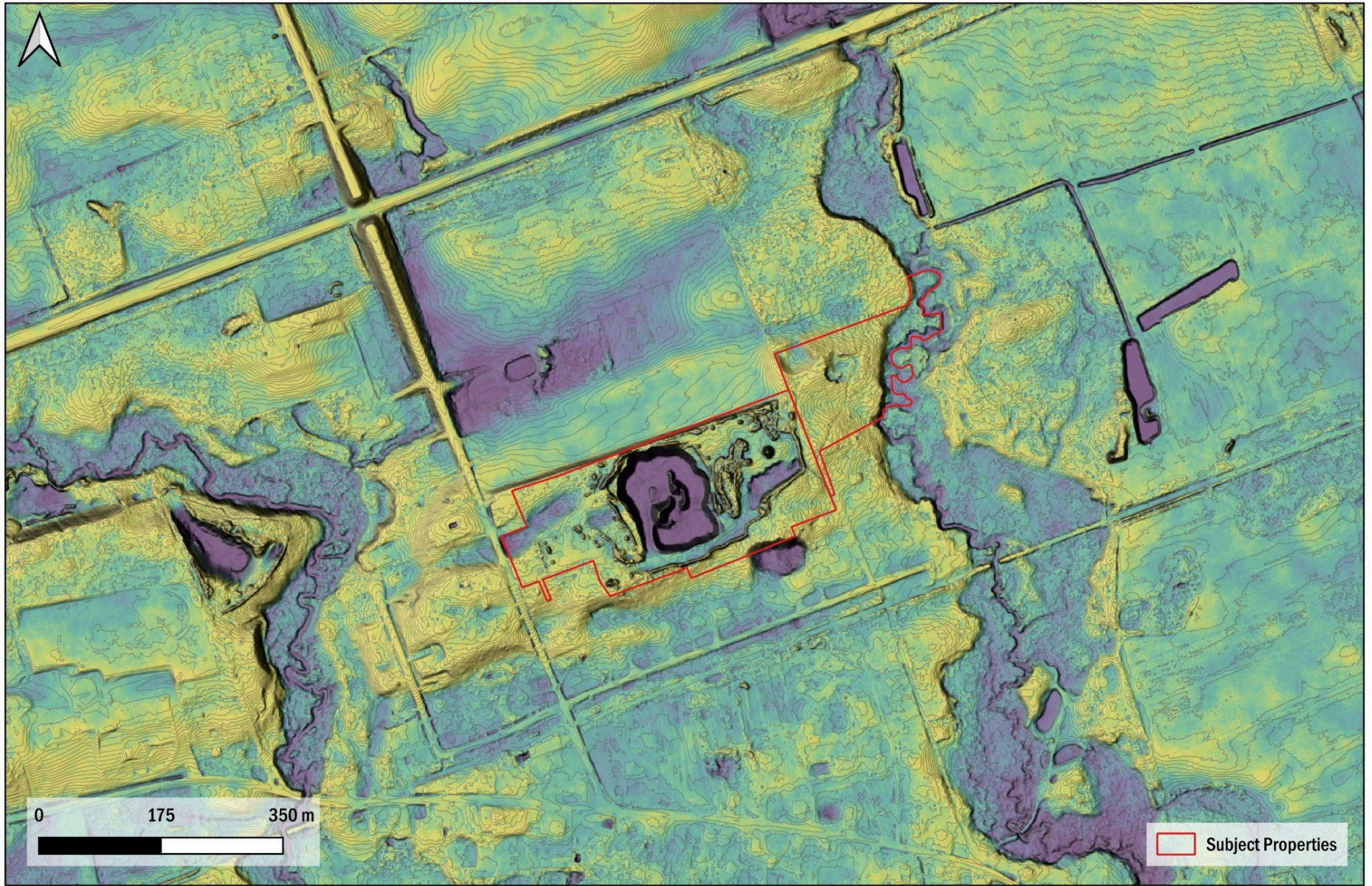
In-house modelling was completed using available LiDAR elevation data to determine the potential extent of wetlands intersecting the Project Site, as a supplement to existing inventories and field delineation. These products included a Depth to Water (DTW) Index (Drawing 7.1.2.2) and a Stochastic Depression Model (Drawing 7.1.2.3).



Drawing 7.1.2.1: Wetland Desktop Assessment Results - NSNRR Wetlands & NSECC 'Potential WSS' (indicated by pink outline, west of Project Site)



Drawing 7.1.2.2: Wetland Desktop Assessment Results - Wetland Predictive Modelling - LiDAR Depth to Water Index



Drawing 7.1.2.3: Wetland Desktop Assessment Results - Wetland Predictive Modelling - LiDAR Stochastic Depression Model

Several additional wetlands are within 500 m of the Project Site (Drawing 7.1.2.1). A 2.7 ha shrub swamp is located west of the Project and appears to be connected to a larger 9.2 ha shrub swamp southwest of the Project, both of which are associated with the Avery Brook floodplain.

The Provincial Landscape Viewer was reviewed to identify any areas of interest related to wetlands within and near the Project Site. No areas were identified that fall under specific designations such as Special Management Zones, WSS, or other protected wetland areas.

Modelling results suggest a greater extent of NSNRR mapped wetlands, as well as additional presence of unmapped wetlands within the vicinity of the Project.

FIELD PROGRAMS : METHODOLOGY

WETLAND DELINEATION: During the assessment, the delineation of all encountered wetlands on the Project Site was conducted per the protocols of the U.S. Army Corps of Engineers (USACE) *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, 1987). Diagnostic parameters for wetland identification were recorded, including those for hydric soils, presence of wetland hydrology, and presence of hydrophytic (water-loving) vegetation. The USACE methodology is widely implemented and is the standard practice within Nova Scotia - as such, the methodology is well understood and is not discussed further within this report. The wetland boundaries were georeferenced to $\pm 3\text{-}5$ m accuracy using a handheld GPS. Wetland and upland control plots were established within an undisturbed portion of the site, with all appropriate conditions recorded digitally using ESRI Survey123 field data collection forms.

Results from the delineation are included in subsequent sections, and wetland plot data is attached in Appendix D.

WETLAND FUNCTIONAL ASSESSMENT: Wetland functional assessments were completed using WESP-AC (WESP-AC; Adamus, 2021) for all identified wetlands within the Project Properties. WESP-AC is a standardized rapid assessment tool that evaluates 17 specific wetland functions through a combination of desktop (landscape-level) and field-based data collection, including biophysical attributes and stressor identification.

Each function receives a Function Score (reflecting ecological capacity) and a Benefit Score (reflecting ecological, social, or economic value). Scores are classified as *Lower*, *Moderate*, or *Higher* based on provincial calibration, allowing comparison among wetlands across Nova Scotia.

Grouped function scores are further organized into two supergroups—Support (Hydrologic, Water Quality, and Aquatic Support) and Habitat (Aquatic and Transition Habitat)—to determine potential WSS status. WSS designation is based on predefined combinations of moderate and high scores across these groups.