Transmission Infrastructure Partnerships 1 Limited

TIP-1 Transmission Line Project
District of Cochrane, ON

Technical Report
Draft Environmental Study Report

BBA Document No. / Rev.: 7311004-006000-4E-ERA-0001 / R00
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FINAL

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Executive summary

Transmission Infrastructure Partnerships-1 (TIP1) commissioned BBA E & C Inc. (BBA) to prepare this draft Environmental Study Report (ESR) for the proposed construction and operation of a new single-circuit 230 kilovolt (kV) transmission line (the Project) near Timmins, Ontario. The Project is approximately 42 kilometres (km) long and will connect the Hydro One Networks Inc. (HONI) existing Porcupine Transmission Substation (Porcupine TS) in the City of Timmins to the proposed Crawford Nickel Mine (Crawford Mine) Substation (Crawford Substation) in Cochrane District. The preferred route for the Project is co-located with HONI's existing 500 kV transmission line and Ministry of Transportation Ontario (MTO)'s existing Highway 655. The purpose of the Project is to:

- Support the much-needed infrastructure and electrification of the planned Crawford Nickel Mine (Crawford Mine);
- Improve regional transmission reliability in conjunction with future transmission projects;
- Support Ontario's transition to a low-carbon economy; and
- Support Indigenous reconciliation and economic development.

The proposed Project has been subject to the *Class Environmental Assessment for Transmission Facilities* (Hydro One Network Inc., 2024) (Class EA), as approved under the Ontario *Environmental Assessment Act* (EAA), as a Category B project. This ESR characterizes the existing environment, assesses the potential environmental effects, proposes mitigations, and documents consultation and study findings. This draft ESR has been prepared following the requirements of the EAA and the Class EA.

This ESR presents how the Alternatives Means to meet the Project need and Alternative Methods (Routes) of the Project were evaluated. Five (5) Project Alternatives Means were considered by TIP1:

- A Do Nothing scenario
- Power generation at Crawford Mine including:
    - Diesel Generation Plant
    - Natural Gas Turbine Power Plant
    - On-site Wind or Solar Power Plant
- Electricity Transmission Line

The ESR determined that an Electricity Transmission Line met the balance of social, environmental, cost, and technical concerns to meet the Project need.

The four (4) Alternatives Methods (Alternative Routes) that were considered for the Project are as follows:

- **Alternative Route 1:** Porcupine TS to Crawford Substation (Alternative Siting 1), is approximately 42 km and parallels an existing transmission line for most of its length, parallels existing roads for approximately two-thirds of its length, and approximately 13 km is new right-of-way (ROW).
- **Alternative Route 2:** Porcupine TS to Crawford Substation (Alternative Siting 2), is approximately 41 km and parallels an existing transmission line for most of its length, a ROW that parallels existing roads for approximately one-half of its length. < 1 km is new ROW.
- **Alternative Route 3:** Porcupine TS along the Mattagami River to Crawford Substation (Alternative Siting 1) is approximately 55 km and parallels an existing transmission line for approximately half of its length; approximately 4 km is new ROW and approximately 20 km parallels an existing transmission line in Timmins.
- **Alternative Route 4:** Pinard Station travelling south to Crawford Substation (Alternative Siting 2) is approximately 164 km and parallels an existing transmission line for most of its length with no new ROW.

Alternative Route 1 was selected as the preferred corridor to carry forward for more detailed identification and analysis in the Class EA. The rationale for the selection of the preferred corridor is as follows:

- Has the lowest length, thereby limiting habitat impacts
- Has the lowest number of angles or turns
- The lowest length through high-density moose and wolf habitat
- Avoids dwellings
- Minimizes intersecting areas that have Indigenous land use sites

Following the identification of the Preferred Route, an environmental inventory was completed using desktop sources, and an initial screening of the environmental assessment criteria was completed. Subsequent field surveys were completed for both the proposed Crawford Mine (2021-2023) and TIP-1 (2023 and 2024). The field surveys included are the Ecological Land Classification and Vegetation Survey, Winter Mammal Survey (Aerial), Amphibian Call Survey, Turtle Basking Survey, Breeding Birds Survey, Nocturnal Owl Survey, Migratory Birds and Waterfowl, bat hibernacula and maternity roosts, fish habitat, and others.

TIP1's consultation activities aimed to inform local authorities and communities with an interest in the Project and facilitate collaboration with them to reduce project impacts. Stakeholder concerns and feedback are valuable sources of information that can improve Project design and outcomes and help TIP1 identify and control external risks. A Notice of Commencement for the Class EA was issued to over 70 stakeholders on November 1, 2023.

Consultation activities were undertaken according to the following principles:

- Early and inclusive engagement;
- Open and transparent communication;
- Meaningful and understandable information sharing;
- Commitment to addressing concerns and answering questions; and
- Adequate and comprehensive documentation.

Public information sessions were hosted on November 15th, 2023, and May 23rd, 2024 following community notices in local newspapers. Information provided to the community included: the environmental assessment process; project need; project description; completed and on-going environmental inventory activities; proposed alignment; project alternatives; anticipated schedule; proposed structures; and environmental considerations. Concerns that were received from the community included clearing requirements, necessary permits, risks to bats, co-location with other infrastructure and property rights. In addition to public information sessions, personal consultation was held with other stakeholder to address their specific concerns.

Engaging with Indigenous communities is a key aspect of the Class EA process. A delegation letter was received from the Ontario Ministry of Energy on October 12, 2023, which delegated the procedural aspect of the Crown's Duty to Consult with Indigenous communities to the Project proponent. The letter included the following list of potentially impacted Indigenous communities:

- Matachewan First Nation (Matachewan);
- Mattagami First Nation (Mattagami);
- Taykwa Tagamou Nation (TTN); and
- Métis Nation of Ontario Abitibi-Témiskamingue Region 3 (MNO).

In addition to the listed communities, Wabun Tribal Council (WTC) has indicated they are representing their member communities and that Flying Post First Nation has asserted their interest in the Project. Wabun Tribal Council and Flying Post First Nation have therefore also been included in Project correspondence, including efforts to meet and share Project information.

A pre-Notice of Commencement email was sent on October 10, 2023, to the communities listed above to notify them of the proposed Project, including the WTC. A formal Notice of Commencement was sent to all Indigenous communities along with the public session information session invitation in November 2023.

TIP1 understands that consulting and engaging with Indigenous communities requires a transparent and meaningful approach. Efforts made to engage all Indigenous stakeholders included:

- Sending notifications and providing information updates on the Project throughout the Class EA process;
- Sending reminder correspondence about upcoming public and Indigenous-specific community information events;
- Offering to meet with the community to present the proposed Project and address the community's issues or concerns; and
- Sending copies of public consultation materials.

Taykwa Tagamou Nation (TTN) accepted offers for professional lunch-and-learns, and two (2) community dinners, to consult with their community. The primary concerns received from community members included: timber harvesting opportunities; proximity of the new line to the existing line; job creation, training and qualifications; contract opportunities; and union roles. TIP-1 continues to engage Indigenous communities on the Project; however, generally no explicit opposition to the Project or objection to the selected route was received.

Potential environmental effects of the proposed Project were identified, and either avoided or mitigated as proposed in this document. Based on the information collected within the Project Study Areas, net adverse environmental effects may be possible, however, none were evaluated to be significant.

A Cumulative Effects Assessment was completed for the Project as required by the Class EA for Transmission Facilities (Hydro One Network Inc., 2024). It was determined that there is no significant cumulative effect with the proposed mitigation measures for the Project and the colocation of the Project with existing and future linear infrastructure.

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Appendix B: Consultation Records
Appendix C: Natural Heritage Baseline Report
Appendix D: Stage 1 Archaeological Resource Assessment
Appendix E: Cultural Heritage Screening Report

Acronyms and Abbreviations

Acronym / Abbreviation	Definition
AMIS	Abandoned Mines Information System
ANSI	Areas of Natural and Scientific Interest
APP	Avian Protection Plan
ARFMI	Abitibi River Forest Management Inc.
BMA	Bear Management Area
CNC	Canadian Nickel Corporation
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
COSSARO	Committee on the Status of Species at Risk in Ontario
EAA	Environmental Assessment Act
EAS	Environmental Alignment Sheets
ELC	Ecological Land Classification
EMP	Environmental Management Plan
END	Endangered
ESA	Endangered Species Act
ESCP	Erosion and Sediment Control Plan
ESR	Environmental Study Report
EXT	Extirpated
FRI	Forest Resource Inventory
IESO	Independent Electricity System Operator
IEZ	Industrial Effect Zone
km	kilometre
kV	kilovolt
Lph	Litres per hour
LSA	Local Study Area
MNO	Métis Nation of Ontario Abitibi-Témiskamingue Region 3
m	metre
MECP	Ministry of Environment, Conservation and Parks
MNR	Ministry of Natural Resources
MTCS	Ministry of Tourism, Culture and Sports

Acronym / Abbreviation	Definition
MTO	Ministry of Transport
NERC	North American Electric Reliability Corporation
NHIC	Natural Heritage Information Centre
ORA	Off Right-of-Way Access
OWES	Ontario Wetland Evaluation System
PSW	Provincially Significant Wetland
Q2	Second quarter of a year
Q3	Third quarter of a year
QEP	Qualified Environmental Professional
ROW	Right-of-Way
RSA	Regional Study Area
S1	Critically Imperiled
S2	Imperiled
S3	Vulnerable
SAR	Species at Risk
SARA	*Species at Risk Act*
SC	Special Concern
SCC	Species of Conservation Concern
SWH	Significant Wildlife Habitat
THR	Threatened
TIP1	Transmission Infrastructure Partnerships 1 Limited
TLA	Transmission line alignment
TLU	Traditional land use
TTN	Taykwa Tagamou Nation
WMU	Wildlife Management Unit
WTC	Wabun Tribal Council

1. Introduction

Transmission Infrastructure Partnerships 1 Limited (TIP1) is a privately owned corporation formed in 2020 as a partnership between Taykwa Tagamou Nation (TTN) (50%), Vires Partners Inc. (25%) and ATX Canada, a subsidiary of Ameren Corporation (25%).

TIP1 proposes to construct and operate a new 230 kV transmission line that will provide electricity from the Ontario provincial power system operated by the Independent Electricity System Operator (IESO) to customers north of Timmins, Ontario (the Project). The first secured customer will be the Canada Nickel Company's (CNC) proposed Crawford Nickel Mine. TIP1 and the Project will support employment in Northern Ontario and Ontario's transition to a lower carbon economy by providing very low emissions electricity in Northern Ontario, an area where many communities are currently reliant on higher emissions sources of energy. The need for new and reliable electricity transmission infrastructure in this part of the province is supported by regional planning and studies confirming the very poor electricity reliability in certain northern and Indigenous communities across Northern Ontario (IESO, 2022). TIP1 has been contacted by other customers north of Timmins, but no contracts for transmission service have been signed at the time of writing.

In addition to the potential additional customers, the existing transmission system in the immediate area is weak and needs re-enforcement (IESO, 2022). This proposed Project may be part of the re-enforcement effort in the future. The need for the Project is defined as:

- **Indigenous Reconciliation and Resurgence |** Taykwa Tagamou Nation is a majority equity owner and shareholder in TIP1. The Nation's community is committed to ensuring a high degree of First Nations employment, contracting, procurement, support, and involvement in the Project.
- **Critical Mineral Supply Supporting Electrification and Energy Transition |** The Project will provide the necessary infrastructure for electrification of the planned Crawford Mine and the mining of nickel, a critical mineral for Ontario's electrification, and the electric battery, automotive, transportation, and energy storage sectors. The support for electrification and associated industries is a key pillar of transitioning to a low-carbon economy.
- **Needed Electricity Infrastructure |** The need for new and reliable electricity transmission infrastructure in this part of the province due to very poor electricity reliability in certain northern and Indigenous communities across Northern Ontario (IESO, 2022).

- **Sustainable Development of Northern Ontario |** The Project will support: (i) the sustainable development of Northern Ontario, (ii) employment in Northern Ontario, and (iii) Ontario's transition to a lower carbon economy through very low emissions electricity infrastructure in Northern Ontario, an area where many communities are currently reliant on higher emissions sources of energy.

The powerline will provide connection between the existing Porcupine Substation and a planned switching station to be built near the proposed TIP1 Switching Station (Crawford Substation). The proposed TIP1 transmission line alignment (TLA) will span approximately 42 km, primarily along the existing transmission line and Highway 655 corridor and will divert to the west for the final approximately 15 km. The construction of the TIP1 transmission line is planned to begin in 2025, with Q2 2027 as the anticipated in-service date.

The TIP1 Project is deemed an Undertaking under the Electricity Projects Regulation (O. Reg. 116/01) of the Ontario *Environmental Assessment Act* and determined to be a Category B Project (Table 1-1) following the *Guide to Environmental Assessment Requirements for Electricity Projects* (MECP, 2024).

Table 1-1: Categories of transmission line projects

Category	Level of Impact	Project Characteristics	Environmental Assessment Requirement
A	No impacts	< 115 kV; or, ≥ 115 kV and ≤ 2 km	No Environmental Assessment requirement, must comply with all other applicable legislative requirements
B	Potential environmental effects that can be mitigated	115 kV and > 2 km; or, > 115 kV and < 500 kV and > 2 km and < 50 km,	Class Environmental Assessment for Transmission Facilities
C	Potential environmental effects that can be mitigated	Between > 115 kV and < 500 kV and ≥ 50 km; or, ≥ 500 kV and > 2 km	Individual Environmental Assessment

As a Category B Project, it is required to follow the process outlined in the *Class Environmental Assessment for Minor Transmission Facilities* (Hydro One Network Inc., 2024).

Under the *Class Environmental Assessment for Minor Transmission Facilities*, two (2) levels of assessment are considered: first a Class EA Screening Process, and second a full Class EA Process referred to as an Environmental Study Report (ESR). Projects that can answer “no” to all 16 of the defined screening questions are essentially “screened out” of requiring an environmental assessment. The TIP1 Project activities were screened against the criteria and due to planned tree clearing activities, it was determined that there was a potential environmental impact, and a further assessment would be appropriate for the Project.

This ESR has been prepared to meet the requirements of the Class EA Process (Hydro One Network Inc., 2024).

The structure of this document is as follows:

- Section 1: Introduction
- Section 2: Project Description
- Section 3: Evaluation of Alternatives
- Section 4: Engagement Summary
- Section 5: Environmental Assessment Methods
- Section 6: Existing Conditions
- Section 7: Effects Assessment
- Section 8: Net Effects Assessment Summary
- Section 9: Cumulative Effects Assessment
- Section 10: Monitoring
- Section 11: Conclusions
- Section 12: References
- Appendices

1.1. Other permits, approvals and authorizations

Upon completion of the Class EA, additional work permits and authorizations will be undertaken in consultation with provincial and federal authorities, as summarized in Table 1-2 below.

Table 1-2: Additional permits

Authority	Permit	Activity
Mattagami Region Conservation Authority	O. Reg. 41/24 Development Permit	Work within a provincially significant wetland (PSW)
Ministry of Transportation	Highway Encroachment	Work within a provincial highway Right of Way
MNRF	Work Permit	Construction on Crown Land
	Land Use Permit	Tenure for permanent facilities on Crown Land
	Forest Resource License	Tree Clearing
NavCanada	Land Use Proposal Submission Form – General	Erecting a powerline
Transport Canada	Aeronautical Assessment Form for Obstacle Notice and Assessment	Erecting a powerline

Transmission line construction in Ontario may require a Leave to Construct permit from the Ontario Energy Board (OEB), however, TIP1 has confirmed that a Leave to Construct is not required because of the secured customer agreement with CNC to purchase the electricity supplied by the TIP1 Project.

2. Project description

The proposed Project is a 42 km, 230 kV electricity transmission line intended to connect Hydro One Networks Inc's (HONI) existing Porcupine Substation in Timmins, Ontario to Crawford Substation constructed at the planned Crawford Mine by TIP1. TIP1 has completed a Transmission Services Agreement with CNC to supply the electricity.

The TIP1 proposed transmission line is consistent with the IESO's Integrated Regional Resource Plan (IRRP) (IESO, 2023) and all IESO procedures and requirements.

If approved, the TIP1 proposed transmission line will secure the delivery of power to the Crawford Mine in an area where there is a paucity of existing and reliable electricity distribution infrastructure. Electric power positively contributes to the mine's intended net zero carbon operations, which will may include carbon sequestration through mineral carbonation of tailings and hydro-electrification on the mine (WSP E&I Canada Limited, 2022).

2.1. Project location

The Transmission Line Project is located in the City of Timmins and the Cochrane District in northeastern Ontario (Map 1). The Project starts at the existing Porcupine Substation, located at the eastern boundary of the City of Timmins.

The Project is located within Treaty 9 territory, and the traditional territories of Taykwa Tagamou Nation, Mattagami First Nation, Flying Post First Nation and Matachewan First Nation. It is also located within the Métis Nation of Ontario (Region 3) harvesting area. The closest First Nation Reserve is Taykwa Tagamou's New Post 69A Reserve located approximately 45 km northeast of the proposed Crawford Substation site.

The Project location also includes recreational uses such as snowmobile trails and informal fishing and hunting areas. The region is also subject to a forest management plan, bear harvesting areas and registered traplines. There is no agricultural use of the lands along the proposed transmission line route.

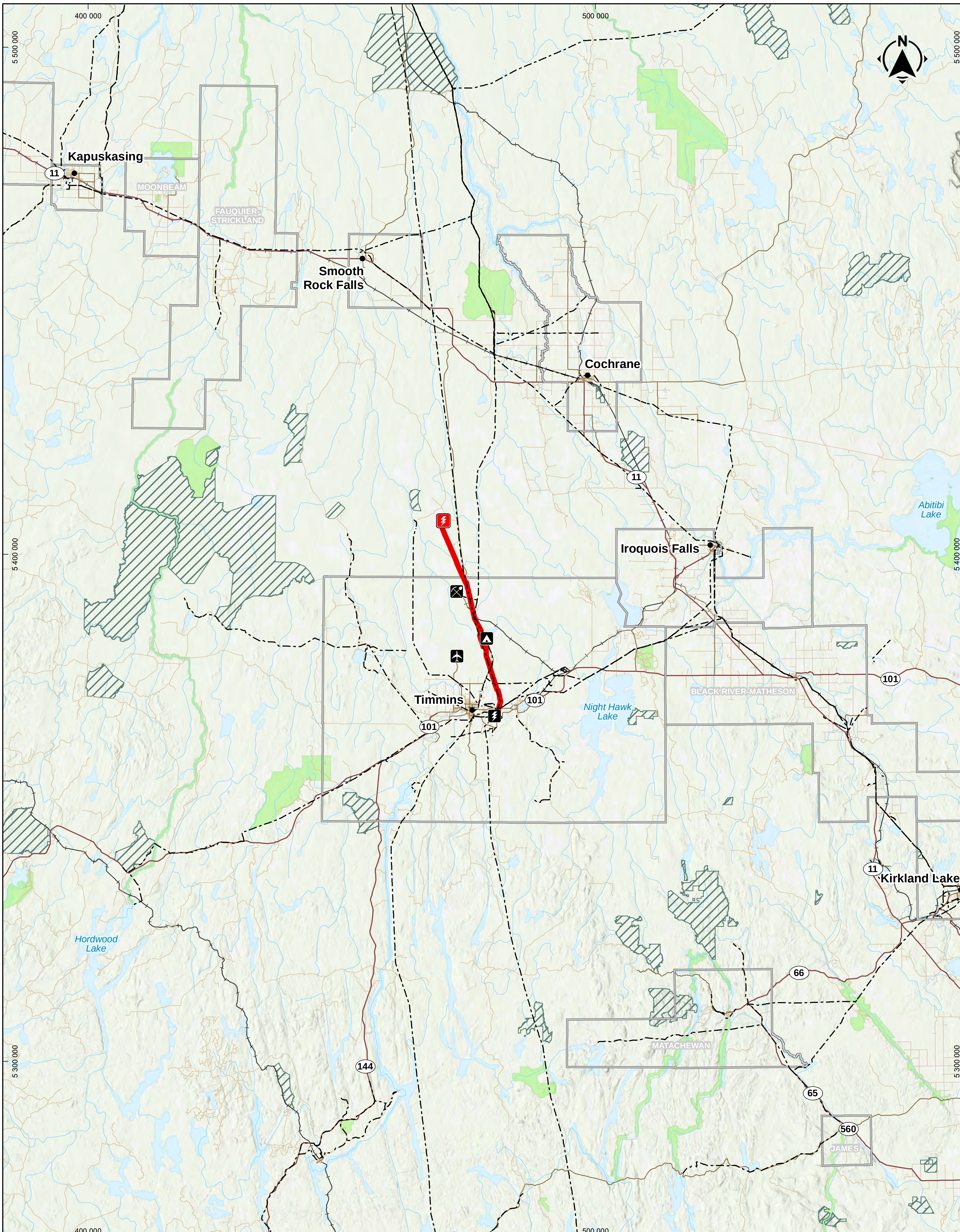
2.2. Proposed route

The Proposed Route meets the technical requirements required for the Project. The Proposed Route was selected for the Project through the process described in Section 3 below. The Proposed Route was selected because it presented the shortest length; minimized habitat impacts; minimized the number of turns; minimized length through high-density moose areas; avoided impacts to residences; and, minimized impacts to areas important to Taykwa Tagamou Nation. Details regarding the proposed structures are shown in Appendix A. Table 2-1 below summarizes the characteristics of the Proposed Route.

Table 2-1: Proposed Route description

Line Segment	Route Description
A-Frame to Str. 2	Exist from HONI A-Frame within existing Porcupine Substation east-southeast to Str. 2.
Str. 2 to Str. 3	Turn northeast to Str. 3.
Str. 3 to Str. 4	Turn northwest to Str. 4, crossing and existing railway alignment.
Str. 4 to Str. 6	Turn north-northeast to Str. 6, following existing HONI 500 kV transmission line alignments.
Str. 6 to Str. 8	Turn northeast to Str. 8
Str. 8 to Str. 9	Turn north-northwest to Str. 9, crossing above existing HONI 500 kV transmission line alignments.
Str. 9 to Str. 14	Turn north-northeast crossing Provincial Highway 101 before Str. 10, to Str. 14.
Str. 14 to Str. 16	Turn north-northwest to parallel existing HONI 500 kV transmission line.
Str. 16 to Str. 17	Turn north to avoid a wetland.
Str. 17 to Str. 21	Turn north-northwest to parallel existing access road.
Str. 21 to Str. 22	Turn northwest to cross existing access road and parallel existing HONI 500 kV transmission line.
Str. 22 to Str. 42	Turn north-northwest to parallel existing HONI 500 kV transmission line. The Transmission Line Alignment (TLA) crosses and existing access road between Str. 25 and Str. 26, and Provincial Highway 655 between Str. 32 and Str. 33.
Str. 42 to Str. 46	Turn north avoid a wetland complex.
Str. 46 to Str. 48	Turn west-northwest to return to parallel with HONI 500 kV transmission line.
Str. 48 to Str. 54	Turn north-northwest to parallel existing HONI 500 kV transmission line.
Str. 54 to Str. 57	Turn northeast to avoid a wetland complex.
Str. 57 to Str. 65	Turn north-northwest to parallel Provincial Highway 655.

Line Segment	Route Description
Str. 65 to Str. 85	Minor deflection at Str. 65 to continue north, parallel to existing HONI 500 kV transmission line. Crossing Provincial Highway 655 between Str. 68 and Str. 69, an existing railway between Str. 69 to Str. 70., and Provincial Highway 655 between Str. 71 and Str. 72.
Str. 85 to Str. 86	Turn west to cross below the existing HONI 500 kV transmission line.
Str. 86 to Str. 118	Turn northeast toward Str. 118.
Str. 118 to Str. 123	Turn north toward Str. 123.
Str. 123 to Crawford Substation	Turn east to terminate within proposed Crawford Substation.



Municipal Boundary

Project Component

Proposed TIP1 Switching Station

Existing Porcupine Transmission Substation (HONI)

Proposed 230 kV Transmission Line

Protected Areas

Conservation Area

Provincial Park

Infrastructures and Equipments

Timmins / Victor M. Power Airport

Big Water Campground

Kidd Creek Mine

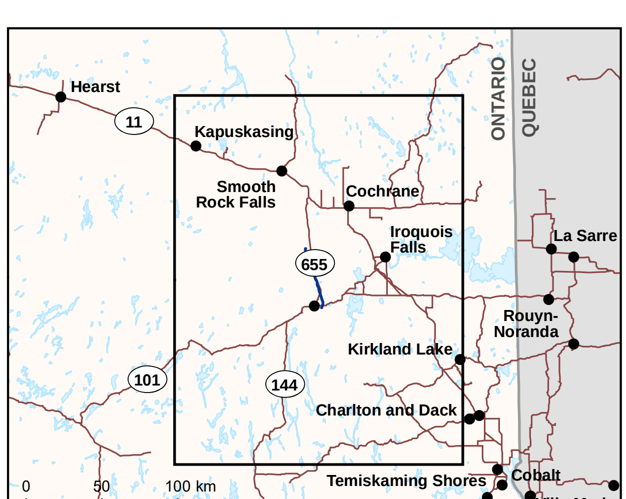
Highway

Principal Road

Local Road

Railway

Transmission Line



TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

TIP-1 Transmission Project, Timmins, Ontario

Map 1
Project Location

Sources:

CanVec, 1/250 000, NRCan, 2017
SDA, 1/20 000, MERN Quebec, June 2022
Official Airports, Ontario Ministry of Natural Resources and Forestry, March 2012
Municipal Boundary , Ontario Ministry of Natural Resources and Forestry, May 2023
Conservation Reserve Regulated, Ontario Ministry of Natural Resources and Forestry, June 2023
Provincial Park Regulated, Ontario Ministry of Natural Resources and Forestry, August 2023
Project Data, BBA, 2024

BBA Project Number: 7311004-007000-4E

2024-09-18

0 7.5 15 km
UTM, zone 17, NAD 83

Prepared by: J. Day | Drawn by: A. Haffaci | Verified by: F. Karcha

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2.3. Construction Phase

The Project Construction Phase is consistent with standard works and activities associated with Category B transmission line projects (Hydro One Network Inc., 2024).

The construction of overhead transmission involves the following activities:

- Selective cutting of vegetation along the Right-of-Way (ROW) and Off-ROW-Access (ORA).
- Establishment of construction access roads.
- Installation of tower foundations.
- Assembly and erection of towers.
- Stringing of conductors.
- Installation of counterpoise (if required).
- Post-construction reclamation of the ROW.

The TIP1 transmission line is proposed to be composed of approximately 123 steel lattice structures located 398 m apart on average/No in-water construction is proposed. The steel structures are expected to be up to 55 m high, but the ultimate height may vary as required by local topography.

The right of way will be cleared of vegetation to an average 50 m width with a maximum of up to 55 m to meet engineering setback requirements for vegetation clearance, other infrastructure, and to allow for construction access.

Construction of the transmission line will occur during the frozen ground conditions to limit impacts from Construction. In some areas where the ground is not susceptible to damage, work may be completed in dry conditions when the ground is not frozen. Access roads may be further frozen in through snow compaction and application of water.

2.3.1. Access roads

To construct and maintain a transmission line, it is necessary to access ROW for equipment and materials. Wherever possible, existing roads and travel lanes are used and resulting damage is repaired when construction activities are completed. As necessary, erosion and sedimentation control (ESC) measures will be applied to minimize impacts. Where new access roads must be constructed, their location is determined in conjunction with the property owners and applicable authorities (e.g., conservation authorities). The environmental effects caused by access roads are considered as part of the study.

2.3.2. Tower foundations

Tower foundations will be constructed of reinforced concrete or steel. In weak soils, pad and pier, spread, or piles may be required. Those foundations in rock will have steel rods drilled and grouted into the rock and a small pad of concrete placed on top.

Equipment such as augers, backhoes, concrete trucks and compressors may be used in foundation construction. Excavated material will be stockpiled and seeded; or spread in a suitable location to ensure proper deposition of excavated materials, in accordance with industry best management practices for soil handling. Throughout foundation construction, ESC measures will be applied in accordance with best management practices.

2.3.3. Tower assembly and erection

Construction materials are transported via the access roads to the foundation locations. Towers and poles are generally assembled, either partially or completely, on the ground before being lifted into position by a crane and secured with the foundation and/or guy wires.

2.3.4. Conductor stringing

Conductor stringing will use tension stringing method, where conductors are pulled under tension through travellers and kept off the ground. The first step in tension stringing is to install the insulator strings and travellers on the tower arms, followed by installing a light rope along the section of line to be strung. Stringing sections can extend up to 10 km.

Generally, a helicopter will be used to deposit the rope in the travellers on each structure. Consecutively larger and stronger ropes and steel cables are then pulled through until a sufficiently strong one is in place to pull the conductors through.

Once strung, conductors are tightened to a specified tension to ensure correct ground clearance based on design and operating conditions. The conductors are then clamped at each tower and damping devices are installed on them to limit vibration. Shield wires are attached at the tower peak positions above the conductors and are strung in a similar manner. Two (2) shield wires will be installed, one of which will be Optical Ground Wire (OPGW) to provide communication between the proposed Crawford Substation and HONI's Porcupine Substation.

Specialized equipment is required for tension stringing. The equipment is moved along existing roads wherever possible, thus avoiding the need to move heavy equipment along the full length of the ROW.

2.3.5. Counterpoise

To ensure that a transmission line will operate efficiently, it is necessary that the electrical ground resistance at each tower (tower footing resistance, or TFR) be low. To accomplish this, a ground electrode is installed at each tower. If, due to soil conditions, the ground resistance is too high, additional grounding must be installed.

The normal procedure to improve TFR is to bury two (2) continuous wires along the ROW, one (1) on each side of the towers. These wires are normally buried to a depth of 460 mm in cultivated ground and 200 mm in bush areas and in rocky ground, if possible. The wires are installed by a tracked vehicle which carries the ground wire on reels and buries it by means of a plough attachment as it proceeds along the ROW. The wires are then connected to each tower.

2.3.6. Post-construction reclamation

The final stage of construction is the reclamation of the ROW and removal of remaining construction materials, restore fencing and access roads, recontour soils, and apply ESC measures along with reseeding using appropriate seed mixes or tree planting.

2.4. Operations and maintenance phase

2.4.1. Transmission line maintenance

Maintenance of transmission lines is required to ensure acceptable performance of the line components over time and to repair minor damage due to accidents or severe weather. This involves periodic aerial patrols and ground inspections. Repairs may include replacement of components using helicopter or truck access. As with Post-Construction Reclamation, normal maintenance activities include removing construction materials and repairing damages to soil.

2.4.2. Emergency maintenance

Emergency repairs will be carried out as quickly as possible to replace structures and major equipment damaged by severe weather or accidents. Heavy equipment and materials are usually required to replace structures during emergency situations and mitigating measures will be taken as soon as possible to repair any damage to the environment after the emergency has been resolved.

2.4.3. Right-of-way management

ROW management practices will adhere to provincial legislative requirements as well as North American Electric Reliability Corporation (NERC) safety standards, and are designed to ensure the long-term safety and reliability of the line and protection of the environment. Management practices are carried out in accordance with general and site-specific specifications which identify the best treatment methods. Periodic ROW inspection and maintenance will be performed. TIP1 has committed to avoiding the use of herbicides for vegetation management on the ROW.

- **Grounds Maintenance:** Includes activities such as grass cutting, and snow removal to keep properties in a visually acceptable and safe condition.
- **Vegetation Control**: Involves the control of woody vegetation to ensure that circuits are not interrupted, and public safety is maintained. Methods include hand cutting, mowing, and mulching. Selective removal of incompatible woody vegetation to promote the development of low growing stable plant communities.
- **Stabilizing or Restoring the Environment:** Sites with potential erosions or sources of sedimentation are identified and controlled by vegetative or mechanical methods.

2.5. Project schedule

The schedule of Project activities is provided in Table 2-2. The schedule provides the next steps in the Class EA process and anticipated construction timeline to achieve the planned In-Service Date (ISD).

Table 2-2: Project schedule

Activity	Period
Draft ESR 30-day Comment Period	~~November 15 to December 15, 2024~~
Comment Response	~~January 2 to January 31, 2025~~
Filing of final ESR and Class EA Statement of Completion	February 2025
Construction Permitting	January 2025 to June 2025
Construction Start	October 2025
Project ISD	March 2027

3. Evaluation of alternatives

This section of the report identifies and evaluates alternative means of meeting the Project need (Section 3.2), including the "do nothing" alternative, and alternative methods (Route Alternatives) of carrying out the Project (Section 3.3).

3.1. Alternatives assessment methodology

Alternatives means and alternative methods were assessed for the Project. The approach was to identify potential means, screen the identified means for feasibility, assess the means against defined criteria, and select a preferred means of meeting the Project need.

The preferred means was then moved forward for an assessment of alternative methods, in this case an evaluation of potential route alternatives. The potential route alternatives were identified, route alternatives were screened for feasibility, feasible route alternatives were assessed against defined criteria, and a preferred alternative route was selected.

Alternative routes were assessed using a geographic information system (GIS) which was examined and assessed against defined criteria to identify key areas of concern, opportunities for optimization, and potential refinements to avoid constraints.

Categories and criteria used to evaluate the alternative means and alternative methods (routes) are presented in Table 3-1.

Table 3-1: Criteria used to evaluate the alternative means and methods (routes).

Category	Criteria
Technical	▪ Constructability ▪ Existing Right-of-Ways ▪ Substation connection requirements.
Cost	▪ Route length ▪ Number of deflections ▪ Structure type. ▪ Cost

Category	Criteria
Natural environment	▪ Provincial Parks, Conservation Reserves and Areas of Natural and Scientific Interest ▪ Watercourse crossings ▪ Wetlands ▪ Topography ▪ Species at Risk ▪ Wildlife and Wildlife Habitat
Socio-cultural environment	▪ Land Use ▪ Residences ▪ Recreational trails and areas ▪ Traplines ▪ Visual Landscape ▪ Archaeology ▪ Built Heritage Resources and Cultural Heritage Landscapes ▪ Indigenous Community Rights/Interests and Use of Land and Resources for Traditional Purposes[1] ▪ Cultural and Spiritual Areas and Sites ▪ Other Applicable Criteria/Indicators Identified by Communities ▪ Natural or built features

The evaluation of alternatives presented is qualitative in nature and considers the qualities and attributes of each corridor as available from desktop information. Other relevant studies[2] have been reviewed and considered.

The available desktop information was reviewed, and criteria were ranked as High, Medium or Low. Definitions for ranking are provided in Table 3-2.

Table 3-2: Criteria ranking definitions.

Rank	Assessment Criteria
High	Assigned to features that were assessed to preclude technical or economic feasibility of the alternative, such as important cultural areas, large waterbodies, dense residential areas, etc.

[1] TIP1 has relied upon information in connection to the assessment of the Crawford Mine to develop the criteria for evaluating alternatives. Relevant project stakeholder and Indigenous Nations and communities' key issues are: 1. impacts to land use, mainly hunting and fishing; 2. Equitable distribution of Project's economic and social benefits; 3. Potential impacts on wildlife; 4. Impacts on practices, activities, and ways of life, including trap lines, fishing and hunting (WSP E&I Canada Limited, 2022)

[2] Studies used include Shared Valued Solutions. 2023. Taykwa Tagamou Nation Traditional Knowledge Study for the Crawford Nickel Project;

Rank	Assessment Criteria
Medium	Assigned to features that were assessed to have inherent risk but were not considered to render an alternative as non-viable when assessed on its own. A medium level of constraint may render an alternative as less desirable, specifically when combined with other medium level constraints. Medium level constraints may be viable but considered to be best to avoid, to the extent practical.
Low	Assigned to features which are not considered limiting and where the alternative is considered viable.

Once each criterion was evaluated and ranked for an alternative, the alternative was determined to be preferred, acceptable, or unacceptable.

Alternatives assigned a criterion within any category of a 'High' rank were immediately determined to be 'unacceptable' for that criteria category. 'Preferred' determination was given to criteria categories that had more 'Low' ranked criterion than 'Medium'. 'Acceptable' determination was given to criteria categories that had equal to or greater number of 'Medium' to 'Low' ranked criterion. No weighting was given to criteria categories and/or individual criteria.

The alternative with the most 'Preferred' determinations was selected to be the preferred alternative that will be carried forward into the environmental assessment.

3.2. Alternative means of meeting project need

Alternative means of meeting the Project need are considered to be functionally different ways of approaching the need for the Project.

The proposed Crawford Mine is the first confirmed customer requiring transmission service on the Project. The estimated total electrical need of the Crawford Mine is 250 MW of power over its planned 43-year operating period (WSP E&I Canada Limited, 2022, p. 25)[3]. Various power generation and transmission alternatives were evaluated based on the ability to meet this need. These alternatives included diesel generators, natural gas-fueled power plant, on-site solar or wind power plant, and the construction of a transmission line connected to the existing electrical grid.

[3] The alternative means analysis only considers the operating phase of the project since fuel-based generators will be needed during construction while the power supply is being built.

3.2.1. Identification of alternative means

The energy supply alternatives were chosen by considering the technical, economic, environmental, and social advantages and disadvantages. Criteria included:

- Ability to meet demand;
- Technical feasibility;
- Cost;
- Technical and economic capacity for upgrades;
- Greenhouse gas (GHG) emissions from energy supply and/or production;
- Impacts on the biophysical and social environments; and
- Integration into regional power supply and grid supply and reliability initiatives.

Do Nothing

The 'Do Nothing' alternative was not able to meet the need to supply electricity to CNC or be able to improve transmission reliability and capacity in northeastern Ontario. Therefore, the "Do Nothing" alternative was not considered a feasible option.

Diesel generators

Diesel generators are a common power source in mines due to their simplicity, power production profile, and high efficiency. Diesel generators are not typically relied on as the sole power source unless the mine is in a remote location (Department of Natural Resources, 2012). Diesel fuel is generally trucked to site and stored in tanks in an above ground tank farm.

To meet the anticipated power requirement, the Crawford Mine would need around 80 Caterpillar 3616 diesel generators which would occupy approximately 2.5 hectares (excluding the tank farm), consume between 68,000 and 80,000 lLph (850 to 1,000 Lph per unit), and emit 184 to 216 tonnes of CO_2 per hour at 70% to 85% operating capacity.

Natural gas

An approximate 400MW natural gas-fired power plant could supply power to the Crawford Mine, occupying about 5 hectares, including the power plant, cooling pond, and switchyard, and emitting approximately 105 to 120 tonnes of CO_2 per hour[4]. The power plant would entail building a pipeline or transporting to site via rail or truck.

On-site solar or wind

The planned Crawford Mine is situated in an area with ground conditions and land cover that is less than conducive to solar development and with a low wind power potential. Wind and solar power have low-capacity factors and are intermittent in nature; as such, a solar or wind facility would need to be overbuilt in generation capacity for the requirements of the mine. Studies would need to be conducted to further define the available resource, determine power storage system size and generator size. Solar farms require approximately 2 hectares per MW, wind requires slightly less. A separate battery storage facility would be required for overnight periods or daytime operations during periods of low solar or wind availability. An estimated 100-150 hectares would be required to create sufficient energy and allow for storage at night and/or during calm periods.

Electrical transmission line

Ontario's electrical grid is made up of a variety of generators including nuclear, hydro power, natural gas, wind, solar and biofuel. The Ontario electrical grid has a low rate of carbon emissions, estimated at approximately 26 grams of CO2e per kWh (IESO, 2021). The Project would add value to the grid by increasing access in Northeastern Ontario, support additional transmission development to enhance grid reliability, and contribute to the electric transmission initiative being undertaken by TTN in the region.

3.2.2. Screening of alternative means

A screening of the alternative means against the evaluation criteria was conducted to confirm if any alternatives could be eliminated. Despite their low carbon equivalent emissions, solar and wind have high land use requirements associated with them, long construction lead times, low-capacity factors, and are an intermittent source of energy, therefore require an additional battery storage facility and/or back up diesel generation. For these reasons, solar and wind were eliminated from further review.

[4] 300 MWh of electricity @ 350 to 400 kg CO_2e per MWh

Table 3-3: Alternative Means Screening Criteria

Alternative Means	Capacity factor (%)[5]	Prospective Footprint (ha)	Estimated Construction Duration (months)	Emissions	CAPEX	OPEX	Facility lifespan (years)	Acceptable
Diesel generator	25[6]	2.5	3-6	Medium	Low	Medium	15	**Yes**
Natural-gas power plant	54	5	12-18	Medium	Medium	Medium	15	**Yes**
Solar[7]	25	600	3-6	Low	High	Low	20	**No**
Wind[8]	35	500	18-24	Low	High	Low	15	**No**
Electrical transmission line	n/a	200	12-18	Low	Low	Low	25	**Yes**

[5] The percentage of time a power plant is running at it's maximum generating capacity. (Department of Energy, 2022)
[6] (Green, Mueller-Stoffels, & Whitney, 2017)
[7] Needs electricity storage.
[8] Needs electricity storage.

3.2.3. Assessment of alternative means

The initial screening of alternative means determined that diesel generators, a natural gas-fired power plant and an electrical transmission line are all potentially feasible alternatives. These three (3) alternatives were therefore advanced for further assessment according to relevant evaluation criteria.

Diesel generators

As shown in Table 3-4, diesel generators were assessed to have low constraints relating to available land and constructability. The cost was considered to have low to medium constraints. The potential impacts to the natural environment were considered low to medium, while the impacts to the socio-cultural environment were considered medium.

Table 3-4: Evaluation of diesel generator constraints

Criteria	Identified Constraints
Technical	Proven technology employed at mine sites throughout Canada (low); simple design and constructability associated with diesel generators and fuel tank farm (low).
Cost	Low-cost power supply option (low); fuel transport cost (medium); and high carbon tax (medium).
Natural environment	This alternative would require approximately 3 hectares of greenfield clearing of forest habitat(low), high risk/low likelihood of environmental spills associated with fuel storage (medium), results in smaller habitat patch sizes and some increased fragmentation (medium).
Socio-cultural environment	Negative perception associated with fuel storage (medium); Negative perception associated with emissions (air quality) (medium).

Natural gas

As shown in Table 3-5, the technical constraints of a natural gas plant are considered variable. The cost constraints are considered low to medium. Potential effects on the natural environment are considered medium, while potential socio-cultural environment effects were considered medium to high.

Table 3-5: Evaluation of natural gas constraints

Criteria	Identified Constraints
Technical	Proven technology employed throughout Canda (low); Detailed design requirements (medium); Difficulty of permitting and constructing a new pipeline (high).
Cost	Low-cost power supply option (low); fuel transport cost through pipeline (medium), and carbon tax (low).
Natural environment	This alternative power plant site would require approximately 3 hectares of greenfield clearing (low) of forest habitat, and approximately 2 hectares converting forest habitat to cooling pond/aquatic habitat (medium), resulting in smaller habitat patch sizes and some increased fragmentation (medium). The pipeline to support the power plant site would require greenfield clearing (forest habitat) (medium) resulting in smaller habitat patch sizes and some increased fragmentation (medium), and the alignment could result in changes to wildlife movement in the region including increased predation (medium).
Socio-cultural environment	Negative perception associated with pipeline (high), and negative perception associated with emissions (medium).

Electrical transmission line

As shown in Table 3-6, the transmission line alternative has low to medium level of technical constraints, low costs, and a medium potential to impact the natural and social environment.

Table 3-6: Evaluation of transmission line constraints

Criteria	Identified Constraints
Technical	Proximity of Porcupine substation (low) Detailed design requirements (medium); Difficulty of permitting and constructing a new transmission line (medium).
Cost	Capital expenditure (low), operating expenditure (low)
Natural environment	This alternative would require approximately 200 hectares of greenfield clearing of forest habitat (medium), resulting in increased linear disturbance and habitat fragmentation (medium). The alignment could result in changes to wildlife movement in the region including increased predation (medium).
Socio-cultural environment	Crosses many properties with a variety of landowners (low)

3.2.4. Selection of preferred alternative means

Table 3-7 provides a comparison of evaluated alternatives with ranking and summary evaluation determining if an alternative is not acceptable, acceptable, or preferred. The preferred alternative means for meeting the Project needs is the transmission line as it has the best score across the evaluation criteria, and it also positively contributes to regional grid supply and reliability initiatives.

Table 3-7: Summary of alternative means assessment

Evaluation Category	Alternative Means					
	Diesel Generator		Natural Gas-Fired Power Plant		Transmission Line	
Technical	2 low rank constraints	**L**	1 low rank constraint 1 medium rank constraint 1 high rank constraint	**H**	1 low rank constraint 2 medium rank constraints	**M**
Cost	1 low rank constraint 2 medium rank constraints	**M**	2 low rank constraints 1 medium rank constraint	**M**	2 low rank constraints	**L**
Natural environment	1 low rank constraint 2 medium rank constraints	**M**	1 low rank constraint 5 medium rank constraints	**M**	3 medium rank constraints	**M**
Socio-cultural environment	2 medium rank constraint	**M**	1 medium rank constraint 1 high rank constraint	**H**	1 low rank constraint	**L**
Alternative Rating	Rating – **Acceptable**		Rating – **Unacceptable**		Rating – **Preferred**	

3.3. Alternative methods of carrying out the project

Alternative methods are different ways of doing the same activity. Alternative methods may include alternative route segments, local route refinements, and alternative locations and alternative designs of the components required to support the construction and operation of the Project. Through an analysis of the route refinements and Project components, alternatives have been evaluated to identify the preferred alternative route.

TIP1 identified and considered four (4) alternative methods (alternative routes) based on avoiding or minimizing Project effects on the environment, including natural or socio-economic features.

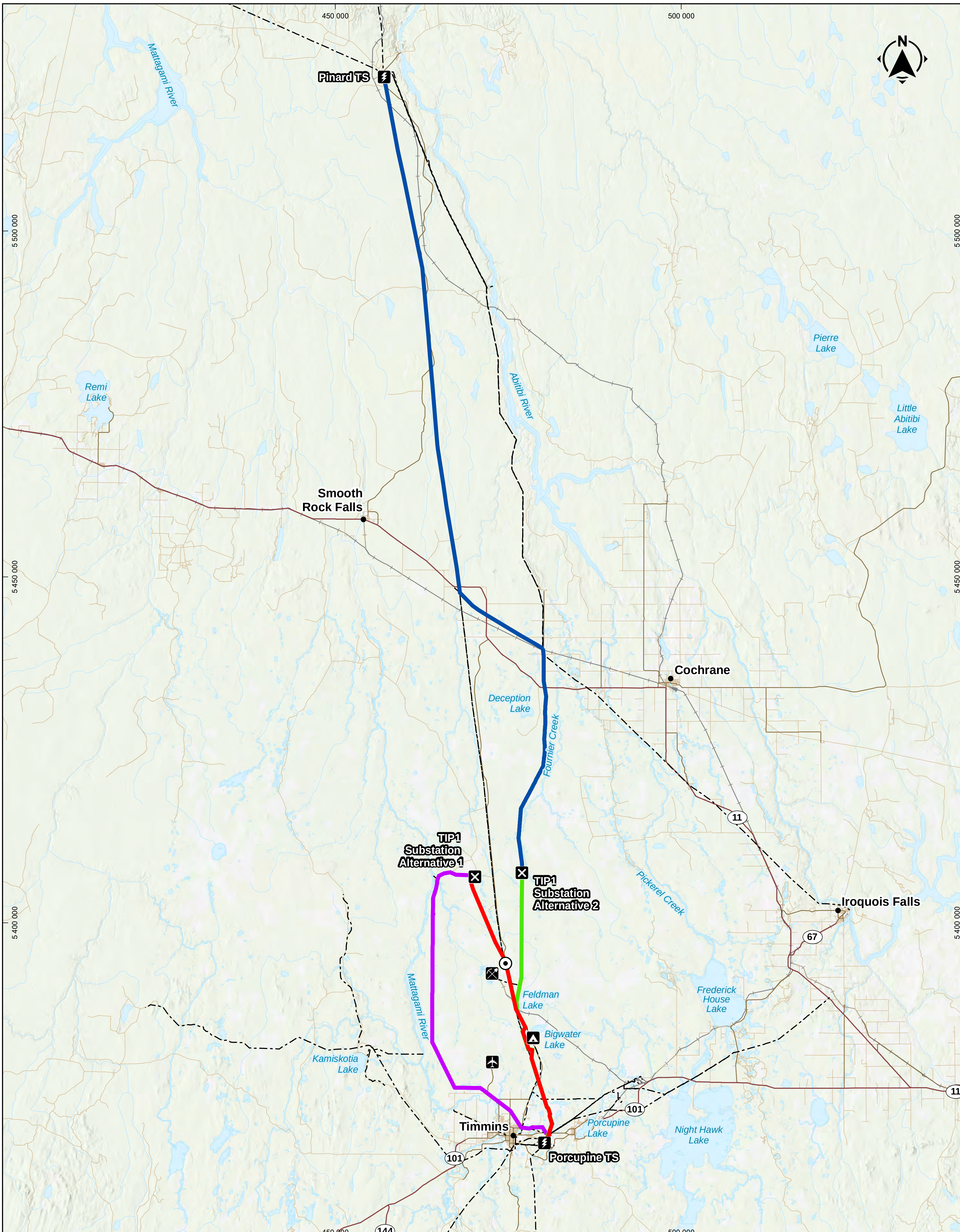
3.3.1. Identification of alternative routes

Alternative routes were defined based upon the following criteria:

- Start points are regional substation(s) with capacity to support the Crawford Mine.
- As much as possible co-locating the new 230 kV transmission line with existing linear infrastructure, namely transmission line corridors.
- Avoid areas of archaeological potential and culturally sensitive sites.
- Minimize length through traditional land use areas (e.g., hunting, gathering, camping).
- Minimize length of the transmission line through sensitive natural environmental areas, such as watercourses, recreation areas, parks and protected areas, and sensitive wildlife habitat.
- Keep routes as straight as reasonably possible, to reduce length of the transmission line, workspace requirements, and the number of deflection structures.
- Minimize potential effects on established land uses and licensed land users (e.g., trapper, bait fish license holders), residences, built-up areas, industrial (e.g., aggregate, mining), etc.
- Minimize crossing existing transmission infrastructure.

Based upon these criteria, the following two (2) substations and four (4) route alternatives have been identified (Map 2):

- **Alternative Route 1:** Porcupine Substation to Crawford Substation Alternative 1 (Alternative Siting 1), shown in red on Map 2, is approximately 42 km and parallels an existing transmission line for most of its length, a ROW that parallels existing roads for approximately ½ of its length; approximately16 km is new ROW (parallels a proposed realignment of Highway 655 and a HONI 500 kV transmission line by Crawford Mine). This is considered the base case, as it is the route shown in Crawford Mine's Detailed Project Description.
- **Alternative Route 2:** Porcupine Substation to Crawford Substation Station Alternative 2 (Alternative Siting 2), shown in green on Map 2, is approximately 41 km and parallels an existing transmission line (approximately 60 m ROW) for most of its length, a ROW that parallels existing roads for approximately ½ of its length; <1 km is new ROW.
- **Alternative Route 3:** Porcupine Substation along the Mattagami River to Crawford Substation Station Alternative 1 (Alternative Siting 1), shown in purple on Map 2, is approximately 55 km and parallels an existing transmission line (approximately 20 m ROW) for approximately ½ of its length; approximately 4 km is new ROW; approximately 20 km parallels an existing transmission line (approximately 20 m ROW) in Timmins (rural residential and commercial/industrial areas).
- **Alternative Route 4:** Pinard Substation travelling south to Crawford Substation Alternative 2 (Alternative Siting 2), shown in blue on Map 2, is approximately 164 km and parallels an existing transmission line (approximately 40 m, 60 m, and 70 m ROWs) for most of its length; <1 km is new ROW.



Alternative Alignments

- Alternative 1 - Porcupine Station to Crawford Switchyard Alternative 1
- Alternative 2 - Porcupine Station to Crawford Switchyard Alternative 2
- Alternative 3 - Porcupine Station along the Temiskaming River to Crawford Switchyard Alternative 1
- Alternative 4 - Pinard Station travelling south to Crawford Switchyard Alternative 2

Infrastructures and Equipments

- Substation ; Porcupine Substation
- Alternative Switchyard
- Timmins / Victor M. Power Airport
- Big Water Campground
- Kidd Creek Mine
- Highway
- Principal Road
- Local Road
- Railway

TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

TIP-1 Transmission Line
Timmins, Ontario

Map 2
Alternative Alignments

Sources:
CanVec, 1/250 000, NRCan, 2017
SDA, 1/20 000, MERN Quebec, June 2022
Official Airports, Ontario Ministry of Natural Resources and Forestry, March 2012
Conservation Reserve Regulated, Ontario Ministry of Natural Resources and Forestry, June 2023
Watercourses and Waterbodies, Ontario Hydro Network (OHN), August 2023
Project Data, BBA, 2023

BBA Project Number: 7311004-007000-4E

2024-09-18

0 5.5 11 km
UTM, zone 17, NAD 83

Prepared by: J. Day | Drawn by: A. Haffaci | Verified by: F. Karcha

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3.3.2. Screening of alternative routes

A preliminary review of the four sites against the evaluation criteria was conducted to confirm if any alternatives could be eliminated.

Alternative Route 4 is significantly longer than the other alternatives and traverses the Kesagami Woodland Caribou Range. In addition, the IESO System Impact Assessment process was completed with Porcupine Substation as the source and not Pinard. Alternative 4 was therefore eliminated.

Alternative Route 2 is situated in an area spatially limited due to existing easements and proposed Crawford Mine components and is relatively far from Crawford Mine power load. The Crawford Mine Substation is proposed to be located on the west side of the Crawford Mine property, therefore bringing electricity to the east side of the property is not ideal. Consequently, Alternative Route 2 was eliminated from further consideration.

3.3.3. Assessment of alternative routes

Characteristics for Alternative Route 1 and Alternative Route 3 relevant to each of the evaluation criteria are presented in Table 3-8 below.

Table 3-8 Summary Characteristics of Alternative Routes

Category	Alternative Route 1	Alternative Route 3
Technical	▪ 4 major road crossings ▪ 1 railway crossing ▪ Integrated into Crawford Mine's Highway 655 and high voltage powerline realignments	▪ 2 major road crossings ▪ 1 high voltage powerline crossing
Cost	▪ 42 km ▪ On the order of 15 angle structures	▪ 55 km ▪ On the order of 20 angle structures
Natural environment	▪ 14 km new ROW through previously undisturbed land[9] ▪ 3 waterbody spans ▪ 9 large stream crossings ▪ Approximately 14 km travels through areas of high moose and wolf density (see Map 9)	▪ 4.5 km new ROW through previously undisturbed land ▪ 2 river crossings ▪ 4 large stream crossings ▪ Approximately 14 km travels through areas of high moose and wolf density. ▪ Mammal migration routes noted along stretch adjacent to Mattagami River (near confluence with Kamiskotia River and near Jocko Creek)
Socio-cultural environment	▪ Near recreational trails (Porcupine Ski Runner Trails) ▪ ROW passes through a number of Taykwa traditional use sites (primarily gathering) in and around the proposed mine area, as well as in and around Timmins	▪ Near recreational trails (Porcupine Ski Runner Trails) ▪ Near dwellings (Timmins stretch) ▪ Adjacent to existing transmission line ROW that parallels the Mattagami River ▪ Concentration of Taykwa traditional use sites (e.g., hunting, gathering) in and around Lower Sturgeon Dam Road

[9] New ROW clearing for Alternative 1 follows the proposed relocation of Highway 655 and the existing HONI 500 kV transmission line due to the Crawford Nickel Mine.

Porcupine TS to Crawford Substation (Alternative Route 1)

Alternative 1 can be dived into three (3) segments, with a total length of 42 km. These segments include:

- A new ROW parallel to the existing 500 kV transmission line ROW north from Porcupine Substation in Timmins for approximately 18.1 km
- A new ROW parallel to a proposed realignment of 500 kV transmission line ROW and Highway 655 for approximately 9.9 km; and
- A new cross-country ROW through previously undisturbed land for approximately 13.7 km.

Table 3-9: Evaluation of Alternative Route 1 Constraints

Criteria	Identified Constraints
Technical	There are four (4) major road crossings (medium), one rail crossing (low), and the route is integrated into Crawford Mine's proposed rail line and realignment of Highway 655 and an existing high-voltage powerline (low).
Cost	Lowest overall costs, compared to the other alternative, associated with the shortest overall transmission line length (low) and 15 angles (low).
Natural environment	This alternative would require approximately 1 km of greenfield clearing (low) of forest habitat, approximately 41 km of clearing adjacent to an existing (and proposed re-alignment) 60m ROW (low), resulting in smaller habitat patch sizes and some increased fragmentation (medium), approximately 14 km passes through high moose and wolf density areas[10] (medium), and the alignment could result in changes to wildlife movement in the region including increased predation (medium).
Socio-cultural environment	This alternative would be in the viewshed from recreational trails (low) and would pass through an area identified as Taykwa land use sites[11] (primarily gathering, north of Kidd Creek) (medium).

Porcupine TS along the Mattagami River (Alternative Route 3)

Alternative Route 3 has six (6) ‘stretches’, totaling approximately 55 km:

- A new ROW parallel to a 20m transmission line ROW north and west from Porcupine Substation for approximately 9 km in context of recreational (trails), commercial, and industrial uses in Timmins.

[10] As per Map 9
[11] As per Shared Valued Solutions. 2023

- A new ROW parallel to a 20m transmission line ROW for approximately 9 km in context of rural residential land uses in Timmins.
- A new ROW parallel to a 20m transmission line ROW for approximately 31 km.
- A new cross-country ROW through previously undisturbed land for approximately 0.5 km.
- A new ROW parallel to Lower Sturgeon Dam Road for approximately 2 km.
- A new cross-country ROW through previously undisturbed land for approximately 4 km.

Table 3-10: Evaluation of Alternative Route 3 constraints

Criteria	Identified Constraints
Technical	There are two (2) major road crossings (low) and one high-voltage transmission line crossing (medium).
Cost	Greater overall costs, compared to the other alternative, associated with a slightly longer overall transmission line length (low) and 20 angles (medium).
Natural environment	This alternative would require approximately 4.5 km of greenfield clearing (medium) of forest habitat, approximately 30 km of clearing adjacent to an existing 20m ROW (medium), resulting in smaller habitat patch sizes and some increased fragmentation (medium), approximately 14 km passes through high moose and wolf density areas[10] (medium), and the alignment could result in changes to wildlife movement in the region including increased predation (medium).
Socio-cultural environment	This alternative would be in the viewshed from recreational trails (low) and dwellings (medium) and possibly from Mattagami River (low). The alternative passes through an area identified as Taykwa land use sites[11] (primarily hunting and gathering, in vicinity of Lower Sturgeon dam road) (medium)

3.3.4. Selection of preferred alternative route

Alternative Route 1 has been selected as the preferred corridor to carry forward for more detailed identification and analysis in the Class EA. The rationale for selection of the preferred corridor is as follows:

- Has the lowest length thereby limiting habitat impacts (changes to patch sizes and/or fragmentation);
- Has the lowest number of angles;
- The lowest length through high density moose and wolf habitat;

- Avoids dwellings; and
- Minimizes intersecting areas that have Indigenous land use sites.

Table 3-11: Summary assessment of alternative methods

Evaluation Category	Alternative Methods			
	Porcupine TS to Crawford Switchyard (Alternative Route 1)		Porcupine TS along the Mattagami River (Alternative Route 3)	
Technical	2 low rank constraint 1 medium rank constraint	**M**	1 low rank constraint 1 medium rank constraint	**M**
Cost	2 low rank constraint	**L**	1 low rank constraint 1 medium rank constraint	**M**
Effects (adverse) to the natural environment	2 low rank constraint 3 medium rank constraint	**M**	5 medium rank constraint	**M**
Effects (adverse) to the socio-cultural environment	1 low rank constraint 1 medium rank constraint	**M**	2 low rank constraint 2 medium rank constraint	**M**
Summary Evaluation	Rating – **Preferred**		Rating – **Acceptable**	

4. Engagement summary

Informing and consulting with local communities, stakeholders, and regulatory authorities is an important component of a Class EA. TIP1's consultation activities aimed to inform local authorities and communities with an interest in the Project and facilitate collaboration with them to reduce project impacts.

Stakeholder concerns and feedback are a valuable source of information that can improve Project design and outcomes and help TIP1 identify and control external risks.

Consultation activities were undertaken according to the following principles:

- Early and inclusive engagement;
- Open and transparent communication;
- Meaningful and understandable information sharing;
- Commitment to addressing concerns and answering questions; and
- Adequate and comprehensive documentation.

The first key step to consultation involved identifying and listing the various stakeholders and community members who are likely to be directly or indirectly impacted or concerned with the Project. TIP1 identified those stakeholders early in the project. The list includes the following groups:

- Indigenous communities;
- Provincial government and agencies;
- Municipal governments; and
- Landowners and local stakeholders.

TIP1's complete consultation record is available in Appendix B.

4.1. Notice of Commencement

The Notice of Commencement (Appendix B) was prepared in accordance with the parameters outlined in the Class EA guideline and verified with MECP prior to publication. It was also provided to Indigenous communities and provincial regulators prior to publication.

On November 1, 2023 the Notice of Commencement was emailed to a list of approximately 70 stakeholders and mailed in hard copy to Indigenous communities, as well as approximately 25 landowners without listed email addresses. The project contact list can be found in Appendix B.

4.2. Public information session 1

The public information session was held in Timmins, Ontario at the local Timmins Museum on November 15, 2023, from 4pm-8pm.

The invitation to the public information session was included in the same mailing as the Notice of Commencement sent to the previously mentioned stakeholders. The session information was also shared on TIP1's website and it was also published in local newspapers (see Table 4-1).

Table 4-1: Publishing record for public notifications

Publication Date	Newspaper
November 2, 2023	Cochrane Times-Post
November 4, 2023	Timmins Daily Press
November 9, 2023	Cochrane Times-Post
November 14, 2023	Timmins Daily Press

The public information session, hosted by TIP1 representatives, aimed to provide participants with an opportunity to learn more about the Project need, the Class EA process, the proposed route alternatives, the route evaluation and selection process, key milestones, and next steps. Information was also provided in poster format (provided in Appendix B) and Project staff were on hand to answer questions. The key information shared at this session included:

- About TIP1;
- Environmental Assessment Process;
- Need for the Project;
- Project Description;
- Terrestrial and Aquatic Studies;
- Archaeology;
- Proposed Alignment;
- Project Alternatives; and
- Project Schedule.

A sign in sheet was provided for attendees to include their name and email if they chose to be added to the stakeholder distribution list. Nine (9) people signed into the information centre, and five (5) individuals were added to the email distribution list. Attendees represented a variety of groups including municipal and provincial government, local power providers, construction professionals, aggregate providers, and local landowners.

The key issues and comments provided by public information centre attendees are summarized as follows:

- Property (including property rights and property acquisition);
- ROW clearing requirements;
- Co-location;
- Biodiversity (namely presence of bats in the area); and
- Necessary permits for the Project.

4.3. Public information session 2

The second public information session which took the form of an Open House was held in Timmins Ontario, at the Senator Hotel on May 29, 2024, from 4pm-8pm.

The invitation to the second public information session was published in local newspapers on May 23rd, 2024 (Table 4-1).

Information was provided in poster format and Project staff were on hand to answer questions. The following posters were displayed and are provided in Appendix B:

- About TIP1
- Project information
- Need for the Project
- Infrastructure Information
- Insights and Feedback
- Project Timeline
- Environmental Considerations

A sign in sheet was provided for attendees to provide their name and contact information if they chose to be added to the stakeholder distribution list. Five (5) people signed into the information centre, and two (2) individuals were added to the email distribution list. Attendees represented a variety of groups including municipal and provincial government, First Nation, Health, and local aggregate providers/local landowners.

4.4. Indigenous communities

Engaging with Indigenous communities is a key aspect of the Class Environmental Assessment (EA) process. The Crown's Duty to Consult, as outlined in Section 35 of the *Constitution Act* (1982), can be fulfilled, either in whole or in part, simultaneously with the Class EA process. As mentioned earlier, an initial outreach to the Ontario Ministry of Energy was undertaken to confirm the Indigenous communities with a potential interest in the Project.

4.4.1. Delegation letter

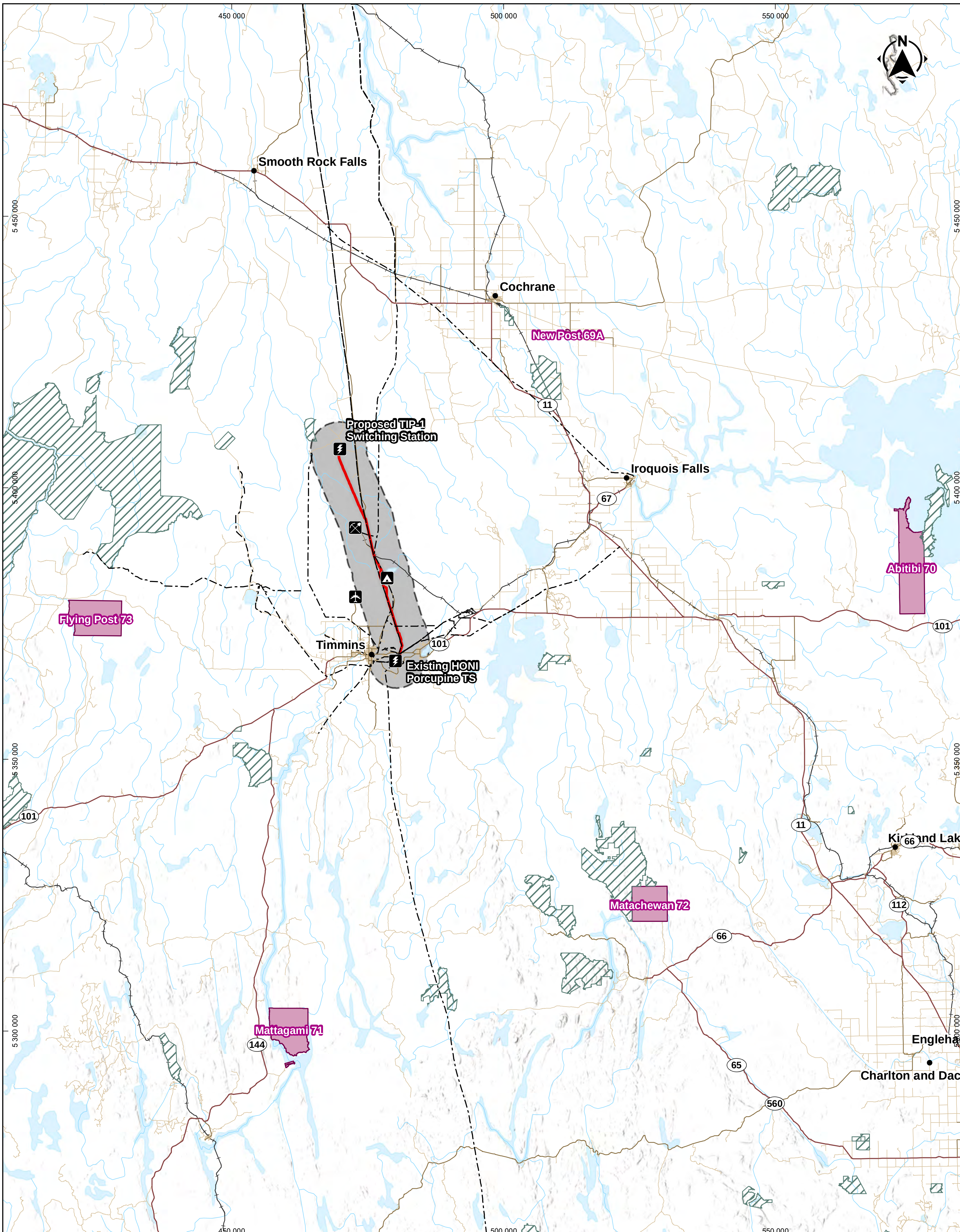
A delegation letter was received from the Ontario Ministry of Energy on October 12, 2023, which delegated the procedural aspect of the Crown’s Duty to Consult with Indigenous communities to the Project proponent. The letter included the following list of potential impacted Indigenous communities:

- Matachewan First Nation (Matachewan);
- Mattagami First Nation (Mattagami);
- Taykwa Tagamou Nation (TTN); and
- Métis Nation of Ontario Abitibi-Témiskamingue Region 3 (MNO).

In addition to the listed communities, Wabun Tribal Council (WTC) has indicated they are representing their member communities and Flying Post First Nation has asserted their interest in the Project. Wabun Tribal Council and Flying Post First Nation have therefore also been included in Project correspondence, including efforts to meet and share Project information.

Indigenous community outreach

A pre-Notice of Commencement email was sent on October 10, 2023, to the communities listed above to notify them of the proposed Project, including the WTC. A formal Notice of Commencement was sent to all Indigenous communities along with the public session information session invitation in November, 2024.



Regional Study Area

Indigenous Community

Project Component

Substation

New 230 kV Transmission Line

Protected Areas

Conservation Area

Infrastructures and Equipments

Timmins / Victor M. Power Airport

Big Water Campground

Kidd Creek Mine

Highway

Principal Road

Local Road

Railway

TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

TIP-1 Transmission Project
Timmins, Ontario

Map 3
Indigenous Communities

Sources:
CanVec, 1/250 000, NRCan, 2017
SDA, 1/20 000, MERN Quebec, June 2022
Official Airports, Ontario Ministry of Natural Resources and Forestry, March 2012
Conservation Reserve Regulated, Ontario Ministry of Natural Resources and Forestry, June 2023
Watercourses and Waterbodies, Ontario Hydro Network (OHN), August 2023
Project Data, BBA, 2023

BBA Project Number: 7311004-007000-4E

2024-09-18

0 7 14 km
UTM, zone 17, NAD 83

Prepared by: C. Moffett Drawn by: A. Haffaci Verified by: C. Moffett

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Following the Open House in May, 2024 , all the communities received a Project update email on June 26, 2024, which included a consultation and meeting request.

On July 29, 2024, the same communities received the draft Culture and Heritage Study Report and Archaeological Stage 1 report in advance for their comments.

Initiatives undertaken include:

- Sending notifications and providing information updates on the Project throughout the Class EA process;
- Sending reminder correspondence about upcoming public and Indigenous-specific community information events; and
- Offering to meet with the community to present the proposed Project and address their issues or concerns.

The list of the communication material provided by TIP1 is presented in Appendix B.

4.4.2. Wabun Tribal Council

Other than the exchanges mentioned above, the following actions were taken by TIP1:

- TIP1 held a virtual meeting with WTC and Matachewan on December 21, 2023. It was an introductory meeting where the general details of the Project were presented.
- WTC was contacted by TIP1 on January 4, 2024, for an in-person meeting request, with another discussion request on February 29, 2024.
- A face-to-face meeting was held on March 6, 2024.
- An email to confirm consultation dates and provide project information was sent by TIP1 to WTC on March 18, 2024, followed by a meeting request follow-up email on March 22, 2024.

Community concerns:

- Economic development opportunities.
- Flying Post First Nation, Matachewan First Nation, and Mattagami wish to participate in the Project and related opportunities.

4.4.3. Matachewan First Nation

Other than the exchanges mentioned above, the following actions were taken by TIP1:

- The Matachewan First Nation received an advanced project Notice of Commencement email on October 21, 2024.
- Subsequently, TIP1 contacted Matachewan First Nation via email on January 4, 2024, and January 9, 2024, requesting a meeting to discuss the project and an approach to consultation and engagement. A follow-up email was sent on January 11, 2024.
- Another meeting request was sent to Matachewan on February 12, 2024.
- TIP1 extended an invite to the Timmins Public Information Session on November 14, 2023, and to the Open House held on May 29, 2024. A representative of the Matachewan First Nation was present at the May Open House.
- TIP1 sent an email on June 5, 2024, with information on the project (including Open House posters) and previous communication records.
- Additionally, TIP1 sent a follow-up meeting request via email on June 26, 2024.

Community concerns:

- Project route mostly on Matachewan territory

4.4.4. Mattagami First Nation

Other than the exchanges mentioned above, the following actions were taken by TIP1:

- The Mattagami First Nation received an advanced project Notice of Commencement email on October 21, 2023.
- Subsequently, TIP1 contacted Mattagami First Nation via email on January 4, 2024, and February 12, 2024, requesting an in-person meeting.
- On March 5, 2024, Mattagami's Economic Development Committee and TIP1 had a face-to-face meeting.
- Mattagami representatives were also present during the Wabun Tribal Council face-to-face meeting held on March 6, 2024.

Community concerns:

- Use of pesticides
- Sharing of traditional land use (TLU) information
- Consideration of the Project's interaction with the proposed Crawford Mine project and CNC Steel plant

4.4.5. Métis Nation of Ontario Abitibi-Témiskamingue Region 3

Other than the exchanges mentioned above, the following actions were taken by TIP1:

- The Métis of Ontario received an advanced project Notice of Commencement email from TIP1 on October 17, 2023.
- TIP1 sent an email on February 2, 2024, requesting a meeting to discuss the project.
- A second meeting request was sent by email to the Métis of Ontario on February 13, 2024.

4.4.6. Flying Post First Nation

Other than the exchanges mentioned above, Flying Post First Nation received an advanced Project Notice of Commencement email from TIP1 on October 21, 2023.

4.4.7. Taykwa Tagamou Nation

Community information session (#1)

On February 1, 2024, TIP1 hosted two (2) information sessions at Taykwa Tagamou Nation in the community gym. The sessions included a lunch-and-learn geared at TTN staff members and a community dinner and presentation for all community members to attend.

Information was provided in PowerPoint presentation and poster format and Project staff were on hand to answer questions. A copy of the posters and presentation is provided in Appendix B. The staff lunch was attended by approximately 20 individuals representing child and family welfare, health services, community workers and band administration.

The key issues and comments by TTN staff are summarized as follows:

- Timber Harvesting Opportunities
- Proximity of the new transmission line to the existing transmission line
- Job Creation, Training and Qualifications
- Contract Opportunities

The evening session included a community dinner attended by approximately 10 individuals. The same presentation was provided and both a formal and informal question period allowed for discussion about Project details.

The key issues and comments by TTN community members are summarized as follows:

- **Project Similarity:** TTN members noted that the new transmission line is like other local projects, which provides them a certain understanding of what to expect.
- **TTN Involvement and Right-of-Way Clearance:** The community expressed a desire for direct involvement in the project's environmental fieldwork and ROW clearance.
- **Community Liaison:** TTN members asked if a dedicated community liaison would be assigned for the project lifecycle.
- **Union Presence and Project Schedule**: TTN members raised the question of union presence in the project and highlighted the need for clarity on how unionized labor will affect their involvement. They also stressed the importance of receiving a clear Project schedule.

Community information session (#2)

On May 30, 2024, TIP1 hosted a community lunch at Taykwa Tagamou Nation in the community gym, where all community members were invited. Information was provided through a PowerPoint presentation and poster format, and Project staff were available to answer questions.

The posters presented were the same as those displayed at the May 29, 2024 Open House. A copy of the posters and presentation is provided in Appendix B.

The event was attended by 26 individuals representing child and family welfare, health services, community workers, elders, and band administration.

Community concerns:

- Employment opportunities
- Type of training and who will provide it.
- Roles of unions related to training or workers.

4.5. Provincial government and agencies

The following Ontario provincial government representatives and agencies were contacted during the class EA process:

- Ministry of the Environment, Conservation and Parks (MECP)
- Ministry of Natural Resources and Forestry (MNRF)
- Ministry of Energy
- Ministry of Transportation

- Hydro-One

Introductory meetings and pre-consultation meetings were held between TIP1 and each of the listed ministries and agencies. An initial outreach to the Ministry of Energy was undertaken to confirm the Indigenous communities with a potential interest in the Project. Since then, TIP1 has stayed in regular contact with representatives of the different ministries and agencies. No comments or concerns were raised during meetings and conversations. TIP1continue to provide updates to and work with them as the Project continues to progress.

See the record of consultation for a list of all the correspondence with provincial government and agencies.

4.6. Municipal governments

The following municipal governments were contacted:

- City of Timmins
- Town of Iroquois Falls
- Town of Cochrane

The three (3) municipalities received the Project’s Notice of Commencement, the public session invite and the community Open House Invite. The town of Timmins is in contact with TIP1 and continues engagement with them. No comments or concerns were raised by the municipal governments.

4.7. Landowners and local stakeholders

TIP1 reached out to landowners and local stakeholders through the public information session held in February 2024 and the Community Open House held in May 2024. The main concerns regarding the project were:

- Effects of the project on the Porcupine Ski Runners Club trails
- Property ownership

TIP1 is in contact with the ski club to address their concerns. The different property owners along the Project transmission line route have been contacted and are in discussions with TIP1.

4.8. Summary of stakeholder comments and concerns

A table summarizing the comments and concerns raised by interested parties throughout the Class EA process is provided below and will be updated with the feedback that will be received on this draft ESR.

Table 4-2: Summary of stakeholder comments and concerns

Theme	Question/Comment	Response
Project information (General)	Who are the owners of this project and how does the partnership work?	Transmission Infrastructure Partnerships Limited (TIP1) is a partnership between Taykwa Tagamou Nation (50%), ATX Canada (25%), a subsidiary of Ameren Corporation, a Fortune 500 utility company, and Vires Partners Inc (25%), a company focused on working with First Nations and Inuit for infrastructure investment opportunities.
Project schedule	What is the project schedule?	Subject to Class EA approval, construction of the TIP1 transmission line is planned to begin in Q3 2025, with Q2 2027 as the anticipated in-service date.
Employment and training	How many jobs will be created during the construction phase?	Our commitment is to maximize local employment opportunities and work closely with First Nations and local communities to ensure that they benefit from job creation. More detailed information on job numbers will be provided as the project progresses.
Local economy	Who is the key contractor for Project construction?	TIP1 is still in the process of finalizing the key contractor for the construction phase of the project. We prioritize selecting contractors who share our commitment to working collaboratively with First Nations and local communities, and who demonstrate a strong track record of delivering high-quality projects safely and efficiently.
Employment and training	Will on the job training be provided to TTN members?	Yes, on-the-job training opportunities will be provided to members of TTN during the construction phase. TIP1 recognizes the importance of investing in local talent and building capacity within indigenous communities. Specific details on training programs and opportunities will be provided when available.

Theme	Question/Comment	Response
Employment and training	Do you have a list of the required job qualifications so TTN can be prepared?	Yes, TIP1 will provide a list of required job qualifications to TTN members to ensure they are prepared to take advantage of employment opportunities associated with the project. This will include both technical skills and any necessary certifications or training requirements. We are committed to supporting TTN members in developing the skills and qualifications needed to participate in the project workforce.
Employment and training	Will there be any opportunities for indigenous communities?	TIP1 is committed to providing meaningful opportunities for indigenous communities to participate in and benefit from the project. This includes employment, training, procurement, and other economic development opportunities. We will work closely with indigenous communities to identify and prioritize opportunities that align with their needs and aspirations, and to ensure that they are meaningfully engaged throughout the project lifecycle.
Environment	Will the project have an effect on Fish and Fish habitat?	TIP1 recognizes the importance of protecting fish and fish habitat throughout the project area. We have identified the waterbodies of the project area and they will be avoided wherever feasible to minimize environmental impact.
Project information (General)	How was the route chosen?	Criteria considered during route selection included minimizing environmental and cultural impacts, optimizing land use, maximizing operational efficiency, and ensuring compliance with regulatory requirements. The route selected rationale is as follows: ▪ Has the lowest length thereby limiting habitat impacts (changes to patch sizes and/or fragmentation) ▪ Has the lowest number of angles ▪ The lowest length through high density moose and wolf habitat ▪ Avoids dwellings ▪ Minimizes intersecting areas that have land use sites

Theme	Question/Comment	Response
Local economy	Will the project have an impact on timber harvesting?	The Project will require timber removal from approximately 58 hectares, predominantly consisting of black spruce and trembling aspen.
Local economy	Will the Project provide forestry opportunities to TTN members?	The project will explore opportunities for forestry-related work that align with project requirements and environmental considerations. This may include vegetation management, clearing, and other forestry activities as appropriate. We will engage with TTN members and local stakeholders to identify and develop these opportunities in a manner that respects traditional land use practices and environmental stewardship.
Local economy	What is the plan for the timber that is harvested?	TIP1's plan is to ensure responsible and sustainable management. Local communities and Indigenous businesses will be engaged for harvesting opportunities. Timber within Abitibi River Forest Management Inc.'s (ARFMI) Forest resource base will go to them; TIP1 is currently working with TTN and other stakeholders to identify recipients of the timber. Mitigation will be implemented to enhance positive effects, including delivering merchantable and non-merchantable timber to TTN community.
Environment	Will TTN be involved in the environmental field work?	We will work collaboratively with the TTN to determine the most appropriate and meaningful ways for them to participate in project activities. While we aim to involve the TTN in various aspects of the project, including environmental monitoring and stewardship, the extent of their involvement will depend on their capacity and expertise.
Project information (General)	Is the Project similar to other transmission lines we see around here?	While each transmission line project is unique, our project will adhere to best practices and regulatory requirements to ensure its safe and efficient construction and operation. We are currently working closely with regulatory authorities, local communities, and stakeholders, including the TTN, to address any specific concerns and ensure that the project meets or exceeds industry standards.

Theme	Question/Comment	Response
Local economy	Who will be responsible for clearing the Right of Way?	The responsibility for clearing the Right of Way will lie with qualified contractors selected through a competitive bidding process. These contractors will be required to adhere to strict environmental standards and mitigation measures to minimize impacts on the surrounding area. We will ensure that the selected contractors are sensitive to the needs and concerns of local communities, including the TTN.
Employment and training	Will TTN members be provided opportunities to participate in field work?	Yes, TTN members were provided with opportunities to participate in field work associated with the project, subject to their interest, qualifications, and availability. We are committed to maximizing local employment and training opportunities, including for indigenous communities, throughout the project lifecycle.
Employment and training	Is this a union project?	While the project may involve collaboration with unions, the specific union affiliations of the project will depend on various factors, including contractual agreements and labor regulations. We are committed to ensure fair and safe working conditions for all workers involved in the project.
Environment	Will TIP1 be using pesticides?	No pesticides will be used for the construction phase of the project as well as for the maintenance of the transmission line.

5. Environmental assessment methods

The *Class Environmental Assessment for Transmission Facilities* requires an environmental inventory that considers Agriculture, Forestry, Cultural Heritage, Human settlements, Mineral resources, Natural environment resources, Recreational resources and Visual resources (Hydro One Network Inc., 2024). Specific to this project, this includes such things as inventory of:

- Areas of biological importance including migration corridors or areas supporting mobile species.
- Species diversity and abundance and their habitats – species at risk or culturally important species.
- Current level of both anthropogenic and natural (fire, flood, drought, etc.) disturbance associated with vegetation and forest land.
- Riparian areas, shoreline, banks, current and future flood risk areas, wetland catchment boundaries.
- Wetland class, ecological community type, functions, current level of disturbance, abundance at local and regional scales.
- Current level and types of land use, including traditional and cultural land use.
- Presence of heritage resources, for example artifacts or cultural landscapes.

TIP1 first scoped and then conducted the assessment. Scoping involves developing the Criteria and Indicators that will be used to predict and quantify environmental impacts of the Project. Scoping also includes identifying the survey methods (e.g., desktop, field) and the spatial area over which information should be collected and assessed. The assessment includes conducting studies, identifying potential interactions of the Valued Components with the proposed Project, predicting the impact (qualitatively and/or quantitative), developing mitigation and monitoring programs to manage those effects, and evaluating the net environmental effects.

5.1. Study area

To adequately characterize the existing environment and predict impacts along the proposed transmission line, a Local Study Area (LSA) has been defined for the purposes of this ESR. The LSA focuses on the existing corridor that is proposed for the TIP1 TLA, along with a 500 m buffer on either side of the corridor (Map 4). This area has been used to describe the existing environment that could potentially be affected by the Project and is considered sufficient to characterize the biophysical and socio-cultural conditions.

To characterize and assess cumulative effects, a Regional Study Area (RSA) has been defined as being comprised of a 5 km buffer on either side of the TIP1 corridor (Map 4).

5.2. Existing conditions

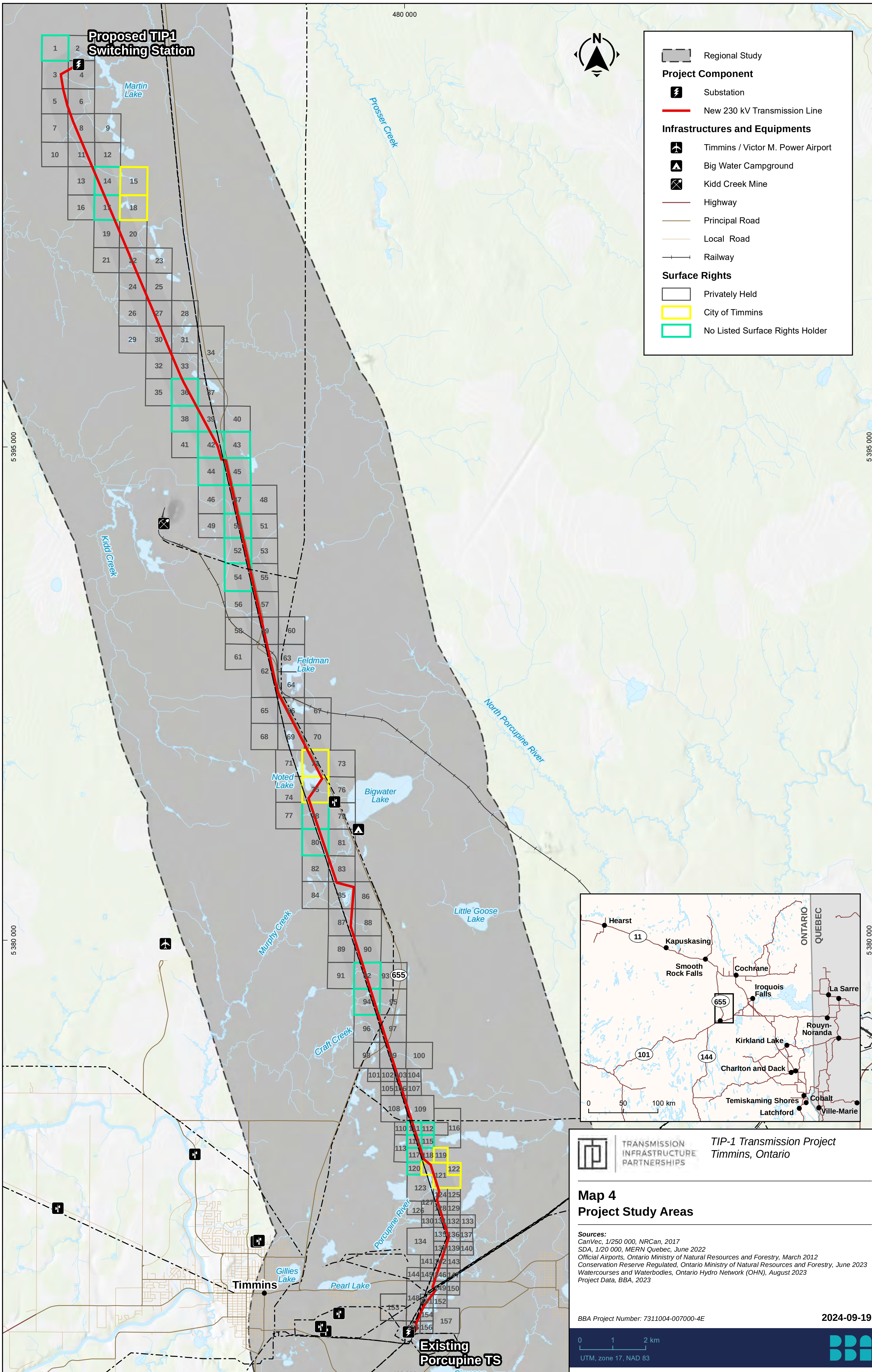
Existing conditions were established through primary and secondary data sources.

As a key customer for the Project, CNC entered into a data sharing agreement with TIP1 that allowed access to baseline studies conducted for their planned Crawford Mine project. The northern half of TIP1's study areas are overlapped by the Crawford Mine project's study areas. BBA has used this as the main source of information to develop an understanding of existing conditions.

Primary data was collected through environmental field work and consultation activities. BBA conducted field studies in 2023 to address data gaps identified in existing baseline studies, including in those areas outside the CNC study area, particularly in relation to vegetation, wildlife habitat reconnaissance, and the aquatic environment.

Additional secondary data was collected through publicly available databases including natural heritage resource databases and mapping tools, municipal websites, government planning and guidance documents, relevant project documents. Field surveys were undertaken in 2021, 2022, and 2023.

Consultation and engagement efforts also contributed to an understanding of existing conditions by seeking information on existing land use and cultural or natural heritage values within the LSA.



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5.3. Initial screening

The assessment is intended to evaluate the biophysical and socio-cultural criteria addressed in the 16 Class EA screening questions (Hydro One Network Inc., 2024).

The screening questions allow for an environmental assessment process that is focused on those environmental and social components that have the potential to interact with Project activities and components. As demonstrated in Table 5-2, nine (9) of the 16 screening questions were answered with “no” interaction with the proposed Project, thereby screening these questions out of consideration. Impacts on agriculture, air quality, noise, water quality and fish habitat, and visual aesthetics were screened out from further assessment for the TIP1 Project due to the limited interaction with the Project activities. The environmental assessment was focused on the following components as further detailed in Table 5-2:

- Land and Resource Use
- Wildlife and Wildlife Habitat
- Rare or Endangered Species of Flora and Fauna
- Timber Resources
- Natural Heritage
- Cultural Heritage

Table 5-1: Initial screening assessment

Criteria Will the Project...		Yes	No	Rationale
a	Conflict with written environmental goals, objectives, plans, standards, policy statements or guidelines approved or adopted by the Province of Ontario; municipal government or local body within an unorganized territory as defined in the *Municipal Act, 2001* where the project is to be located	☒	☐	Examination of environmental goals, objectives, plans, standards, policy statements and guidelines at the provincial and municipal level is warranted
b	Have significant effects on persons or property, including lands zoned to permit residential or other sensitive land uses	☒	☐	The Project crosses various lands and land uses.

	Criteria Will the Project...	Yes	No	Rationale
c	Necessitate the irreversible commitment of any significant amount of non-renewable resources, including Prime Agricultural Lands, which includes Specialty Crop Areas (as defined in the Provincial Policy Statement under the Planning Act) and/or Canada Land Inventory Classes 1, 2 and 3 lands	☐	☒	The Project is not located within an agricultural area; therefore, this criterion has been screened out of further consideration
d	Pre-empt the use, or potential use, of a significant natural resource for any other purpose	☒	☐	The Project is within a natural resource use area and further assessment is warranted
e	Result in a significant detrimental effect on air or water quality or on ambient noise levels for adjacent areas	☐	☒	The Project is not a significant source of air emissions. Watercourse crossings and work in and around wetlands will occur during frozen conditions, preventing adverse impact on water quality. This criterion has been screened out of further consideration
f	Cause significant interference with the movement of any resident or migratory fish, wildlife species, species at risk, or their respective habitats	☒	☐	The Project is within an area used by wildlife and further assessment is warranted. Watercourse crossings and work in an around wetlands will occur during frozen conditions, preventing adverse impact on fish and fish habitat.
g	Establish a precedent or involve a new technology, either of which is likely to have significant environmental effects now or in the future	☐	☒	The Project relies on established technologies with proven applications and known environmental mitigation measures.
h	Be a pre-condition to the implementation of another larger and more environmentally significant project that is subject to an Individual Environmental Assessment or Renewable Energy Approval that has not yet been approved at the issuance of the Notice of Commencement of the undertaking	☐	☒	The key customer is a planned nickel mine whose development is not subject to an Individual Environmental Assessment (Ontario process) or Renewable Energy Approval.

Criteria **Will the Project…**		Yes	No	Rationale
i	Likely generate significant secondary effects, directly caused by the proponent's activities, which will adversely affect the environment	☒	☐	In the context of Transmission Facility Class EA, 'secondary effects' are intended to mean 'indirect effects'. Indirect effects, should there be any, will be assessed under the relevant Valued Component, i.e., under land and land use (Q. b), natural resources (Q. c), wildlife (Q. f), visual aesthetics (Q. j), timber resources (Q. n), natural heritage resources (Q. o), cultural heritage resources (Q. p).
j	Block pleasing views or significantly affect the aesthetic image of the surrounding area	☐	☒	The project follows existing transmission lines, roadways, rand rail lines with similar visual impacts. Where new disturbance is developed, it follows proposed realignments of existing infrastructure. There are no known sensitive viewscapes within the LSA.
k	Significantly change the social structure or demographic characteristics of the surrounding neighbourhood or community	☐	☒	The majority of the Project workforce is limited to the Construction phase and will not change the social structure of the community as the workforce is much small than the local population.
l	Overtax existing community services or facilities (e.g., transportation, water supply, sanitary and storm sewers, solid waste disposal system, schools, parks and/or care facilities);	☐	☒	The Project has limited requirements for municipal services.
m	Result in undesired or inappropriate access to previously inaccessible areas	☐	☒	The Project follows existing transmission lines, roadways, and rail lines (current Highway 655 / HONI powerline alignment and re-alignment proposed north of Kidd Creek Mine as part of the Crawford Mine Project). Where new access is developed, the access follows proposed realignment of existing infrastructure.
n	Create the removal of a significant amount of timber resources	☒	☐	Tree clearing will be required for the Project.
o	Result in significant effects to natural heritage resources	☒	☐	Natural heritage resource assessment is warranted.

Criteria **Will the Project…**		Yes	No	Rationale
p	Result in significant effects to cultural heritage resources (which may include built heritage resources, cultural heritage landscapes, and/or archaeological resources). Significant effects to cultural heritage resources are to be determined based on technical, cultural heritage studies prepared by qualified persons	☒	☐	A cultural heritage assessment is warranted as per the Ministry of Citizenship and Multiculturalism.

5.4. Criteria and Indicators

TIP1 developed criteria, indicators, and measurable parameters to use for the analysis of the seven (7) screening criteria identified as having the potential to interact with Project, including predicting and quantifying impacts and developing mitigation measures. Analysis was based on qualitative and/or quantitative predictions of impacts anticipated to occur from construction or operation of the transmission line.

Table 5-2 summarizes criteria and indicators TIP1 has developed through consideration of the Project type, its potential interactions with the environment, and the environmental context.

Table 5-2: TIP1 Class EA Screening Criteria, and Indicators

Screening Criteria Will the Project…		Project Interaction?	Rationale	Criteria and Sub-Criteria	Indicators	Assessment
a	Conflict with written environmental goals, objectives, plans, standards, policy statements or guidelines approved or adopted by the Province of Ontario; municipal government or local body within an unorganized territory as defined in the Municipal Act, 2001 where the project is to be located	Potentially	▪ Examination of environmental goals, objectives, plans, standards, policy statements and guidelines at the provincial and municipal level is warranted	▪ Land and Resource Use: - Land use planning - Parks and Protected Areas (Provincial Parks, Regional Parks, Conservation Reserves, Areas of Natural and Scientific Interest - Enhanced Management Areas	▪ Change and conformance with land use planning. ▪ Change to protected areas including: - provincial parks and provincial nature reserves - regional parks - conservation reserves. - areas of natural and scientific interest (earth and life science), including candidate areas; and - other ecologically sensitive areas.	▪ Qualitative assessment of current and planned future land uses. ▪ Qualitative assessment of changes potentially required in land use policy and planning. ▪ The potential effects to protected areas are measured quantitatively by calculating the area affected by the Project footprint, through the use of land use mapping.
b	Have significant effects on persons or property, including lands zoned to permit residential or other sensitive land uses	Potentially	▪ The Project crosses various lands and land uses.	▪ Land and Resource Use: - Recreation and commercial tourism - Hunting, gathering, trapping and fishing	▪ Change to recreation and commercial tourism considering: - proximity to outpost camps in the study area. - proximity to areas of concern associated with tourism and recreation in the study area. - proximity to cabins and cottages in the study area. - proximity to recreational trails and access points in the study area. - proximity to other recreational features, including canoe routes, backcountry campsites, shore launch sites, boat launches in the study area. - proximity to campgrounds in the study area; and - proximity to golf courses in the study area. ▪ Changes to hunting, gathering, trapping and fishing in the study area considering: - Wildlife Management Units crossed by the Project footprint. - proximity to traplines in the study area. - number and types of hunting licences in the study area; and - waterbody features used for recreational fishing in the Project footprint.	▪ The potential effects are also assessed qualitatively through assessment of change in environmental conditions (e.g., noise, water quality, visual aesthetics) and cultural and recreational values that might change users' experience, along with protected areas users' access. ▪ Quantitative assessment of change in area and access to recreational and commercial outdoor tourism features (e.g., outpost camps, cabins and cottages, recreational trails, canoe routes, etc.) by calculating the area affected by the Project footprint and, if possible, the number of affected features, using land use mapping. ▪ Qualitative assessment of change to recreational and commercial outdoor tourism values within the area (e.g., outpost camps, cabins and cottages, recreational trails, canoe routes, etc.). ▪ Quantitative assessment of change in area and access to Wildlife Management Units, traplines, hunting areas and waterbody features by calculating their respective area affected by the Project footprint, using land use mapping. ▪ Qualitative assessment of change in area and access to traplines, hunting areas, gathering areas, and waterbody features for recreational fishing.

Screening Criteria Will the Project…		Project Interaction?	Rationale	Criteria and Sub-Criteria	Indicators	Assessment
c	Necessitate the irreversible commitment of any significant amount of non-renewable resources, including Prime Agricultural Lands, which includes Specialty Crop Areas (as defined in the Provincial Policy Statement under the Planning Act) and/or Canada Land Inventory Classes 1, 2 and 3 lands	No	The Project is not located within an agricultural area; therefore, this criterion has been screened out of further consideration	n/a	n/a	n/a
d	Pre-empt the use, or potential use, of a significant natural resource for any other purpose	Potentially	The Project is within a natural resource use area and further assessment is warranted	▪ Land and Resource Use: - Mining Resources - Forestry Resources	▪ Change to current land use, including: - Mining - Forestry	▪ Qualitative assessment of current and planned future land uses.
e	Result in a significant detrimental effect on air or water quality or on ambient noise levels for adjacent areas	No	The Project is not a significant source of air emissions. Watercourse crossings and work in an around wetlands will occur during frozen conditions, preventing adverse impact on water quality. Therefore, this criterion has been screened out of further consideration	n/a	n/a	n/a
f.1	Cause significant interference with the movement of any resident or migratory wildlife species, or their respective habitats	Potentially	The Project is within an area used by wildlife and further assessment is warranted	▪ Wildlife and Wildlife Habitat - Ungulates [moose] - Furbearers [American marten, beaver, gray wolf] - Bats, Raptors, Migratory Birds - Wildlife breeding and nesting habitat - Wildlife movement corridors	▪ Wildlife presence and abundance: - Moose and spirit moose - Predators ▪ Wildlife movement ▪ Important habitat features: - Moose mating areas - Bat maternity roost and hibernacula ▪ Habitat availability considering: - change to amount (ha) of wildlife habitat in the study area and animal use of available habitat. ▪ Habitat quantity considering: - change to amount (ha) of Species at Risk (SAR) critical habitat in the study area. ▪ Habitat distribution considering: - change to spatial configuration of habitat in the study area, including the effects on wildlife movement and habitat connectivity.	▪ Changes in habitat availability and animal use are estimated quantitatively by calculating the number of different types of suitable habitat for each criterion, and qualitatively considering potential changes in habitat use (e.g., avoidance due to sensory disturbance). ▪ Changes in habitat distribution, including the effects on wildlife movement and habitat connectivity, are estimated qualitatively by examining changes to the distribution of habitat patches within the relevant criterion-specific study areas, and considering potential barriers to movement.

Screening Criteria Will the Project…		Project Interaction?	Rationale	Criteria and Sub-Criteria	Indicators	Assessment
f.2	Cause significant interference with the movement of any resident or migratory fish or their respective habitats	No	Watercourse crossings and work in and around wetlands will occur during frozen conditions, preventing adverse impact on fish and fish habitat. The Project does not include in-water work; therefore, this criterion has been screened out of further consideration	n/a	n/a	n/a
f.3	Cause significant interference with the movement of any resident or migratory species at risk, or their respective habitats	Potentially	The Project is within an area used by species at risk and further assessment is warranted	▪ Rare, Threatened or Endangered Species of Flora or Fauna or their Habitat - Wildlife SOCC [bald eagle, barn swallow, Canada warbler, common nighthawk, eastern wood-pewee, olive-sided flycatcher, peregrine falcon, rusty blackbird, yellow rail, Midland Painted turtle, Snapping turtle] - Wildlife[Little brown myotis and northern myotis, Tricolored bat, Eastern whip-poor-will, Bank swallow, Bobolink, Blanding's turtle, Lesser Yellowlegs, Chimney swift, Woodland caribou] - Plants SAR [Black Ash] - Rare plants communities and wetlands	▪ Habitat availability considering: - change to amount (ha) of species at risk habitat in the study area and animal use of available habitat. - change to among (ha) of rare plant community and wetlands. ▪ Habitat quality considering: - change (qualitative) to the type and condition of habitat available for various life history stages of wildlife. ▪ Distribution and connectivity considering: - change (qualitative) to habitat availability, including the effects on wildlife movement and habitat connectivity.	▪ Quantitative assessment of potential changes to total area of habitat present, calculated and presented as absolute (i.e., area) and relative (e.g., percentage change), as appropriate. ▪ Qualitative assessment of the quality of habitat available for species at risk confirmed or potentially present. ▪ Distribution and connectivity assessed through a qualitative assessment of changes to distribution via direct and indirect changes in habitats.
g	Establish a precedent or involve a new technology, either of which is likely to have significant environmental effects now or in the future	No	The Project relies on established technologies with proven applications and known environmental mitigation measures therefore, this criterion has been screened out of further consideration.	n/a	n/a	n/a

Screening Criteria Will the Project…		Project Interaction?	Rationale	Criteria and Sub-Criteria	Indicators	Assessment
h	Be a pre-condition to the implementation of another larger and more environmentally significant project that is subject to an Individual Environmental Assessment or Renewable Energy Approval that has not yet been approved at the issuance of the Notice of Commencement of the undertaking	No	The key customer is a planned nickel mine whose development is not subject to an Individual Environmental Assessment (Ontario process) or Renewable Energy Approval therefore, this criterion has been screened out of further consideration.	n/a	n/a	n/a
i	Likely generate significant secondary effects[12], directly caused by the proponent's activities, which will adversely affect the environment	No	In the context of Minor Transmission Facility Class EA, 'secondary effects' are intended to mean 'indirect effects'. Indirect effects, should there be any, will be assessed under the relevant Valued Component, i.e., under land and land use (Q. b), natural resources (Q. c), wildlife (Q. f), visual aesthetics (Q. j), timber resources (Q. n), natural heritage resources (Q. o), cultural heritage resources (Q. p).	Potential indirect effects include: ▪ Indirect effects to wildlife presence, abundance and movement through direct effects to wildlife habitat ▪ Indirect effects to hunting, gathering, trapping, and fishing, through direct effects to wildlife habitat and change in access Indirect effects, or secondary effects, to each of these values are discussed under Screening Criteria f.1 and b, respectively.	n/a	n/a
j	Block pleasing views or significantly affect the aesthetic image of the surrounding area	No	No sensitive viewscapes appear to exist in vicinity of the proposed Project, and the Project is collocated with existing transmission infrastructure. The issue has not been raised through engagement activities. Therefore, this criterion has been screened out of further consideration	n/a	n/a	n/a
k	Significantly change the social structure or demographic characteristics of the surrounding neighbourhood or community	No	The Project workforce is limited to construction phase and will not change the social structure of the community.	n/a	n/a	n/a
l	Overtax existing community services or facilities (e.g., transportation, water supply, sanitary and storm sewers, solid waste disposal system, schools, parks and/or care facilities);	No	The Project has limited requirements for municipal services.	n/a	n/a	n/a

[12] The Environmental Assessment Branch intends 'secondary effects' to mean 'indirect effects.

Screening Criteria Will the Project…		Project Interaction?	Rationale	Criteria and Sub-Criteria	Indicators	Assessment
m	Result in undesired or inappropriate access to previously inaccessible areas	No	This project is co-located with an exiting linear corridor (and proposed re-alignment in association with the Crawford Mine). The project does not lead to a significant change in this factor; therefore, this criterion has been screened out of further consideration	n/a	n/a	n/a
n	Create the removal of a significant amount of timber resources	Potentially	Tree clearing will be required for the Project	Timber Resources	▪ Timber resources quantity considering: - change to an area, type and volume of merchantable timber in the Project footprint.	▪ Quantitative assessment of potential changes to total area of merchantable timber resources, calculated and presented as absolute (i.e., area) and relative (e.g., percentage change), as appropriate. ▪ Quantitative assessment of potential changes to total volume of merchantable timber, calculated and presented as absolute (i.e., area) and relative (e.g., percentage change), as appropriate.
o	Result in significant effects to natural heritage resources [13]	Potentially	Significant wetland, significant wildlife habitat, significant habitat of endangered species and threatened species, and/or ANSI may occur in the LSA.	Natural Heritage Resources	▪ Significant wetland ▪ Significant woodland ▪ Significant valleylands ▪ Significant wildlife habitat ▪ Significant habitat of endangered species and threatened species ▪ ANSI	▪ Quantitative assessment of potential changes to total area of natural heritage resources, calculated and presented as absolute (i.e., area) and relative (e.g., percentage change), as appropriate. ▪ Ecosystem quantity considering: - change to area (ha) of significant wetland communities in the Project footprint, by type (e.g., bog, fen, swamp wetlands). - change to amount (ha) of mapped suitable habitat with high potential to support wildlife or plant SAR, wildlife or plant SOCC, traditional use wildlife or plants in the study area. ▪ Ecosystem distribution considering: - change to spatial configuration of the above-described significant natural heritage resources (e.g., fragmentation) in the study area. ▪ Ecosystem condition considering: - change to the integrity or naturalness of the above-described natural heritage resources in the study area, including their ability to support the communities of organisms naturally associated with them.

[13] Natural heritage features and areas: means features and areas, including *significant wetlands*, *significant coastal wetlands*, *fish habitat*, *significant woodlands* south and east of the Canadian Shield, *significant valleylands* south and east of the Canadian Shield, *significant* habitat of *endangered species* and *threatened species*, *significant wildlife habitat*, and *significant areas of natural and scientific interest*, which are important for their environmental and social values as a legacy of the natural landscapes of an area.

Screening Criteria Will the Project…		Project Interaction?	Rationale	Criteria and Sub-Criteria	Indicators	Assessment
p	Result in significant effects to cultural heritage resources (which may include built heritage resources, cultural heritage landscapes, and/or archaeological resources). Significant effects to cultural heritage resources are to be determined based on technical, cultural heritage studies prepared by qualified persons	Potentially	▪ A cultural heritage assessment is warranted as per the Ministry of Citizenship and Multiculturalism.	▪ Cultural Heritage Resources - archaeological resources - built heritage resources and cultural heritage landscapes. - traditional knowledge	▪ Change to archaeological resources considering: - number of archaeological sites in the Project footprint. - area (ha) of Project footprint with archaeological potential; and - number of archaeological sites where archaeological assessment is completed prior to Project construction. ▪ Change to built heritage resources and cultural heritage landscapes considering: - proximity of built heritage resources and cultural heritage landscapes identified in the study area; and - proximity of known historical cemeteries.	▪ Quantitative and qualitative assessment of known archaeological sites, objects, material, or physical features that may have cultural heritage value or interest, that are protected under the *Ontario Heritage Act*. ▪ Quantitative and qualitative assessment of areas with archaeological potential. ▪ Quantitative and qualitative assessment of known and potential built heritage resources and cultural heritage landscapes.

5.5. Net effects assessment

Net effects are identified by first considering the effects that will occur from the Project (e.g., habitat clearing) and the mitigation to be implemented (e.g., post-construction reclamation) (i.e., the project effects). Net effects, or residual effects, are the effects that remain after application of mitigation measures.

Table 5-3: Definitions for net effects characterization

Magnitude[14]	Spatial Extent	Temporal Consideration
Low	Within TLA, Off Right-of-Way access (ORA), and associated temporary workspaces	Short-term – effect occurs during construction phase
Moderate	Within LSA	Medium-term – effect occurs during construction and/or operation but is does not persist beyond first few years of operation
High	Within RSA	Long-term – effect occurs during construction and/or operation and persists into operations

5.6. Cumulative effects assessment

Cumulative effects occur when net effects from the planned Project interact with net effects from current, and future projects, magnifying the overall net effects of the TIP1 project.

As described in Section 5.1, an RSA was established to characterize cumulative effects.

Cumulative effects predicted in the RSA are qualitatively characterized in terms of spatial (e.g., scale or magnitude) and temporal variables.

[14] Intensity of an effect or degree of change from baseline conditions. These are quantitative to the extent possible, e.g., in reference in reference to thresholds (ecological, regulatory, etc.).

6. Existing conditions

The following section inventories the environment in the Local Study Area. In accordance with Section 3.3.4 of the Class EA (Hydro One Network Inc., 2024), information was collected for the purposes of defining existing conditions based on the results of the initial screening (Section 5.3):

- Land and Resource Use
- Wildlife and their habitat
- Natural heritage resources (e.g., significant wetlands, significant wildlife habitat, etc.)
- Cultural heritage resources (i.e., built heritage resources, cultural heritage landscapes and archeological resources)

Information for the inventory was obtained through published documents, government agency resources databases and mapping tools, municipal websites, government planning and guidance documents, relevant project documents, and reports commissioned by CNC.

Field studies included bird, bat, amphibian, reptile, surface water physical properties and fish habitat, ecological land classification, and archaeology surveys. Bird surveys, amphibian call surveys and bat maternity roost recordings were also undertaken.

Primary data collection was undertaken through targeted natural environment field surveys. Environmental baseline data collection was undertaken between 2012 and 2023 (Table 6-1).

Archaeology survey included a Stage 1 desktop study undertaken in Summer 2023 with Stage 2 field studies planned during detailed design and in advance of construction.

Table 6-1 Completed environmental surveys.

Survey Type	2021	2022	2023
Ecological Land Classification and Vegetation Survey	Validation of ELC and vegetation inventory on 162 sites		Validation of ELC and vegetation inventory on 50 sites
Winter Mammal Survey (Aerial)	23 flight lines	29 flight lines	-
Amphibian Call Survey	10 Sites	51 Sites	-
Turtle Basking Survey	-	17 Sites	eDNA sampling at 3 locations of historical observation
Breeding Birds Survey	79-point counts	49-point counts	126-point counts
Bird ARU Survey	20 units	10 units	10 units

Survey Type	2021	2022	2023
Marsh Bird Survey	1-point count	9-point count	-
Nocturnal Owl Survey	-	25-counts at 20-stations	-
Migratory Birds and Waterfowl	-	29 flight lines and 17-stations	-
Species-at-Risk Birds	-	-	Short-eared Owl and Lesser Yellowlegs
Bats – hibernacula	5 ground searches	12 ground searches, and 2-stations for bat detectors.	2-stations for bat detectors
Bats – maternity roosts	20 ground surveys and 18-stations for bat detectors	9 ground surveys and 17 stations for bat detectors	13 ground surveys and 10-stations for back detectors
Fish and Fish Habitat	30 survey locations		18 survey locations

6.1. Land use planning

The Local Study Area (LSA) lies within the City of Timmins and Cochrane District. Land use planning and development in the LSA is guided by provincial land use planning (for Crown land outside Timmins), the Provincial Policy Statement and the City of Timmins's Official Plan and Zoning Bylaw. The Cochrane District does not provide any specific land use planning direction.

6.1.1. Provincial Policy Statement

The proposed Project is defined as "infrastructure" in the Provincial Policy Statement (Ministry of Muncipal Affairs and Housing, 2020). Section 1.6.8 of the Provincial Policy Statement is relevant to infrastructure and can be summarized as follows:

- Planning and protecting corridors and ROWs for infrastructure to meet current and projected needs.
- Preserving and reusing abandoned corridors for purposes that maintain the corridor's integrity and continuous linear characteristics wherever feasible.
- Co-locating linear infrastructure is promoted where appropriate.

Section 1.6.8.6 of the Provincial Policy Statement requires that when planning corridors and ROWs for significant electricity transmission and infrastructure facilities that consideration be given to resources managed under Section 2 of the Provincial Policy Statement, which includes natural heritage, water, agriculture, minerals, petroleum, aggregate, cultural heritage and archaeology.

6.1.2. Critical minerals strategy

As part of Ontario's critical minerals strategy, the province has identified the need to grow domestic processing capacity and create resilient local supply chains as an area of action. Part of this commitment is to support mining companies by providing an affordable and reliable supply of electricity (Government of Ontario, 2022). The Project has identified the planned Crawford Nickel Mine as its key customer, a future producer of critical minerals that requires a reliable source of electricity for processing and to meet its goal of remaining carbon neutral. The Project contributes to one of the key pillars outlined in the Province's Critical Minerals Strategy

6.1.3. Crown land use planning

The LSA passes through three (3) Crown planning areas including the Kidd Creek Complex, the Kamiskotia Complex, and the Timmins Porcupine Urban Area (Ministry of Natural Resources and Forestry, 2023). All Crown lands within the LSA are designated 'General Use Area' a land use designation which allows for utilities.

6.1.4. City of Timmins

The City of Timmins Official Plan provides guidance and direction for how the land in the municipality should be used by delineating lands into distinct land use areas and developing policy direction for each of those areas. The LSA is located within lands designated as 'Resource Development Area' (City of Timmins, 2017a). The Official Plan allows for utility corridors to be developed in any land use designation area and are expected to be designed in a manner that will minimize negative effects through such things as building only what is necessary, and implementing measures to facilitate compatibility with their surroundings (City of Timmins, 2010).

The City of Timmins Zoning Bylaw provides the policy direction to implement the Official Plan. The LSA is predominantly situated on RD-RU zoned lands but also passes through EA-IM in and around Kidd Mine, RD-MX in and around the aggregate facilities, and RD-HAZ-MIN in and around the mine tailing hazard lands to the north of Porcupine Substation (City of Timmins, 2023). The Zoning Bylaw indicates that hydro-electric facilities are permitted uses in any land use zone and that height restrictions indicated in any land use zone do not apply to electric transmission towers.

Residential dwellings are not permitted to be built within 30 m of 240+ kV transmission line corridors (City of Timmins, 2011).

6.1.5. Mattagami Region Conservation Authority

A small portion of the Mahaffy Township Ground Moraine conservation reserve, east of Mattagami River and south of Lower Sturgeon Dam, lies within the terminal end of the RSA, approximately 4.1 km from the nearest structure.

The Project alignment passes through the Hersey Lake Conservation Area north of the Porcupine Substation. Some portions of the Transmission Line Alignment (TLA) pass through regulated properties of the Mattagami Region Conservation Authority in Murphy and Tisdale Townships, however, no in-water work is planned and Conservation Authority setbacks from watercourses will be respected.

6.2. Sensitive land uses

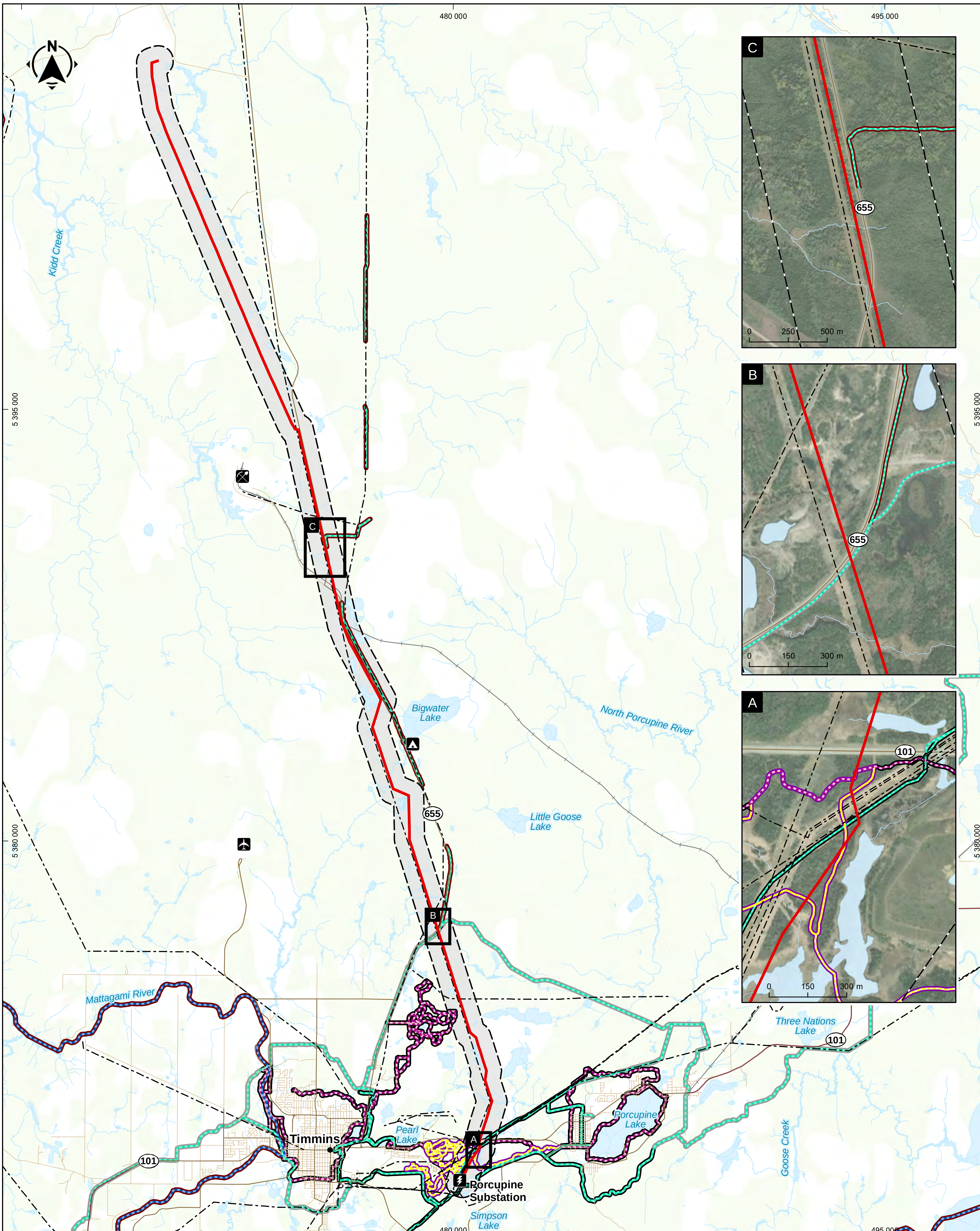
The LSA includes some sensitive land uses including recreation and commercial tourism. Hunting and trapping also take place within the LSA.

6.2.1. Recreation and commercial tourism

There is a trail network in vicinity of the Porcupine substation (Porcupine ski runners trail network and Conservation Authority trails) as wells as snowmobile trail that runs the length of the existing powerline corridor that is paralleled for much of the proposed TIP1 Project. The snowmobile trail is part of the Ontario Federation of Snowmobile Club's Trans Ontario Provincial Trails system, in this region (District 17[15]) being operated and maintained by volunteer snowmobile clubs of the Timiskaming Abitibi Trail Association including the Timmins Snowmobile Club, the Polar Bear Riders Snowmobile Club, and the Arctic Riders Snowmobile Club. Porcupine ski runners' trails, and Hersey Lake trail shown on Map 5.

Big Water Campground, a private campground adjacent to Bigwater Lake, is located within the RSA.

[15] http://www.tata-bestsnowmobiling.com/



Local Study Area (LSA)

Project Component

New 230 kV Transmission Line

Infrastructures and Equipments

Substation

Timmins / Victor M. Power Airport

Big Water Campground

Kidd Creek Mine

Railway

Trails (Recreational activities)

Canoe Route

Hiking or Walking

Hiking and Cross Country Skiing

Snowmobile trail

Owner or Operator of Trails

City of Timmins

Porcupine Ski Runners

OFSC official trail

No name

TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

TIP-1 Transmission Project
Timmins, Ontario

Map 5
Trails Near the Local Study Area (LSA)

Sources:
CanVec, 1/250 000, NRCan, 2017
Watercourses and Waterbodies, Ontario Hydro Network (OHN), August 2023
Satellite Image (Maxar) licensed, resolution 31 cm, Copyright © May 2023

Project Data, BBA, 2023

BBA Project Number: 7311004-007000-4E

2024-09-19

0 1 350 2 700 m

UTM, zone 17, NAD 83

Prepared by: J. Day Drawn by: A. Monnard Verified by: F. Karcha

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6.2.2. Hunting, gathering and trapping

Hunting activities are managed by the MNRF, whose administration for this forest is led by their District offices, in Cochrane, Timmins, and Kirkland Lake. The majority of the Project RSA is located within Wildlife Management Unit 30, with the southern terminal end in and around Porcupine substation lying within Wildlife Management Unit 29 (Map 6).

Hunting

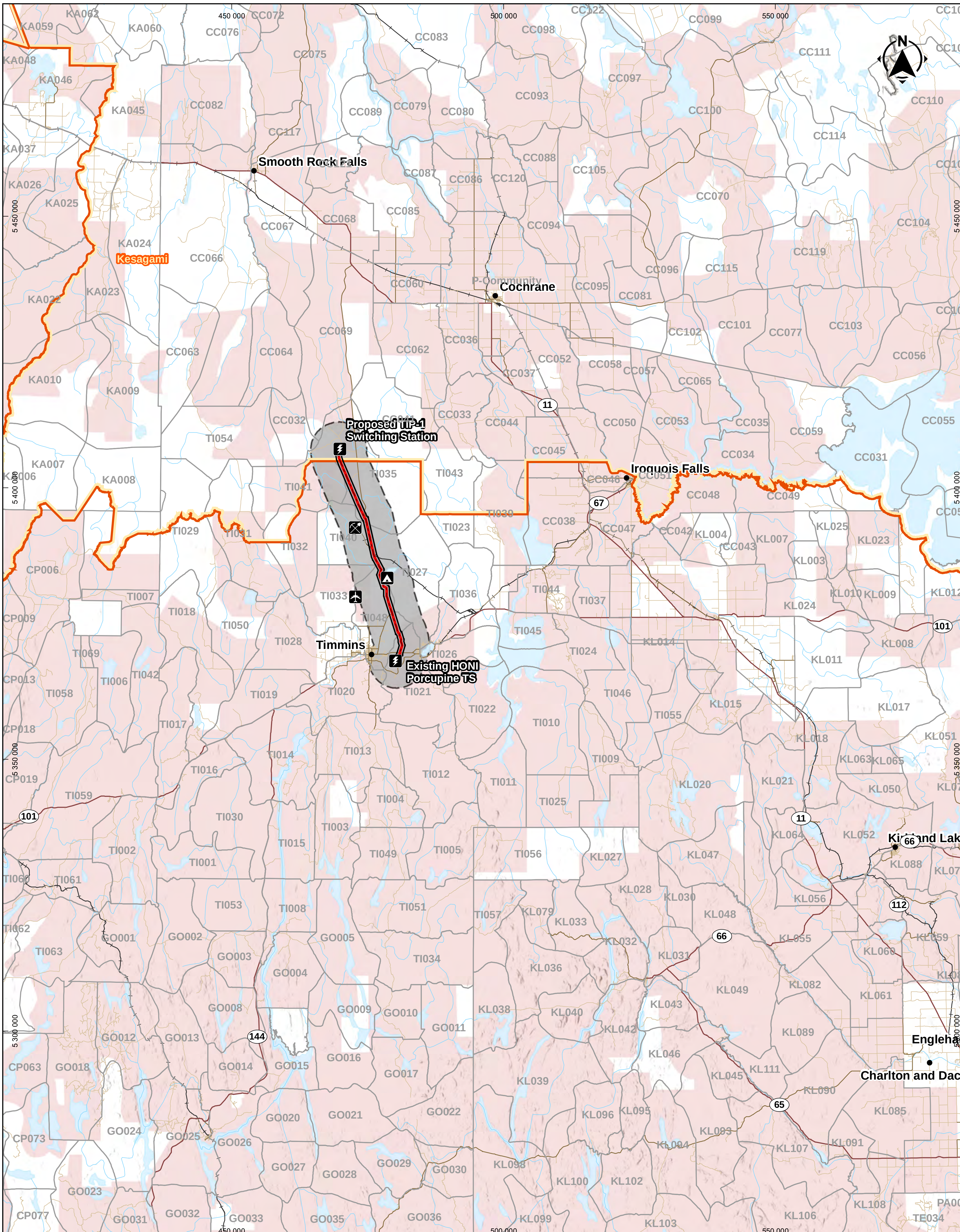
Hunting activity and harvest information for moose, white-tailed deer, wolf and coyote within a Wildlife Management Unit (WMU), specifically WMU 30 are provided in the following tables (Table 6-2, Table 6-3, Table 6-4).

More than 1,200 moose (570 bulls, 313 cows, 356 calves) were harvested between 2006 to 2022, with an annual average of 73 moose harvested and 1406 active hunters (Ministry of Natural Resources and Forestry, 2024).

Table 6-2: Moose hunting activity and harvest data for WMU 30 between 2006 to 2022.

Year	Active Hunters	Bull Harvest	Cow Harvest	Calf Harvest	Total Harvest
2006	2048	63	37	22	122
2007	1892	51	30	57	138
2008	1909	54	18	8	80
2009	1909	54	33	23	110
2010	2048	78	27	49	154
2011	2041	65	34	36	135
2012	1952	47	38	8	93
2013	2030	52	35	24	111
2014	2082	44	25	38	107
2015	1053	7	6	14	27
2016	797	0	6	3	9
2017	849	7	2	17	26
2018	904	6	5	16	27
2019	979	9	6	16	31

Year	Active Hunters	Bull Harvest	Cow Harvest	Calf Harvest	Total Harvest
2020	859	7	7	13	27
2021	284	13	0	7	20
2022	265	13	4	5	22
ANNUAL AVERAGE	**1406**	**34**	**18**	**21**	**73**
TOTAL	[redacted]	**570**	**313**	**356**	**1239**



Regional Study Area

Local Study Area

Project Component

Substation

New 230 kV Transmission Line

Infrastructures and Equipments

Timmins / Victor M. Power Airport

Big Water Campground

Kidd Creek Mine

Highway

Principal Road

Local Road

Railway

Territory Management

Bear Management Area

Caribou Range Boundary

Trapline Area

TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

TIP-1 Transmission Project
Timmins, Ontario

Map 6
Wildlife Management Areas

Sources:
CanVec, 1/250 000, NRCan, 2017
SDA, 1/20 000, MERN Quebec, June 2022
Official Airports, Ontario Ministry of Natural Resources and Forestry, March 2012
Conservation Reserve Regulated, Ontario Ministry of Natural Resources and Forestry, June 2023
Watercourses and Waterbodies, Ontario Hydro Network (OHN), August 2023
Project Data, BBA, 2023

BBA Project Number: 7311004-007000-4E

2024-09-18

0 7 14 km

UTM, zone 17, NAD 83

Prepared by: C. Moffett Drawn by: R. Sourceaux Verified by: C. Moffett

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Approximately 14 white-tailed deer (14 antlered, 0 antlerless) were harvested between 2009 to 2022, with an annual average of one (1) white-tailed deer harvested and 21 active hunters (Ministry of Natural Resources and Forestry, 2024).

Table 6-3: White-tailed deer hunting activity and harvest data for WMU 30 between 2009 to 2022.

Year	Active Hunters	Antlered Harvest	Antlerless Harvest	Total Harvest
2009	14	0	0	0
2010	2	0	0	0
2011	8	6	0	6
2012	29	0	0	0
2013	13	0	0	0
2014	38	0	0	0
2015	3	0	0	0
2016	15	0	0	0
2017	93	3	0	3
2018	16	0	0	0
2019	27	3	0	3
2020	14	1	0	1
2021	13	1	0	1
2022	15	0	0	0
ANNUAL AVERAGE	**21**	**1**	**0**	**1**
TOTAL	[redacted]	**14**		**14**

Approximately 30 wolves and coyotes were harvested between 2012 to 2022, with an annual average of 3 wolves and coyotes harvested by 71 active hunters (Ministry of Natural Resources and Forestry, 2024).

Table 6-4: Wolf and coyote hunting activity and harvest data for WMU 30 between 2012 to 2022.

Year	Active Hunters	Total Harvest
2012	50	3
2013	46	5
2014	58	2
2015	98	8
2016	98	2
2017	64	5
2018	81	0
2019	78	1
2020	61	1
2021	70	2
2022	74	1
ANNUAL AVERAGE	**71**	**3**
TOTAL	[redacted]	**30**

Gathering occurs in the area including berry picking, medicines gathering, and wild rice harvesting. No wild rice harvesting is known to occur in the RSA. Fruit and medicinal plant populations occur in the LSA, however, information on extent and locations relative to the Project have not been shared with TIP1.

Traplines

The LSA falls within five (5) Trapline Areas Map 6; Table 6-5). Trappers' cabins are in the general area, but none occur within the LSA. No data is available for the LSA on species, trapping activity and harvests.

Table 6-5: Trapline area number and owners in the study area.

Trapline area number	Name
TI021	Jodie Russel
TI027	Ken Beamish
TI035	Permanently Vacant
TI040	Permanently Vacant
TI048	Guy Lambert

Bear management areas

The LSA traverses through Bear Management Areas (BMA) TI-29-007, TI-29-008, and TI-30-048 and the RSA extends into BMA CC-30-015 (Map 6, Table 6-6). Approximately 1,000 black bears were harvested between 2012 to 2022, with an annual average of 92 black bears harvested and 421 active hunters (Ministry of Natural Resources and Forestry, 2024).

Table 6-6: Bear management area number and operators in the RSA

BMA	OPERATOR INFO
TI-29-007	Vacant
TI-29-008	Schwehr's Out-fitting
TI-30-048	Vacant
CC-30-015	Kammoe & Son Outfitters

Table 6-7: Black bear hunting activity and harvest data for WMU 30 between 2012 to 2022.

Year	Active Hunters	Total Harvest
2012	391	110
2013	374	81
2014	622	148
2015	611	144
2016	538	99
2017	360	64
2018	369	79
2019	391	60

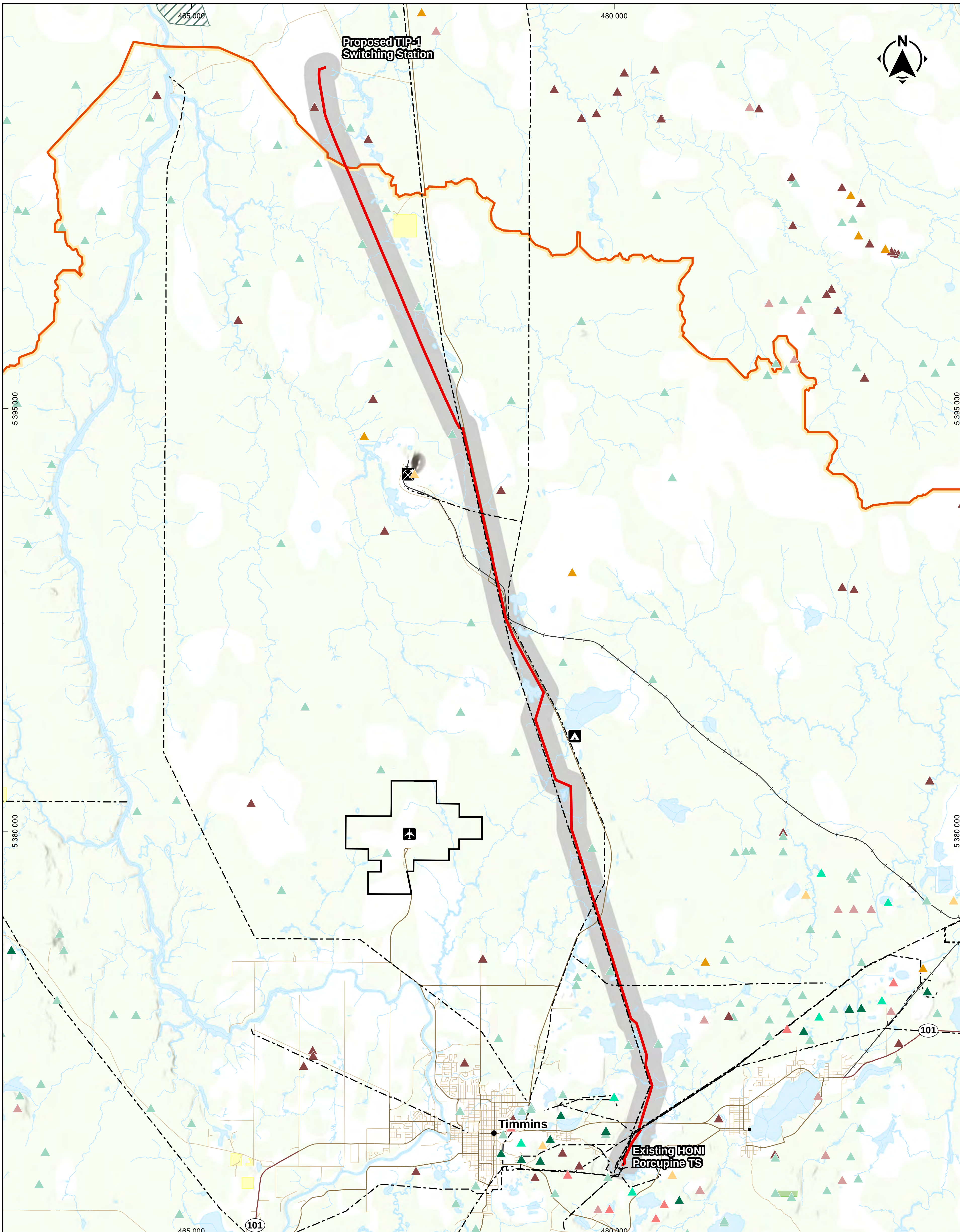
Year	Active Hunters	Total Harvest
2020	394	94
2021	312	82
2022	266	46
ANNUAL AVERAGE	**421**	**92**
TOTAL	[redacted]	**1007**

6.3. Natural resource use

6.3.1. Mineral resources

The region has been an area of interest for its mineral potential since 1955, with many mining companies and government bodies investigating the area. A rich base metal deposit in Kidd Township, now the site of the Kidd Creek Mine was discovered in 1963, which led to significant exploration in Crawford Township between the 1960s and 1970s (Natural Resources Canada and Ontario Geological Survey, 2015).

The TLA passes through numerous mining claims, mineral leases and mining patents (Ministry of Mines, 2024). The City of Timmins online mapping indicates the TLA passes through mineral development, mineral extraction zone, aggregate reserve, and pit and quarry areas (City of Timmins, 2024). Map 7 presents mineral inventory information (Ministry of Mines, 2024) available for the area. Kidd Creek Mine and Hollinger Pit, northwest of Porcupine substation are the only operating mines in the RSA. Several past producing mines occur in the southern terminus of the RSA. No operating or past producing mines or developed prospects occur within the LSA. Developed prospects occur within the RSA, including Canada Nickel's prospects at the north terminus (including prospects for platinum and palladium as well) and several developed prospects for gold, iron, nickel, and silver in the southern terminus of the RSA. Prospects for lead, silver, and zinc occur in vicinity of Kidd Creek Mine (the Chance Mining Property), for peat east of Kidd Mine, and for gold (Beaumont Shaft) north of Porcupine substation.



New 230 kV Transmission Line

Protected Areas

Conservation Area

Infrastructures and Equipments

Timmins / Victor M. Power Airport
Big Water Campground
Kidd Creek Mine
Highway
Principal Road
Local Road
Railway

Ontario Mineral Inventory

Developed Prospect With Reported Reserves or Resources
Developed Prospect Without Reported Reserves or Resources
Discretionary Occurrence
Occurrence
Past Producing Mine With Reserves or Resources
Past Producing Mine Without Reserves or Resources
Producing Mine
Prospect

Pits and Quarries

Pit
Quarry

TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

TIP-1 Transmission Project
Timmins, Ontario

Map 7
Land Use

Sources:
CanVec, 1/250 000, NRCan, 2017
SDA, 1/20 000, MERN Quebec, June 2022
Official Airports, Ontario Ministry of Natural Resources and Forestry, March 2012
Conservation Reserve Regulated, Ontario Ministry of Natural Resources and Forestry, June 2023
Pits and Quarries, Ontario Ministry of Natural Resources and Forestry, November 2018
Watercourses and Waterbodies, Ontario Hydro Network (OHN), August 2023
Project Data, BBA, 2023

BBA Project Number: 7311004-007000-4E

2024-09-18

0 1.35 2.7 km
UTM, zone 17, NAD 83

Prepared by: J. Day | Drawn by: A. Haffaci | Verified by: F. Karcha

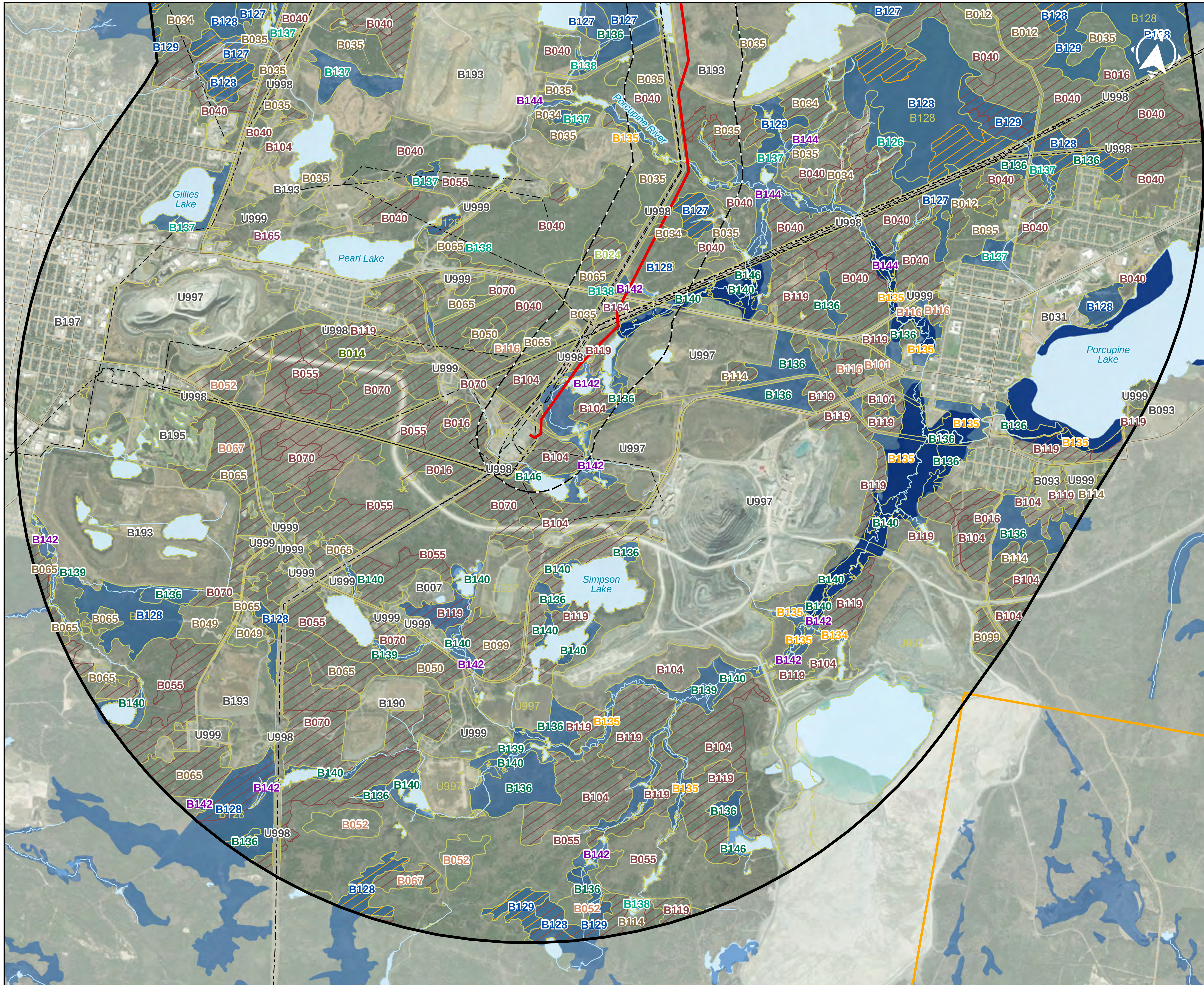
Fichier : 7311004_000000_4E_D20_0009_R00_LandUse_7.mxd

6.3.2. Forestry resources

The LSA is located within the Abitibi River Forest, which encompasses approximately 35,000 km^2, extending westward from the Ontario / Québec border for 190 km to the southern limit, south of Timmins, to the northern most extent of the Ontario Province's managed forest land. The Abitibi River Forest is currently managed by Abitibi River Forest Management Inc., which is made up of forest resource management partners that are responsible for forest management planning and operations.

The most recent Forest Management Plan provides planned forest activities between 2022-2032 (Abitibi River Forest Management Inc., 2022). The LSA is predominantly patent land and is excluded from the forest harvest land base (Abitibi River Forest Management Inc., 2022). While there is forested land-cover located within the LSA, a majority of the forest occurs on patent land. These areas fall outside of Forestry Management Units, Agreement Forest Areas, Forest Cover Units, Forest Resource Inventory Areas, or Wood Use Areas Forest Resources as identified through the MNRF Forest Resource Inventory (MNRF, 2017). As such, there is no potential for the proposed Project to affect the productivity or utilization of the land for timber harvesting.

Upland forests in the RSA are typically dominated by black spruce and Jack pine or trembling aspen and paper birch (Map 8). Other tree species that were inventoried within the LSA are balsam fir, eastern white cedar, tamarack, and balsam poplar.



Regional Study Area (RSA)
Local Study Area (LSA)
Provincially Significant Wetland (Evaluated)
Wetland

Infrastructures and Equipments

Principal Road
Local Road
Transmission Line

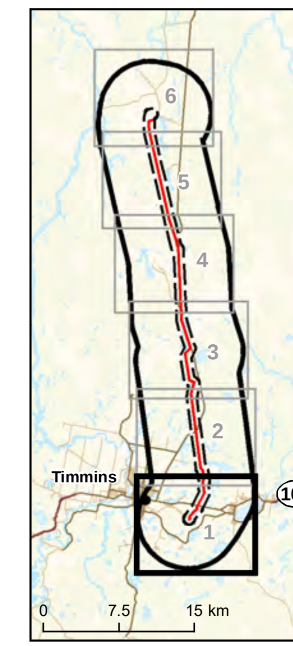
Project Component

New 230 kV Transmission Line

Vegetation

Vegetation Communities (Abitibi River FRI) - labelled with ecosite code
Canopy Height >= 12 meters
Old vegetation >= 90 years

B190	Anthropologically Disturbed Upland Communities and Areas
B126	Bog
B102	Coniferous forest
B204	Coniferous forest (Black Spruce-Pine)
B100	Coniferous forest (Hemlock-cedar)
B012	Coniferous forest (Pine-Black Spruce)
B048	Coniferous forest (Pine)
B067	Coniferous forest (Spruce-Fir)
B016	Deciduous forest (Aspen-Birch)
B136	Fen
B142	Marsh
B164	Rock ecosite
B127	Swamp (Conifer)
B133	Swamp (Hardwood)
B135	Swamp (Thicket)



TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

TIP-1 Transmission Project
Timmins, Ontario

Map 8-1
Forest Cover Type and Canopy Height (>12 m)

Sources:
Ontario Road Network (ORN), Ontario Ministry of Natural Resources and Forestry, June 2023
Wetlands, Ontario Ministry of Natural Resources and Forestry, April 2024
Forest Resources Inventory, Ontario Ministry of Natural Resources and Forestry, June 2023
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Project Data, BBA, 2024

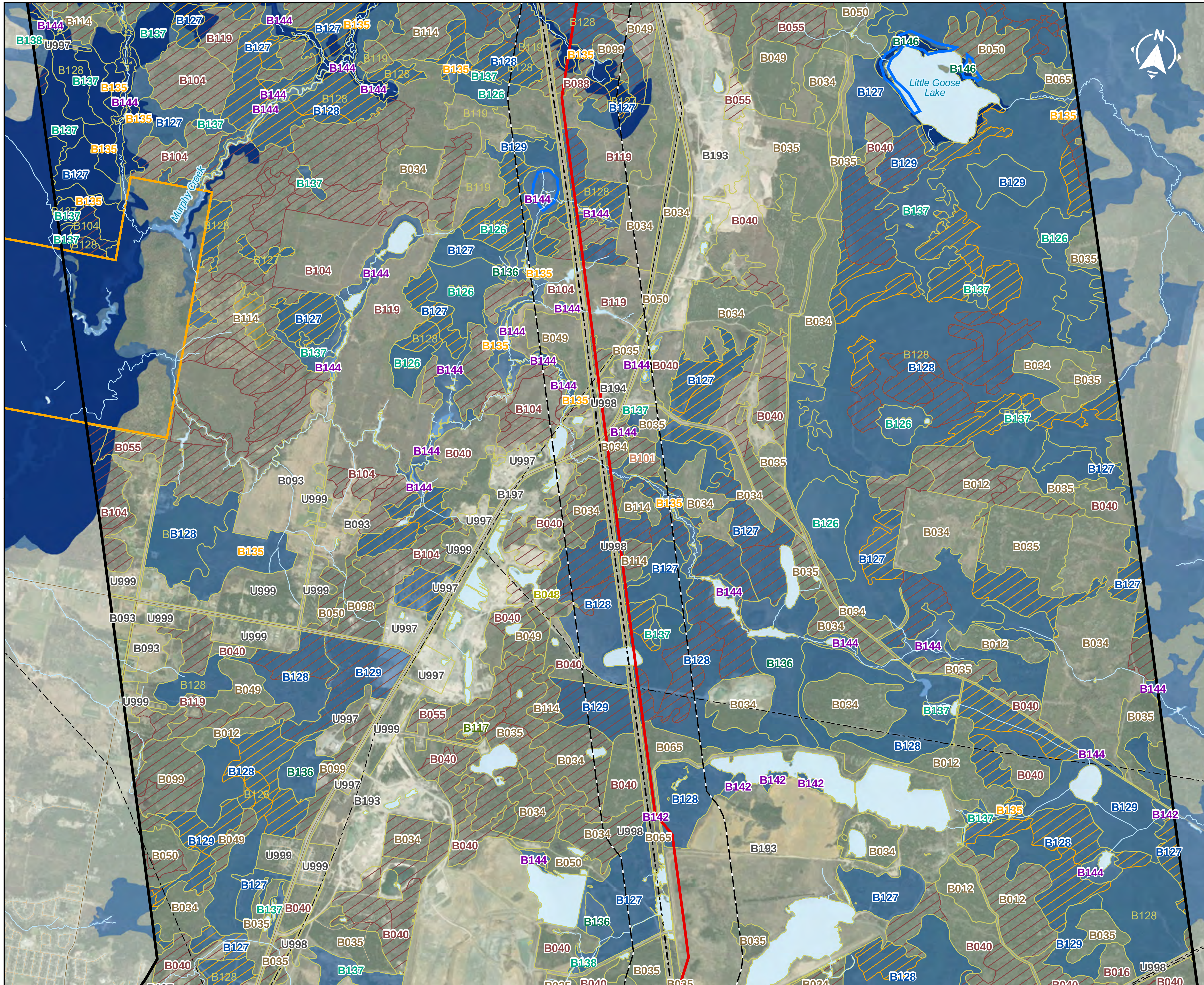
BBA Project Number: 7311004-000000-4E

2024-09-19

0 400 800 m
UTM, Zone 17, NAD 83

Prepared by: J. Day
Drawn by: A. Monnard
Verified by: F. Karcha

File: 7311004_000000_4E_D40_0006_R00_ForestCover_8.mxd



Regional Study Area (RSA)

Local Study Area

Provincially Significant Wetland (Evaluated)

Wetland

Wetland (City of Timmins Official Plan)

Project Component

New 230 kV Transmission Line

Vegetation

Vegetation Communities (Abitibi River FRI) - labelled with ecosite code

Canopy Height >= 12 meters

Old vegetation >= 90 years

B190 Anthropologically Disturbed Upland Communities and Areas

B126 Bog

B102 Coniferous forest

B204 Coniferous forest (Black Spruce-Pine)

B100 Coniferous forest (Hemlock-cedar)

B012 Coniferous forest (Pine-Black Spruce)

B048 Coniferous forest (Pine)

B067 Coniferous forest (Spruce-Fir)

B016 Deciduous forest (Aspen-Birch)

B136 Fen

B142 Marsh

B164 Rock ecosite

B127 Swamp (Conifer)

B133 Swamp (Hardwood)

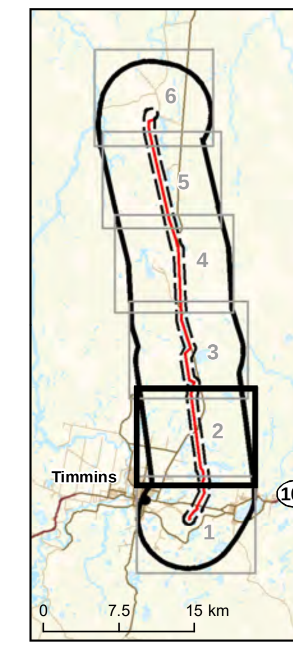
B135 Swamp (Thicket)

Infrastructures and Equipments

Principal Road

Local Road

Transmission Line



TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

TIP-1 Transmission Project
Timmins, Ontario

Map 8-2
Forest Cover Type and Canopy Height (>12 m)

Sources:
Ontario Road Network (ORN), Ontario Ministry of Natural Resources and Forestry, June 2023
Wetlands, Ontario Ministry of Natural Resources and Forestry, April 2024
Forest Resources Inventory, Ontario Ministry of Natural Resources and Forestry, June 2023
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Project Data, BBA, 2024

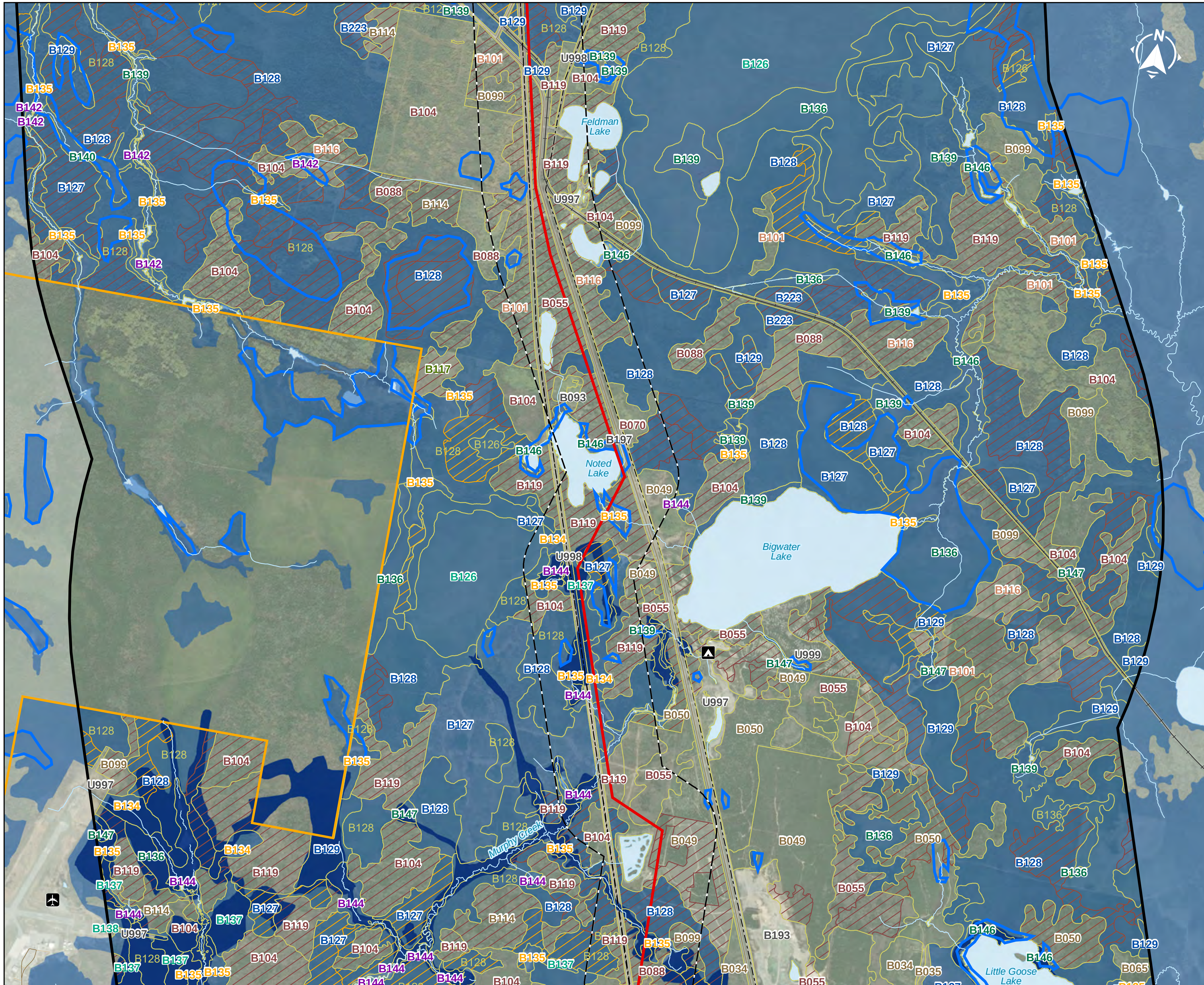
BBA Project Number: 7311004-000000-4E

2024-09-19

0 400 800 m
UTM, Zone 17, NAD 83

Prepared by: J. Day
Drawn by: A. Monnard
Verified by: F. Karcha

File: 7311004_000000_4E_D40_0006_R00_ForestCover_8.mxd



Regional Study Area (RSA)

Local Study Area (LSA)

Provincially Significant Wetland (Evaluated)

Wetland

Wetland (City of Timmins Official Plan)

Project Component

New 230 kV Transmission Line

Vegetation

Vegetation Communities (Abitibi River FRI) - labelled with ecosite code

Canopy Height >= 12 meters

Old vegetation >= 90 years

B190 Anthropologically Disturbed Upland Communities and Areas

B126 Bog

B102 Coniferous forest

B204 Coniferous forest (Black Spruce-Pine)

B100 Coniferous forest (Hemlock-cedar)

B012 Coniferous forest (Pine-Black Spruce)

B048 Coniferous forest (Pine)

B067 Coniferous forest (Spruce-Fir)

B016 Deciduous forest (Aspen-Birch)

B136 Fen

B142 Marsh

B164 Rock ecosite

B127 Swamp (Conifer)

B133 Swamp (Hardwood)

B135 Swamp (Thicket)

Infrastructures and Equipments

Principal Road

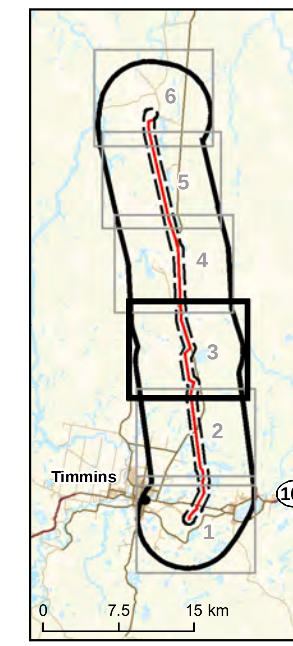
Local Road

Railway

Transmission Line

Timmins / Victor M. Power Airport

Big Water Campground



TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

TIP-1 Transmission Project
Timmins, Ontario

Map 8-3
Forest Cover Type and Canopy Height (>12 m)

Sources:
Ontario Road Network (ORN), Ontario Ministry of Natural Resources and Forestry, June 2023
Wetlands, Ontario Ministry of Natural Resources and Forestry, April 2024
Forest Resources Inventory, Ontario Ministry of Natural Resources and Forestry, June 2023
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Project Data, BBA, 2024

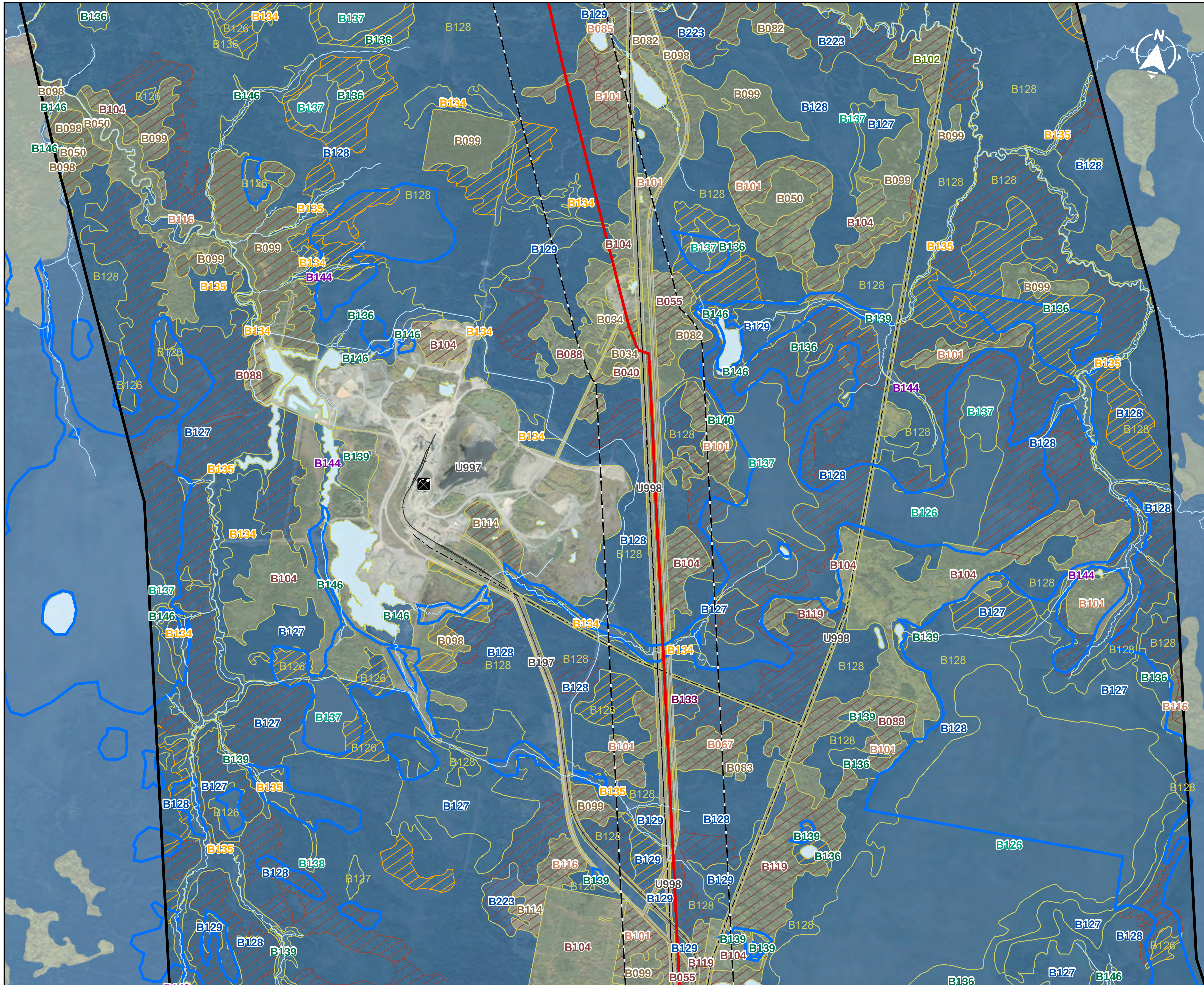
BBA Project Number: 7311004-000000-4E

2024-09-19

0 400 800 m
UTM, Zone 17, NAD 83

Prepared by: J. Day   Drawn by: A. Monnard   Verified by: F. Karcha

File: 7311004_000000_4E_D40_0006_R00_ForestCover_8.mxd



Regional Study Area (RSA)
Local Study Area (LSA)
Wetland
Wetland (City of Timmins Official Plan)

Project Component

New 230 kV Transmission Line

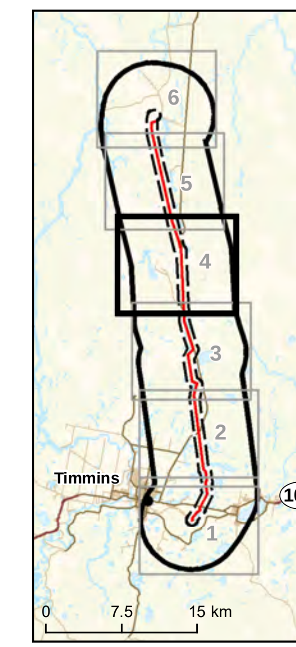
Vegetation

Vegetation Communities (Abitibi River FRI) - labelled with ecosite code
Canopy Height >= 12 meters
Old vegetation >= 90 years

B190	Anthropologically Disturbed Upland Communities and Areas
B126	Bog
B102	Coniferous forest
B204	Coniferous forest (Black Spruce-Pine)
B100	Coniferous forest (Hemlock-cedar)
B012	Coniferous forest (Pine-Black Spruce)
B048	Coniferous forest (Pine)
B067	Coniferous forest (Spruce-Fir)
B016	Deciduous forest (Aspen-Birch)
B136	Fen
B142	Marsh
B164	Rock ecosite
B127	Swamp (Conifer)
B133	Swamp (Hardwood)
B135	Swamp (Thicket)

Infrastructures and Equipments

Principal Road
Local Road
Railway
Transmission Line
Kidd Creek Mine



TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

TIP-1 Transmission Project
Timmins, Ontario

Map 8-4
Forest Cover Type and Canopy Height (>12 m)

Sources:
Ontario Road Network (ORN), Ontario Ministry of Natural Resources and Forestry, June 2023
Wetlands, Ontario Ministry of Natural Resources and Forestry, April 2024
Forest Resources Inventory, Ontario Ministry of Natural Resources and Forestry, June 2023
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Project Data, BBA, 2024

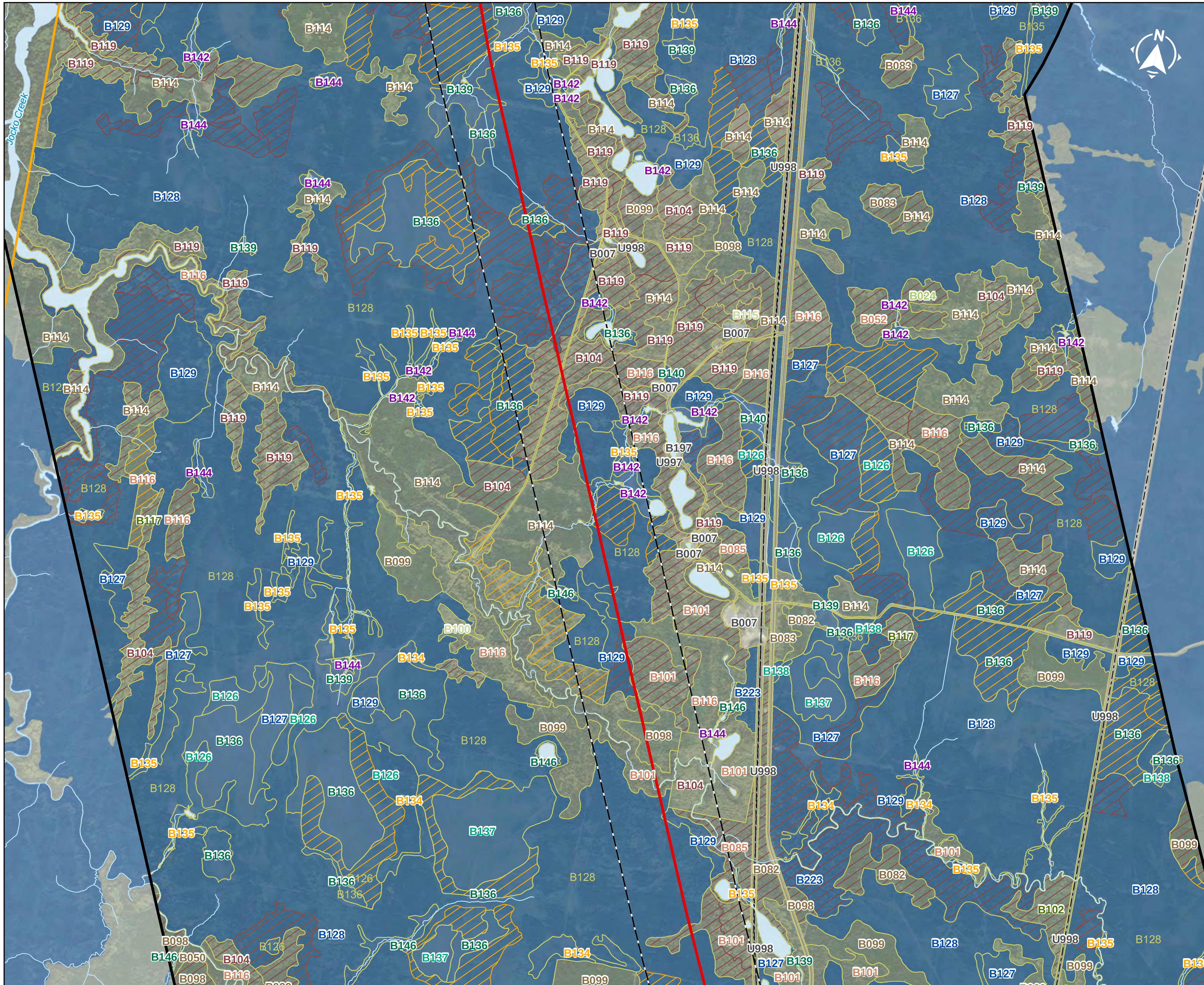
BBA Project Number: 7311004-000000-4E

2024-09-19

0 400 800 m
UTM, Zone 17, NAD 83

Prepared by: J. Day
Drawn by: A. Monnard
Verified by: F. Karcha

File: 7311004_000000_4E_D40_0006_R00_ForestCover_8.mxd



Regional Study Area (RSA)

Local Study Area (LSA)

Wetland

Project Component

New 230 kV Transmission Line

Vegetation

Vegetation Communities (Abitibi River FRI) - labelled with ecosite code

Canopy Height >= 12 meters

Old vegetation >= 90 years

B190 Anthropologically Disturbed Upland Communities and Areas

B126 Bog

B102 Coniferous forest

B204 Coniferous forest (Black Spruce-Pine)

B100 Coniferous forest (Hemlock-cedar)

B012 Coniferous forest (Pine-Black Spruce)

B048 Coniferous forest (Pine)

B067 Coniferous forest (Spruce-Fir)

B016 Deciduous forest (Aspen-Birch)

B136 Fen

B142 Marsh

B164 Rock ecosite

B127 Swamp (Conifer)

B133 Swamp (Hardwood)

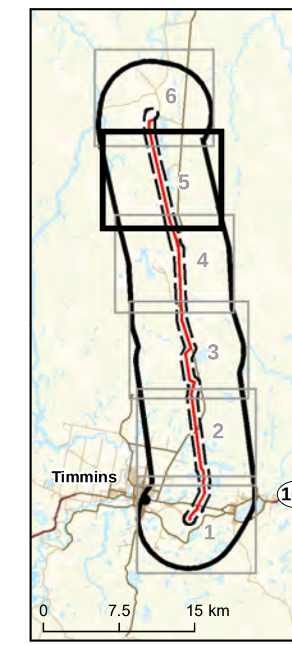
B135 Swamp (Thicket)

Infrastructures and Equipments

Principal Road

Local Road

Transmission Line



TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

TIP-1 Transmission Project
Timmins, Ontario

Map 8-5
Forest Cover Type and Canopy Height (>12 m)

Sources:
Ontario Road Network (ORN), Ontario Ministry of Natural Resources and Forestry, June 2023
Wetlands, Ontario Ministry of Natural Resources and Forestry, April 2024
Forest Resources Inventory, Ontario Ministry of Natural Resources and Forestry, June 2023
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Project Data, BBA, 2024

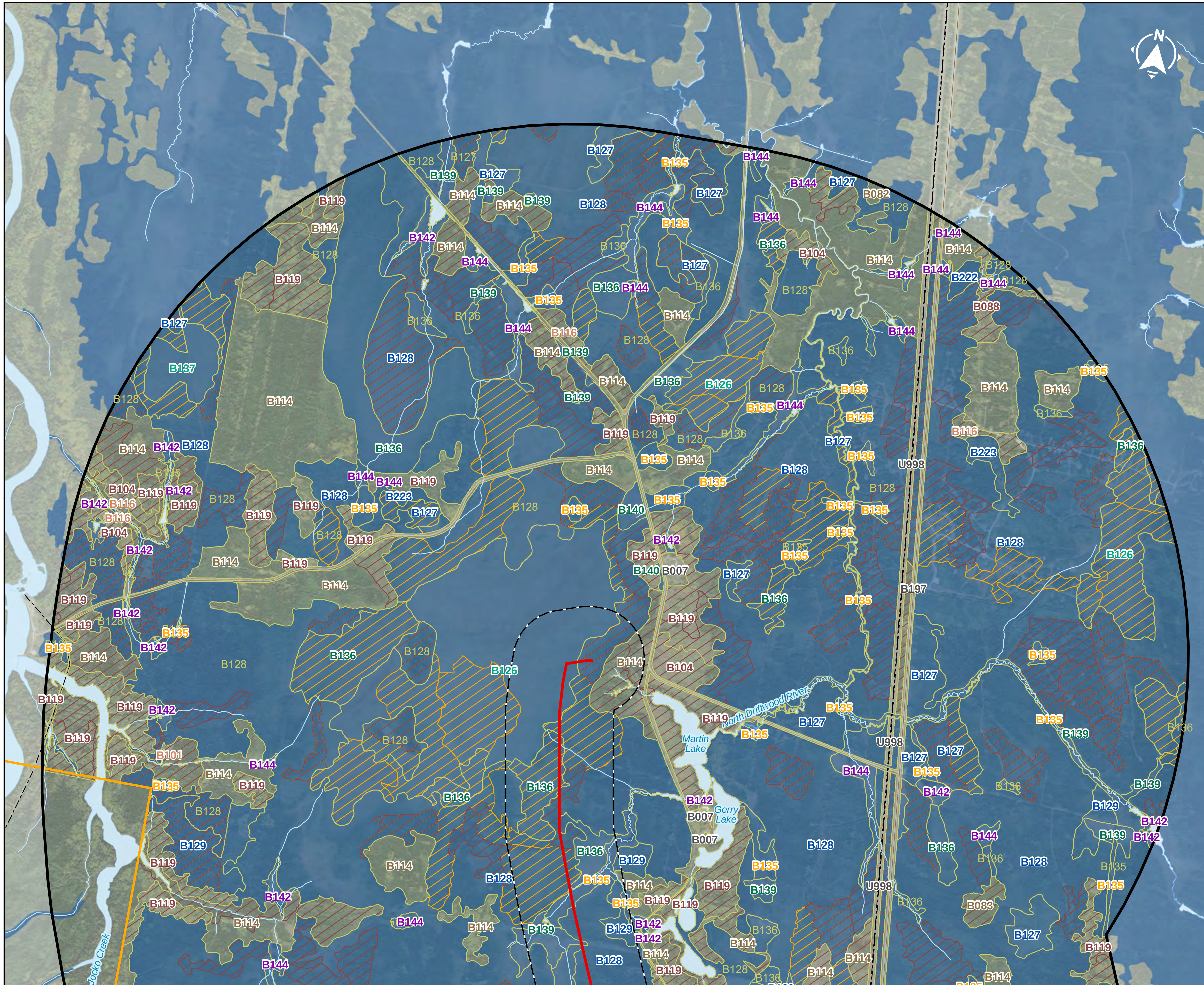
BBA Project Number: 7311004-000000-4E

2024-09-19

0 400 800 m
UTM, Zone 17, NAD 83

Prepared by: J. Day
Drawn by: A. Monnard
Verified by: F. Karcha

File: 7311004_000000_4E_D40_0006_R00_ForestCover_8.mxd



Regional Study Area (RSA)

Local Study Area (LSA)

Wetland

Project Component

New 230 kV Transmission Line

Vegetation

Vegetation Communities (Abitibi River FRI) - labelled with ecosite code

Canopy Height >= 12 meters

Old vegetation >= 90 years

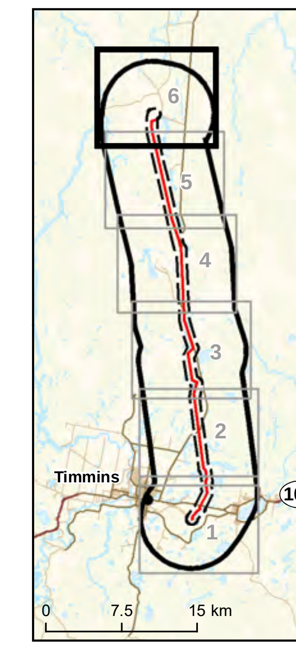
B190	Anthropologically Disturbed Upland Communities and Areas
B126	Bog
B102	Coniferous forest
B204	Coniferous forest (Black Spruce-Pine)
B100	Coniferous forest (Hemlock-cedar)
B012	Coniferous forest (Pine-Black Spruce)
B048	Coniferous forest (Pine)
B067	Coniferous forest (Spruce-Fir)
B016	Deciduous forest (Aspen-Birch)
B136	Fen
B142	Marsh
B164	Rock ecosite
B127	Swamp (Conifer)
B133	Swamp (Hardwood)
B135	Swamp (Thicket)

Infrastructures and Equipments

Principal Road

Local Road

Transmission Line



TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

TIP-1 Transmission Project
Timmins, Ontario

Map 8-6
Forest Cover Type and Canopy Height (>12 m)

Sources:
Ontario Road Network (ORN), Ontario Ministry of Natural Resources and Forestry, June 2023
Wetlands, Ontario Ministry of Natural Resources and Forestry, April 2024
Forest Resources Inventory, Ontario Ministry of Natural Resources and Forestry, June 2023
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Project Data, BBA, 2024

BBA Project Number: 7311004-000000-4E

2024-09-19

0 400 800 m
UTM, Zone 17, NAD 83

Prepared by: J. Day
Drawn by: A. Monnard
Verified by: F. Karcha

File: 7311004_000000_4E_D40_0006_R00_ForestCover_8.mxd

6.4. Wildlife and wildlife habitat

The RSA supports a wide range of wildlife and wildlife habitat, including that of Species at Risk (SAR) and Species of Conservation Concern (SOCC). Due to their ecological and/or cultural importance, TIP1 has focused on the following taxonomic groups and/or wildlife species for the purpose of assessment, as they provide an ability to understand impacts to wildlife generally and mitigation applied to these taxonomic groups/wildlife species will limit impacts to the broad range of wildlife and habitat occurring in the LSA:

- Ungulates (moose, woodland caribou (SAR))
- Furbearers (fisher, fox, lynx, marten, mink, wolf)
- Bats (little brown myotis (SAR))
- Birds (Canada warbler (SOCC), chimney swift (SAR), common nighthawk (SOCC), evening grosbeak (SOCC), lesser yellowlegs (SAR), olive-sided flycatcher (SOCC), and rusty blackbird (SOCC))
- Herptiles (American toad, boreal chorus frog, green frog, mink frog, spring peeper, and wood frog)

The Forest Resource Inventory (FRI) class and delineated ecosites are presented in a series of figures (Maps 4-1 to 4-6; Appendix C), serving as a basis to understand the range of wildlife habitat types available across the RSA.

Wetlands account for approximately half of the LSA landcover, while upland habitat accounts for 38% and anthropologic land cover accounts for approximately 10% (BBA Engineering Ltd., 2024). Swamp wetlands, particularly conifer swamp, are the predominant wetland type while uplands are evenly split between deciduous (aspen-birch) and conifer forest (predominantly pine-black spruce and spruce-fir). Habitat types and distribution are relatively similar across the RSA. Table 6-8 summarizes hectares of habitat types across the LSA and RSA.

Table 6-8: Habitat types within the RSA.

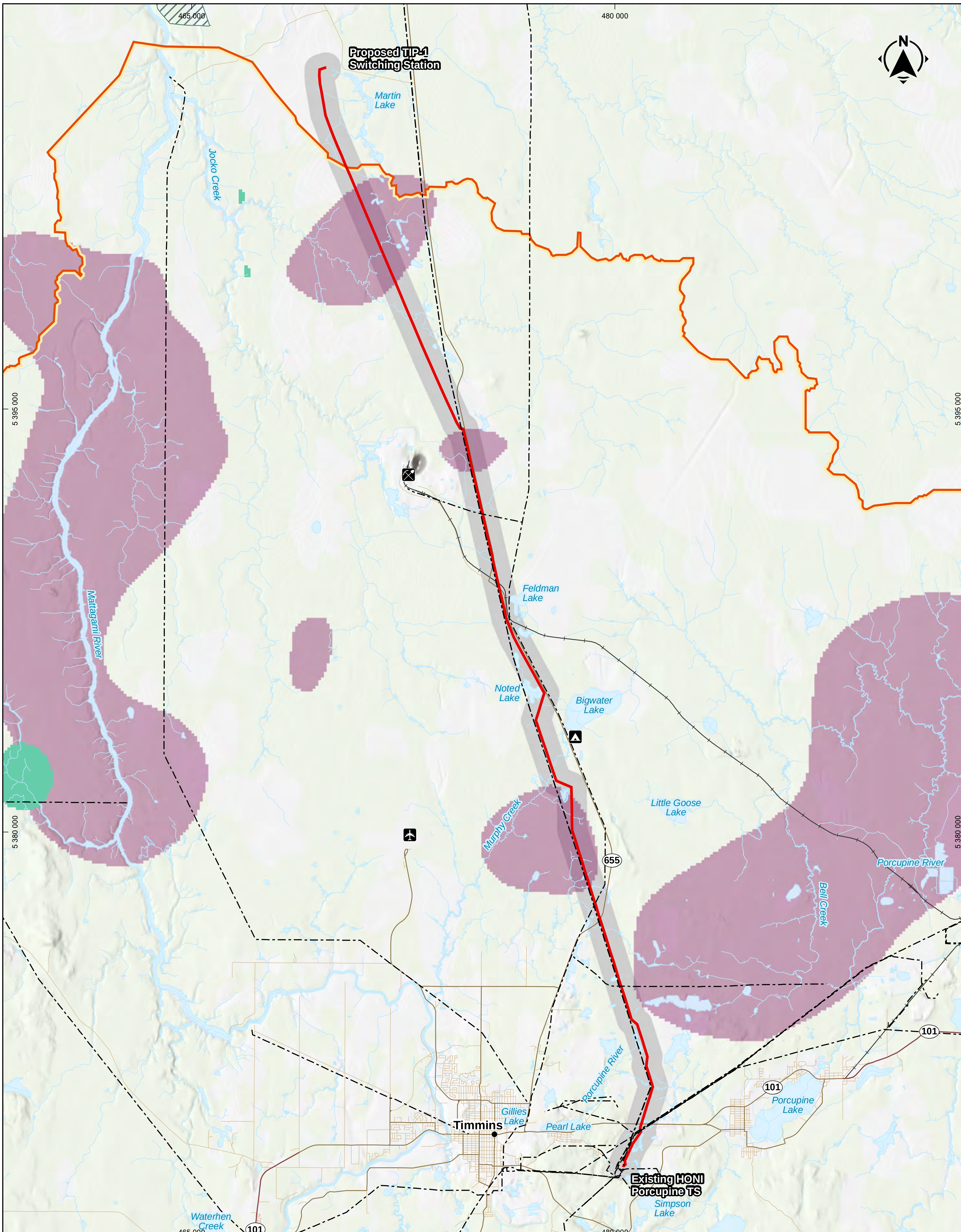
Ecosite category	Area in the LSA (ha)	LSA cover (%)	Area in the RSA (ha)	RSA cover (%)
Wetlands	**2163.3**	**51%**	**26468.3**	**57%**
Bogs and Fens	**262.7**	**6%**	**5157.8**	**11%**
Bog	134.7		2640.0	
Fen	127.9		2517.8	

Ecosite category	Area in the LSA (ha)	LSA cover (%)	Area in the RSA (ha)	RSA cover (%)
Swamps	**1810.2**	**43%**	**20748.8**	**44%**
Conifer swamp	1692.1		19617.8	
Hardwood swamp	9.4		27.1	
Thicket swamp	108.7		1103.9	
Marshes	**90.5**	**2%**	**561.8**	**1%**
Marsh	90.5		561.8	
Upland Communities	**1594.3**	**38%**	**14790.1**	**32%**
Deciduous Forest	**817.9**	**19%**	**7615.3**	**16%**
Deciduous forest (aspen-birch)	817.9		7615.3	
Coniferous Forest	**776.5**	**18%**	**7174.9**	**15%**
Conifer	0.0		82.4	
Black spruce-pine	11.5		28.5	
Pine-black spruce	456.7		3656.0	
Pine	0.0		12.2	
Spruce-fir	308.2		1578.2	
Hemlock-cedar	0.0		17.6	
Rock Ecosites	**4.8**	**0%**	**9.0**	**0%**
Anthropologically Disturbed Upland Communities and Areas	**468.3**	**11%**	**5485.5**	**12%**
TOTAL	**4230.8**	**100%**	**46752.9**	**100%**

6.4.1. Ungulates

Moose

A majority of the LSA occupies habitat suitable to moose (e.g., early successional forest, shrubby areas, and wetlands). The LSA traverse moose aquatic feeding areas along it's entire length, mostly in association with riparian areas and small wetlands (Ministry of Natural Resources and Forestry, 2020). In this region, moose are expected to have a density of 0.12-0.28 moose/km^2 in the LSA (Ministry of Natural Resources, 2010). There are three (3) areas of higher moose density within the LSA and an additional high-density area within the RSA (Map 9). Moose (27 individuals and 57 separate sets of moose tracks) were observed during winter aerial surveys conducted for the Crawford Mine, typically within clearcuts, regenerating forest and riparian areas (WSP E&I Canada Limited, 2024a, p. 45).



New 230 kV Transmission Line

Protected Areas

Conservation Area

Relatively High Moose Density Area (2022)

Relatively High Wolf Density Area (2022)

Mattagami Region Conservation Authority (MRCA)

Infrastructures and Equipments

Timmins / Victor M. Power Airport

Big Water Campground

Kidd Creek Mine

Highway

Principal Road

Local Road

Railway

TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

TIP-1 Transmission Project
Timmins, Ontario

Map 9
High Density Moose and Wolf Areas

Sources:
CanVec, 1/250 000, NRCan, 2017
SDA, 1/20 000, MERN Quebec, June 2022
Conservation Reserve Regulated, Ontario Ministry of Natural Resources and Forestry, June 2023
Watercourses and Waterbodies, Ontario Hydro Network (OHN), August 2023
Project Data, BBA, 2023

BBA Project Number: 7311004-007000-4E

2024-09-18

0 1.35 2.7 km
UTM, zone 17, NAD 83

Prepared by: J. Day
Drawn by: A. Haffaci
Verified by: F. Karcha

Fichier : 7311004_000000_4E_D20_0011_R00_MooseWolves_9.mxd

Woodland Caribou

The Kesagami Woodland Caribou Range overlaps the northern terminus of the LSA (Map 6); habitat in this part of the Range being considered Category 3 (Remaining Area within Range), as per the "General Habitat Description for the Forest-dwelling Woodland Caribou" (WSP E&I Canada Limited, 2024a, p. 46). No woodland caribou or caribou tracks were documented during aerial surveys conducted for the Crawford Mine; survey tracts extending across the RSA and into the Range (WSP E&I Canada Limited, 2024a, pp. 30, 45).

The RSA is considered to have a low likelihood of occupied habitat for woodland caribou because of habitat characteristics including early successional vegetation, significant forestry and mining disturbance, and presence of alternate prey (moose) which typically attracts a known predator of woodland caribou, wolves.

As woodland caribou is a SAR species, it is also addressed in Section 6.5 (rare species) and Section 6.8 (Significant Wildlife Habitat).

6.4.2. Furbearers

There is a long history of trapping in the area, beaver being the most commercially trapped species, followed by fisher, fox, lynx, marten, mink, muskrat and otter, with lesser trapping of coyote, squirrel, weasel, and wolf (Abitibi River Forest Management Inc., 2022). Furbearers trapped in Timmins includes: beaver, fisher, lynx, marten, mink, otter, muskrat, fox and (timber) wolf (Bickford, 1990); these species, as well as coyote and weasel are trapped in the broader landscape (Abitibi River Forest Management Inc., 2022). Furbearing species detected across the northern half of the RSA, but not in the LSA, include American beaver, American martin, fox, lynx, otter, snowshoe hare, and wolf (gray) (WSP E&I Canada Limited, 2024a). Lynx and fox were the most abundant furbearers observed (WSP E&I Canada Limited, 2024a).

The snowshoe hare occurs frequently, is largely ubiquitous across the region, and has been observed along the LSA (iNaturalist, 2024). Neither furbearer species nor notable furbearer habitat was observed within the LSA during surveys performed by BBA. However, sightings are available from the community-science web platform iNaturalist including black bear, beaver, lynx, red squirrel, and snowshoe hare in the Porcupine ski runners trails region, beaver, deer mouse, lynx, and red squirrel in the Hersey Lake region, groundhog near Big Lake campground, black bear near Kidd Creek Mine, and wolf (grey)in vicinity of the proposed Crawford Mine (iNaturalist, 2024). Incidental observations of beaver, fox, lynx, and otter within the LSA were made during aerial surveys conducted for the Crawford Mine project (WSP E&I Canada Limited, 2024a, p. 75).

TIP1 has focused upon the following furbearers to capture the range of species and habitat types found across the LSA[16]:

- **Fisher:** (habitat specialist) found in a variety of forested areas, avoid open areas, and preferring dense mixed conifers and hardwoods forests or second growth stands and swamps. Hollow trees and logs, holes in rocky ledges, old porcupine dens and cavities in the snow are likely den sites. Fisher also make dens under large boulders and brush piles. A favourite spot for a nesting den is high in a hollow hardwood tree. Kits typically born in March – April. Kits fully weaned after 4 months but natal/maternal dens used until kits are typically 8-10 weeks of age (Ministry of Environment, Conservation and Parks, 2021).
- **Fox:** (habitat generalist) found in areas ideally comprised of open fields (cultivated, pasture or abandoned), abundant hedgerows, rolling hills, river valleys and forest edges. Natal/maternal dens associated with a variety of structures, hollow logs or trees, rock outcrops, burrows, abandoned buildings, or brush piles. Dens feature tunnels located about 1.2 m (4 ft) below ground and running to lengths of 7.8 m (25 ft). One or more tunnel entrances, about 25 cm (10 in) in diameter, provide escape routes. Reuse among years not reported. Pups generally born mid-April to mid-May; weaned by about 4 months of age.
- **Lynx:** (habitat generalist) typically associated with open or disturbed habitats. May require dense coniferous forest during winter). Kittens typically born in May and June. Kittens are weaned after about 2 months but may remain in natal or maternal dens until about 3 months of age.
- **Marten:** (habitat specialist) large patch, late successional (mature and overmature) conifer forests (fir or spruce-dominated stands) (Watt, Baker, Hogg, McNicol, & Naylor, 1996). Kits born mid-March to late April. Kits fully weaned by about 6 weeks, but tree cavities used until kits are about 7-8 weeks of age.
- **Mink:** (habitat specialist) prefer areas in which there are water bodies such as streams, lakes or ponds, and avoid open areas. Forested, log-strewn or thicketed areas offer prime habitat. Den sites are usually dominated by coniferous trees such as spruce, balsam and cedar. Kits born April through June. Kits may occupy the natal den for about 40 days, coincident with the time to weaning.

[16] Habitat preference descriptions and den characteristics compiled from the Ontario Fur Managers Federation (Ontario Fur Managers Federation, 2024) and the “Forest management guide for conserving biodiversity at the stand and site scales. Background and rationale for direction” (Ministry of Natural Resources, 2010) unless otherwise referenced.

Wolves

Grey wolf and Eastern wolf (a SAR species) are found in Ontario, grey wolf being considered the only wolf species found in the region (WSP E&I Canada Limited, 2024a, p. 46). Wolf sightings in the area include an observation near the proposed Crawford Mine recorded on iNaturalist. Tracks at 21 locations were documented during the Crawford Mine aerial surveys (WSP E&I Canada Limited, 2024a). These included single tracks and one instance where five (5) sets of wolf tracks were observed together. WSP prepared a wolf density model based on evidence of wolf activity; an area of medium-low to medium wolf density occurs near Jocko Creek and Kidd Creek, a small section of the RSA (but not the LSA) extending into this area (WSP E&I Canada Limited, 2024a, p. 73) (Map 9).

6.4.3. Bats, raptors, migratory birds

Bats

Big brown bats, eastern red bats, eastern small-footed bats, hoary bats, little brown myotis, northern long-eared myotis, silver-haired bats, and tri-colored bats occur in Ontario, all but eastern small-footed bats being observed into the “Far North of Ontario”, an area approximately 150 km north of the RSA (Layng, et al., 2019). Acoustic bat detection surveys were conducted in relation to the proposed Crawford Mine project, targeting mature mixed and deciduous forests to assess the suitability of forests for bat maternity roosting habitat, with a study area overlapping the upper half of the LSA (WSP E&I Canada Limited, 2024a, p. 29). Eastern red bat, hoary bat, silver-haired bats were detected (as well as undifferentiated myotis species, high-frequency species, and low-frequency species) (WSP E&I Canada Limited, 2024a, pp. 42-44). The silver-haired bat was the most detected species[17] (69% of all detections), hoary bat (17% of all detections) and undifferentiated low-frequency bat species (13% of all detections) also accounting for many bat detections. In other regional studies, hoary bat was the most detected species, followed by little brown myotis and eastern red bats (Layng, et al., 2019), while a study closer to the RSA (conducted south of Timmins) detected hoary bat (59% of all detections) and little brown myotis (31% of all detections) most often, observing six (6) species in total: big brown bat, eastern red bat, hoary bat, little brown myotis, northern long-eared bat, and silver-haired bat (Layng, et al., 2019). While the tricolored bat has not been recorded in studies conducted in the area its presence within the RSA cannot be ruled out. Tricolored bats may summer within or

[17] Inferences about abundance based on acoustic detection may not be reliable (Layng, et al., 2019).

near the RSA but is unlikely that they hibernate within or near the RSA (WSP E&I Canada Limited, 2024a).

As little brown myotis is a SAR species, it is also addressed in Section 6.5 (rare species) and Section 6.8 (Significant Wildlife Habitat).

Key habitat of interest includes maternity roosts (all the species use trees as maternity roosts), nursery colonies and overwintering habitat. Eastern red bats roost singularly in large deciduous trees in low-density stands, hoary bats roost singularly in foliage, and silver-haired bats roost alone or in small groups in deep tree crevasses or behind loose bark of large trees (e.g., eastern white pine) (Layng, et al., 2019). Big brown bats prefer roosting in buildings but can also be found in hollow trees or under bark (Gerson, 1984). Bat maternity roost surveys conducted in relation to the Crawford Mine identified suitable cavity trees ranging from 0 to 360 trees per hectare (with an average density of 65.6 snags/ha, with snag trees primarily being white birch (50.0%) and trembling aspen (27.5%) (WSP E&I Canada Limited, 2024a). Due to the similarity of ecosites and partial overlap of the TIP1 Project and Crawford Mine LSAs, average snag density across ecosites found across the LSA have been adopted from bat maternity roost surveys conducted for the Crawford Mine (Table 6-9).

Snag density surveys revealed potentially high-quality maternity roosting habitat for SAR bats, however a very low number of passes were identified to SAR species relative to the total number of recorded passes.

Table 6-9: Snag density across the LSA.

Ecosite	Hectares	Snag density (snags/ha)	Potential # of snags[18]
Wetlands	**1770.8**		**68756**
Bogs and Fens	**96.3**	**20.0**	**1926**
Sparse Treed Fen (B136)	96.3	20.0	1926
Swamps	**1674.6**		**66830**
Organic Poor Conifer Swamp (B127)	172.2	15.0	2584
Organic Intermediate Conifer Swamp (B128)	1374.2	40.6	55794
Organic Rich Conifer Swamp (B129)	128.1	66.0	8453
Upland Communities	**521.7**		**69733**
Deciduous Forest	**114.0**		**5862**
Moist, Fine: Aspen – Birch Hardwood (B119)	114.0	51.4	5862

[18] Number of snags provides indication of the relative potential for bat roosting but not all trees will be occupied at the same time, some are lost over time, and some are recruited as trees age.

Ecosite	Hectares	Snag density (snags/ha)	Potential # of snags[18]
Coniferous Forest	**407.65**		**63871**
Fresh, Silty to Fine Loamy: Spruce – Fir Conifer (B101)	266.49	213.3	56842
Moist, Fine: Pine – Black Spruce Conifer (B114)	92.9	36.7	3409
Moist, Fine: Spruce – Fir Conifer (B116)	48.26	75.0	3620
TOTAL	**2292.5**		**138489**

No bat hibernacula are known to occur within the LSA. Abandoned mines (on the order of 3 km from the proposed powerline) that might harbour suitable habitat features for hibernating bats occur in the southern part of the RSA.

Birds

Approximately 250+ bird species are found in the area (Timmins Area Birds, 2024), approximately 168 of which are documented as breeding in the area (Timmins Area Birds, 2024). CNC observed 132 bird species in total across the range of bird surveys conducted in relation to the Crawford Mine, including two SAR species (chimney swift and lesser yellowlegs) and five (5) SOCC species (Canada warbler, common nighthawk, evening grosbeak, olive-sided flycatcher, and rusty blackbird) (WSP E&I Canada Limited, 2024a). CNC observations are considered representative of species presence and abundance expected within the LSA since habitats across both project's study areas are similar and overlap in the northern half of the LSA.

The most abundant and frequently observed species include the white-throated sparrow (84.4% of the point counts stations), ruby-crowned kinglet (65.4% of point count stations), and the Tennessee warbler (51.7% of the point count stations). Migratory bird/waterfowl surveys recorded 66 species of birds, most of which were believed to be migrating through the area (WSP E&I Canada Limited, 2024a). During breeding bird surveys, CNC recorded eight (8) species as probably breeding (Canada goose, Canada jay, common grackle, common loon, common raven, dark-eyed junco, green-winged teal, and northern flicker) and 44 species possibly breeding, while seven (7) species (American wigeon, eastern kingbird, gadwall, merlin, mourning dove, redhead, and semipalmated plover) were observed during the breeding season, with no evidence of breeding noted (WSP E&I Canada Limited, 2024a).

A bald eagle nest, and three (3) bald eagles soaring nearby, were recorded in the existing powerline corridor east of Noted Lake (BBA Engineering Ltd., 2024).

6.4.4. Herptiles

Amphibians

American toad, mink frog, spring peeper, and wood frog sightings near McIntyre and Hollinger pits and Hersey Lake Conservation Area have been documented within the LSA on iNaturalist (iNaturalist, 2024). American toad, blue-spotted salamander, boreal chorus frog, eastern red-backed salamander, mink frog, spring peeper, and wood frog have also been observed within the RSA (WSP E&I Canada Limited, 2024a). Mink frog and wood frog were observed by BBA in 2023 and American toad, boreal chorus frog, green frog, mink frog, spring peeper, and wood frog were observed during surveys conducted for the Crawford Mine (WSP E&I Canada Limited, 2024a). Spring peeper was detected in most of the wetlands surveyed while boreal chorus frog and green frog were uncommon, being detected at only two survey stations each.

Evidence of frog and toad breeding was found in most of the wetlands surveyed by BBA, but none of them achieved the thresholds for Significant Wildlife Habitat which considers species abundance and diversity. Wetlands represent approximately half of the plant communities within the LSA and are predominantly in the form of swamp communities, although bogs, fens, and marshes are also present.

Targeted surveys for salamanders have not been completed, though incidental observations of an unidentified salamander (*Ambystomid sp.*) and a blue-spotted salamander were recorded north of the proposed mine and beyond the RSA (WSP E&I Canada Limited, 2024a).

Reptiles

Several sightings of common garter snake and Eastern garter snake have been documented within the LSA near Schumacher Pit, Hersey Lake Conservation Area, and around the Kidd Creek Mine (iNaturalist, 2024). Eastern garter snake, midland painted turtle, and snapping turtle have been observed in the RSA (WSP E&I Canada Limited, 2024a). ARFMI (Abitibi River Forest Management Inc., 2022, p. 54) and CNC (WSP E&I Canada Limited, 2024a, p. 8) report sightings of Blanding's turtle in the region. Due to the low probability of the proposed Project to interact with the aquatic environment (open water habitat types), TIP1 did not conduct turtle basking surveys (or Blanding's turtle[19] surveys).

[19] Community members have informed CNC that Blanding's turtle occur in their RSA although CNC has not been able to confirm their presence through field studies conducted to date (WSP E&I Canada Limited, 2024a, pp. 8, 37).

6.5. Rare, threatened or endangered species

The Ontario *Species at Risk Act* lists rare species and ranks them based on their conservation rank. Species of Conservation Concern (SOCC) are species ranked as 'special concern'. These species are identified as being under pressure of becoming endangered or threatened; or becoming a Species at Risk (SAR) (i.e., an endangered- or threatened-ranked species); SAR are at risk of becoming extinct or extirpated from a defined area. SAR have habitat and species protections through the Act, while all rare species have best management practices to limit or prevent impact on the species or their habitat, including identifying significant wildlife habitat for SOCC and SAR within the LSA (see Section 6.8).

Rare species protected under the provincial ESA that may occur within the RSA are presented in Table 6-10.

Table 6-10: Wildlife SOCC and SAR species potentially occurring within the RSA[20].

Species common name	Ontario *Endangered Species Act* rank	NHIC observation recorded in LSA?[21]
Birds		
Bald eagle	Special Concern	☐
Bank swallow	Threatened	☒
Barn swallow	Threatened	☐
Black tern	Special Concern	☒
Bobolink	Threatened	☒
Canada warbler	Special Concern	☐
Chimney swift	Threatened	☐
Common nighthawk	Special Concern	☐
Eastern whip-poor-will	Threatened	☒
Eastern wood peewee	Special Concern	☐
Evening grosbeak	Special Concern	☒
Golden-winged warbler	Special Concern	☐
Horned grebe	Special Concern	☐

[20] List compiled based on species distribution descriptions (Ministry of Environment and Energy, 2024), Abitibi Forest Management Inc.'s Forest Management Plan (Abitibi River Forest Management Inc., 2022), and Canada Nickel's Crawford Mine terrestrial ecology baseline report (WSP E&I Canada Limited, 2024a)
[21] NHIC data for 1-km blocks: 876-292, -293, - 302, -303, -312, -313, -394, -395, 396, -404, -405, -406, -414, -415, -416, -420, -547, -556, -557, -558, -566, -567, -568 (Ministry of Natural Resources and Forestry, 2024)

Species common name	Ontario *Endangered Species Act* rank	NHIC observation recorded in LSA?[21]
Lesser yellowlegs	Threatened	☐
Olive-sided flycatcher	Special Concern	☒
Peregrine falcon	Special Concern	☒
Rusty blackbird	Special Concern	☐
Short-eared owl	Special Concern	☐
Wood thrush	Special Concern	☐
Yellow rail	Special Concern	☐
Insects		
Gypsy cuckoo bumble bee	Endangered	☒
Monarch	Special Concern	☐
Transverse lady beetle	Endangered	☒
Yellow-banded bumble bee	Special Concern	☒
Mammals		
Eastern cougar	Endangered	☐
Eastern small-footed myotis	Endangered	☐
Little brown myotis	Endangered	☐
Northern myotis	Endangered	☐
Tri-coloured bat	Endangered	☐
Wolverine	Threatened	☐
Woodland caribou (boreal population)	Threatened	☐
Reptiles		
Blanding's turtle	Threatened	☒
Snapping turtle	Special Concern	☒

The assessment has been focused upon ten rare vertebrate species based on consideration of the likelihood of SOCC and SAR species habitat occurrence within the LSA (based on the biology of the species and the results of field investigations (BBA or CNC) as well, the project interaction with the environment.

- Canada warbler (SOCC)
- Chimney swift (SAR)
- Common nighthawk (SOCC)
- Evening grosbeak (SOCC)
- Lesser yellowlegs (SAR)
- Little brown myotis (SAR)
- Olive-sided flycatcher (SOCC)
- Rusty blackbird (SOCC)
- Woodland caribou (SAR)
- Yellow rail (SOCC)

Rare species along with their respective habitat preference and occurrence within the LSA, are summarized in subsequent sections.

6.5.1. Wildlife species of conservation concern

Canada warbler

Canada warbler have been observed within the general area of the RSA and suitable habitat is expected to occur within the LSA. Canada warblers are typically found in wet, mixed deciduous-coniferous forests with a well-developed shrub layer. They also use riparian shrub forest on slopes and in ravines, and in stands regenerating after natural and anthropogenic disturbances.

In 2023, the Canada warbler was observed to be breeding at two locations within the LSA (Birds Canada, 2023).

Common nighthawk

Suitable habitat is expected to occur in the LSA. Common nighthawk has been observed to the north of the RSA (WSP E&I Canada Limited, 2024a, p. 106), as well as multiple times within the RSA and three (3) times within the LSA (BBA Engineering Ltd., 2024). Common nighthawk breed in a wide range of habitat types including open forests (cuts, burns, or rock outcrops), prairie with short grass or bare patches, dry bogs, rocky areas, sandy coastal habitats, and settled areas such as railways, gravel roads, cultivated fields, parks, urban areas with gravel roofs. In boreal regions, outcrops and post-burn habitats may provide important nesting areas.

13 records of common nighthawk breeding within the LSA in 2018, 2021, 2022, and 2023 are available from the Canadian breeding bird atlas (Birds Canada, 2023).

Evening grosbeak

Suitable habitat is expected to occur within the LSA. Evening grosbeak have been observed within the RSA and once in the LSA (near the proposed Crawford mine) (BBA Engineering Ltd., 2024). Evening grosbeak nests in conifer-dominated forests (COSEWIC, 2016).

46 records of evening grosbeak (breeding survey, Christmas count survey) within the LSA in 1988, 1989, 2004, 2017, 2018, 2019, 2021, 2022, 2023, and 2024 are available from the Canadian breeding bird atlas (Birds Canada, 2023).

Olive-sided flycatcher

Olive-sided flycatcher was observed within the RSA near Jocko Creek, to the northeast of the RSA (WSP E&I Canada Limited, 2024a, p. 106), and within the LSA, near the proposed Crawford mine (BBA Engineering Ltd., 2024). Olive-sided flycatcher are widely distributed across forested regions.

Rusty blackbird

Suitable habitat is expected to occur within the LSA. Rusty blackbird have been observed within the RSA and within the LSA, near the proposed Crawford mine (BBA Engineering Ltd., 2024). Rusty blackbird breeds in wet forests, including areas with fens, bogs, muskeg, and beaver ponds.

31 records of rusty blackbird (breeding survey, general observation) within the LSA in 2018, 2019, 2020, 2021, 2022, 2023, and 2024 are available from the Canadian breeding bird atlas (Birds Canada, 2023).

Yellow rail

Yellow rail has been observed within the general area of the RSA and suitable habitat is expected to occur within the LSA. Yellow rail nests in wet marshy areas of short, grass-like vegetation, usually sedge, that have an overlying dry mat of dead vegetation.

6.5.2. Wildlife species at risk

Chimney swift

Chimney swift have been observed within the general area of the RSA and suitable habitat is expected to occur within the LSA. Chimney swift breed in natural tree cavities where they are available, as well as artificial vertical cavities, specifically chimneys.

One (1) record of chimney swift breeding (in Timmins) within the LSA in 2003 is available from the Canadian breeding bird atlas (Birds Canada, 2023).

Little brown myotis

Little brown myotis (an unconfirmed myotis) has been detected within and in close proximity to the LSA (BBA Engineering Ltd., 2024) during acoustic surveys conducted in relation to the Crawford Mine project (2 confirmed, 5 unconfirmed Myotis sp.) (WSP E&I Canada Limited, 2024a). Little brown myotis typically roosts in deciduous trees (Layng, et al., 2019).

Lesser yellowlegs

Suitable habitat is expected to occur within the LSA. Lesser yellowlegs have been observed within the RSA and within the LSA, near the proposed Crawford mine (BBA Engineering Ltd., 2024). Lesser yellowlegs typically nests on dry ground near wetland areas used for foraging (COSEWIC, 2020).

66 records of lesser yellowlegs (breeding survey, general observation) within the LSA in 2017, 2018, 2019, 2020, 2021, 2022, 2023, and 2024 are available from the Canadian breeding bird atlas (Birds Canada, 2023).

Woodland caribou

Woodland caribou or their sign have not been observed within the general area of the RSA, but a portion of the RSA falls within the Kesagami Range. Caribou typically occur in low densities, ranging widely over mature, conifer-dominated forests. The RSA contains low suitability habitat and is classed as Category 3 habitat for that portion falling within the Range.

6.5.3. Plant species at risk

Ontario tracks several rare plant species, however black ash, a tree species that is widespread and common across Ontario but in rapid decline due to the invasive emerald ash borer, is the only plant SAR (Endangered) species with potential to occur in the LSA. Black ash prefers wet areas and are commonly found in northern swampy woodlands (i.e., swamps, floodplains, fens), from eastern Manitoba, through Ontario to as far east as Newfoundland.

A total of 209 vascular plant species were identified during field surveys of the LSA undertaken in August 2023 by BBA (BBA Engineering Ltd., 2024). Of these, 94% are native to Ontario and none are listed SAR or SOCC. There is potential for black ash to be found within the LSA, for example the one (1) tree CNC found within the mine footprint (WSP E&I Canada Limited, 2024a). No black ash observations within the LSA are recorded on iNaturalist.

Prohibitions set out in the Ontario *Endangered Species Act* do not apply to trees found in the LSA since they are located outside a municipality or territorial districts listed in Schedule 1 of O. Reg 6/24.

6.6. Fish and fish habitat

Porcupine River and six (6) of its tributaries, Craft Creek and three (3) of its tributaries, Murphy Creek and two (2) of its tributaries, an unnamed creek (connecting Bouchard, Noted, and Bigwater Lakes), four (4) tributaries to Kidd Creek, Jocko Creek and two (2) of its tributaries, and six (6) tributaries of the North Driftwood River as well as Edward Lake, Noted Lake, Bouchard Lake, Duck Lake, Feldman Lake and five (5) unnamed lakes occur within the LSA. Aquatic habitat and surface water quality was characterized by BBA at 18 inventory stations in these watercourses and water bodies in August 2023 (Appendix C). Fish, some of which were brook stickleback, were observed in approximately half of all waterbodies and watercourses surveyed. Other fish species which could occur within the RSA include forage (baitfish) species, as well as coarse fish (e.g., sucker) and upper trophic predatory species (e.g., northern pike) (WSP E&I Canada Limited, 2024b). No aquatic SAR were anticipated within the watercourses and waterbodies, and none were encountered during the 2021 to 2023 studies.

The permanent watercourses range in size from 1 to 2.5 m wide (although two (2) of the watercourses are 6 m wide) and are shallow (approximately 0.5 m deep). The intermittent watercourses are approximately 1.5 m wide and approximately 0.1 m deep. Watercourses have organic bed substrate except for three watercourses that are sand, sand and silt, and sand and organic. Watercourses generally occur within the context of wetlands (e.g., marsh, swamp), some of the watercourses passing through the existing powerline corridor and cover converting to meadow.

Watercourse crossings and work in an around wetlands will occur during frozen conditions, preventing adverse impact on fish and fish habitat. Best management practices will be implemented to limit or prevent effects of any watercourse crossings required for construction of the powerline. Therefore, fish and fish habitat has not been carried forward to the effects assessment.

6.7. Timber resources

Information related to the forest resources is presented in Section 6.3.

6.8. Natural Heritage Resources

Natural Heritage Resources include:

- Significant wetland
- Significant woodland
- Significant valleylands
- Significant wildlife habitat
- Areas of Natural and Scientific Interest (ANSI)

No Significant Woodland, Significant Valleylands or ANSI are located within the RSA. (Ministry of Natural Resources and Forestry, 2024).

A fulsome Natural Heritage baseline report is provided in Appendix C and is summarized below.

6.8.1. Significant wetlands

Wetlands represent approximately half of the plant communities within the LSA and are predominantly in the form of swamp communities, although bogs, fens, and marshes are also present (Table 6-8; Maps 4-1 to 4-6; Appendix C).

Provincially Significant Wetlands (PSW) and Unevaluated Wetlands occur at several locations within the LSA, including the PSWs Kraft Creek / Murphy Creek Wetland, the Little Goose Lake Wetland, and the Porcupine Lake Wetland (Maps 4-1 to 4-6; Appendix C).

The provincially mapped Unevaluated Wetlands, and wetlands identified by BBA occurring throughout the RSA have not been evaluated for Provincial Significance, as the Ontario Wetland Evaluation System (OWES) is not intended for boreal forest extensive wetland complexes. OWES cannot be used to evaluate these extensive wetlands and those that require protection must be protected through other mechanisms such as Provincial Parks, Conservation Reserves, and ANSIs, etc. (Ministry of Natural Resources and Forestry, 2022).

While the extensive wetlands in the northern part of the RSA have not been formally evaluated for provincial significance, there is the potential that additional PSWs are present within the LSA and along the TLA based on wetland size, diversity, hydrological function, and presence of SAR (Maps 4-1 to 4-6; Appendix C). Fieldwork conducted in 2021-2022 (WSP E&I Canada Limited, 2024a) and in 2023 by BBA (Appendix C) supported the preliminary evaluation of these wetlands, including several intersecting the TLA.

6.8.2. Significant Wildlife Habitat

The Significant Wildlife Habitats (SWH) within the RSA were determined to be either candidate or confirmed. Based on Ministry of Natural Resources and Forestry (2015), SWH may consist of the following:

- Seasonal concentration areas for animals;
- Rare vegetation communities;
- Specialized habitat for wildlife; and
- Habitat for species of conservation concern.

Seasonal concentration areas for animals

Seasonal concentration areas are those where wildlife species occur annually in aggregations at certain times of the year. Such areas are sometimes highly concentrated with members of a given species, or several species, within relatively small areas. Table 6-11 provides a summary of the seasonal concentration areas located within the RSA.

Table 6-11: Seasonal concentration areas for animals within the RSA.

Area	Type	Description
Waterfowl Stopover and Staging Areas (Terrestrial)	Candidate	Three (3) areas of a candidate ecosite, B093, are present in the RSA (Maps 5-2 and 5-3; Appendix C). One of them, near Noted Lake, is present within the LSA (2.77 hectares), but field investigations have not found congregations nearing the defining criteria to consider this candidate SWH, although indicators species were observed (WSP E&I Canada Limited, 2024a). Two (2) other locations within the RSA (Map 5; Appendix C) are considered candidate SWH.
Waterfowl Stopover and Staging Areas (Aquatic)		Three (3) candidate ecosites, B142, B144, and B146 are present in the RSA, including 14 locations within the LSA (collectively 101.14 hectares) (Map 5; Appendix C). In the RSA that overlaps with CNC's Mine Project Study Area, candidate SWH were not confirmed although indicator species were present.
Bat Hibernacula		The majority located in southernmost part of the RSA (one located within the LSA near the Porcupine Substation and one north of Noted Lake), based on AMIS location data of abandoned mine shafts (Appendix C). Aerial and ground surveys did not monitor the presence of indicator species (tri-colored bat and big brown bat) with ARU, thus the potential bat hibernacula SWH remains categorized as candidate (WSP E&I Canada Limited, 2024a).
Bat Maternity Colonies		Several qualifying ecosites occur in the RSA (B024, B040, B055, B070, B088, B104 and B119), including several areas within the LSA (collectively 741.81 hectares) (Appendix C). All mixed treed and deciduous treed forests over 80 years old are considered candidate SWH, reducing the total candidate bat maternity colony SWH in the LSA to six (6) locations along the length of the LSA (100.40 hectares).
Colonially Nesting Bird Breeding Habitat (Tree / Shrubs)		Many candidate ecosites are found in the RSA, but defining criteria have not been confirmed, thus this SWH type remains candidate.
Colonially Nesting Bird Breeding Habitat (Ground)		Candidate ecosites (B142 and B144) are present within the RSA, (both ecosites occur in the LSA (94.90 hectares) but only one indicator species, herring gull, was reported to breed in the RSA from the *Ontario Breeding Bird Atlas*. Herring gull was observed in 2023 during migratory bird surveys (WSP E&I Canada Limited, 2024a), but was not confirmed breeding.

Area	Type	Description
Turtle Wintering Area		Given the extent of wetlands throughout the RSA, candidate turtle wintering area is similarly extensive and are found in the RSA in ecosites B128-B130, B133-B140, B142, and B146-B147. All but ecosite B147 are found in the LSA, accounting for 1,823.05 hectares (41%) of the LSA. Two (2) records of the snapping turtle, one of the indicator species with the painted turtle, are presented near Timmins in the *Ontario Reptiles and Amphibians Atlas*. Turtle basking surveys and other fieldwork conducted in relation to CNC's Crawford Mine Project did not document any turtles (WSP E&I Canada Limited, 2024a).
Reptile Hibernaculum		Indicator ecosites for reptile hibernaculum are numerous in the RSA: B012, B014, B016, B024, B128-B130, B133-B139, and B164-B165. Ecosites B128-B130, B133-B139 are found within the LSA, accounting for 1,759.89 hectares (39%) of the LSA. Targeted field surveys for reptile congregations did not occur and no SWH have been confirmed.

Rare plant communities

Rare plant communities often contain rare species, particularly plants and small invertebrates, which depend on such habitats for their survival and cannot readily move to or find alternative habitats. The province tracks 516 rare plant communities across Ontario. No rare plant communities are recorded by the province within the LSA (Ministry of Natural Resources and Forestry, 2024). However, yellow birch (ecosites B040, B055, B070, B088, B104, and B119) and hardwood swamp (ecosites B130 and B133) are rare plant communities that have potential to occur within ecosites found throughout the RSA (WSP E&I Canada Limited, 2024a). The Hardwood Swamp rare plant community has been confirmed in one location and two remain candidate (all occurring within ecosite B130) including one plant community intersected by the proposed powerline at approximately the mid-point along the alignment, the other plant communities lying within the RSA (BBA Engineering Ltd., 2024).

Hardwood swamps are forests dominated by a hardwood canopy located in a lower topographic position and subject to flooding.

Specialized habitat for wildlife

Some wildlife species require large areas of suitable habitat or unique habitat/landscape features for their long-term survival. Many wildlife species require substantial areas of suitable habitat for successful breeding. Their populations decline when habitat becomes fragmented and reduced in size.

Table 6-12 provides a summary of the candidate and confirmed specialized habitat for wildlife within the RSA.

Table 6-12: Specialized habitat for wildlife within the RSA.

Area	Type	Description
Waterfowl Nesting Area	Candidate	Candidate waterfowl nesting areas are found throughout the RSA and LSA in indicator ecosites B129, B130, B133-B135, B140, B142, B144, B146, and B147 (Map 7; Appendix C). All but ecosite B147 are found in the LSA, accounting for 356.19 hectares (8%) of the LSA. Ten indicator species (American black duck, American widgeon, Canada goose, common goldeneye, common merganser, gadwall, green-winged teal, wood duck, mallard, and hooded merganser) have been documented in the area (WSP E&I Canada Limited, 2024a), but defining criteria have not been met to confirm SWH.
Bald Eagle and Osprey Nesting Habitat	Confirmed	A bald eagle nest and three (3) bald eagles were observed during aerial surveys (WSP E&I Canada Limited, 2024a) within the LSA near Noted Lake (Map 7; Appendix C). It is assumed that this pair nested during 2021 at the nest location near the observation, thus confirming this SWH type within the LSA (Map 7; Appendix C). For a bald eagle, the active/main nest and a 400 to 800 m radius around the nest is the SWH. The area of the habitat from 400 to 800 m is dependent on sightlines from the nest to the development and inclusion of perching and foraging habitat.
Woodland Raptor Nesting Habitat	Confirmed and Candidate	Seven (7) indicator species were identified in the RSA: American kestrel, boreal owl, broad-winged hawk, common raven, merlin, sharp-shinned hawk, and red-tailed hawk (WSP E&I Canada Limited, 2024a). Three (3) common raven nests were identified during aerial surveys, confirming SWH. Any forested ecosite within the LSA is candidate habitat (Map 7; Appendix C).
Seeps and Springs	Candidate	Seeps/springs are not associated with any particular ecosite type; any forested ecosite with <25% meadow/field/pasture within the headwaters of a stream or river system may be candidate SWH. Although they were not documented it is likely seeps/springs occur within the RSA. The indicator species ruffed grouse and moose are found in the RSA.
Aquatic Feeding Habitat	Confirmed	Aquatic feeding habitats are an extremely important habitat component for moose and other wildlife as they supply important nutrients. Numerous locations occur in the RSA (21.39 hectares in total), according to Ministry of Natural Resources and Forestry data (Map 7; Appendix C), that categorizes habitat as Low, Moderate, and High. Areas in the RSA are almost all listed as Very High and are considered confirmed. Numerous locations occur with the LSA (collectively 2.41 hectares or 11% of aquatic feeding habitat).

Area	Type	Description
Mineral Licks	Candidate	Mineral licks provide a concentrated source of essential mineral nutrients to ungulates. In areas of granitic bedrock, the site is usually overlain with calcareous glacial till. Mineral licks likely occur in the RSA, although none have been documented to date, including within the LSA where more intensive field work has been conducted.
Denning Sites for Mink, Otter, Gray Wolf, Eastern Wolf, Canada Lynx, Marten, Fisher, Black Bear	Candidate	Important fur-bearing mammals and den sites can be a limiting factor in sustaining populations. The indicator species confirmed during surveys conducted by CNC include American marten, Canada lynx, otter, and wolf, with candidate lynx den being found within the LSA; however, no denning sites were confirmed (WSP E&I Canada Limited, 2024a) (Map 7; Appendix C).
Rendezvous Sites	Candidate	Rendezvous sites may be found in a variety of habitats such as isolated areas including open bogs, burns, fens, other wetlands, meadows, and clear-cuts. No locations are provided in provincial data, but wolf tracks were seen around the RSA during aerial surveys (WSP E&I Canada Limited, 2024a). Rendezvous sites are often used by wolf packs for multiple years and may be used as den sites in a subsequent year.
Amphibian Breeding Habitat: Wetland	Confirmed and Candidate	Candidate ecosites (B128, B129, B133, B134, B135, B142, B144, and B146) occur in the RSA. All of these ecosites are found within the LSA, accounting for 1,728.54 hectares (39%) of the LSA. Amphibian surveys and incidental observations during field work conducted by CNC (overlapping the northern half of the LSA) documented eight (8) indicator species: American Toad, blue-spotted salamander, boreal chorus frog, green frog, mink frog, northern leopard frog, spring peeper, and wood frog (WSP E&I Canada Limited, 2024a). One area of amphibian breeding habitat (wetland) was confirmed in the north end of the RSA within ecosite B128 (Map 7; Appendix C). The associated amphibian movement corridor was also identified and is shown on Map 7 of Appendix.
Amphibian Breeding Habitat: Woodland	Candidate	A variety of suitable woodland ecosites occur in the RSA. Indicator species, including adult American toad, blue-spotted salamander, spring peeper, and wood frog were documented in the CNC Mine survey area (WSP E&I Canada Limited, 2024a), which covers the northern half of the LSA. Despite the required variety of indicator species being present in suitable ecosites, the defining criteria were not met during the Crawford Mine inventories.
Turtle Nesting Areas	Candidate	This SWH type is rare, and when identified will often be the only breeding site for local populations of turtles. Ecosite B007 provides candidate SWH for turtle nesting areas but this ecosite is not found within the RSA. Ecosite B031, also provides candidate SWH for turtle nesting areas. This ecosite if found within the RSA, adjacent to Porcupine Lake as well as other locations in the north end of the RSA but is not found within the LSA (Map 7; Appendix C).

Area	Type	Description
Mast Producing Areas	Candidate	Candidate mast producing areas occur in the RSA, as well as in ecosite B114 in the LSA (collectively 92.90 hectares (2%) of the LSA), which produced abundant blueberry sp. Two (2) indicator species, black bear and ruffed grouse, have been documented in CNC field studies (WSP E&I Canada Limited, 2024a).
Sharp-tailed Grouse Leks	Candidate	Leks are an important habitat feature required to maintain populations of sharp-tailed grouse. Leks are typically a grassy field/meadow separated by >15ha from adjacent shrublands and >30ha from adjacent treed areas. Sharp-tailed grouse and potential lek areas (but no lek activity) were observed during field surveys conducted for the Crawford Mine (WSP E&I Canada Limited, 2024a). Candidate ecosites for leks include B093, B126, and B136-B140, all being present in the RSA (Map 7; Appendix C). All of these ecosites are found within the LSA, accounting for 261.01 hectares (6%) of the LSA.

Animal movement corridors

Animal movement corridors are elongated areas used by wildlife to move from one (1) habitat to another. They are important to ensure genetic diversity in populations, to allow seasonal migration of animals (e.g., deer moving from summer to winter range) and to allow animals to move throughout their home range from feeding areas to cover areas. Table 6-13 summarizes the candidate and confirmed animal movement corridors present within the RSA.

Table 6-13: Animal movement corridors within the RSA.

Area	Type	Description
Amphibian Movement Corridors	Confirmed	An amphibian movement corridor, corresponding to the confirmed amphibian breeding habitat: wetland, was identified in RSA (WSP E&I Canada Limited, 2024a), and the movement corridor consists of a 200 m area to the east of the amphibian breeding habitat which connects the wetland to surrounding undeveloped areas (Map 7; Appendix C). No movement corridors have been observed in the LSA.
Cervid Movement Corridors	Candidate	This SWH is considered candidate as Moose Aquatic Feeding Area was confirmed in the RSA. Corridors typically follow riparian areas, woodlots, and areas of physical geography such as ravines or ridges. Several corridors occur throughout the LSA
Furbearer Movement Corridor	Candidate	Given the high potential for lynx, mink and otter denning sites within the RSA, this SWH type is also considered candidate. All treed ecosites adjacent to or within shoreline habitats are considered candidate.

Habitat for species of conservation concern

Species of conservation concern known or potentially occurring within the RSA are summarized in Table 6-10.

Habitats of Species of Conservation Concern (SOCC) include wildlife species that are listed as Special Concern, that are declining, or are featured species. Table 6-14 summarizes the candidate and confirmed habitat for SOCC within the RSA.

Table 6-14: Habitat for species of conservation concern within the RSA.

Area	Type	Description
Marsh Bird Breeding Habitat	Candidate	Marsh bird breeding habitat is rare in Northern Ontario and is very productive for marsh bird populations. Marsh bird surveys conducted in relation to the Crawford Mine documented the following indicator species: sora (3), Virginia rail (1), and a yellow rail (not definitive) (WSP E&I Canada Limited, 2024a). They were not confirmed as breeding and as such do not confirm SWH within the Crawford Mine study area. Other indicator species such as American bittern, pied-billed grebe, ring-necked duck, sandhill crane, and trumpeter swan, were also found in the CNC Project Study Area (WSP E&I Canada Limited, 2024a). Candidate ecosites for marsh bird breeding habitat occur within the RSA (B134-B140, B142, B144, and B146-B147) (Map 8; Appendix C). All of these ecosites are found within the LSA, accounting for 356.75 hectares (8%) of the LSA.
Open Country Bird Breeding Habitat	Candidate	Candidate SWH are large field/meadow areas (includes natural and cultural fields and meadows) >30 ha. Ecosites B031 and B093 are found in the RSA. Indicator species such as Northern Harrier, Savannah Sparrow and LeConte's Sparrow were documented during bird surveys (WSP E&I Canada Limited, 2024a). No Short-eared Owl have been documented in any filed surveys, including targeted Short-eared Owl surveys in June 2023 (WSP, 2024). Ecosite B093 located within the LSA was surveyed and no indicator species was documented (WSP, 2024) so this ecosite is not meeting the criteria for confirmed SWH. The other ecosites remain candidates (Map 8; Appendix C).
Shrub or Early Successional Breeding Bird Habitat	Candidate	Indicator species of this SWH that were observed included American Woodcock, Ruffed Grouse, and Eastern Kingbird (WSP E&I Canada Limited, 2024a). No breeding evidence was recorded for the Eastern Kingbird, and the habitat was not greater than 30 ha. The shrub areas need to be larger than 30 ha to meet the criteria for shrub breeding bird habitat. Other candidate ecosites (B134 and B135) are found along watercourses in the RSA (Map 8; Appendix C).

Area	Type	Description
Special Concern Wildlife Species	Confirmed and Candidate	Several species documented in secondary sources are designated Special Concern or Provincially Rare (endangered or threatened) (see Section 6.4). Candidate Species include monarch, peregrine falcon, yellow-banded bumble bee, and yellow rail. Confirmed Species include (WSP E&I Canada Limited, 2024a) barn swallow, Canada warbler, common nighthawk, evening grosbeak, olive-sided flycatcher, and rusty blackbird. The SWH for these species is the area of the habitat to the finest ELC scale that protects the habitat form and function. Element occurrences and habitat mapping for these species has been completed for the RSA (Map 8 in Appendix C). Several occurrences of confirmed habitat for common nighthawk (33.87 hectares in total), common nighthawk and olive-sided flycatcher (35.10 hectares in total), and rusty blackbird (6.92 hectares) occur in the LSA adjacent to Noted Lake and around the Crawford Mine Site.

6.9. Cultural heritage resources

6.9.1. Stage 1 Archaeological Resource Assessment

Woodland Heritage Northeast Ltd. (WHNE) was contracted by BBA on behalf of TIP1 to conduct a Stage 1 Archaeology Assessment (Appendix D) for the Project. All archaeological consulting activities were performed in accordance with the *Standards and Guidelines for Consultant Archaeologists* (Ministry of Tourism and Culture, 2011) by a licenced archaeologist.

Before the initiation of fieldwork, WHNE undertook a review of the Ontario Archaeological Sites Database (OASD) through the MCM's PastPortal to determine the number and nature of archaeological sites registered on or in the immediate vicinity of the subject property. The site files and catalogued reports at the WHNE office were also checked to confirm the database results and include updates which have not yet been entered into the database. No archaeological sites have been registered within three kilometres of the proposed transmission line.

Based on the information obtained during the background research, the assessment was focused on 12 areas of archaeological interest identified within the proposed transmission line corridor. These areas were assessed systematically, beginning with the southernmost (Area 12) and working northward, inspecting the ground conditions throughout the areas to be impacted. Additional field transects were made in peripheral areas in Areas 7 to 12 to identify ground features associated with potential relict shorelines, a portage, and a wagon road identified during the background research.

Additionally, the study areas were examined with a drone, obtaining high-resolution near-ground imagery of the areas to be impacted. Where an on-ground field inspection could not be completed due to poor accessibility, notably in Areas 1, 2, and 6, the drone was used to remotely assess the ground conditions. Erring on the side of caution, only the visibly saturated swamplands without tree cover were considered to have low archaeological potential whereas any treed areas were considered to have potential. As such, all areas of interest along the proposed transmission line corridor were subjected to firsthand observation and/or aerial examination.

Areas 1, 2, and 6 were remotely assessed with the support of a drone, identifying low-lying, saturated terrain in the lands bordering the small watercourses. As an on-ground assessment could not be carried out in these areas, all forested areas were sufficiently drained to have archaeological potential.

Area 3 consists of a proposed section on the north and south of Bouchard Lake. The land immediately bordering the western side of the lake was determined to be low-lying and saturated, although it typically rose into a level and well-drained terrace with confirmed archaeological potential. As with the previous areas, low-lying terrain leading to well-drained pockets of land with archaeological potential was documented at Areas 4 and 5 along the shoreline of Noted Lake.

The field inspection confirmed the presence of relict shoreline features in Areas 7, 8, 10, and 12, with former shorelines represented by terrain rises followed by level, well-drained terrain. The historical portage between the upper Porcupine River and Pearl Lake in Area 12 as well as the historical wagon road in Area 8 could not be confirmed during the on-ground inspection. Nonetheless, based on field discussions with members of the accompanying Indigenous communities which stressed the cultural importance of early transportation routes, all areas within 150 metres of these mapped historical transportation routes were considered to have archaeological potential.

Through the on-ground inspection coupled with the drone examination, it was determined that Area 9 features level and well-drained terrain on both the north and south sides of the lake. These areas are considered to have confirmed archaeological potential.

Finally, the on-ground inspection confirmed that the lands within 50 metres of the creek in Area 11 consist of low-lying and permanently saturated terrain with low archaeological potential.

Overall, level and well-drained areas were documented in Areas 1 to 10 and 12. These areas are considered to have confirmed archaeological potential and are candidates for Stage 2 testing. The remaining areas were determined to have low archaeological potential due to the presence of permanently saturated ground conditions or due to the excessive distance from features of archaeological potential.

6.9.2. Cultural Heritage Screening

Woodland Heritage Northeast Ltd. (WHNE) was contracted by BBA on behalf of TIP1 to conduct a Cultural Heritage Screening Report (Appendix E) for the Project. Several areas of archaeological potential were identified through the Stage 1 Archaeological Assessment (Section 6.9.1) undertaken on the project footprint in 2023. These include several areas with archaeological potential for pre-contact settlement, and a series of portages between the Porcupine River and the Mattagami River.

At the conclusion of the Built Heritage study, it was determined that no standing or collapsed structures were present within or adjacent to the study area. Various sources were contacted to inquire as to determine any heritage values and the responses received indicated that no previously identified cultural heritage values were present on the property. In addition, no evidence suggesting the presence of any built structure on the property, either standing or in ruins, was identified through the fieldwork, an examination of historical maps, or satellite imagery.

An analysis of the potential for Cultural Heritage Landscapes was undertaken based on guidance from the 0500E MCM Checklist, as well as the direction provided by UNESCO, and no evidence of cultural heritage landscapes was found to be associated within the LSA.

Further Built Heritage and Cultural Heritage Landscape work is not recommended at this time.

7. Effects assessment

7.1. Land use

Project impacts

The proposed Project is a compatible land use that integrates well into regional and local land use planning for the area. The proposed TLA crosses the Hersey Lake Conservation Area; however, the Project is collocated with an existing 500 kV transmission line and does not cross any existing trails within the Hersey Lake Conservation Area.

Complimentary land uses are possible within the ROW during operations.

Proposed mitigations

No mitigation is proposed.

Net effects assessment

No net effects to land use planning, parks and protected areas are anticipated.

7.2. Sensitive land use

7.2.1. Recreation and commercial tourism

Project impacts

Recreational and commercial tourism use in the LSA and RSA consist of formal and informal trail use and a private campground. The Project will not be visible from the campground, nor from many segments of the existing trail network in the RSA. Aside from a short period of restricted access during the construction phase, sensitive land uses, including recreational trails, are possible and anticipated to continue during the operations phase of the Project.

The proposed Project, aside from during construction, will not impede continued use and enjoyment of the land.

Proposed mitigations

Mitigation to be implemented include:

- TIP1 will engage trail operators and community members during detailed design, including foundation and access planning, to minimize impacts to important trail segments.
- Implement access control to the Project throughout the Construction phases to minimize conflicts with recreational users.
- Implement traffic control near trail segments.
- Fence-off excavations if left unsupervised and regularly check fencing and signage.
- Maintain communication and notification throughout the Project Construction phase to ensure adequate notice for any trail impacts or temporary closures.

Net effects assessment

No net effects to recreation or commercial tourism are anticipated.

7.2.2. Hunting, trapping, and gathering

Project impacts

The powerline is to be built adjacent to existing linear disturbances; therefore, no effects of the Project on hunting, trapping, or fishing are predicted. Powerlines may impact gathering in relation to access and foundation installation.

Proposed mitigations

Mitigation to be implemented include:

- TIP1 will continue to engage stakeholders during detailed design, including foundation and access planning, to minimize impacts to important gathering areas.

Net effects assessment

No net effects to hunting, trapping, and gathering are anticipated.

7.3. Natural resource use

7.3.1. Mineral resources

Project impacts

The Project will be co-located with existing powerlines and highway.

The powerline may span across access to mineral resources related facilities. Transmission structures will avoid placement within existing mineral resource access.

Proposed mitigations

No mitigation is proposed.

Net effects assessment

No net effects are predicted on current and planned future mineral land uses in relation to the project.

7.3.2. Forestry resources

Project impacts

The LSA traverses approximately 3,400 m (approximately 17 ha) of ARFMI's forest reserve; no areas are in short-term planned cut-blocks of ARFMI's Forest Management Plan (Abitibi River Forest Management Inc., 2022).

Land occupied or spanned by the transmission line is co-located with other linear features which aids in limiting adding complexity to ARFMI's forestry management planning.

Proposed mitigations

Mitigation to be implemented includes:

- TIP1 will provide merchantable trees within the footprint and within Abitibi's land base to Abitibi.
- Merchantable timber from areas outside Abitibi's land base may be provided to TTN (being part owner of the powerline).
- TTN, being part owner of the powerline, will be provided first right-of-refusal for non-merchantable timber.

Net effects assessment

Due to the proposed Project TLA being largely excluded from forest resources use, and co-located with other linear infrastructure, no net effects are predicted on current and planned future forestry resources land uses in relation to the project.

7.4. Wildlife and Wildlife Habitat

Wetlands (93.6 ha or 47%) and upland communities (91.0 ha or 45%) each account for approximately half of the TLA landcover, while anthropologic land cover accounts for approximately 6% Table 7-1. Similar to the distribution of habitat types across the LSA, swamp wetlands, particularly conifer swamp, are the predominant wetland type while uplands are more skewed to coniferous forest in the TLA. Table 7-1 summarizes hectares of habitat types across the TLA and LSA[22].

Table 7-1: Habitat types within the TLA.

Ecosite category	Area in the TLA (ha)	TLA cover (%)	Area in the LSA (ha)	LSA cover (%)	% LSA directly affected by Project
Wetlands	**93.6**	**47%**	**2163.3**	**51%**	**4%**
Bogs and Fens	**12.8**	**6%**	**262.7**	**6%**	**5%**
Bog	3.3		134.7		

[22] Habitat coverage is based upon current conditions, not upon expected conditions when the powerline is to be built.

Ecosite category	Area in the TLA (ha)	TLA cover (%)	Area in the LSA (ha)	LSA cover (%)	% LSA directly affected by Project
Fen	9.5		127.9		
Swamps	**76.5**	**38%**	**1810.2**	**43%**	**4%**
Conifer swamp	71.5		1692.1		
Hardwood swamp	0.0		9.4		
Thicket swamp	5.0		108.7		
Marshes	**4.3**	**2%**	**90.5**	**2%**	**5%**
Marsh	4.3		90.5		
Upland Communities	**91.0**	**45%**	**1594.3**	**38%**	**6%**
Deciduous Forest	**40.3**	**20%**	**817.9**	**19%**	**5%**
Deciduous forest (aspen-birch)	40.3		817.9		
Coniferous Forest	**50.8**	**25%**	**776.5**	**18%**	**7%**
Conifer	0.0		0.0		
Black spruce-pine	0.0		11.5		
Pine-black spruce	30.7		456.7		
Pine	0.0		0.0		
Spruce-fir	20.1		308.2		
Hemlock-cedar	0.0		0.0		
Rock Ecosites	**0.0**	**0%**	**4.8**	**0%**	**0%**
Anthropologically Disturbed Upland Communities and Areas	**15.7**	**8%**	**468.3**	**11%**	**3%**
TOTAL	**200.3**	**100%**	**4230.8**	**100%**	**5%**

7.4.1. Ungulates

7.4.1.1. Moose

Project impacts

Potential impacts to moose include changes to habitat and changes to movement patterns resulting from construction activities and habitat change.

The TLA will cross three (3) areas with relatively high moose densities and is within 500 m of a fourth (4th) larger high moose density area in the southern portion of the RSA (Map 9). The high moose density areas correspond with black spruce forest shorter than 12 m, as well as deciduous forest greater than 12 m. Forest clearing and maintenance may not be required in the black spruce areas and areas cleared in deciduous stands may naturally regenerate to shrubby areas preferred by moose for foraging. Studies indicate moose do not avoid powerlines with corridor widths less than 90 m (Bartzke, May, Bevanger, Stokke, & Røskaft, 2014; Bartzke, May, Solberg, Rolandsen, & Røkaft, 2015) while forest clearing and vegetation maintenance may increase habitat more desirable to moose (Bartzke, May, Bevanger, Stokke, & Røskaft, 2014). If moose can see UV frequency light, similar to reindeer and caribou, they may avoid powerlines during periods when corona discharge (UV light) is occurring (Tyler, Stokkan, Hogg, Nellemann, & Vistnes, 2016).

Proposed mitigations

Mitigations to reduce impacts on moose include:

- Implement visual barriers of plantings or natural materials for portions of the TLA located within preferred moose habitat, and as applicable, to limit long views and exposure (e.g., reduce predator visibility) (Ministry of Natural Resources, 2010).
- Manage snow and slash on Project access roads to allow for wildlife crossings, such as ensuring windrow breaks every 50 m for snow or slash.
- Implement access control to the Project throughout the Construction and Operations phases.
- Implement a Project speed limit for vehicles traveling within the TLA or Project-managed access roads to less than 30 km/h in order to minimize vehicle-wildlife collisions.
- Fence-off excavations if left unsupervised and regularly check excavations for trapped wildlife.
- Prohibit hunting, fishing, or recreational use of the Project by the workforce.
- Pre-construction wildlife survey will be conducted prior to vegetation clearing to prevent damage to occupied denning locations.

Net effects Assessment

Even with application of mitigation, TIP1 predicts net effects for moose. These are characterized in Table 7-2.

Table 7-2 Characterization of net effects on moose.

Magnitude	Spatial Extent	Temporal Consideration
Low	Within LSA	Long-term – effect occurs during construction and/or operation and persists into operations

7.4.1.2. Woodland caribou

Project impacts

There is limited (to nil) caribou presence in the area, as well as limited habitat with characteristics suitable for caribou. In addition, moose are present in the LSA and being an important prey species for wolf and black bear, they could lead to increased predator population, further limiting caribou presence in the area (predator avoidance). Studies indicate caribou avoid habitat within 5 km of development however powerlines (aside from their construction) may not influence their habitat use (Golder Associates, 2018)

Proposed mitigations

No mitigation is proposed.

Net effects assessment

Due to the proposed project being located in an area largely not used by caribou, and co-located with other linear infrastructure, no net effects are predicted on woodland caribou or their habitat in relation to the project.

7.4.2. Furbearers

Project impacts

Effects on furbearers are considered through the lens of considering impacts upon fisher, fox, lynx, marten, and mink. Fox and lynx are habitat generalists, although dense coniferous forest can be important to lynx in the winter. Fisher can use many forest types, but also may prefer dense forest (although mixed conifer or hardwood forest can be suitable). Marten prefers large patches of late successional forest (fir or spruce dominated) (Watt, Baker, Hogg, McNicol, & Naylor, 1996). Mink may prefer coniferous forest (spruce, fir) with high structural diversity (e.g., log strewn or thicketed). Watt et al (1996) describe the importance of old and decaying trees and large coarse woody debris to marten, although this may apply to a wide array of furbearers.

The TLA passes through approximately 20 hectares of spruce-fir forest, however majority of this forest type is outside of the TLA. Black spruce/larch forest, with canopy closure ranging from 25-75%, is the predominant forest cover type traversed by the Project. In general, deciduous forest is more predominant in the southern end of the PDA. There are five (5) small patches of forest >120 years old (medium canopy closure black spruce/larch) intersected by the powerline (collectively on the order of 2 km linear length).

The proposed Project will clear low to moderate quality furbearer habitat and may lead to avoidance behaviour (during construction and operation). Furbearers, especially those preferring dense coniferous forest (e.g. marten), may avoid wide linear infrastructure (Tigner, Bayne, & Boutin, 2015), avoidance behavior possibly extending up to 100 m from the TLA (the Infrastructure Effect Zone[23] (IEZ) (de Jonge, Gallego-Zamorano, Huijbregts, Schipper, & Benitez-Lopez, 2022). However, furbearer observations have been positively correlated to linear infrastructure, for example carnivorous furbearers hunting prey (Baltensperger, Morton, & Huettmann, 2017; de Jonge, Gallego-Zamorano, Huijbregts, Schipper, & Benitez-Lopez, 2022). Furbearer response to habitat clearing is complex and the proposed Project may not lead to significant differences in furbearer species abundance and use in the LSA.

[23] The spatial extent into the surrounding environment adjacent to infrastructure to which negative effects on wildlife can be observed.

Proposed mitigations

Mitigations to reduce impacts on furbearers include:

- Strategic retention of old or decaying trees and/or placement of cleared old and decaying trees and stems for habitat (e.g., dens).
- Implement access control to the Project throughout the Construction and Operations phases.
- Implement a Project speed limit for vehicles traveling within the TLA or Project-managed access roads to less than 30 km/h in order to minimize vehicle-wildlife collisions.
- Fence-off excavations if left unsupervised and regularly check excavations for trapped wildlife.
- Prohibit hunting, fishing, or recreational use of the Project by the workforce.
- Pre-construction wildlife survey (e.g., to identify dens).
- Develop and implement accidental den discovery contingency plan.

Net effects assessment

Even with application of mitigation, TIP1 predicts net effects for furbearers. These are characterized in Table 7-3.

Table 7-3: Characterization of net effects on furbearers.

Magnitude	Spatial Extent	Temporal Consideration
Low	Within LSA	Long-term – effect occurs during construction and/or operation and persists into operations

7.4.3. Bats, raptors, migratory birds

7.4.3.1. Bats

Project impacts

The proposed Project occurs in the context of deciduous, mixed, and coniferous forest and wetland habitat. Bat species and habitat presence is expected to be ubiquitous along the TLA. Approximately 5% of snags within the LSA are estimated to be removed following the initial clearing of the TLA (Table 7-4).

Little brown myotis and northern long-eared bat are expected to change their activity to forest edge habitat created by the powerline, while eastern red bat, hoary bat, and silver-haired bat may change their activity to cleared areas within the powerline corridor (Mills, Adams, & Phoenix, 2013).

Edge habitat created by linear infrastructure in forested habitat may increase insect populations (Villemey, et al., 2018), leading to an increase in bat foraging. Bats generally are attracted to powerlines during high relative humidity, possibly due to powerlines attracting insects, while bats may avoid powerlines during lower humidity levels due to physical structures and/or electromagnetic fields (Froidevaux, Jones, Kerbiriou, & Park, 2023). Passive-listening bats may avoid powerlines in these same conditions due to corona discharge noise (Froidevaux, Jones, Kerbiriou, & Park, 2023).

Summers et al. (2022) found that hibernating bats were not significantly influenced in response to blasting new tunnels within an underground sand mine that hosted colonies in inactive areas of a mine complex (some blasting areas within 50 m of hibernacula). The construction noise and vibration within the TLA is not expected disturb bat hibernacula.

Erecting roost boxes adjacent to water sources may be an effective mitigation for local populations (Brack, Sparks, & Kennedy, 2022).

Table 7-4: Snag loss associated with the proposed Project.

Ecosite	Hectares in the LSA	Hectares in the TLA	Snag density (snags/ha)	Potential # of snags[24] in the LSA	Potential # of snags in the TLA	% in TLA
Wetlands	**1770.8**	**77.7**		**68756**	**3016**	**4%**
Bogs and Fens	**96.3**	**6.2**	**20**	**1926**	**124**	**6%**
Sparse Treed Fen (B136)	96.3	6.2	20	1926	124	
Swamps	**1674.6**	**72**		**66830**	**2892**	**4%**
Organic Poor Conifer Swamp (B127)	172.2	6.0	15	2584	90	
Organic Intermediate Conifer Swamp (B128)	1374.2	59.9	40.6	55794	2432	
Organic Rich Conifer Swamp (B129)	128.1	5.6	66	8453	370	
Upland Communities	**521.7**	**19.9**		**69733**	**4176**	**6%**
Deciduous Forest	**114.0**	**0.1**		**5862**	**5**	**<1%**
Moist, Fine: Aspen – Birch Hardwood (B119)	114.0	0.1	51.4	5862	5	
Coniferous Forest	**407.65**	**19.8**		**63871**	**4171**	**7%**
Fresh, Silty to Fine Loamy: Spruce – Fir Conifer (B101)	266.49	19.5	213.3	56842	4159	
Moist, Fine: Pine – Black Spruce Conifer (B114)	92.9	0.3	36.7	3409	12	
Moist, Fine: Spruce – Fir Conifer (B116)	48.26	0.0	75	3620	0	
TOTAL	**2292.5**	**97.6**		**138489**	**7191**	**5%**

[24] Number of snags provides indication of the relative potential for bat roosting but not all trees will be occupied at the same time, some are lost over time, and some are recruited as trees age.

Proposed mitigations

Mitigation implemented for furbearers are expected to be suitable for lowering any adverse effects of the proposed Project. Additional mitigation includes:

- Strategic placement of roost boxes in medium to highly suitable bat habitat.

Net effects assessment

Even with application of mitigation, net effects are predicted for bats. These are characterized in Table 7-5.

Table 7-5: Characterization of net effects on bats.

Magnitude	Spatial Extent	Temporal Consideration
Low	Within TLA	Medium-term – effect occurs during construction and/or operation but is does not persist beyond first few years of operation

7.4.3.2. Birds

Project impacts

Habitat loss, sensory disturbance/change, and human activity may lead to changes in bird species presence and abundance. Bird abundances have been observed to be higher in close proximity to linear infrastructure, dropping within the first 35 m, then increasing again with an overall IEZ on the order of 650m (de Jonge, Gallego-Zamorano, Huijbregts, Schipper, & Benitez-Lopez, 2022). Carnivorous birds appear to have larger drops in abundance but smaller IEZs than non-carnivorous birds and all bird species' abundance reductions within the IEZ is greater in open habitat environments but the IEZ is smaller in comparison to closed habitat (de Jonge, Gallego-Zamorano, Huijbregts, Schipper, & Benitez-Lopez, 2022). Collision with powerlines is a source of mortality, particularly for raptors and waterfowl, and especially for lines close to shoreline in open habitat (APLIC, 2012).

Proposed mitigations

Mitigations implemented for furbearers are expected to be suitable for lowering adverse effects on birds associated with the proposed Project. Additional mitigation includes:

- Designing transmission structures and substation equipment to adhere to best practices reduce risk of electrocution and collision (APLIC, 2012).
- Install avian collision markers on the shield wires crossing any identified stopover habitat, or open-water wetlands.
- Install nest deterrents as necessary to prevent use by bird species.
- Install guards within substation equipment as necessary to prevent electrocution of birds and wildlife.
- Pre-construction active raptor nest survey and implementation of setbacks to reduce adverse effect of construction.
- Avoid clearing and construction work within the breeding bird period. If work is required during the breeding bird period, conduct pre-construction nest survey in advance of construction (no later than 3- to 7-days prior to Construction start (breeding season dependent)). If work is stopped on-site during the breeding bird period for more than 3- to 7-days (breeding season dependent), an additional survey should be conducted.
- Develop and implement an Avian Protection Plan as part of Construction and Operations phases.
- Consider installation of raptor nest platforms and nest boxes of various dimensions and heights to prevent utilization of transmission structures.

Net effects assessment

Even with application of mitigation, TIP1 predicts net effects for birds. These are characterized in Table 7-6.

Table 7-6: Characterization of net effects on birds.

Magnitude	Spatial Extent	Temporal Consideration
Moderate	Within LSA	Long-term – effect occurs during construction and/or operation and persists into operations

7.4.4. Herptiles

Project impacts

The proposed Project traverses wetlands across approximately half its length. Construction activities are scheduled for dry or frozen conditions and structures are not proposed to be located within open water areas. Habitat loss associated with the structures and construction are not predicted to measurably impact herptiles.

Proposed mitigations

No mitigation is proposed.

Net effects assessment

Herptile habitat loss is not predicted to lead to a measurable net effect on herptiles in the LSA.

7.5. Rare, threatened or endangered species

7.5.1. Wildlife species of conservation concern

Project impacts

Wildlife SOCC known or potentially occurring in the LSA include Canada warbler, common nighthawk, evening grosbeak, olive-sided flycatcher, rusty blackbird, and yellow rail. Potential impacts to birds, including SOCC, is addressed in Section 7.4.3.2. Impacts on habitat of these species are addressed in Section 7.7.2.3.

Proposed mitigations

No mitigation is proposed.

Net effects assessment

Net effects on wildlife SOCC are addressed in Section 7.4.3.2 and Section 7.7.2.3.

7.5.2. Wildlife species at risk

Project impacts

Wildlife SAR known or potentially occurring in the LSA include chimney swift, little brown myotis, lesser yellowlegs, and woodland caribou. Potential impacts to woodland caribou are addressed in Section 7.4.1.2, impacts to bats, including SAR, are addressed in Section 7.4.3.1, and impacts to birds, including SAR, is addressed in Section 7.4.3.2. Impacts on habitat of these species are addressed in Section 7.7.2.1. Understanding to date is that no legally protected wildlife habitat occurs within the TLA.

Proposed mitigations

No mitigation is proposed.

Net effects assessment

Net effects to woodland caribou, bat SAR species, and bird SAR species are addressed in Section 7.4.1.2, Section 7.4.3.1, and Section 7.4.3.2, respectively. Net effects on habitat of these species are addressed in Section 7.7.2.1.

7.5.3. Plant species at risk

Project impacts

Plant SAR (black ash) and their habitat may be removed at structure locations. No plant SAR have been located within the LSA to date. Black ash is shade-intolerant and typically grow up to 20 m in height but can reach 27 m. They may not be considered a hazard tree within the ROW, depending on height and growth factor.

Proposed mitigations

Mitigation to reduce impacts on plant SAR includes:

- Pre-construction vegetation survey to confirm black ash stands are not present within the TLA.

Net effects assessment

No net effects to plant SAR are predicted.

7.6. Timber resources

Project impacts

The LSA traverses areas of merchantable timber. There area forest cover within the LSA with an upper canopy greater than 12 m (Table 7-7) was used to provided indicative areas of merchantable timber.

Table 7-7: Area of TLA that passes through forest cover with upper canopy height greater than 12 m.

Tree Species	Area by age class (hectares)				
	0-49	50-99	100-149	150+	Total
Coniferous					**42.93**
balsam fir		1.04			1.04
black spruce		19.01	6.07		25.08
eastern white-cedar		1.26			1.26
jack pine		3.55			3.55
larch			9.17	2.36	11.53
white spruce		0.47			0.47
Deciduous					**15.36**
trembling aspen	3.5	11.86			15.36

The Project will require timber removal from approximately 58 hectares, predominantly consisting of black spruce and trembling aspen.

Timber within ARFMI's forest resource base will be provided to ARFMI. TIP1 will work with MNRF to release other timber resources as approved.

Proposed mitigations

Mitigation to be implemented include:

- Merchantable (outside of ARFMI and other lands that retain timber ownership) and non-merchantable timber will be delivered to TTN community (being part owner of the powerline).
- TTN, being part owner of the powerline, will be provided first right-of-refusal for preparation of the timber harvest plan and timber harvest, slash clearing, and slash management.

Net effects assessment

Loss of the land base for forest regeneration is not predicted to lead to a measurable net effect on timber resources in the LSA.

7.7. Natural Heritage Resources

7.7.1. Significant wetlands

Project impacts

A PSW, the Kraft Creek/Murphy Creek wetland complex, is traversed by the TLA (Appendix C). The wetland occurs over an approximately 1.2 kilometre stretch therefore it cannot be spanned, and due the size of the wetland there is no cost-effective means of avoiding it. Project impacts to PSW may include changes to water quality, changes to habitat, and lost of wetland area.

Proposed mitigations

Mitigation and best management practices to reduce impacts on the Provincially Significant Wetland (PSW) include:

- Micro-siting of structures, construction access, and crane areas to minimize disturbance to the wetland.
- Limit construction to frozen conditions.
- Flagging the wetland and construction footprint within the wetland.

- Utilize temporary access matting or ice roads to minimize impacts to wetland vegetation and substrate.
- Develop an Erosion and Sediment Control Plant (ESCP) to prevent sedimentation into the wetland.
- Develop a Spill Contingency Plan and implement spill prevention measures.
- Do not transfer fuel within the boundaries of the PSW. Conduct all refuelling activities with an appropriate spill kit available. Use drip trays when refueling to prevent releases to the environment.
- Inspect all heavy equipment and light vehicles for leaks and failures daily.
- Place drip trays under all equipment parked or stored within wetland boundaries. Inspect drip trays daily.
- Natural recovery and/or planting to reclaim temporarily disturbed areas that will trend the revegetated lands towards the plant community found at the wetland.
- Avoid the use of pesticides for vegetation control within the TLA.

Net effects assessment

Even with application of mitigation, net effects are predicted for Significant Wetlands. These are characterized in Table 7-8.

Table 7-8: Characterization of net effects on Significant Wetlands.

Magnitude	Spatial Extent	Temporal Consideration
Moderate	Within TLA	Medium-term – effect occurs during construction and/or operation but is does not persist beyond first few years of operation

7.7.2. Significant wildlife habitat

7.7.2.1. Seasonal concentration areas for animals

Project Impacts

Table 7-9 provides a summary of the seasonal concentration areas located within the TLA and LSA. The proposed Project is not predicted to have measurable impact upon seasonal concentration areas.

Table 7-9: Seasonal concentration areas for animals within the TLA and LSA.

Area	Type	Area within TLA (ha)	Area within LSA (ha)
Waterfowl Stopover and Staging Areas (Terrestrial)	Candidate	0.0	1 location, 2.77
Waterfowl Stopover and Staging Areas (Aquatic)		9 locations within the TLA (collectively 4.39 hectares [4%])	14 locations within the LSA (collectively 101.14 hectares)
Bat Hibernacula		0	Two (one near the Porcupine Substation and one north of Noted Lake)
Bat Maternity Colonies		0	six locations along the length of the LSA (collectively 100.40 hectares).
Colonially Nesting Bird Breeding Habitat (Tree / Shrubs)		0	0
Colonially Nesting Bird Breeding Habitat (Ground)		0	0
Turtle Wintering Area		0	0
Reptile Hibernaculum		0	0

Proposed mitigations

Mitigations proposed for birds in Section 7.4.3.2 are expected to address impacts to waterfowl stopover and staging areas (aquatic).

Net effects assessment

Net effects are predicted for waterfowl stopover and staging areas (aquatic). These are characterized in Table 7-10.

Table 7-10: Characterization of net effects on waterfowl stopover and staging areas (aquatic).

Magnitude	Spatial Extent	Temporal Consideration
Low	Within TLA	Long-term – effect occurs during construction and/or operation and persists into operations

7.7.2.2. Rare plant communities

Project impacts

The proposed Project does not intersect any rare plant communities. The closest rare plant community is a Hardwood Swamp approximately 450 m from the edge of the TLA.

Proposed mitigations

No mitigation is proposed as no impacts are anticipated to rare plant communities.

Net effects assessment

No net effects are predicted on rare plant communities in relation to the project.

7.7.2.3. Specialized wildlife habitat

Project impacts

Table 7-11 provides a summary of specialized habitat for wildlife located within the TLA and LSA. The proposed Project is not predicted to have measurable impact upon specialized habitat for wildlife.

Table 7-11: Specialized wildlife habitat within the TLA and LSA.

Area	Type	Area within TLA (ha)	Area within LSA (ha)
Waterfowl Nesting Area	Candidate	15 locations (collectively 14.79 hectares [4%])	54 locations (collectively 356.19 hectares)
Bald Eagle and Osprey Nesting Habitat	Confirmed	0	One bald eagle nest near Noted Lake

Area	Type	Area within TLA (ha)	Area within LSA (ha)
Woodland Raptor Nesting Habitat	Confirmed and Candidate	Any forested ecosite within the LSA is candidate habitat (on the order of 90 hectares as well as treed bog, fen, and marsh habitat [5%]).	Any forested ecosite within the LSA is candidate habitat (on the order of 1600 hectares as well as treed bog, fen, and marsh habitat).
Seeps and Springs	Candidate	0	0
Aquatic Feeding Habitat	Confirmed	3 locations (collectively 0.07 hectares [3%])	9 locations (collectively 2.41 hectares)
Mineral Licks	Candidate	0	0
Denning Sites for Mink, Otter, Gray Wolf, Eastern Wolf, Canada Lynx, Marten, Fisher, Black Bear	Candidate	0	One lynx den
Rendezvous Sites	Candidate	0	0
Amphibian Breeding Habitat: Wetland	Confirmed and Candidate	0	0
Amphibian Breeding Habitat: Woodland	Candidate	0	0
Turtle Nesting Areas	Candidate	0	0
Mast Producing Areas	Candidate	0	0
Sharp-tailed Grouse Leks	Candidate	6 locations (collectively 8.40 hectares [4%])	14 locations (collectively 216.09 hectares)

Proposed mitigations

Mitigations proposed for wildlife and wildlife habitat (Section 7.4), and significant wetlands (Section 7.7.1) are expected to address impacts to specialized wildlife habitat.

Net effects assessment

Net effects are predicted for waterfowl nesting area, woodland raptor nesting habitat, moose aquatic feeding habitat, and sharp-tailed grouse leks. These are characterized in Table 7-10.

Table 7-12: Characterization of net effects on waterfowl nesting area, woodland raptor nesting habitat, (moose) aquatic feeding habitat, and sharp-tailed grouse leks.

Magnitude	Spatial Extent	Temporal Consideration
Low	Within TLA	Long-term – effect occurs during construction and/or operation and persists into operations

7.7.2.4. Animal movement corridors

Project impacts

Table 7-13 provides a summary of animal movement corridors located within the TLA and LSA. The proposed Project is not predicted to have measurable impact upon animal movement corridors.

Table 7-13: Animal movement corridors within the TLA and LSA.

Area	Type	Area within TLA (ha)	Area within LSA (ha)
Amphibian Movement Corridors	Confirmed	0	0
Cervid Movement Corridors	Candidate	Several corridors occur throughout the TLA.	Several corridors occur throughout the LSA.
Furbearer Movement Corridor	Candidate	All treed ecosites adjacent to or within shoreline habitats are considered candidate (21 watercourse spans and adjacent to/span of four lakes).	All treed ecosites adjacent to or within shoreline habitats are considered candidate (28 watercourses and ten lakes).

Proposed mitigations

No mitigation is proposed.

Net effects assessment

Due to the nature of powerlines and the context of the proposed project’s development (i.e., built adjacent to linear corridor), no net effects are predicted on animal movement corridors in relation to the project.

7.7.2.5. Significant habitat of species of conservation concern

Project impacts

Species of conservation concern known or potentially occurring within the TLA and LSA include Canada warbler, common nighthawk, evening grosbeak, olive-sided flycatcher, rusty blackbird, and yellow rail. Table 7-14 summarizes the candidate and confirmed habitat for SOCC within the TLA and LSA. The proposed Project is not predicted to have measurable impact upon significant habitat for SOCC.

Table 7-14: Habitat for Species of Conservation Concern within the TLA and LSA.

Area	Type	Area within TLA (ha)	Area within LSA (ha)
Marsh Bird Breeding Habitat	Candidate	21 locations (ecosite: B134-B136, B139, B142, B144, B146. Collectively 18.76 hectares [5%]; min: 0.03 ha, max: 2.7 ha, avg: 0.9 ha)	72 locations (ecosite: B134-B140, B142, B144, and B146-B147. Collectively 356.75 hectares; min: 0.4 ha, max: 32.2 ha, avg: 5.0 ha)
Open Country Bird Breeding Habitat	Candidate	0	7 locations (collectively 129.53 hectares)
Shrub or Early Successional Breeding Bird Habitat	Candidate	2 locations (collectively 0.67 hectares [3%])	9 locations (collectively 22.99 hectares)
Special Concern Wildlife Species	Confirmed and Candidate	1 location (common nighthawk. 1.39 hectares [2%])	6 locations (3 common nighthawk, 2 common nighthawk and olive-sided flycatcher, 1 rusty blackbird. Collectively 75.89 hectares)

Proposed mitigations

Mitigation proposed for birds (Section 7.4.3.2) are expected to reduce impacts to SOCC and their habitat. No additional mitigation is proposed.

Net effects assessment

Net effects are predicted for marsh bird breeding habitat, shrub or early successional breeding bird habitat, and special concern wildlife species. These are characterized in Table 7-15.

Table 7-15: Characterization of net effects on marsh bird breeding habitat, shrub or early successional breeding bird habitat, and special concern wildlife species.

Magnitude	Spatial Extent	Temporal Consideration
Low	Within TLA	Long-term – effect occurs during construction and/or operation and persists into operations

7.8. Cultural heritage resources

Project impacts

As a result of the background research and a field inspection, no built structures, and no built structures older than 40 years old, were identified on the property. Additionally, the proposed lands do not appear to be part of a cultural landscape, according to the Cultural Heritage Screening Report (Appendix E).

Several areas of archaeological potential were noted, and plans have been established to undertake additional work to survey the areas of archaeological potential identified during the Stage 1 archaeological resource assessment report under P208-0330-2023 (Appendix D). Potential impacts from the Project may include the damage or loss of unanticipated historical resources.

Proposed mitigations

No mitigations are proposed to protect cultural heritage resources.

The following mitigations area proposed to address potential impacts to areas of archaeological potential:

- Complete a Stage 2 archaeological survey for subsurface ground disturbance in areas of archaeological potential.
- Stop work if unanticipated archaeological or cultural resources are discovered during project activities.
- Create and implement a contingency plan for unanticipated discoveries.
- Avoid subsoil disturbance for the Project travel lane and access within areas of archaeological potential by using access matting, corduroy roads, or freezing-in snow-fill.
- Include an archaeological monitor during construction within areas of potential, if recommended.

Net effects assessment

Due to the nature of powerlines, the context of the proposed project's development, and the results of the archaeological assessment, no effects or net effects are predicted on archaeological resources in relation to the project.

Due to the nature of powerlines, the context of the proposed project's development, and results of the cultural heritage screening, no effects or net effects are predicted on built heritage resources and cultural heritage landscapes in relation to the project.

8. Net effects assessment summary

Table 8-1 summarize the potential impacts of the Project, proposed mitigation measures, and resultant net effects for each Project component.

Table 8-1: Summary of project net effects

Valued Component	Potential Impact	Proposed Mitigation Measures	Magnitude	Spatial Extent	Temporal Extent	Significance
Land Use	The proposed Project is a compatible land use that integrates well into regional and local land use planning for the area. Complimentary land uses are possible within the ROW during operations.	None proposed.	-	-	-	Not significant.
Recreation and Commercial Tourism	A short period of restricted access during the construction phase to sensitive land uses, including recreational trails, are possible and anticipated to continue during the operations phase of the Project. No impediment to continued use and enjoyment of the land during Operations phase anticipated.	▪ TIP1 will engage trail operators and community members during detailed design, including foundation and access planning, to minimize impacts to important trail segments. ▪ Implement access control to the Project throughout the Construction phases to minimize conflicts with recreational users. ▪ Implement traffic control near trail segments. ▪ Fence-off excavations if left unsupervised and regularly check fencing and signage. ▪ Maintain communication and notification throughout the Project Construction phase to ensure adequate notice for any trail impacts or temporary closures.	-	-	-	Not significant.
Hunting, Trapping, and Gathering	None anticipated.	▪ TIP1 will continue to engage stakeholders during detailed design, including foundation and access planning, to minimize impacts to important gathering areas.	-	-	-	
Mineral Resources	None anticipated.	None proposed.	-	-	-	Not significant.
Forestry Resources	None anticipated	▪ TIP1 will provide merchantable trees within the footprint and within Abitibi's land base to Abitibi. ▪ Merchantable timber from areas outside Abitibi's land base may be provided to Indigenous communities. ▪ TTN will be provided first right-of-refusal for non-merchantable timber.	-	-	-	Not significant.
Ungulates	Potential impacts to moose include changes to habitat and changes to movement patterns resulting from construction activities and habitat change.	▪ Implement visual barriers of plantings or natural materials for portions of the TLA located within preferred moose habitat, and as applicable, to limit long views and exposure (e.g., reduce predator visibility) (Ministry of Natural Resources, 2010). ▪ Manage snow and slash on Project access roads to allow for wildlife crossings, such as ensuring windrow breaks every 50 m for snow or slash. ▪ Implement access control to the Project throughout the Construction and Operations phases. ▪ Implement a Project speed limit for vehicles traveling within the TLA or access roads to less than 30 km/h in order to minimize vehicle-wildlife collisions. ▪ Fence-off excavations if left unsupervised and regularly check excavations for trapped wildlife. ▪ Prohibit hunting, fishing, or recreational use of the Project by the workforce. ▪ Pre-construction wildlife survey will be conducted no more than 7-days prior to vegetation clearing to prevent damages to occupied denning locations.	Low	LSA	Long-term	Not significant.

Valued Component	Potential Impact	Proposed Mitigation Measures	Magnitude	Spatial Extent	Temporal Extent	Significance
Furbearers	Loss of moderate quality furbearer habitat. Induction of avoidance behaviour during construction and operation.	▪ Strategic retention of old or decaying trees and/or placement of cleared old and decaying trees and stems for habitat (e.g., dens). ▪ Implement access control to the Project throughout the Construction and Operations phases. ▪ Implement a Project speed limit for vehicles traveling within the TLA or access roads to less than 30 km/h in order to minimize vehicle-wildlife collisions. ▪ Fence-off excavations if left unsupervised and regularly check excavations for trapped wildlife. ▪ Prohibit hunting, fishing, or recreational use of the Project by the workforce. ▪ Pre-construction wildlife survey (e.g., to identify dens). ▪ Develop and implement accidental den discovery contingency plan.	Low	LSA	Long-term	Not significant.
Bats	Potential loss of roost habitat within the TLA. Changes to foraging behaviours.	▪ Measures as proposed for Furbearers (Section 7.4.2) ▪ Strategic placement of roost boxes in medium to highly suitable bat habitat.	Low	TLA	Medium-term	Not significant.
Raptors and Migratory Birds	Potential habitat loss. Potential behaviour changes due to sensory disturbance from human activity. Potential to change bird species presence and abundance.	▪ Measures as proposed for Furbearers (Section 7.4.2) ▪ Designing transmission structures and substation equipment to adhere to best practices reduce risk of electrocution and collision (APLIC, 2012). ▪ Install avian collision markers on the shield wires crossing any identified stopover habitat, or open-water wetlands. ▪ Install nest deterrents as necessary to prevent use by bird species. ▪ Install guards within substation equipment as necessary to prevent electrocuted. ▪ Pre-construction active raptor nest survey and implementation of setbacks to reduce adverse effect of construction. ▪ Avoid clearing and construction work within the breeding bird period. If work is required during the breeding bird period, conduct pre-construction nest survey in advance of construction (no later than 7 days prior to Construction start). If work is stopped on-site during the breeding bird period for more than 7-days, an additional survey should be conducted. ▪ Develop and implement an Avian Protection Plan as part of Construction and Operations phases. ▪ Consider installation of raptor nest platforms and nest boxes of various dimensions and heights to prevent utilization of transmission structures.	Moderate	LSA	Long-term	Not significant.
Herptiles	None anticipated.	None proposed.	-	-	-	Not significant.
Wildlife Species of Conservation Concern	None anticipated.	None proposed.	-	-	-	Not significant.
Wildlife Species at Risk	None anticipated.	None proposed.	-	-	-	Not significant.
Plant Species at Risk	None anticipated.	▪ Pre-construction vegetation survey to confirm black ash stands are not present within the TLA.	-	-	-	Not significant.

Valued Component	Potential Impact	Proposed Mitigation Measures	Magnitude	Spatial Extent	Temporal Extent	Significance
Significant Wetlands	Potential changes to water quality, and wetland habitat loss.	▪ Micro-siting of structures, construction access, and crane areas to minimize disturbance to the wetland. ▪ Limit construction to frozen conditions. ▪ Flagging the wetland and construction footprint within the wetland. ▪ Utilize temporary access matting or ice roads to minimize impacts to wetland vegetation and substrate. ▪ Develop an Erosion and Sediment Control Plant (ESCP) prevent sedimentation into the wetland. ▪ Develop a Spill Contingency Plan and implement spill prevention measures. ▪ Do not transfer fuel within the boundaries of the PSW. Conduct all refuelling activities with an appropriate spill kit available. Use drip trays when refueling to prevent releases to the environment. ▪ Inspect all heavy equipment and light vehicles for leaks and failures daily. ▪ Place drip trays under all equipment parked or stored within wetland boundaries. Inspect drip trays daily. ▪ Natural recovery and/or planting to reclaim temporarily disturbed areas that will trend the revegetated lands towards the plant community found at the wetland. ▪ Avoid the use of pesticides for vegetation control within the TLA.	Moderate	TLA	Medium-term	Not significant.
Significant Wildlife Habitat	Potential disturbance to waterfowl stopover and staging areas (aquatic), waterfowl nesting area, woodland raptor nesting habitat, moose aquatic feeding habitat, and sharp-tailed grouse leks.	▪ Mitigations proposed for wildlife and wildlife habitat (Section 7.4), and significant wetlands (Section 7.7.1) are expected to address impacts to specialized wildlife habitat	Low	TLA	Long-term	Not significant.
Cultural Heritage Resources	The damage or loss of unanticipated historical resources.	▪ Complete a Stage 2 archaeological survey for subsurface ground disturbance in areas of archaeological potential. ▪ Stop work if unanticipated archaeological or cultural resources are discovered during project activities. ▪ Create and implement a contingency plan for unanticipated discoveries. ▪ Avoid subsoil disturbance for the Project travel lane and access within areas of archaeological potential by using access matting, corduroy roads, or freezing-in snow-fill. ▪ Include an archaeological monitor during construction within areas of potential, if recommended.	-	-	-	Not significant.

9. Cumulative effects assessment

The proposed Project will be built in the context of existing projects including land development and infrastructure associated with the City of Timmins, McEwen Mining's continued open-pit mining to the southwest of Porcupine substation, Glencore Canada's continued underground mining (and progressive reclamation) at Kidd Mine, ARFMI harvesting activities, and the Crawford Mine and including the proposed re-alignment of the highway, powerline, and rail. ARFMI harvesting activities are the only proposed projects TIP1 is aware of in terms of considering future cumulative effects.

Considering the proposed Project will be co-located with a wide linear corridor, the addition of the Project's net effects and interaction with net effects of existing and future projects is not predicted to be measurable.

10. Monitoring

According to the *Class Environmental Assessment for Transmission Facilities* (Hydro One Network Inc., 2024), the purpose of effects monitoring is to confirm the Project's environment effects compared to the predicted Project effects, verify the effectiveness of proposed mitigations, and determine if additional mitigation measures are necessary. Monitoring activities also ensure compliance with environmental and land use commitments, approval conditions, and compliance with environmental legislation.

For the purposes of monitoring, one or more Qualified Environmental Professionals (QEP) will be responsible for developing a Project-specific Environmental Management Plan (EMP) and associated contingency plans described within this document, monitoring construction activities, and advising construction teams on changes to Project mitigations and implementations.

The Project-specific EMP will be prepared following the completion of the Class EA process and finalized before the start of construction. The EMP will include:

- Relevant Project information and environmental commitments including any conditions of approval.
- Providing Environmental Alignment Sheets (EAS) to map all Project environmental constraints relevant to the TLA and Off Right-of-Way Access (ORA).
- Specific directions and standards to implement the proposed mitigation measures and response plans.
- Relevant contingency plans to be implemented during construction.
- Relevant forms for environmental audits, site inspections, wildlife logs, and other required documentation.
- A communication tree for emergency responses.
- Prescribe the form for tracking records of inspections, audits, logs, and incidents.

In addition to regular inspections, a procedure will be developed for local stakeholders and Indigenous people to submit feedback formally regarding the transmission line to address concerns during the construction, operations, and decommissioning phases. A response protocol will also be established to ensure that a response to the formal complaint is provided.

Following Construction, an Operations EMP with an as-built EAS will be prepared to guide ongoing operational activities to ensure future compliance.

11. Conclusions

Transmission Infrastructure Partnerships 1 is seeking approval under the Ontario *Environmental Assessment Act* to construction a new 230 kV single-circuit transmission line based on the need to supply confirmed customers (CNC), improve future transmission system reliability by supporting system development, reduce fossil fuel dependence in northern communities, and advance reconciliation with Indigenous communities. The proposed route of the Project follows existing and future linear infrastructure disturbances and minimizes impacts to local stakeholders, the environment, and Indigenous communities.

Feedback received since the Notice of Commencement was issued in ~~November~~ 2023, and the results of the environmental inventory, were incorporated in the proposed route. Environmental effects were identified and considered for the Project, and appropriate mitigation measures were proposed to reduce or eliminate the net effect and significance of these impacts. As a result, no significant net adverse environmental effects are anticipated, and no cumulative environmental effects are anticipated.

12. References

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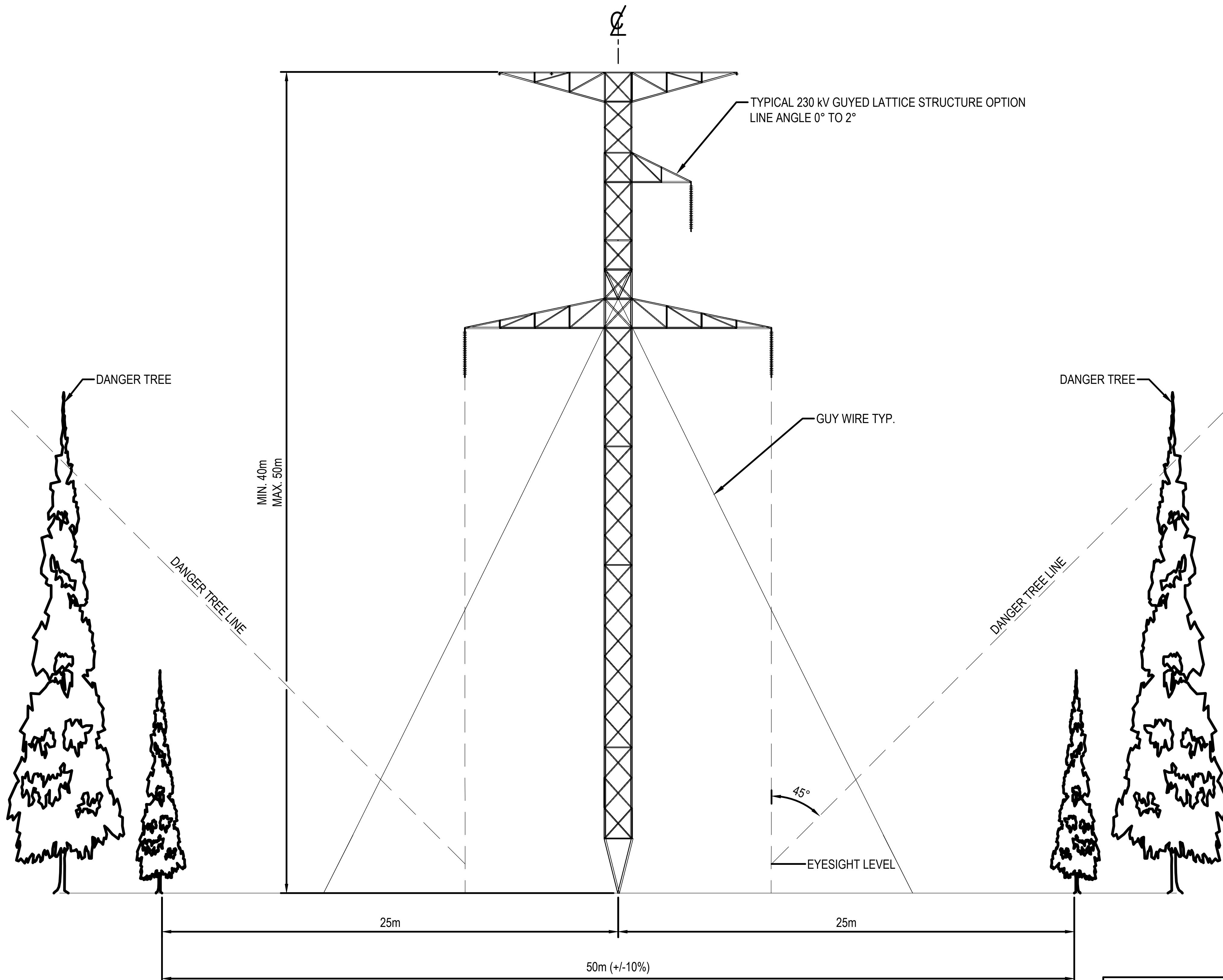
Appendix A: Project Infrastructure

NOTE:

1- ALL DIMENSIONS ARE IN METERS (m).



RIGHT-OF -WAY

FOR INFORMATION
NOT TO BE USED FOR CONSTRUCTION

REV	DESCRIPTION	VERIFIED BY	APPROVED BY	DATE
AA	FOR INFORMATION	C.PEIRIS	M. NÉRON	2024-08-14

REVISIONS

CLIENT: TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

BBA

DESIGNED BY: C. PEIRIS	DRAFTED BY: C. PEIRIS
PREPARED BY: C. PEIRIS	CHECKED BY: M. NÉRON
SCALE: N.T.S.	DATE: 2024-08-14

SEAL:

PROJECT: CRAWFORD PROJECT

TITLE:
230 kV TRANSMISSION LINE
PRELIMINARY RIGHT-OF-WAY FOR
GUYED LATTICE STRUCTURE

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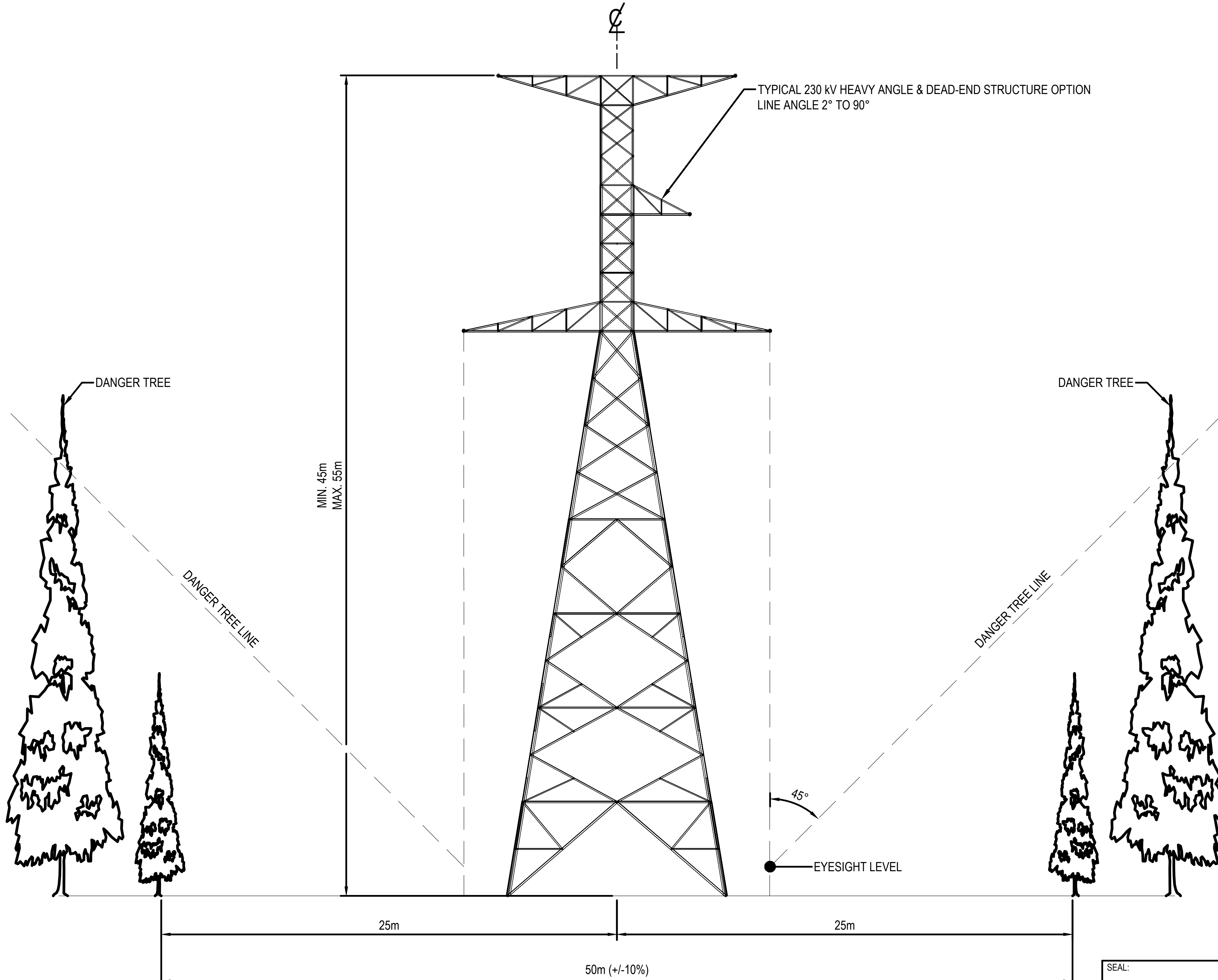

NOTE:

1- ALL DIMENSIONS ARE IN METERS (m).

FOR INFORMATION
NOT TO BE USED FOR CONSTRUCTION

RIGHT-OF -WAY

REV	DESCRIPTION	VERIFIED BY	APPROVED BY	DATE
AA	FOR INFORMATION	C. PEIRIS	M. NÉRON	2024-08-14

REVISIONS

CLIENT: TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

BBA

DESIGNED BY: C. PEIRIS	DRAFTED BY: C. PEIRIS
PREPARED BY: C. PEIRIS	CHECKED BY: M. NÉRON
SCALE: N.T.S.	DATE: 2024-08-14

SEAL:

PROJECT: CRAWFORD PROJECT

TITLE: 230 kV TRANSMISSION LINE
PRELIMINARY RIGHT-OF-WAY FOR
HEAVY ANGLE & DEAD-END STRUCTURE

DRAWING No.:	SHEET:	SIZE:	REV.
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Appendix B: Consultation Records

- Appendix B-1: Project Contact List
- Appendix B-2: Notifications
- Appendix B-3: Consultation and Open House Material
- Appendix B-4: Communication log

Appendix A1- Project Contact List

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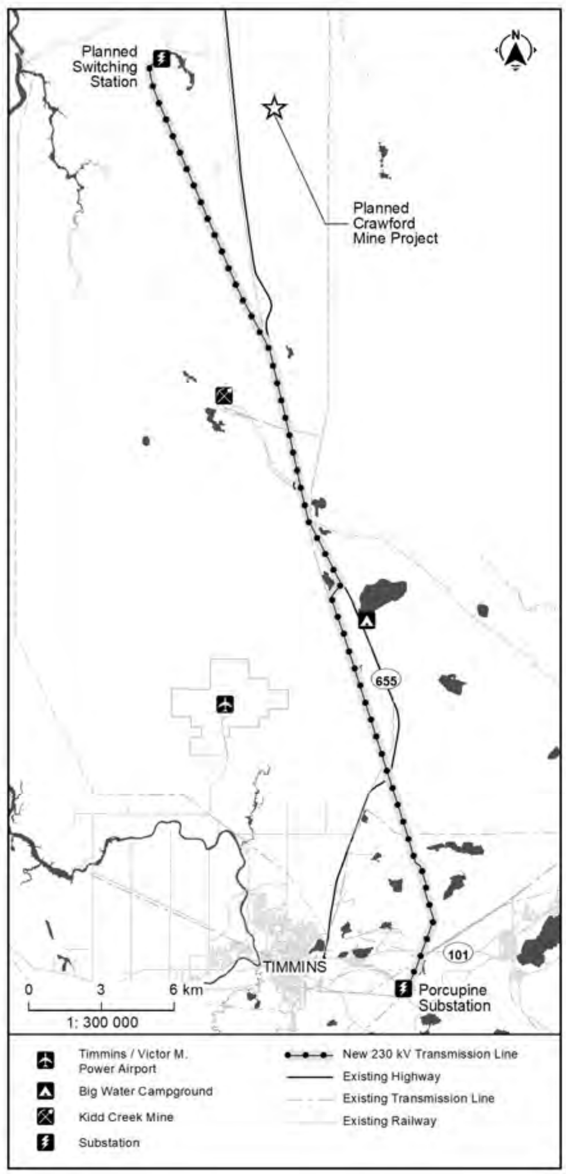
Ye Jun	Cheng		Landowner	9397 Longwoods Road, Chatham ON N7M 5J7
		GOLDCORP PORCUPINE NOMINEE LTD - NEWMONT	Landowner	4315 Gold Mine Rd. South Porcupine ON P0N 1H0
		MONETA PORCUPINE MINES INC.		1875 ON-101 Schumacher ON P0N 1G0
		CUSTOM CONCRETE	Landowner	2416 Highway 655 Timmins ON P4N 8R9
Hugh	Stirling O'Neill		Landowner	1387 Chenier Avenue Timmins ON P4R 1A8
		2197630 ONTARIO LTD., Caron Equipment	Landowner	39 Quebec Avenue South Porcupine ON P0N 1H0
		TIMMINS FOREST PRODUCTS LTD.	Landowner	592 Toke St. Timmins ON P4N 6W1
Marc	Carriere		Landowner	1407 Pine St South Timmins ON P4N 2M1
		FLY LAKE ESTATES INC.	Landowner	75 Milford Crescent Brampton ON L6S 3E3
Guy	Lambert		Landowner	448 Tonelli Ave. Timmins ON P4N 7B6
Joann	Mathews Carpenter	Daniel Byron Mathews	Landowner	Rt. 7, Box 176 Ada Oklahoma 74820
		NEW SENATOR-ROUYN LIMITED	Landowner	100 King St W Toronto ON M5X 2A1
Lynne	Picotte	John Klimo	Landowner	7999 HWY 655 Timmins ON P4N 8R9
		1604360 ONTARIO LIMITED	Landowner	373 Commercial Avenue Timmins ON P4N 2X8
Robert and Sallie	Teasdale		Landowner	142 Freeland Drive Stratford ON N4Z 1H2

Notice of Commencement and Public Information Session

Class Environmental Assessment for a new 230 kilovolt
Transmission Line from Timmins north along Hwy 655

TIP-1 Transmission Line Project



This Notice of Commencement is provided to inform the public, Indigenous communities and interested parties that Transmission Infrastructure Partnerships 1 Limited (TIP-1) is beginning an environmental study to determine the potential environmental effects of the construction of a 230kV transmission line connecting the Porcupine Substation in Timmins, ON with a planned new switching station to be constructed 42 km north of Timmins.

Who We Are
TIP-1 is jointly and equally owned by Taykwa Tagamou Nation (TTN) and Transmission Infrastructure Partnerships Limited (TIP). The Company has an agreement in place with Canada Nickel Corporation to support the electrical demand of the planned Crawford Mine Project.

The Project
The TIP-1 Transmission Line will promote Indigenous participation, support the development of Ontario's critical mineral supply, and improve electrical reliability in the Northern Ontario.

The proposed project is subject to a Class Environmental Assessment for Minor Transmission Line Facilities (Hydro One, 2022) under the Ontario Environmental Assessment Act.

Public Information Session

November 15, 2023
4pm-8pm
Timmins Museum
325 2nd Ave
Timmins, ON P4N 8A4

Questions? Comments?
For more information and to reach out with comments or questions about the TIP-1 Transmission Line Project, please visit our Project website **www.tip.limited** or email us at **info@tip.limited**

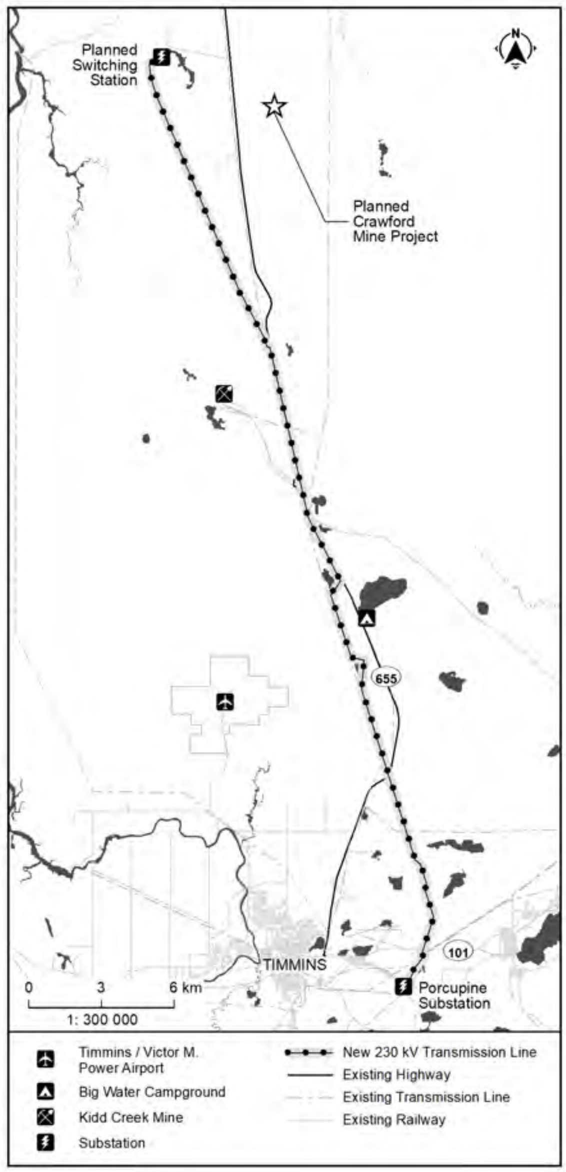
October 23, 2023

All personal information included in a submission – such as name, address, telephone number and property location – is collected, maintained and disclosed by the Ministry of the Environment Conservation and Parks for the purpose of transparency and consultation. The information is collected under the authority of the *Environmental Assessment Act* or is collected and maintained for the purpose of creating a record that is available to the general public as described in s.37 of the *Freedom of Information and Protection of Privacy Act*. Personal information you submit will become part of a public record that is available to the general public unless you request that your personal information remain confidential. For more information, please contact the Project Officer or the Ministry of the Environment and Climate Change's Freedom of Information and Privacy Coordinator at (416) 327-1434.

TRANSMISSION
INFRASTRUCTURE
PARTNERSHIPS

OPEN HOUSE INVITATION

TIP-1 Transmission Line Project



You are invited to the second open house hosted by TIP-1, a company jointly owned by Taykwa Tagamou Nation and Transmission Infrastructure Partnerships Limited (TIP), where you can learn more about the construction of a proposed 230kV transmission line.

This transmission line will connect the Porcupine Substation in Timmins, ON, with a planned new switching station located 42 km north of Timmins.

The proposed project is subject to a Class Environmental Assessment for Transmission Facilities (Hydro One, 2024) under the Ontario Environmental Assessment Act.

Meeting Information
Wednesday, May 29th, 2024
4pm-8pm

Location
Senator Hotel
14 Mountjoy St South
Timmins, ON (P4N 1S4)

Feel free to attend anytime during the allotted time frame; please note we will not be hosting a formal presentation.

No pre-registration required.

For any questions or more information

www.tip.limited

info@tip.limited

TIP-1 Transmission Line Project

Public Information Session

November 15, 2023

ABOUT TIP-1

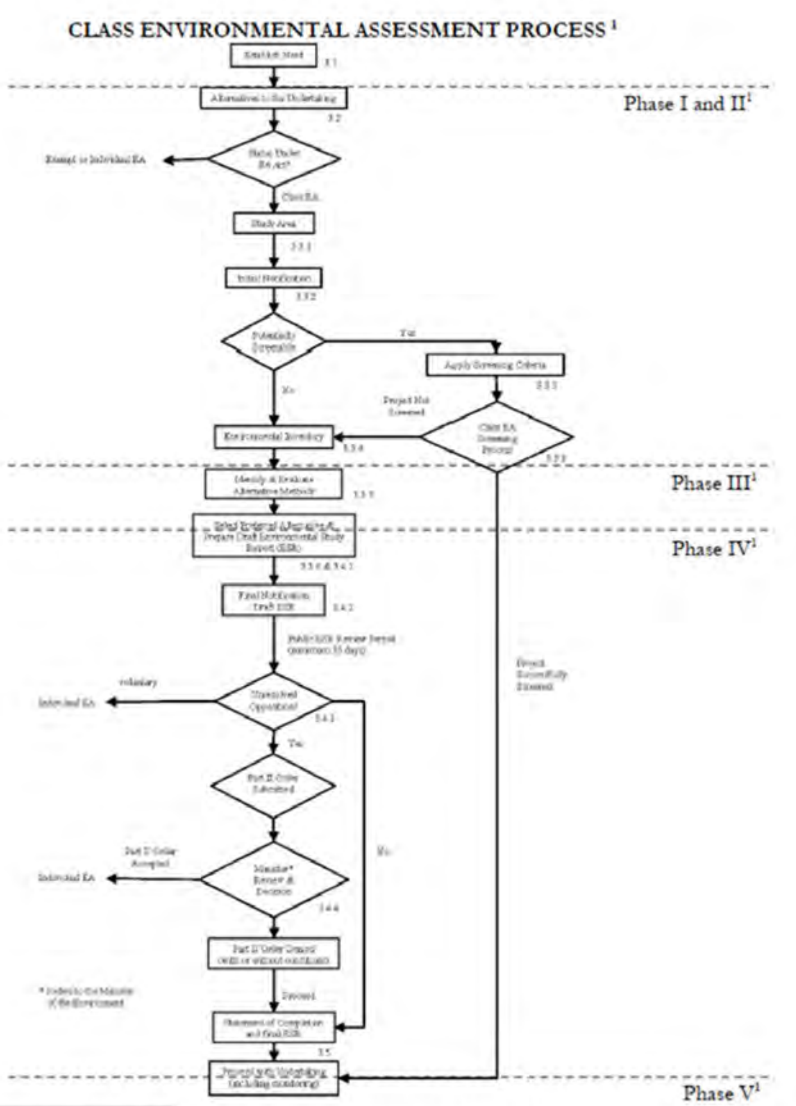
Transmission Infrastructure Partnerships Limited is a partnership between Ameren Corporation, a Fortune 500 utility company, and Vires Partners Inc, a company focused on working with First Nations and Inuit for infrastructure investment opportunities.

TIP has a portfolio of partnerships with First Nations and Inuit holding 14 separate transmission line opportunities across Eastern and Northern Canada. The total capital projected for these opportunities is an estimated C$6.6B, with TIP offering a path to a 100% equity stake for First Nations and Inuit. All these projects are in the early stages of development except for the Crawford Mine Transmission Project, which has entered permitting and financing.

This initial project is an investment opportunity in a significant transmission line, with a high potential for stable regulated asset returns.

ENVIRONMENTAL ASSESSMENT PROCESS

Class EA for Minor Transmission Facilities
Category B: 230kV less than 50km



[1] Phases of Generic Project Planning Process as described in the MOECC's Code of Practice, s. 6.1.7

Establish Need
Identify Study Area
Notice of Commencement
Apply Screening Criteria
Undertake Environmental Inventory
Evaluate Alternatives
Final Notice and Draft ESR
Statement of Completion and Final ESR

NEED FOR THE PROJECT

Indigenous Reconciliation and Resurgence.

TTN is an equal majority equity owner and shareholder in TIP-1. It is committed to ensuring a high degree of First Nations employment, contracting, procurement, support, and involvement in the Project.

Critical Mineral Supply Supporting Electrification and Energy Transition.

The Project will support the electrification of the planned Crawford Mine a critical mineral project that will contribute to Ontario's electrification, and the electric battery, automotive, transportation, and energy storage sectors.

Needed Electricity Infrastructure.

The need for new and reliable electricity transmission infrastructure in this part of the province is supported by regional planning and studies confirming the very poor electricity reliability in certain northern and Indigenous communities across Northern Ontario.

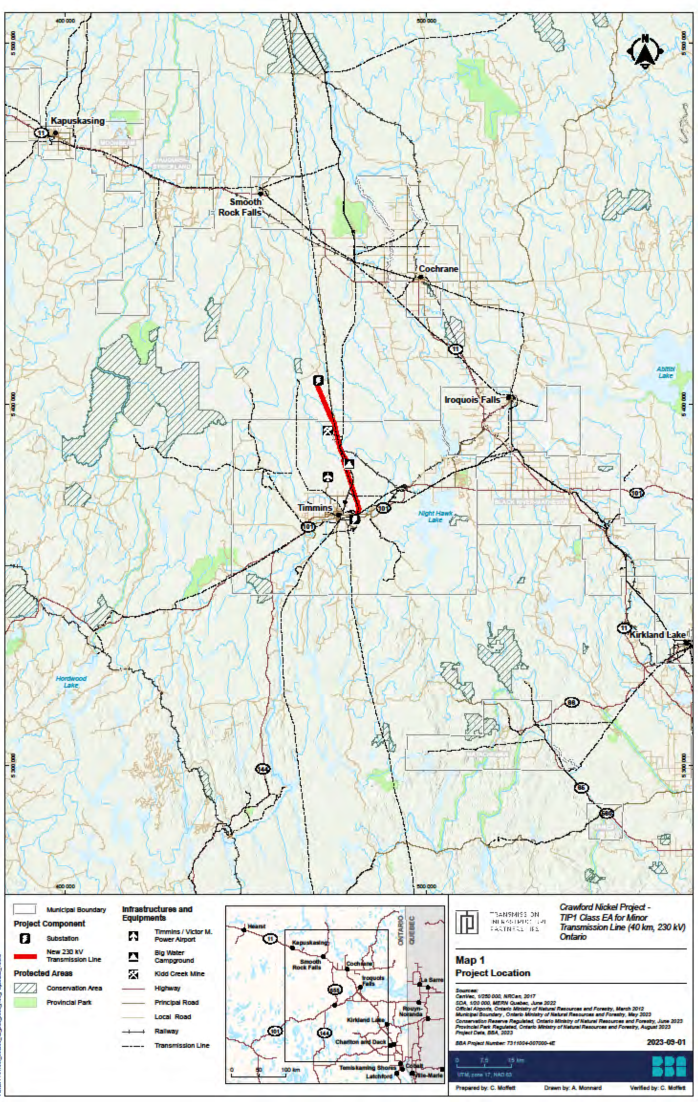
Sustainable Development of Northern Ontario.

TIP-1 and the proposed transmission project support employment in Northern Ontario and Ontario's transition to a lower carbon economy through very low emissions electricity infrastructure in Northern Ontario, an area where many communities are currently reliant on higher emissions sources of energy.

PROJECT DESCRIPTION

230kV transmission line connecting the Porcupine Substation in Timmins, ON with a planned new switching station to be constructed 42 km north of Timmins, adjacent to the planned Crawford Mine Project. Approximately 100 wood poles will be installed along a 50m right of way.

Watercourse crossings and sensitive wildlife habitat will be avoided where possible.



Site preparation

Access Roads:

Tower Foundations:

Tower Assembly and Erection:

Conductor Stringing:

Counterpoise:

Clean-up:

Ongoing maintenance

TERRESTRIAL STUDIES

Terrestrial field work was undertaken within the study area throughout 2021 and 2022

Bird studies included surveys for
- Breeding birds
- Migratory birds
- Noctural owls
- Waterfowl, shorebirds
- Marsh birds

Amphibian call surveys and bat maternity roost recordings were also undertaken

Additional Ecological Land Classification and stream and lake mapping was completed within the study area in August 2023

ARCHAEOLOGY

Stage 1 desktop study undertaken in Summer 2023

Stage 2 field studies planned for Spring 2024

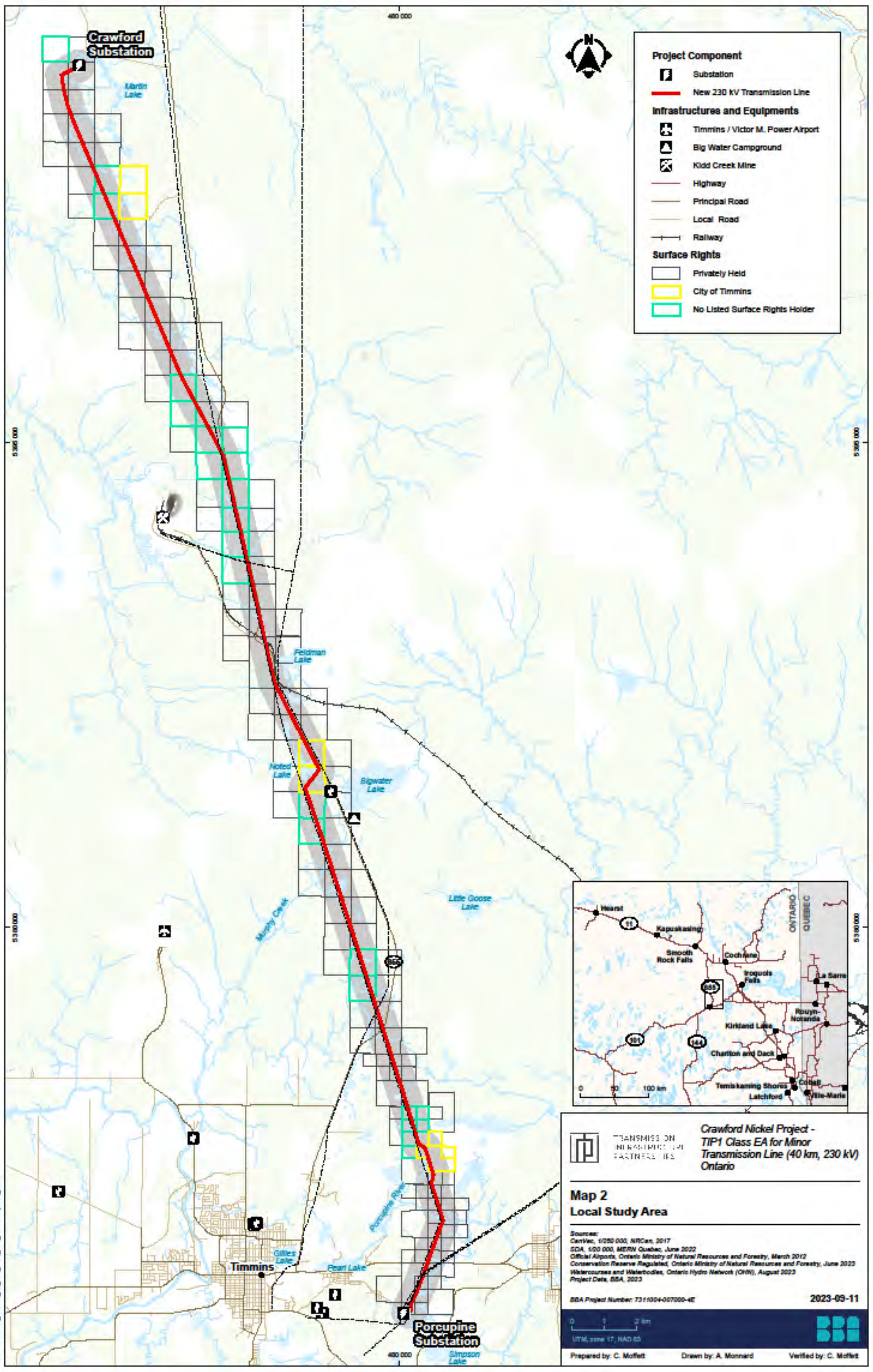
Several areas of potential have been identified

Lake Ojibway shoreline

Avoid shorelines for routing of the transmission line and siting of poles

PROPOSED ALIGNMENT

- Local Study Area includes 1km wide 42km long corridor
- Right of Way will be 50m total
- Runs east of existing highway and power line for first 25km
- Siting of towers has not been complete
- Will not require work in water
- Avoids significant wildlife habitat where possible



PROJECT ALTERNATIVES

Alternative 1 Base Case:
- 42km line running north from Porcupine Station
- 25km is along existing ROW

Alternative 2 Western Option:
- +60km running east of Mattagami River

Alternative 3 Northern Option:
- +100km line running south from Pinard Station

Alternative Methods include diesel generators, on site solar or wind power generation, natural gas trucked or piped to site

PROJECT SCHEDULE

The Class EA officially began in November 2023. The coming months will include an assessment of potential effects which will be published in a Draft Environmental Study Report planned to be complete in February 2024.

Additional field work and consultation will be undertaken to finalize the report, with a planned completion date of September 2024.

TRANSMISSION
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PROJECT TIMELINE

Activity Status

Project initiation

Determine project location	✓
Preliminary design	Underway
Issue project notification	✓

Environmental Assessments

Terrestrial fieldwork including birds and mammal surveys	✓
Ecological land classification	✓
Stream and lake mapping	✓
Stage 1 Archaeological Assessment	✓
Stage 2 Archaeological Assessment	TBD

Consultations

Timmins public consultation	Underway
First Nations consultations	Underway

Q2 2023
- Electricity Transmission Licence Received
- Ontario Energy Board Decision (EB-2023-0084)

Q3 2023
- Completion of environmental surveys
- Archeaological Survey

Q2 2024
- Host Public Open Houses

Q3 2024
- Completion of Consultation
- Stage 2 Archaeological Assessment
- Draft Environmental Study Report for Public Comment

Q4 2024
- Succesful MTF
- Class EA Screening
- Environmental Permits for Construction

Q2 2025
- Environmental Permits for Construction

Q3 2025
- Start of Construction

Q1 2027
- Transmission Line Energization

ENVIRONMENTAL CONSIDERATIONS

- Class EA for Minor Transmission Facilities under the responsibility of the Ministry of Environment, Conservation and Parks of Ontario.
- Category B Project (230 kV, < 50 km)

Wildlife	• Surveys have been completed for songbirds, raptors, sharptailed grouse, bats, and amphibians. • Habitat has been assessed for dens, amphibians, moose, and waterfowl. • No nests, dens, or hibernacula for species-at-risk have been identified.
Land Use	• The project aligns with regional and local land use planning. • Complementary land uses are possible within the project's right-of-way (ROW) during operations.
Recreation and tourism	• Continued recreational activities anticipated during and after construction. • Community engagement planned for detailed design to avoid important trail segments.
Hunting, Trapping and Gathering	• Project alignment respects existing linear disturbances. • No measurable effects predicted on hunting, trapping, or fishing. • Community engagement planned to avoid impacting important plant populations
Mineral Resources	• Co-location with existing infrastructure to minimize disruption. • Measures to avoid impeding access to mineral resources facilities.
Forestry Resources	• Minimal impact on forest reserve and planned cutblocks. • Merchantable trees provided to Abitibi River Forest Management Inc. • No significant effects predicted on current or planned forestry resource land uses.

ABOUT TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

Transmission Infrastructure Partnerships Limited (TIP-1) is a partnership between Tagwa Tagamou Nation (50%), ATX Canada (25%) , a subsiduary of Ameren Corporation, a Fortune 500 utility company, and Vires Partners Inc (25%) , a company focused on working with First Nations and Inuit for infrastructure investment opportunities.

The TIP-1 partnership was formed to build a power transmission line that will supply clean, green, electricity to a new nickel mine being developed by Canada Nickel Company (CNC).

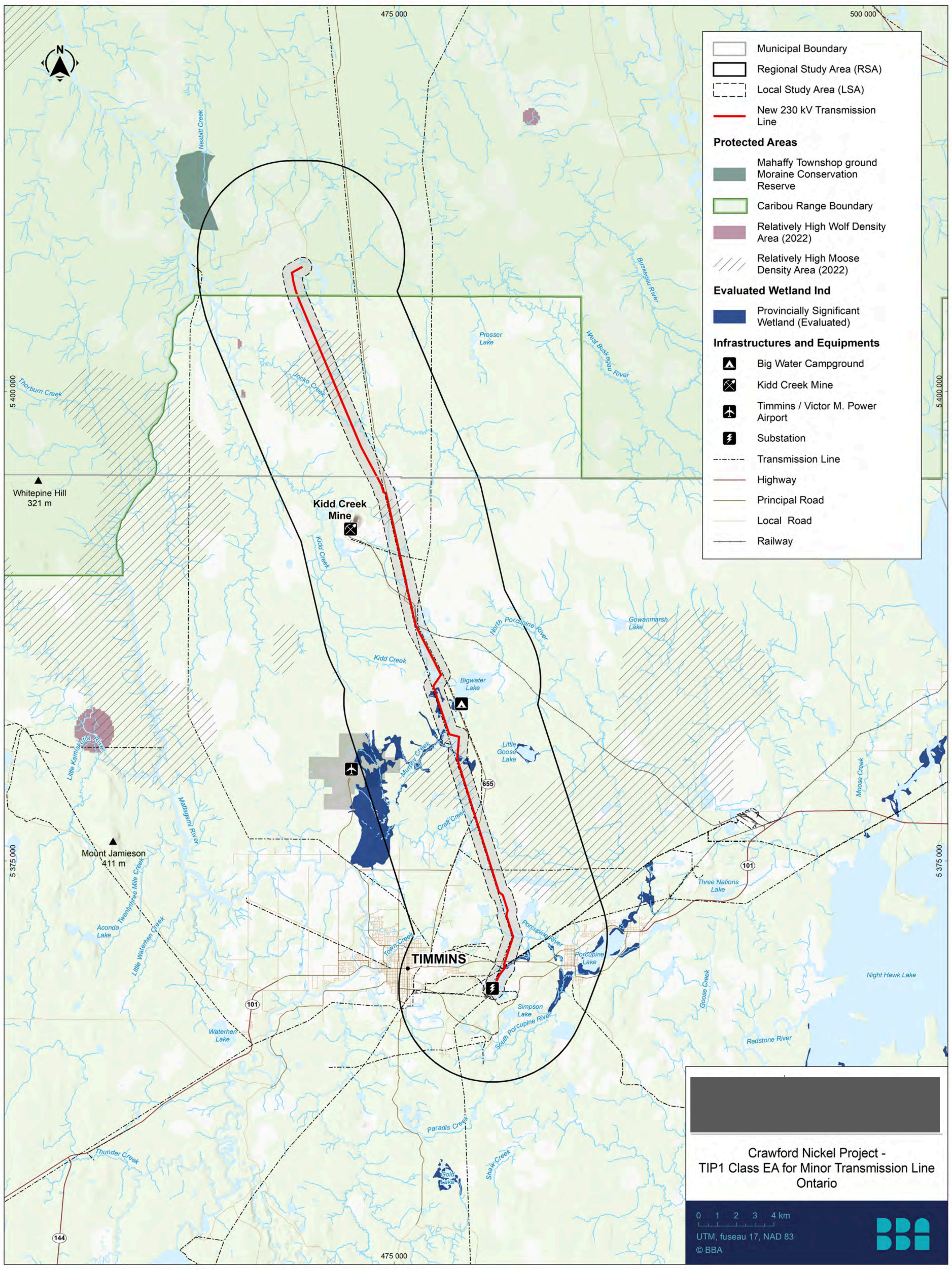
CNC's Crawford Nickel Mine is one of the largest nickel deposits in the world. Nickel is a key commodity to facilitate the green energy transition and to supplying the production of stainless steel.

The Crawford Mine will also be the world's largest carbon neutral mining operation with an all-electric powered mining fleet and an ability to capture and sequester carbon emissions.

Carbon neutrality at the mine is an achievement that will be facilitated by the power provided from TIP-1's transmission line.

This initial project is an investment opportunity in a significant transmission line, with a high potential for stable regulated asset returns.

PROJECT INFORMATION



Description

A 230 kV transmission line will connect the Porcupine Substation in Timmins, ON, to a new switching station located 42 km north, adjacent to the planned Crawford Mine Project.

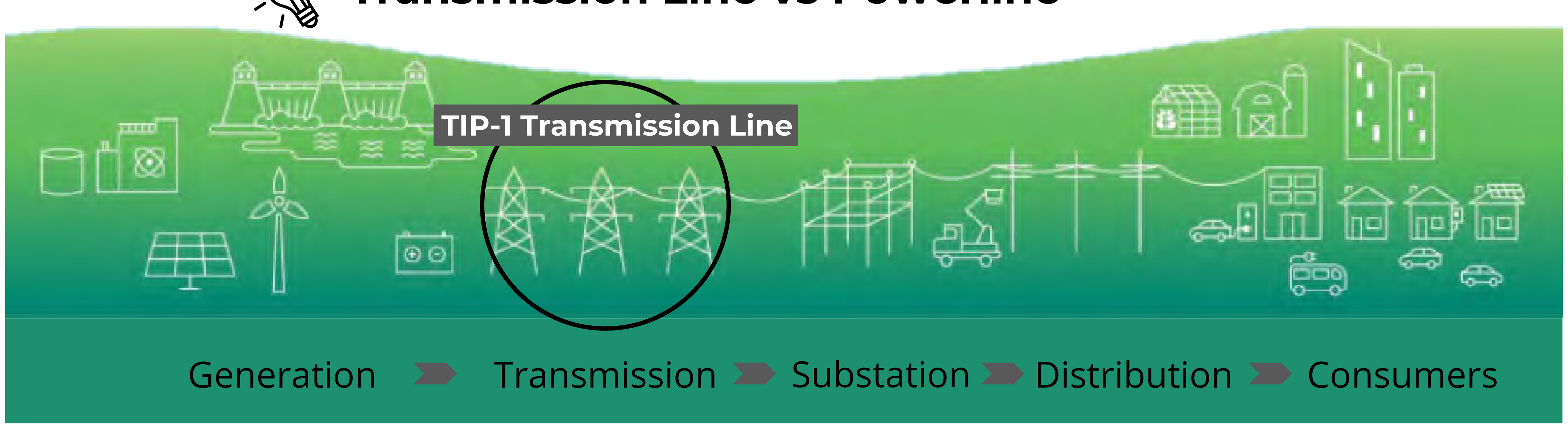
Installation details

Transmission structures will be installed within a 50m right of way. Structures are anticipated to be a guyed steel structure pending final design.

Environmental considerations

Watercourse crossings and sensitive wildlife habitats will be avoided wherever feasible to minimize environmental impact

Transmission Line vs Powerline



NEED FOR THE PROJECT

TIP-1 Indigenous commitment

- Taykwa Tagamou Nation holds an equal majority equity stake in TIP-1 and is dedicated to fostering Indigenous employment, contracting, procurement, support, and participation within the project.

Critical Mineral Supply for Energy Transition

- The Project will facilitate the electrification of the upcoming Crawford Mine, a critical mineral project that will contribute to Ontario's electrification goals and the advancement of electric battery, automotive, transportation, and energy storage sectors.

Electricity Infrastructure Needs

- The demand for dependable electricity transmission infrastructure in this region is underscored by regional planning and studies highlighting the inadequate electricity reliability in certain northern and Indigenous communities across Northern Ontario.

Promoting Sustainable Development

- TIP-1 and the proposed transmission project support employment growth in Northern Ontario, contributing to Ontario's shift towards a lower carbon economy through the establishment of very low emissions electricity infrastructure, particularly in regions where communities heavily rely on higher emissions energy sources.

TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

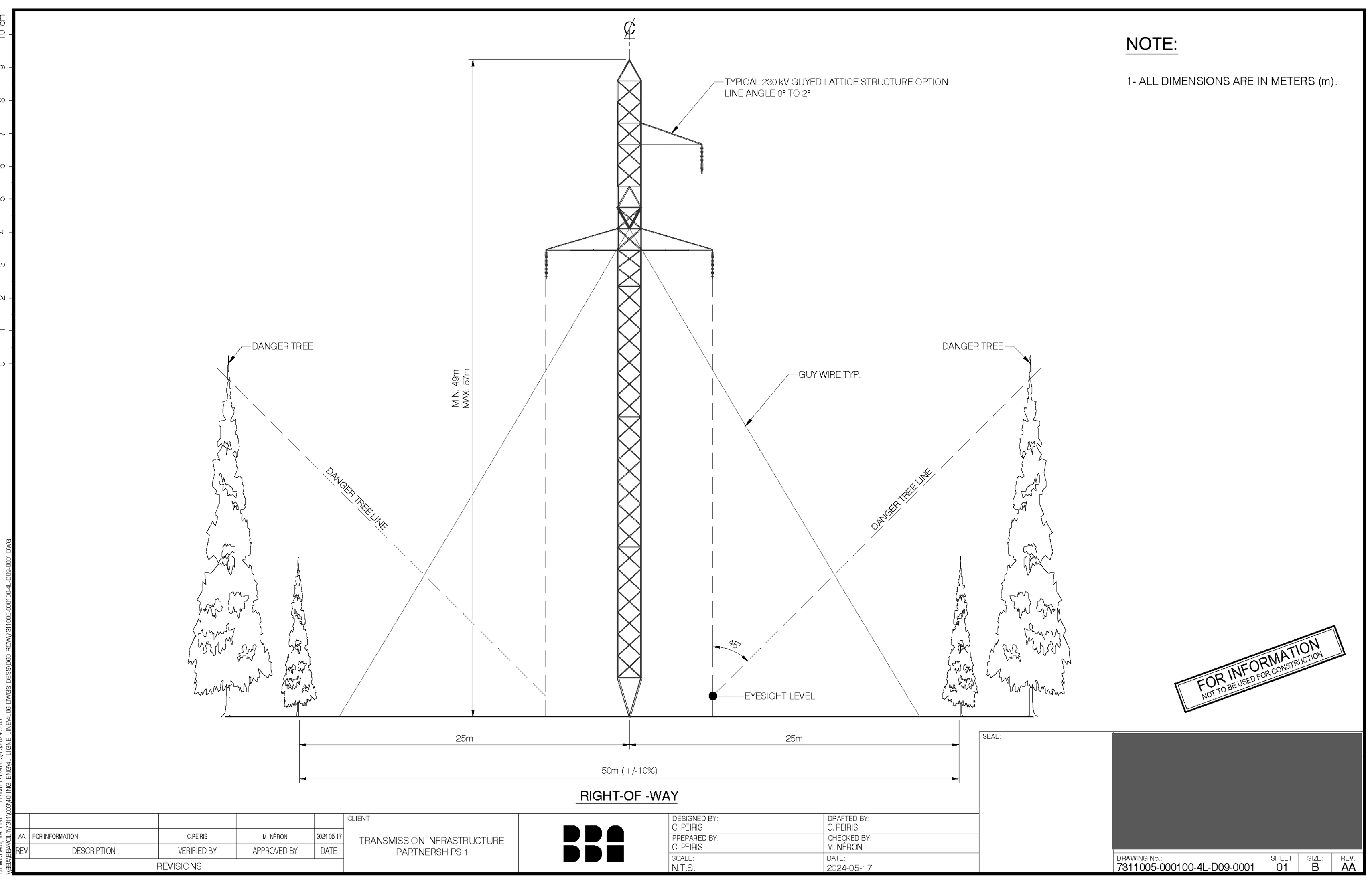
INFRASTRUCTURE INFORMATION

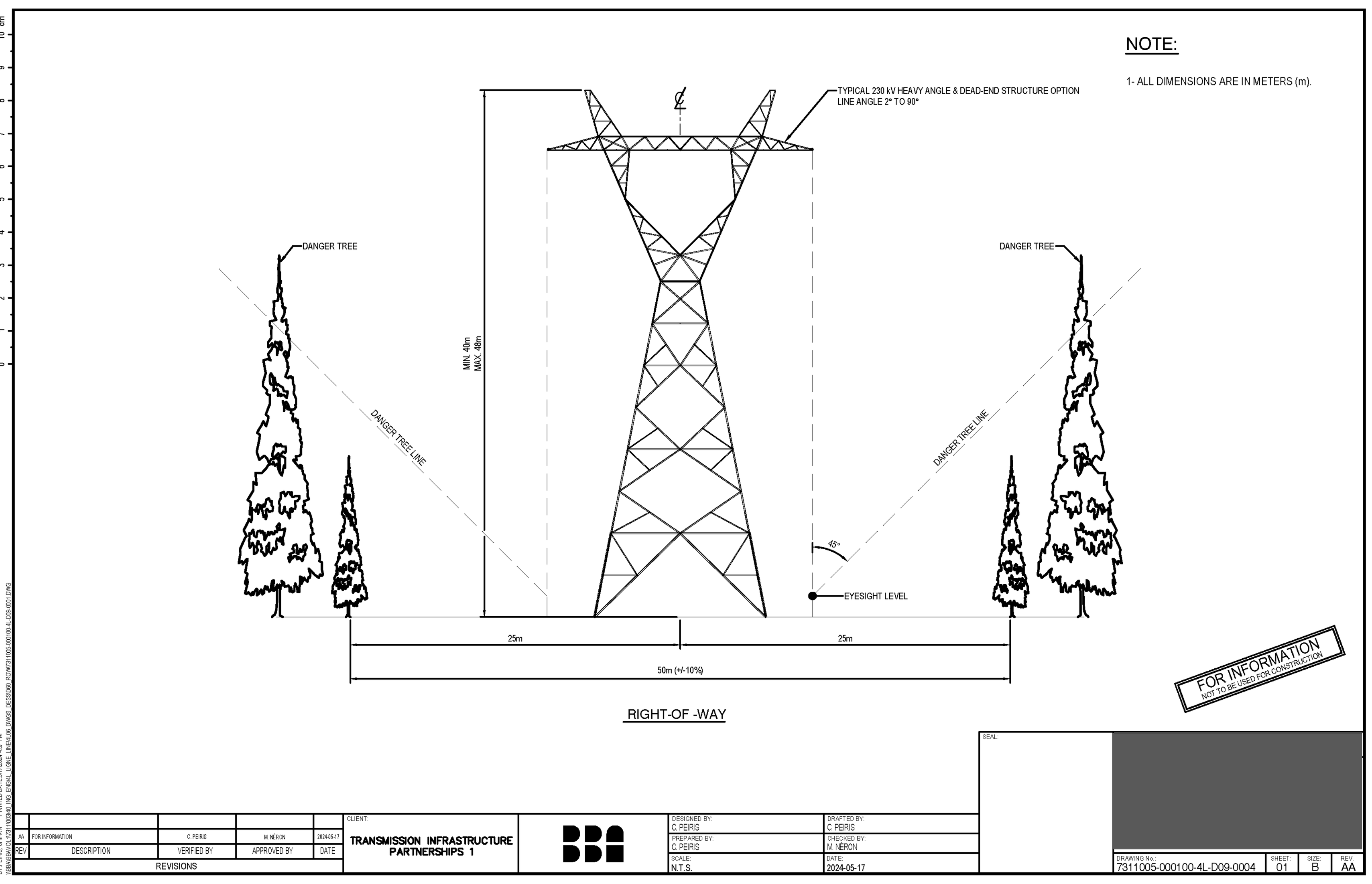
Structural Options

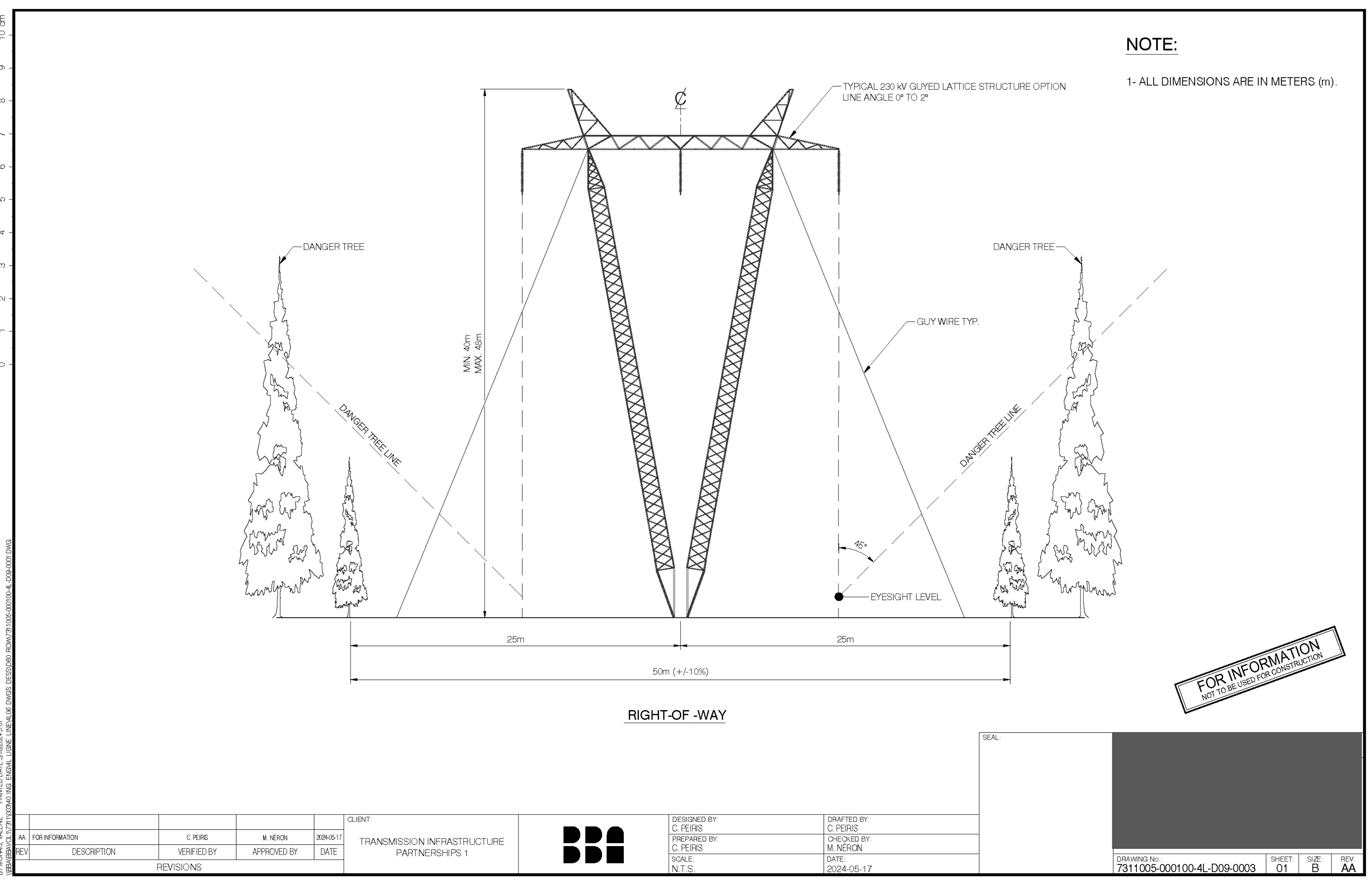
- Four types of structures are under consideration for the project.
- Two or three of these options will be selected for use.

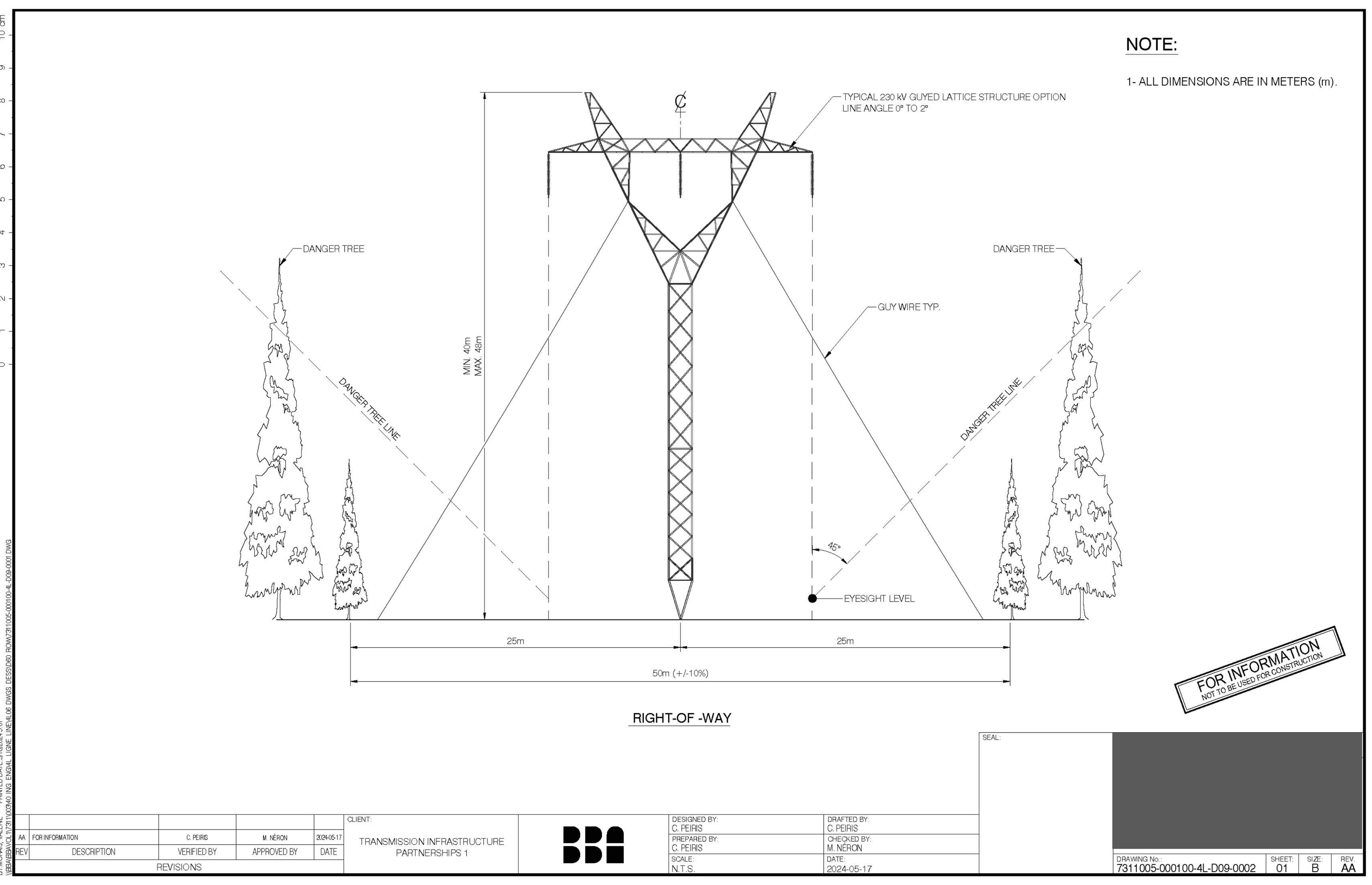
Advantages of Steel Structures

- Potentially greater electricity transport capabilities.
- Boast a longer lifespan compared to alternative materials.
- Fewer structures are required compared to wood poles, allowing for larger spans and greater overhead clearances.
- Lowers the risk posed by wildfire.









INSIGHTS AND FEEDBACK

Local Job opportunities

- Our commitment is to maximize local employment opportunities, especially for First Nations and local communities. More detailed job numbers will be provided as the project progresses.
- We will provide a list of required job qualifications to interested stakeholders to ensure they are prepared for employment opportunities associated with the project.
- Meaningful opportunities for indigenous communities will include employment, training, procurement, and economic development.

Engagement and consultation efforts

- We have held introductory meetings with key regulatory agencies and provided a Notice of Commencement in accordance with the Class EA guideline to Indigenous communities and provincial regulators.
- Conducted a first public information session in Timmins on November 15 and a community information session with the Taykwa Tagamou community on February 1st.
- Proactive steps have been taken to engage with indigenous communities throughout the project's development process.
- We are in communication with the Wabun Tribal Council, representing the Matachewan, Flying Post, and Mattagami nations, with plans for formal consultations to be scheduled.

Environmental process

- The Class EA for Transmission Facilities mandates an environmental inventory covering various aspects including Agriculture, Forestry, Cultural Heritage, Human Settlements, Mineral Resources, Natural Environment Resources, Recreational Resources, and Visual Resources.
- Criteria considered during route selection included minimizing environmental and cultural impacts, optimizing land use, maximizing operational efficiency, and ensuring compliance with regulatory requirements.
- The current route was selected to minimize habitat impacts through colocation with other facilities and minimize total length, reduce turns, minimize the length through high density moose and wolf habitat, and avoid dwellings.

UPDATES ON OUR CHANGES

- Changed line route to minimize environmental impacts
- Substituted wood poles with steel structures

Appendix C: Natural Heritage Baseline Report

Transmission Infrastructure Partnerships 1 Limited

TIP-1 Transmission Line Project

Carnegie Township, District of Cochrane, ON

Technical Report

Natural Environment Baseline Technical Data Report

BBA Document No./Rev.: 7311004-004000-4E-ERA-0002-R00

October 25, 2024

FINAL

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BBA Document No./Rev.: 7311004-004000-4E-ERA-0002/RAA

REVISION HISTORY

Revision	Document Status – Revision Description	Date
R00	Final	2024-10-25

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APPENDICES

Appendix A: Vascular Plants inventoried in the LSA (August 2023)
Appendix B: Photographs of Vegetation Communities and Aquatic Habitat Surveys (August 2023)
Appendix C: Birds Surveyed in the CNC Project Study Area (WSP E&I Canada Limited, 2024a)
Appendix D: Aquatic Habitat Characterization (August 2023)

Acronyms and Abbreviations

Abbrev/Acronym	Definition
ANSI	Area of Natural and Scientific Interest
CNC	Canada Nickel Company Inc.
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
COSSARO	Committee on the Status of Species at Risk in Ontario
ELC	Ecological Land Classification
ESA	Endangered Species Act
FRI	Forest Resources Inventory
km	kilometer
kV	kilovolt
LIO	Land Information Ontario
LSA	Local study area
MECP	Ministry of the Environment, Conservation and Parks
MNRF	Ministry of Natural Resources and Forestry
NHIC	Natural Heritage Information Centre
OBBA	Ontario Breeding Bird Atlas
OWES	Ontario Wetland Evaluation System
RSA	Regional study area
SAR	Species at Risk
SARA	Species at Risk Act
SCC	Species of Conservation Concern
TLA	Transmission line alignment

1. Introduction

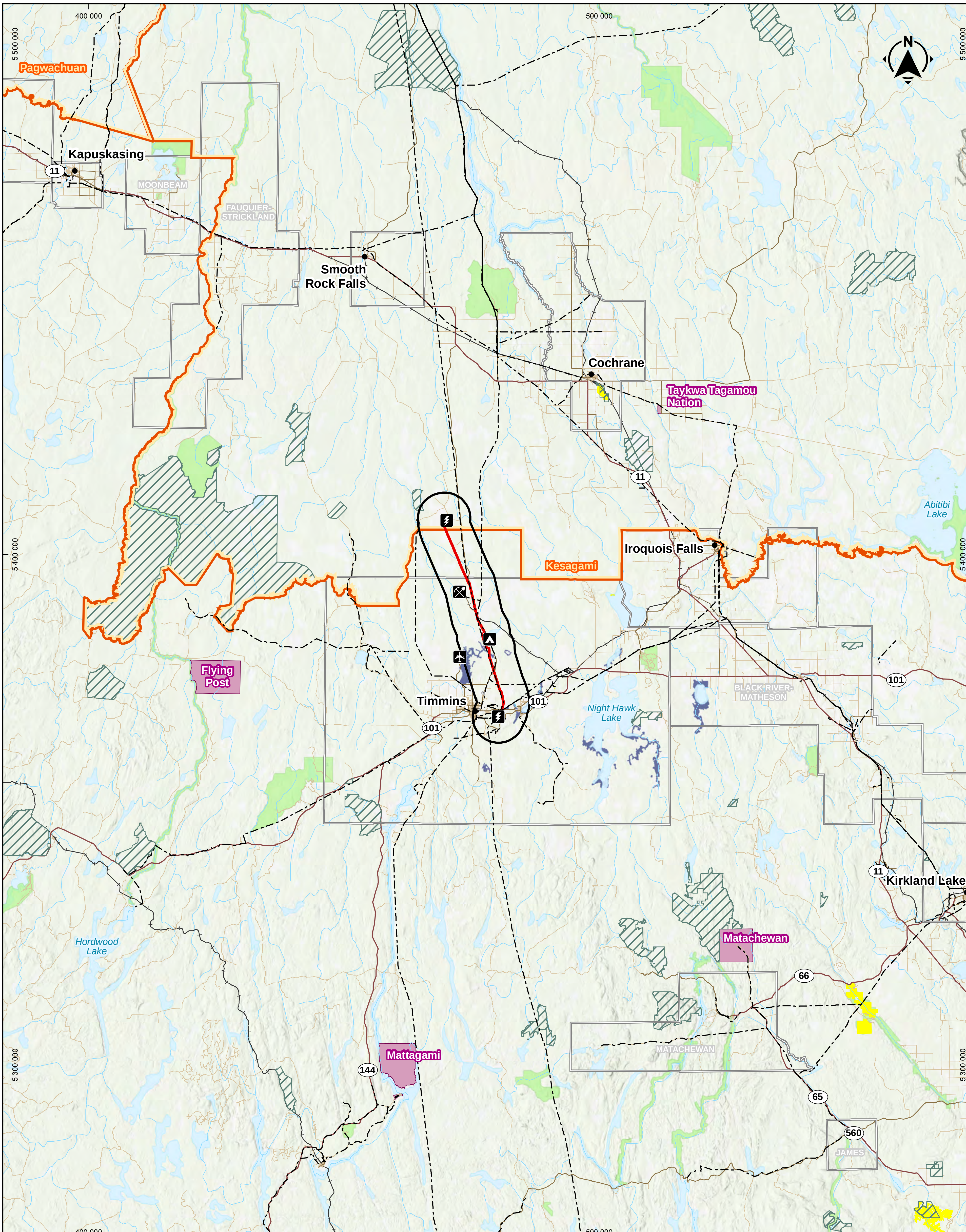
Transmission Infrastructure Partnership (TIP-1) proposes to construct and operate a new 230 kV transmission line from the existing Porcupine Substation to the switchyard at Canada Nickel Company's (CNC) proposed Crawford Copper Mine, referred to as the TIP-1 Transmission Line Project (the Project). The proposed TIP-1 transmission line alignment (TLA) will span 42 km, primarily along an existing corridor, including an existing corridor that CNC plans to divert to accommodate their proposed mine (Map 1).

1.1. Study objectives and scope

TIP-1 has retained BBA, to carry out a natural environment baseline study over a Regional Study Area (RSA) centered along the proposed Transmission Line Alignment (TLA). The RSA used in this study consists of the area located within 5 km of the TLA (Map 2). The surface area of the RSA is 49,960.9 ha. This baseline environmental study documents the existing conditions of the terrestrial natural heritage features and aquatic resources present within the RSA and identifies potential constraints. BBA also established a Local Study Area (LSA) that encompasses the TLA and the area 500 m to either side (Map). The LSA is expected to be the area over which direct and indirect effects of the TLA are measurable. TIP-1 works in close collaboration with CNC and has entered into a natural environment data-sharing agreement with CNC so they can use this information in support of their Class EA for Minor Transmission Facilities.

1.2. Study area overview

The RSA is located within the ecoregion 3E (Lake Abitibi Ecoregion). The majority of the ecoregion is contained within the Hudson Bay Watershed, which contains a large number of meandering rivers, including the Abitibi and Mattagami Rivers and numerous lakes. Drainage is highly variable. Ecoregion 3E is located on the Precambrian Shield, underlain by granitic or gneissic bedrock, with some areas of less acidic metavolcanic and metasedimentary rock. The Clay Belt is prominent in the northeastern part of the ecoregion and is situated on deep glaciolacustrine sediments of the former post-glacial Lake Barlow-Ojibway and on morainal calcareous clays and silts. The Clay Belt is a vast tract of fertile soil in Canada, stretching across Cochrane District in Ontario and Abitibi County in Quebec, covering 180,000 km^2 in total with 120,000 km^2 of that in Ontario. Ground moraine is prominent in most other areas (Crins, Gray, Uhlig, & Wester, 2009).



Municipal Boundary

Regional Study Area

Indigenous Community

Project Component

New 230 kV Transmission Line

Protected Areas

Conservation Reserve

Provincial Park

Provincially Significant Wetland (Evaluated)

Area of Natural and Scientific Interest (ANSI)

Caribou Range Boundary

Infrastructure and Facilities

Substation

Timmins / Victor M. Power Airport

Big Water Campground

Kidd Creek Mine

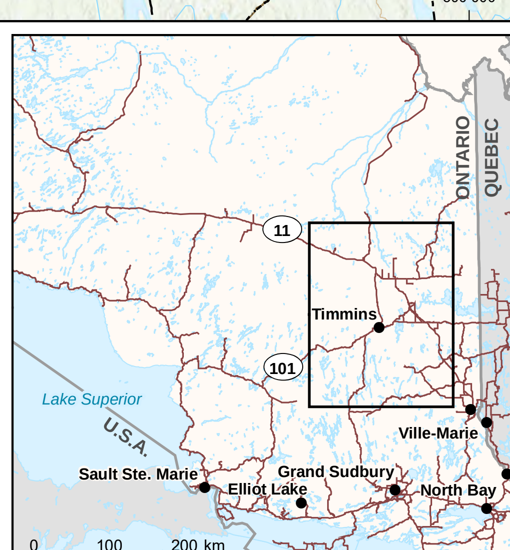
Highway

Principal Road

Local Road

Railway

Transmission Line



TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

TIP-1 Transmission Project
Timmins, Ontario

Map 1
Project Location

Sources:
CanVec, 1/250 000, NRCan, 2017
ANSI, Ontario Ministry of Natural Resources and Forestry, June 2024
Conservation Reserve Regulated, Ontario Ministry of Natural Resources and Forestry, June 2023
Indian Reserve, Ontario Ministry of Natural Resources and Forestry, 2023
Municipal Boundary , Ontario Ministry of Natural Resources and Forestry, May 2023
Official Airports, Ontario Ministry of Natural Resources and Forestry, March 2012
Provincial Park Regulated, Ontario Ministry of Natural Resources and Forestry, August 2023
Wetlands, Ontario Ministry of Natural Resources and Forestry, April 2024
Project Data, BBA, 2024

BBA Project Number: 7311004-007000-4E

2024-09-26

0 7.5 15 km
UTM, zone 17, NAD 83

Prepared by: M.-N. Chouinard   Drawn by: A. Monnard   Verified by: F. Karcha

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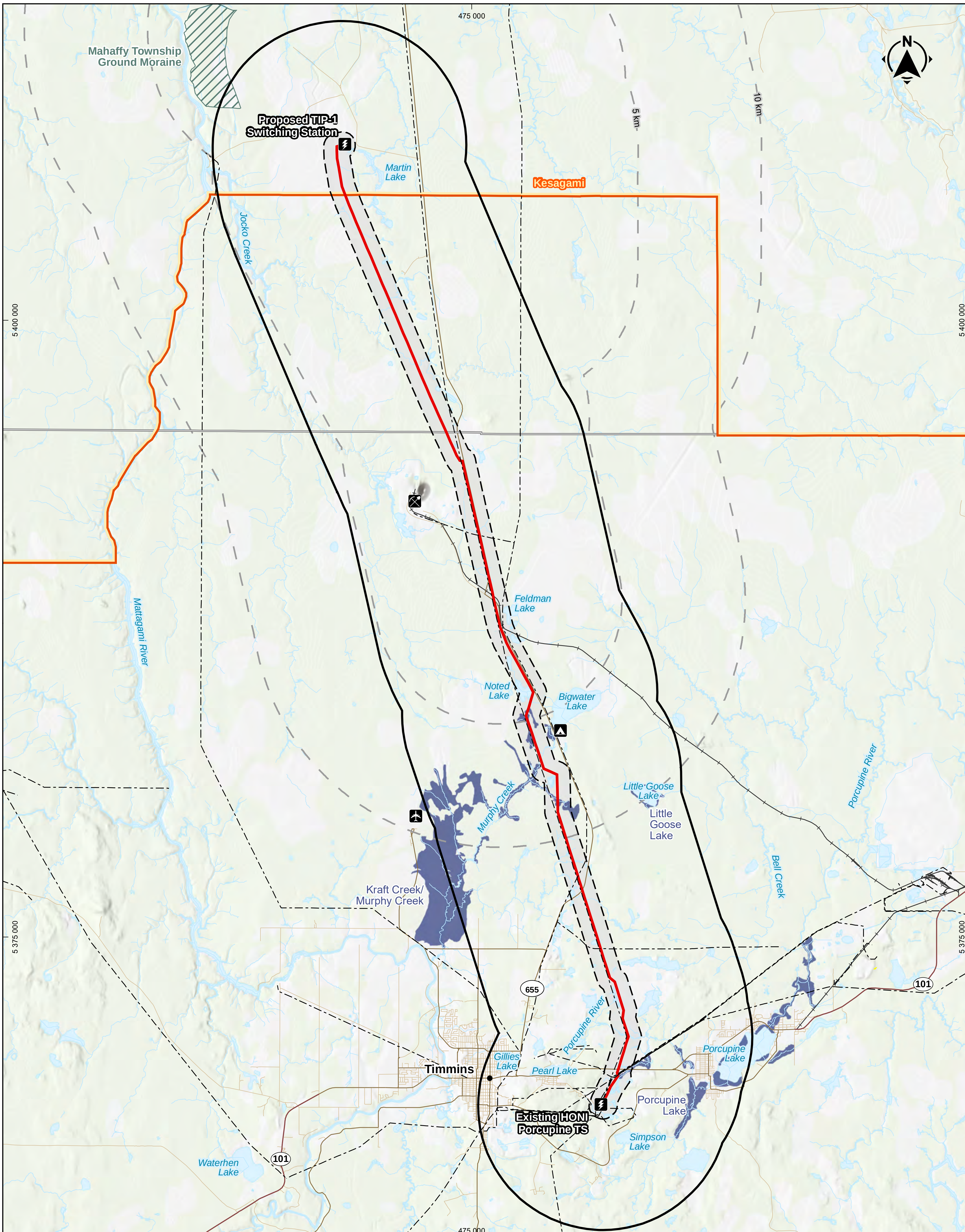


Regional Study Area (RSA)

Local Study Area (LSA)

Crawford Nickel Project Study Area

Project Component

New 230 kV Transmission Line

Protected Areas

Conservation Reserve

Provincially Significant Wetland (Evaluated)

Area of Natural and Scientific Interest (ANSI)

Caribou Range Boundary

Infrastructure and Facilities

Substation

Timmins / Victor M. Power Airport

Big Water Campground

Kidd Creek Mine

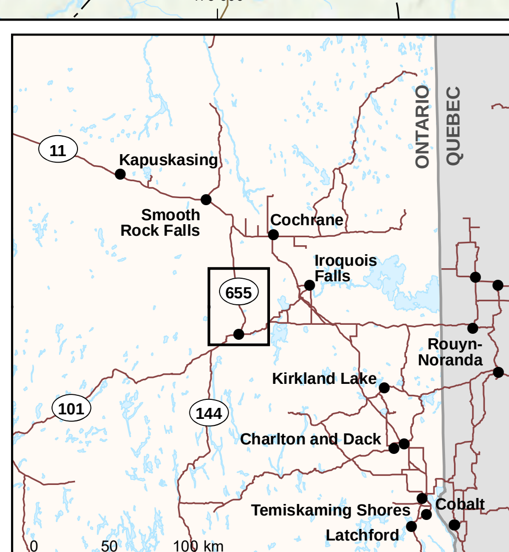
Highway

Principal Road

Local Road

Railway

Transmission Line



TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

TIP-1 Transmission Project
Timmins, Ontario

Map 2
BBA and Crawford Nickel Canada (CNC) study areas

Sources:
CanVec, 1/250 000, NRCan, 2017
ANSI, Ontario Ministry of Natural Resources and Forestry, June 2024
Conservation Reserve Regulated, Ontario Ministry of Natural Resources and Forestry, June 2023
Municipal Boundary , Ontario Ministry of Natural Resources and Forestry, May 2023
Official Airports, Ontario Ministry of Natural Resources and Forestry, March 2012
Provincial Park Regulated, Ontario Ministry of Natural Resources and Forestry, August 2023
Wetlands, Ontario Ministry of Natural Resources and Forestry, April 2024
Project Data, BBA, 2024 & WSP, 2024a

BBA Project Number: 7311004-007000-4E

2024-09-26

0 1.5 3 km
UTM, zone 17, NAD 83

BBA

Prepared by: M.-N. Chouinard Drawn by: A. Monnard Verified by: F. Karcha

Fichier : 7311004_000000_4E_D20_0013_R00_Map2.mxd

The climate in this ecoregion is included in the Humid Mid-Boreal Ecoclimatic Region. Mean annual precipitation ranges between 652 and 1,029 mm, and mean summer rainfall is 220 to 291 mm. Winters are long, cold, and snowy, while summers are warm but short. The mean annual temperature range, that represents the average of the 12 monthly means, is -0.5 to 2.5˚C and the mean length of the growing season is between 167 and 185 days (Mackey, McKenney, Yang, McMahon, & Hutchison, 1996a) (Mackey, McKenney, Yang, McMahon, & Hutchison, 1996b)

The vegetation in this ecoregion is boreal, with black spruce, white spruce, balsam fir, jack pine, tamarack, white birch, trembling aspen, and balsam poplar constituting the main forest species (Hills, 1959; Rowe, 1972). Mixed forest and coniferous forest each represent almost 30 % of the ecoregion, both forest types and landscape pattern/cover being associated with fire cycles. Sparse forest (10.8%), deciduous forest (7.2%), and cutover (7.8%) represent the balance of vegetation coverage, while water comprises 6.7 % of the ecoregion.

As with the vegetation, the fauna of the ecoregion is typically boreal. Moose, gray wolf, American marten, Canada lynx, snowshoe hare, red squirrel, beaver, and eastern red-backed vole are characteristic mammals. Common loon, great blue heron, bald eagle, osprey, spruce grouse, gray jay, common raven, Philadelphia vireo, Tennessee warbler, palm warbler, yellow-rumped warbler, Lincoln’s sparrow, white-throated sparrow, purple finch, and pine siskin are among the representative birds in the ecoregion. Amphibians and reptiles include spotted salamander, boreal chorus frog, wood frog, mink frog, midland painted turtle, and eastern garter snake. Representative fish include brook trout, lake whitefish, northern pike, walleye, and yellow perch.

Currently, 16 types of natural heritage areas are located in Ecoregion 3E, including Northern Claybelt Forest Complex Conservation Reserve, Kettle Lakes Provincial Park and Mahaffy Township Ground Moraine Conservation Reserve that are located near the RSA (Map 2).

2. Existing information

Existing information includes primary data captured by WSP E&I Canada Limited (WSP) in relation to CNC’s Crawford Mine, as well as government reports, databases and maps, community-science platforms, and academic and grey literature.

CNC has prepared a desktop study and conducted field work in relation to their Crawford Mine project. The study area for the CNC Project terrestrial baseline covered an area up to 10 km from the CNC Project Location, which encompasses around 60 % of the RSA for the transmission line assessment (Map 2Map). The aerial surveys covered a broader study area, covering the totality of the RSA for the transmission line. The study area for the CNC Project fish and fish habitat baseline was smaller, covering various lakes, waterbodies and tributaries surrounding the Mine Project.

Between 2021 and 2023, field investigations were undertaken for the terrestrial (WSP E&I Canada Limited, 2024a), and fish and fish habitat (WSP E&I Canada Limited, 2024b) baseline surveys. To characterize the terrestrial environment, surveys were completed at various times of the year to target appropriate windows for specific species. Field studies conducted by WSP include:

- Flora and vegetation communities:
  - Vegetation surveys to confirm existing Ecological Land Classification (ELC) delineations
  - Rare vegetation community/type surveys
- Herptile surveys:
  - Amphibian call surveys
  - Turtle basking surveys
  - Targeted Blanding's turtle habitat assessments (eDNA sampling)
- Bird surveys:
  - Breeding bird surveys (point counts)
  - Bird autonomous recording units (ARU)
  - Crepuscular bird surveys
  - Marsh bird surveys
  - Nocturnal owl surveys
  - Migratory bird/waterfowl surveys
  - Species at risk birds (short-eared owl and lesser yellowlegs) surveys
- Bat surveys:
  - Bat maternity roost habitat surveys
  - Bat hibernacula habitat surveys
  - Bat detector surveys
  - Bat hibernacula acoustic surveys

- Aerial surveys:
  - Mammals: flight transects to document ungulates (moose and woodland caribou) and furbearers (gray wolf, red fox, Canada lynx, American beaver, North American river otter, American marten, fisher)
  - Birds: large stick nests were search for during aerial surveys
  - Blanding's turtle habitat assessments
- Fish and fish habitat:
  - Fish habitat assessment
  - Fish community surveys, with eDNA sampling at some locations to assess potential presence of species at risk and to provide full species profiles for comparison to the conventional community sampling results
  - Bathymetric surveys
  - Contaminant in fish tissue analyses
  - Surface water quality and sediment analyses
  - Benthic invertebrate community surveys
  - Lower trophic assessment

Field methods for the suite of studies conducted by WSP are discussed in Section 3 of the Terrestrial Ecology Baseline Study (WSP E&I Canada Limited, 2024a), and the Fish and Fish Habitat Baseline report (WSP E&I Canada Limited, 2024,b). Since TIP-1 and CNC work closely and the Study Area of the CNC Project covers 60% to 100% of the RSA, BBA has used this as the main source of information to develop an understanding of existing conditions within the RSA.

Additional sources of background information reviewed included:

- Natural Heritage Information Centre (NHIC): PSWs, ANSIs, Conservation Reserves, records of wildlife, SAR occurrences
- MNRF Land Information Ontario (LIO) and GeoHub
- iNaturalist (2022)
- SARA Registry and associated COSEWIC Status Assessments and Recovery Strategies
- eBird (2022)
- Timmins Official Plan (2010)

3. Field work methodology

BBA carried out additional vegetation surveys and fish habitat characterization within the LSA. This LSA corresponds to an area covering the territory that may be affected by the development and operation activities of the Project. The goal is to obtain a perimeter within which the activities related to the project are likely to cause measurable impacts. The LSA is the primary focus of data collection to characterize the existing environment.

BBA conducted vegetation and fish habitat characterization surveys to collect data along and in vicinity of the TLA. This data is informative to confirming ELC mapping, which underlies wildlife habitat classifications, and to gather information for transmission line spans over watercourse.

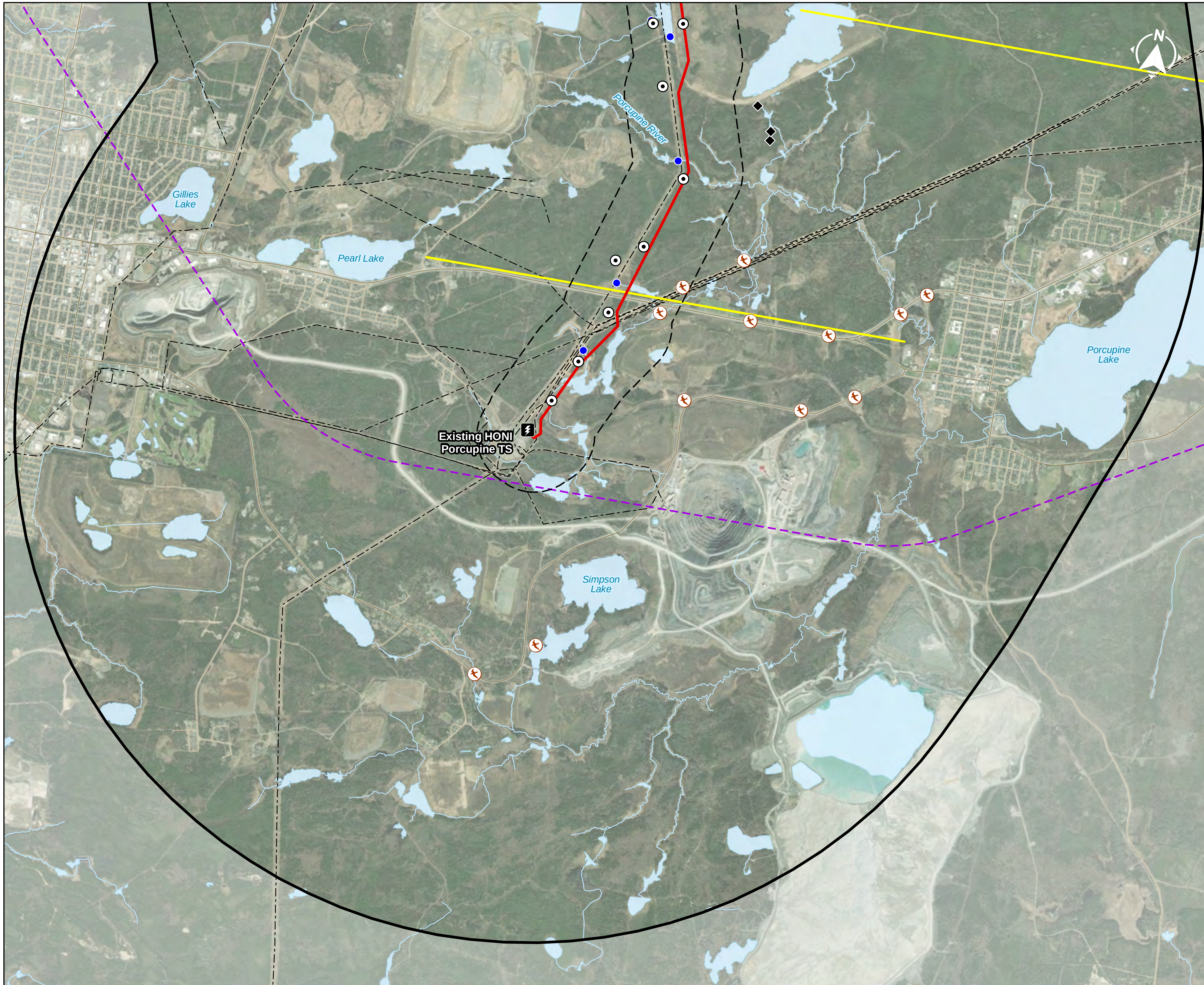
BBA did not conduct wildlife surveys. BBA used CNC's data that fell within or near the LSA. WSP habitat classifications within their Study Area were adopted for the LSA due to proximity and overlap of each project's study areas.

3.1. Vegetation and wetlands

Vegetation communities within the RSA have been delineated and described by the Forest Resources Inventory (FRI) available from LIO (LIO, 2007, 2021). The FRI is a large-scale survey of the province's forests and wetlands. These datasets provide vegetation boundaries, forest stand information (i.e., tree composition, height, age, and distribution), and general information on wetlands. Communities are classified to ecosite using the Ecosites of Ontario (Banton and al., 2009). The majority (96,5 %) of the RSA is located within the Abitibi River FRI Version 2 (LIO, 2021); however, three (3) small portions of the RSA are located within the Romeo-Malette FRI Version 1 (LIO, 2007). The Romeo-Malette FRI does not provide the vegetation community descriptions using the Boreal ELC coding system, unlike the Abitibi River FRI. Surveys were undertaken within the local LSA to validate the existing ecosite classification provided in FRI data. A total of 50 sites within the LSA received confirmational ELC survey and vegetation inventory between August 2 and August 29, 2023 (Map 3-1).

Sample selection was somewhat limited by site access; however, a wide range of vegetation types across the LSA were assessed. At each survey site, biologists confirmed the ecosite and collected the following information:

- List of all plant species observed, including the relative abundance of each species;
- Dominant plant species in the vegetation layers of the community (canopy, sub-canopy, understory, and ground layer);
- Substrate type and depth, moisture regime, and topography with the use of a hand auger;
- General classification of the site into broad habitat categories (e.g., forest, fen, marsh);
- Photographs; and
- Other relevant information as applicable.



Regional Study Area
Local Study Area (LSA)

Project Component

New 230 kV Transmission Line

Aerial Surveys (CNC)

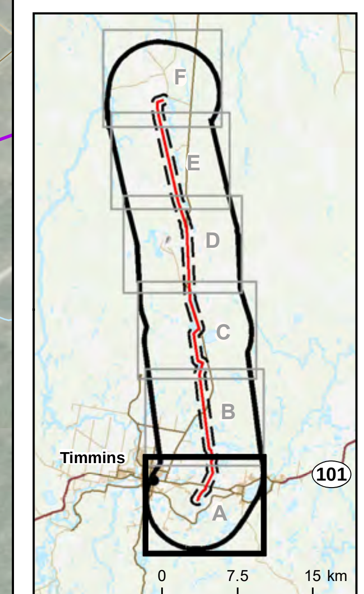
Crawford Nickel Project Study Area (2022)
Flightline Transect ('21/'22)

Infrastructure and Facilities

Substation
Principal Road
Local Road
Transmission Line

Survey locations

BBA ELC (2023)
Aquatic sample point
Ecological land classification (2021)
Bird detector station (2023)
SAR bird (2023)



TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

TIP-1 Transmission Project
Timmins, Ontario

Map 3-1A
BBA and CNC sample points

Sources:
Ontario Road Network (ORN), Ontario Ministry of Natural Resources and Forestry, June 2023
Forest Resources Inventory, Ontario Ministry of Natural Resources and Forestry, June 2023
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Project Data, BBA, 2024 and WSP, 2024a

BBA Project Number: 7311004-000000-4E

2024-09-30

0 400 800 m
UTM, Zone 17, NAD 83

Prepared by: M.-N. Chouinard
Drawn by: A. Monnard
Verified by: F. Karcha

File: 7311004_000000_4E_D20_0014_R00_Map3.mxd

Regional Study Area

Local Study Area

Project Component

New 230 kV Transmission Line

Aerial Surveys (CNC)

Crawford Nickel Project Study Area (2022)

Flightline Transect ('21/'22)

Infrastructure and Facilities

Principal Road

Local Road

Transmission Line

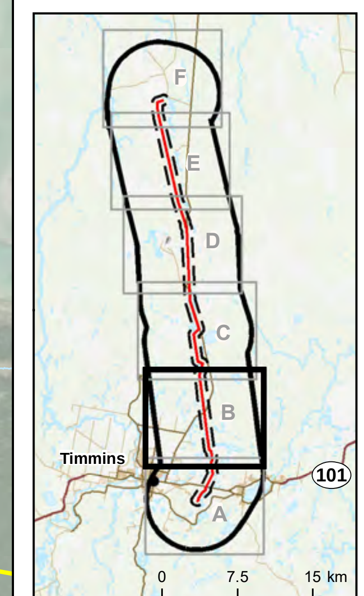
Survey locations

BBA ELC (2023)

Aquatic sample point

Bird detector station (2023)

SAR bird (2023)



TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

TIP-1 Transmission Project
Timmins, Ontario

Map 3-1B
BBA and CNC sample points

Sources:
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Forest Resources Inventory, Ontario Ministry of Natural Resources and Forestry, June 2023
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Project Data, BBA, 2024 and WSP, 2024a

BBA Project Number: 7311004-000000-4E

2024-09-30

0 400 800 m
UTM, Zone 17, NAD 83

Prepared by: M.-N. Chouinard   Drawn by: A. Monnard   Verified by: F. Karcha

File: 7311004_000000_4E_D20_0014_R00_Map3.mxd

Regional Study Area
Local Study Area

Project Component

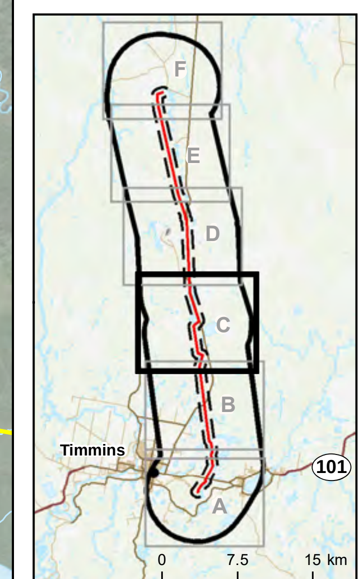
New 230 kV Transmission Line

Aerial Surveys (CNC)

Crawford Nickel Project Study Area (2021)
Crawford Nickel Project Study Area (2022)
Flightline Transect ('21/'22)

Infrastructure and Facilities

Principal Road
Local Road
Railway
Transmission Line
Timmins / Victor M. Power Airport
Big Water Campground



Survey locations

BBA ELC (2023)
Aquatic sample point
Ecological land classification (2021)
Ecological land classification (2022)
Bat detector location (2021,2022)
Bat maternity (2021,2022)
Bird detector station (2021, 2022)
Bird detector station (2023)
SAR bird (2023)
Breeding bird survey station (2021, 2022)
Migratory bird survey station (2022)
Migratory bird survey station
Owl survey station (2022)
Owl survey station (2023)
Amphibian (2021, 2022)

TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

TIP-1 Transmission Project
Timmins, Ontario

Map 3-1C
BBA and CNC sample points

Sources:
Ontario Road Network (ORN), Ontario Ministry of Natural Resources and Forestry, June 2023
Forest Resources Inventory, Ontario Ministry of Natural Resources and Forestry, June 2023
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Project Data, BBA, 2024 and WSP, 2024a

BBA Project Number: 7311004-000000-4E

2024-09-30

0 400 800 m
UTM, Zone 17, NAD 83

Prepared by: M.-N. Chouinard
Drawn by: A. Monnard
Verified by: F. Karcha

File: 7311004_000000_4E_D20_0014_R00_Map3.mxd

Regional Study Area

Local Study Area

Project Component

New 230 kV Transmission Line

Aerial Surveys (CNC)

Crawford Nickel Project Study Area (2021)

Crawford Nickel Project Study Area (2022)

Flightline Transect ('21/'22)

Infrastructure and Facilities

Principal Road

Local Road

Railway

Transmission Line

Kidd Creek Mine

Survey locations

BBA ELC (2023)

Aquatic sample point

Ecological land classification (2021)

Ecological land classification (2022)

Bat detector location (2021,2022)

Bat detector location (2023)

Bat maternity (2021,2022)

Bat maternity (2023)

Bird detector station (2021, 2022)

Bird detector station (2023)

SAR bird (2023)

Breeding bird survey station (2021, 2022)

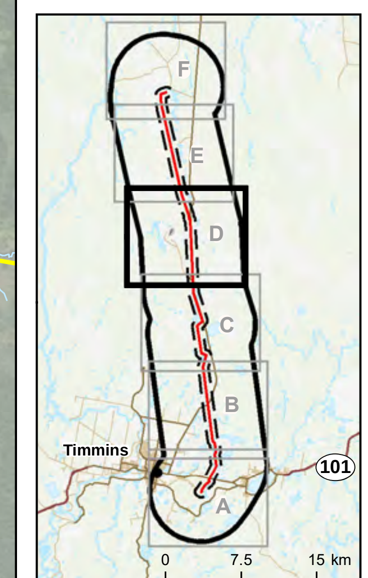
Migratory bird survey station (2022)

Migratory bird survey station

Owl survey station (2022)

Owl survey station (2023)

Amphibian (2021, 2022)



TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

TIP-1 Transmission Project
Timmins, Ontario

Map 3-1D
BBA and CNC sample points

Sources:
Ontario Road Network (ORN), Ontario Ministry of Natural Resources and Forestry, June 2023
Forest Resources Inventory, Ontario Ministry of Natural Resources and Forestry, June 2023
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Project Data, BBA, 2024 and WSP, 2024a

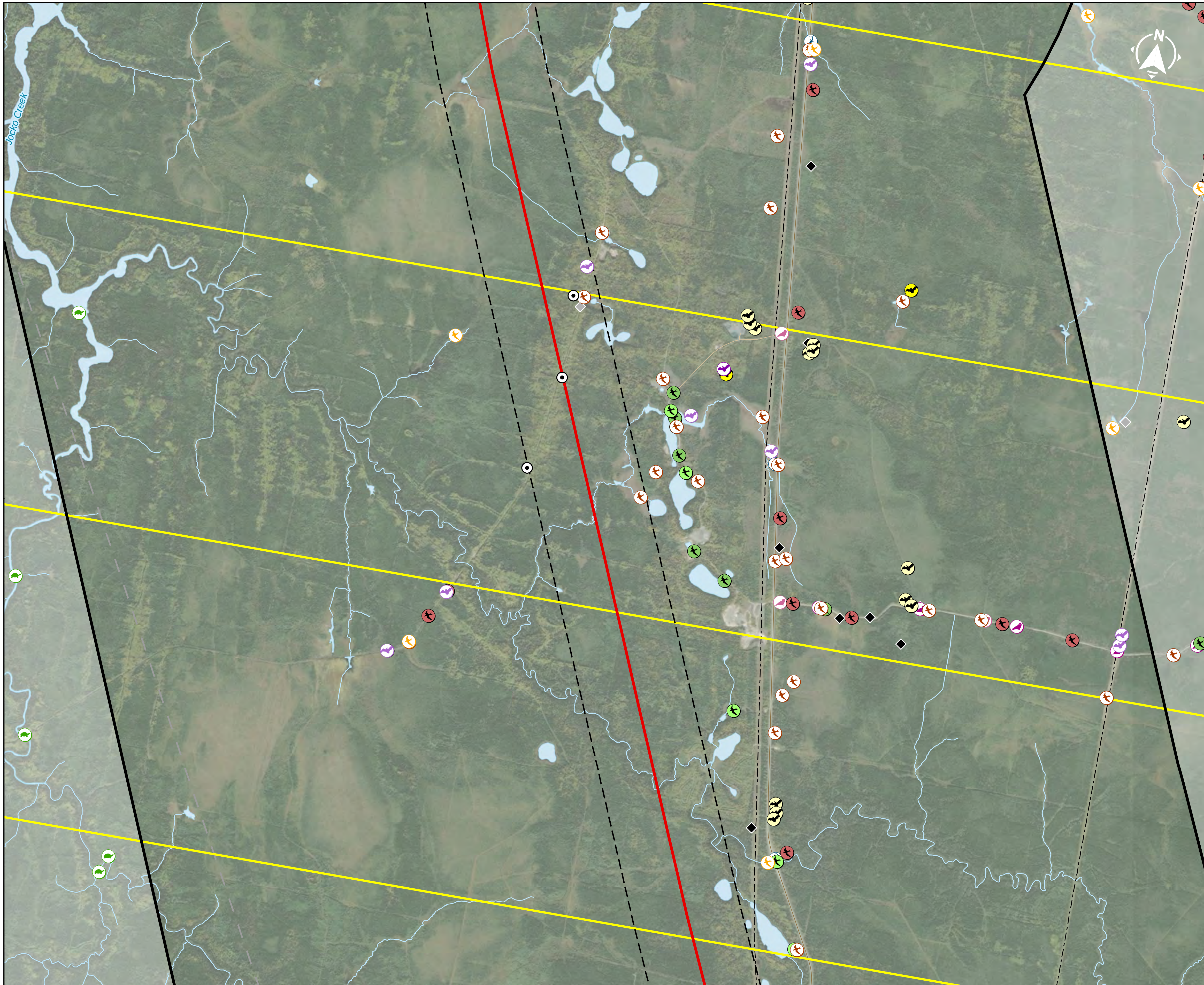
BBA Project Number: 7311004-000000-4E

2024-09-30

0 400 800 m
UTM, Zone 17, NAD 83

Prepared by: M.-N. Chouinard Drawn by: A. Monnard Verified by: F. Karcha

File: 7311004_000000_4E_D20_0014_R00_Map3.mxd



Regional Study Area

Local Study Area

Project Component

New 230 kV Transmission Line

Aerial Surveys (CNC)

Crawford Nickel Project Study Area (2021)

Crawford Nickel Project Study Area (2022)

Flightline Transect ('21/'22)

Infrastructure and Facilities

Principal Road

Local Road

Transmission Line

Survey locations

BBA ELC (2023)

Ecological land classification (2021)

Ecological land classification (2022)

Bat detector location (2021,2022)

Bat detector location (2023)

Bat maternity (2021,2022)

Bat maternity (2023)

Bird detector station (2021, 2022)

Bird detector station (2023)

Bird ARU (2023)

SAR bird (2023)

Breeding bird survey station (2021, 2022)

Migratory bird survey station (2022)

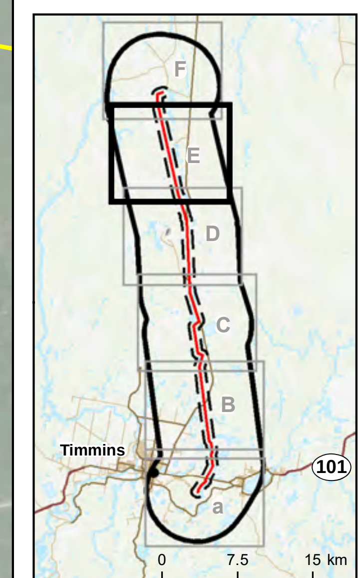
Migratory bird survey station

Owl survey station (2022)

Owl survey station (2023)

Amphibian (2021, 2022)

Blanding's turtle (2023)



TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

TIP-1 Transmission Project
Timmins, Ontario

Map 3-1E
BBA and CNC sample points

Sources:
Ontario Road Network (ORN), Ontario Ministry of Natural Resources and Forestry, June 2023
Forest Resources Inventory, Ontario Ministry of Natural Resources and Forestry, June 2023
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Project Data, BBA, 2024 and WSP, 2024a

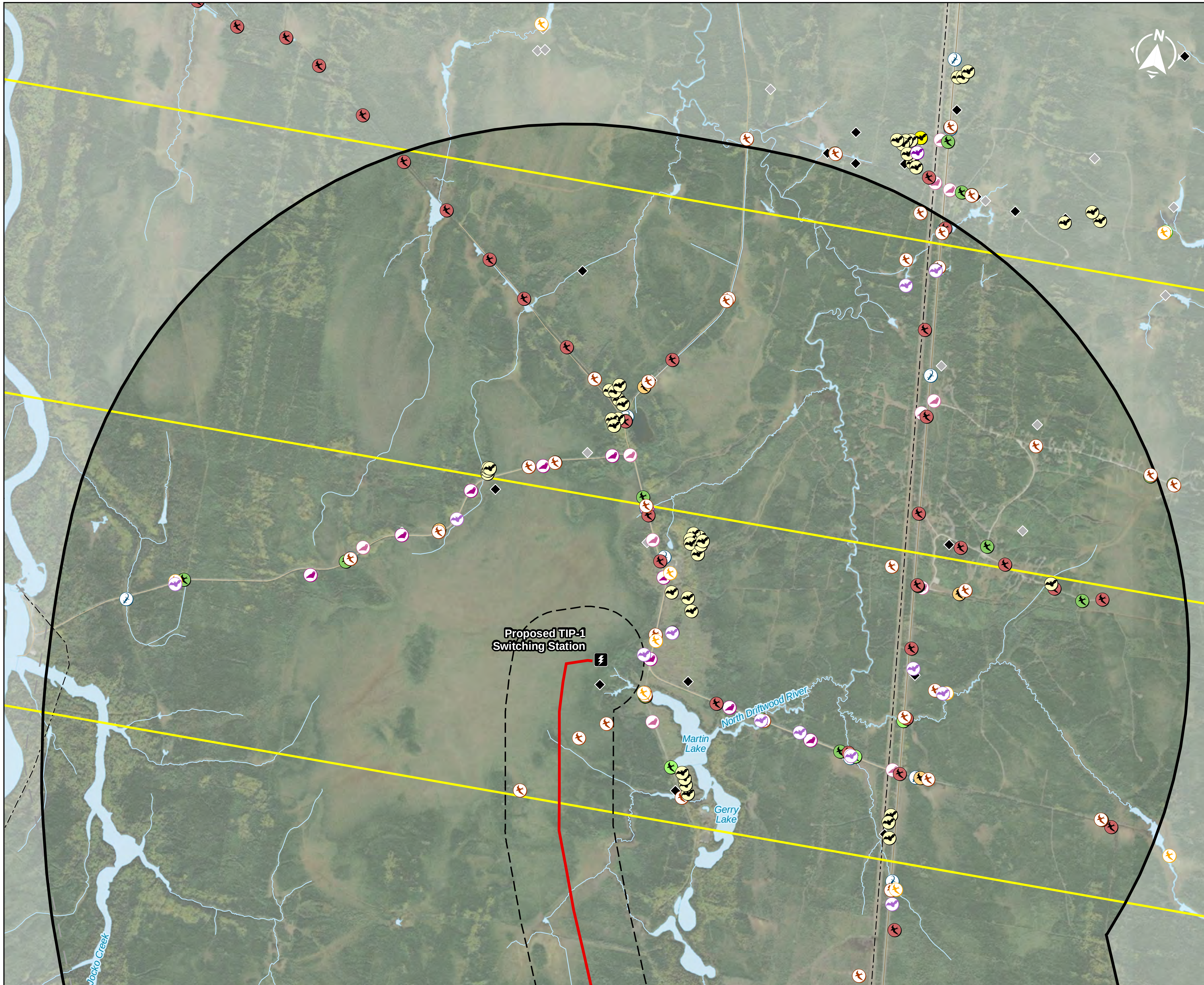
BBA Project Number: 7311004-000000-4E

2024-09-30

0 400 800 m
UTM, Zone 17, NAD 83

Prepared by: M.-N. Chouinard
Drawn by: A. Monnard
Verified by: F. Karcha

File: 7311004_000000_4E_D20_0014_R00_Map3.mxd



Regional Study Area
Local Study Area

Project Component

New 230 kV Transmission Line

Aerial Surveys (CNC)

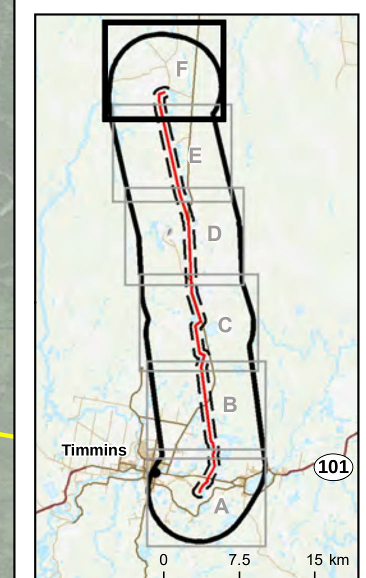
Crawford Nickel Project Study Area (2021)
Crawford Nickel Project Study Area (2022)
Flightline Transect ('21/'22)

Infrastructure and Facilities

Substation
Principal Road
Local Road
Transmission Line

Survey locations

Ecological land classification (2021)
Ecological land classification (2022)
Bat detector location (2021,2022)
Bat detector location (2023)
Bat maternity (2021,2022)
Bat maternity (2023)
Bird detector station (2021, 2022)
Bird detector station (2023)
Bird ARU
SAR bird (2023)
Breeding bird survey station (2021, 2022)
Migratory bird survey station (2022)
Migratory bird survey station
Owl survey station (2022)
Owl survey station (2023)
Amphibian (2021, 2022)
Blanding's turtle (2023)



TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

TIP-1 Transmission Project
Timmins, Ontario

Map 3-1F
BBA and CNC sample points

Sources:
Ontario Road Network (ORN), Ontario Ministry of Natural Resources and Forestry, June 2023
Forest Resources Inventory, Ontario Ministry of Natural Resources and Forestry, June 2023
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Project Data, BBA, 2024 and WSP, 2024a

BBA Project Number: 7311004-000000-4E

2024-09-30

0 400 800 m
UTM, Zone 17, NAD 83

Prepared by: M.-N. Chouinard   Drawn by: A. Monnard   Verified by: F. Karcha

File: 7311004_000000_4E_D20_0014_R00_Map3.mxd

Each location was assigned a Boreal ecosite code. ELC codes from the FRI were updated, as necessary, but FRI boundaries were not altered at this scale as the area is very homogenous, and transitions between communities are very gradual. Additionally, vegetation cover, substrate, moisture, etc., occurs in a gradient (Ecosites of Ontario 2009); therefore, altering boundaries was deemed unnecessary.

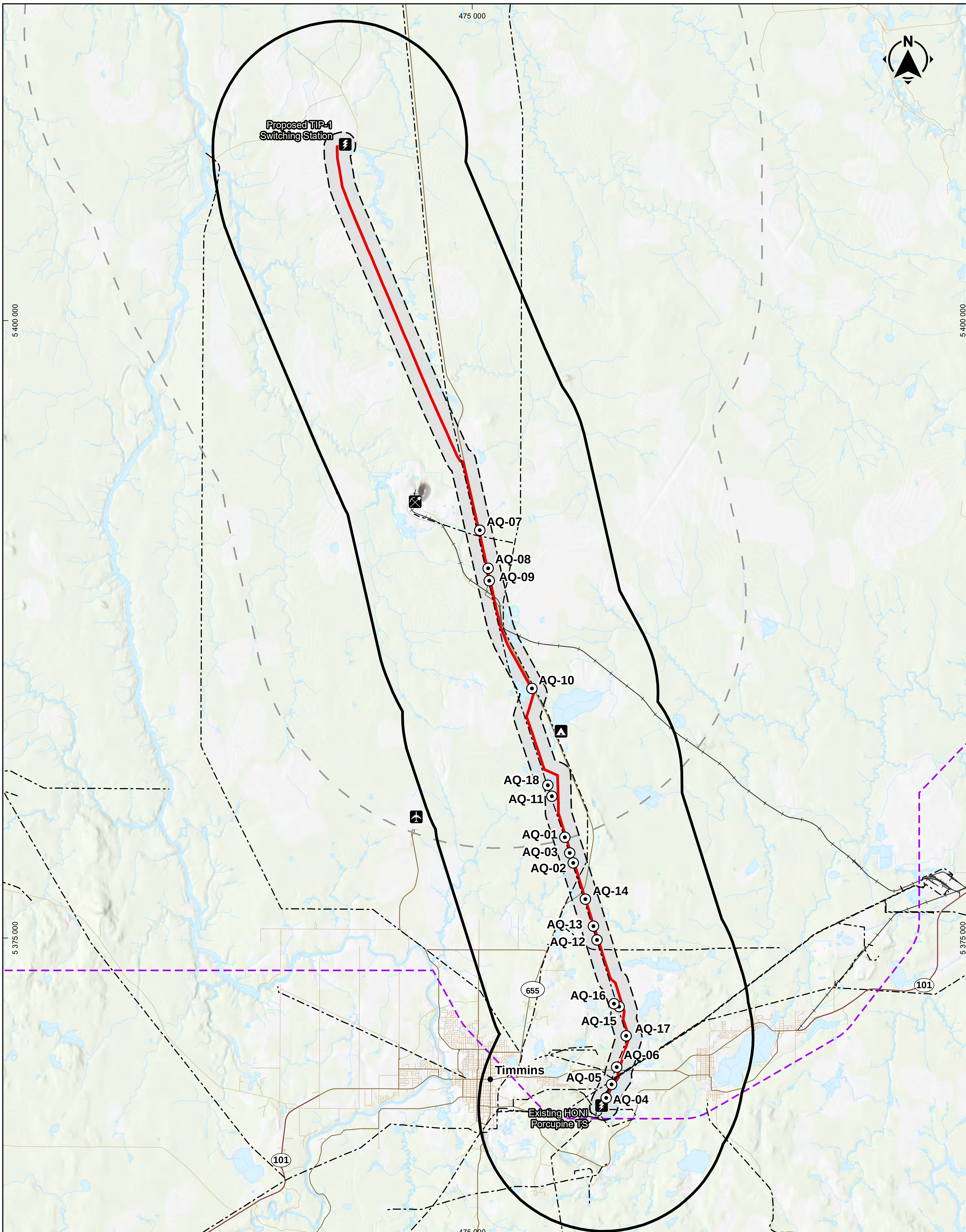
3.2. Fish habitat

Habitat assessments were conducted at representative stations in watercourses and waterbodies within the LSA during the August 2023 surveys. A total of 18 watercourses and waterbodies were surveyed within the LSA between August 3 and 10, 2023 (Map 3-2). At each survey site, biologists collected the following information:

- Watercourse or waterbody type;
- Permanence;
- Morphology;
- Habitat types;
- Vegetation coverage (macrophytes and riparian vegetation);
- Substrate composition;
- Photographs; and
- Other relevant information as applicable.

In-field surface water quality measurement were also recorded at each sample location using handheld portable water quality instrument calibrated as needed per the manufacturer's directions. The following parameters were measured:

- Temperature (°C);
- Conductivity (µS/cm));
- pH; and
- Dissolved oxygen (mg/L).



Regional Study Area (RSA)

Local Study Area (LSA)

Crawford Nickel Project Study Area (10 km)

Crawford Nickel Project Study Area for Aerial Surveys

BBA Aquatic Habitat Survey Locations (2023)

Project Component

New 230 kV Transmission Line

Infrastructure and Facilities

Substation

Timmins / Victor M. Power Airport

Big Water Campground

Kidd Creek Mine

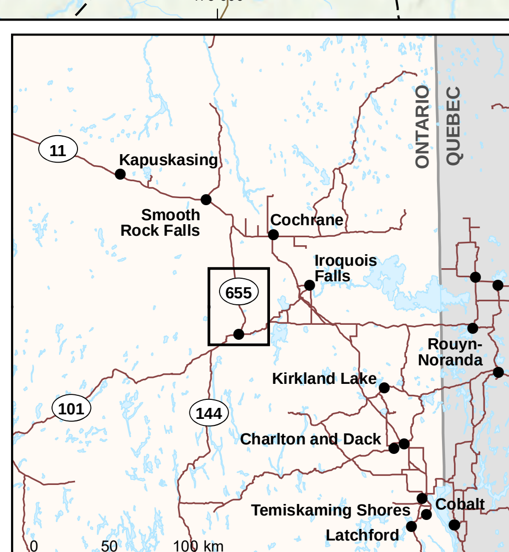
Highway

Principal Road

Local Road

Railway

Transmission Line



TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

TIP-1 Transmission Project
Timmins, Ontario

Map 3-2
BBA Aquatic Survey Stations

Sources:
CanVec, 1/250 000, NRCan, 2017
SDA, 1/20 000, MERN Quebec, June 2022
Official Airports, Ontario Ministry of Natural Resources and Forestry, March 2012
Municipal Boundary , Ontario Ministry of Natural Resources and Forestry, May 2023
Provincial Park Regulated, Ontario Ministry of Natural Resources and Forestry, August 2023
Project Data, BBA, 2024

BBA Project Number: 7311004-007000-4E

2024-09-30

0 1.5 3 km

UTM, zone 17, NAD 83

BBA

Prepared by: M.-N. Chouinard   Drawn by: A. Monnard   Verified by: F. Karcha

Fichier : 7311004_000000_4E_D20_0031_R00_Map3B.mxd

4. Baseline conditions

4.1. Flora and vegetation communities

A total of 209 vascular plant species were identified during field surveys in August 2023. Of these, 94% are native to Ontario and none are listed provincially or federally as SAR or SCC. The compiled plant species list is presented in Appendix A.

Photographic records of the ecosites/vegetation communities are provided in Appendix B.

The RSA is comprised of 59 distinct plant communities (upland and wetland). Upland vegetation communities are distinguished from wetland communities by plant species that are typically not well adapted or marginally adapted to hydrophytic (wet) conditions. Soils are non-hydric, mineral, and indicators of wetland hydrology are absent (e.g., saturated soils, oxidized rhizospheres on living roots or water-stained leaves).

Wetlands represent half (52.98 %) of the plant communities within the RSA, as well as within the LSA (49,29 %), most of which are swamp communities (Table 1). The FRI class and the ecosites delineated are presented in a series of maps (Map 4Map). Deciduous forest and coniferous forest co-dominate the upland communities in the RSA and the LSA, and anthropologically disturbed upland communities and areas represent a little bit more than 10% of both the RSA and the LSA.

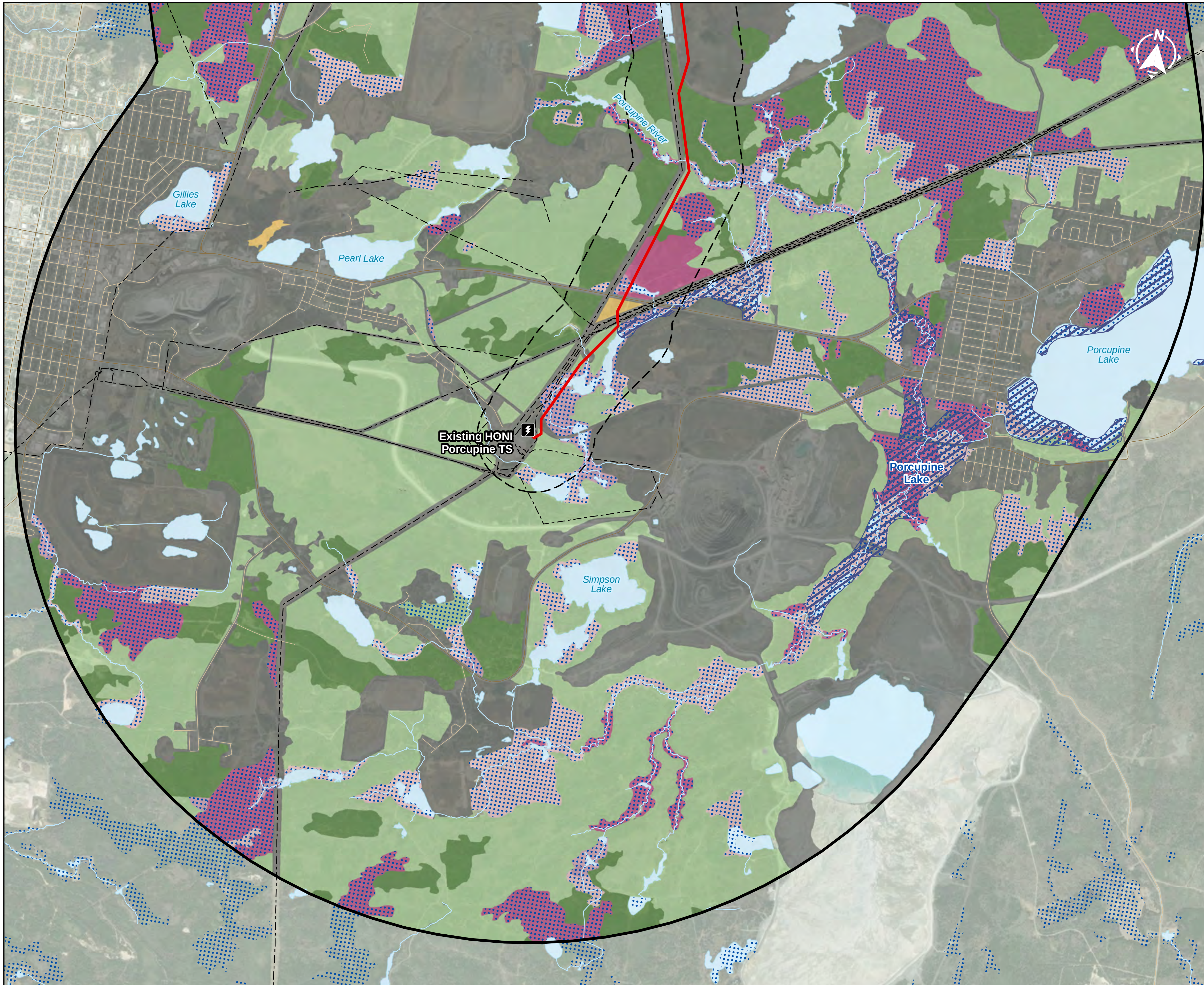
Table 1: Vegetation communities occurring within the Regional Study Area

Ecosite Code	Ecosite Name	Area in the RSA (ha)	RSA cover (%)	Area in the LSA (ha)	LSA cover (%)
Wetlands					
Bogs and Fens					
B126	Treed bog	2 058.10	4.12	123.06	2.80
B136	Sparse Treed Fen	1 952.01	3.91	87.53	1.99
B137	Sparse Treed Bog	566.14	1.13	10.63	0.24
B138	Open Bog	15.71	0.03	1.05	0.02
B139	Poor Fen	246.12	0.49	23.08	0.53
B140	Open Moderately Rich Fen	139.24	0.28	5.92	0.13
B146	Open Shore Fen	165.00	0.33	11.40	0.26
B147	Shrub Shore Fen	15.43	0.03	-	-

Ecosite Code	Ecosite Name	Area in the RSA (ha)	RSA cover (%)	Area in the LSA (ha)	LSA cover (%)
Total Bogs and Fens		**5 157.76**	**10.32**	**262.66**	**5.98**
Swamps					
B127	Poor Conifer Swamp	2 414.18	4.83	142.41	3.24
B128	Intermediate Conifer Swamp	16 208.42	32.44	1 419.77	32.35
B222	Mineral Poor Conifer Swamp	7.38	0.01	-	-
B223	Mineral Intermediate Conifer Swamp	172.11	0.34	-	-
B129	Rich Conifer Swamp	815.68	1.63	129.93	2.96
B130	Intolerant Hardwood Swamp	18.53	0.04	0.84	0.02
B133	Hardwood Swamp	8.52	0.02	8.52	0.19
B134	Mineral Thicket Swamp	187.28	0.37	26.15	0.60
B135	Organic Thicket Swamp	916.64	1.83	82.52	1.88
Total Swamps		**20 748.76**	**41.53**	**1 810.15**	**41.24**
Marshes					
B142	Mineral Meadow Marsh	168.49	0.34	45.83	1.04
B144	Organic Meadow Marsh	393.29	0.79	44.69	1.02
Total Marshes		**561.78**	**1.12**	**90.52**	**2.06**
Total Wetland Communities		**26 468.29**	**52.98**	**2 163.33**	**49.29**
Terrestrial Communities					
Deciduous Forest					
B016	Very Shallow, Dry to Fresh: Aspen - Birch Hardwood	34.22	0.07	-	-
B040	Dry, Sandy: Aspen - Birch Hardwood	1 215.20	2.43	105.60	2.41
B055	Dry to Fresh, Coarse: Aspen - Birch Hardwood	1 131.23	2.26	112.04	2.55
B070	Moist, Coarse: Aspen - Birch Hardwood	270.52	0.54	13.69	0.31
B088	Fresh, Clayey: Aspen - Birch Hardwood	226.56	0.45	40.02	0.91
B104	Fresh, Silty to Fine Loamy: Aspen - Birch Hardwood	2 839.71	5.68	327.51	7.46
B119	Moist, Fine: Aspen - Birch Hardwood	1 897.82	3.80	219.03	4.99
Total Deciduous Forest		**7 615.26**	**15.24**	**817.89**	**18.64**
Coniferous Forest					
B012	Very Shallow, Dry to Fresh: Pine - Black Spruce Conifer	211.56	0.42	-	-

Ecosite Code	Ecosite Name	Area in the RSA (ha)	RSA cover (%)	Area in the LSA (ha)	LSA cover (%)
B014	Very Shallow, Dry to Fresh: Conifer	16.25	0.03	-	-
B024	Very Shallow, Humid: Black Spruce - Pine Conifer	28.52	0.06	11.52	0.26
B034	Dry, Sandy: Jack Pine - Black Spruce Dominated	937.59	1.88	75.60	1.72
B035	Dry, Sandy: Pine - Black Spruce Conifer	609.40	1.22	108.63	2.48
B048	Dry to Fresh, Coarse: Red Pine - White Pine Conifer	12.20	0.02	0.02	0.00
B049	Dry to Fresh, Coarse: Jack Pine - Black Spruce Dominated	420.32	0.84	96.75	2.20
B050	Dry to Fresh, Coarse: Pine - Black Spruce Conifer	394.38	0.79	1.84	0.04
B052	Dry to Fresh, Coarse: Spruce - Fir Conifer	81.11	0.16	-	-
B065	Moist, Coarse: Pine - Black Spruce Conifer	178.43	0.36	31.37	0.71
B067	Moist, Coarse: Spruce - Fir Conifer	83.67	0.17	16.62	0.38
B082	Fresh, Clayey: Jack Pine - Black Spruce Dominated	85.22	0.17	10.32	0.24
B083	Fresh, Clayey: Pine - Black Spruce Conifer	34.88	0.07	-	-
B085	Fresh, Clayey: Spruce - Fir Conifer	39.50	0.08	9.58	0.22
B098	Fresh, Silty to Fine Loamy: Jack Pine - Black Spruce Dominated	127.38	0.25	22.61	0.52
B099	Fresh, Silty to Fine Loamy: Pine - Black Spruce Conifer	656.85	1.31	12.34	0.28
B100	Fresh, Silty to Fine Loamy: Hemlock - Cedar Conifer	8.32	0.02	-	-
B101	Fresh, Silty to Fine Loamy: Spruce - Fir Conifer	658.78	1.32	237.21	5.40
B102	Fresh, Silty to Fine Loamy: Conifer	23.98	0.05	-	-
B114	Moist, Fine: Pine - Black Spruce Conifer	1 799.96	3.60	97.28	2.22
B115	Moist, Fine: Hemlock - Cedar Conifer	9.31	0.02	-	-
B116	Moist, Fine: Spruce - Fir Conifer	715.12	1.43	44.77	1.02
B117	Moist, Fine: Conifer	42.14	0.08	-	-
Total Coniferous Forest		**7 174.86**	**14.36**	**776.45**	**17.69**
Total Terrestrial Communities		**14 790.13**	**29.60**	**1 594.34**	**36.33**

Ecosite Code	Ecosite Name		Area in the RSA (ha)	RSA cover (%)	Area in the LSA (ha)	LSA cover (%)
Rock Ecosites						
B164	Rock Barren		4.84	0.01	4.84	0.11
B165	Open Rock Barren		4.13	0.01	-	-
Total Rock Ecosites			**8.97**	**0.02**	**4.84**	**0.11**
Anthropologically Disturbed Upland Communities and Areas						
B007	Active Mineral Barren		47.57	0.10	-	-
B031	Dry, Sandy: Sparse Shrub		24.06	0.05	-	-
B093	Fresh, Silty to Fine Loamy: Field		108.23	0.22	2.76	0.06
B190	Industrial Waste		40.87	0.08	-	-
B193	Active Coarse Clean Fill		1 286.58	2.58	89.76	2.05
B194	Coarse Clean Fill		16.26	0.03	16.26	0.37
B195	Active Fine Clean Fill		55.25	0.11	-	-
B197	Pavement/ Concrete		1 288.82	2.58	110.13	2.51
U997	Unclassified	Commercial industrial	1 744.11	3.49	56.91	1.30
U998		Utilities	473.52	0.95	192.44	4.38
U999		Residential	400.27	0.80	-	-
Total Anthropologically Disturbed Areas			**5 485.52**	**10.98**	**468.26**	**10.67**
Total Upland Communities			**20 284.62**	**40.60**	**2 067.44**	**47.11**



Regional Study Area (RSA)
Local Study Area (LSA)
Provincially Significant Wetland (Evaluated)
Wetland

Ecosites

Wetlands

Bogs and Fens
Marshes
Swamps

Terrestrial Communities

Coniferous Forest
Deciduous Forest

Others

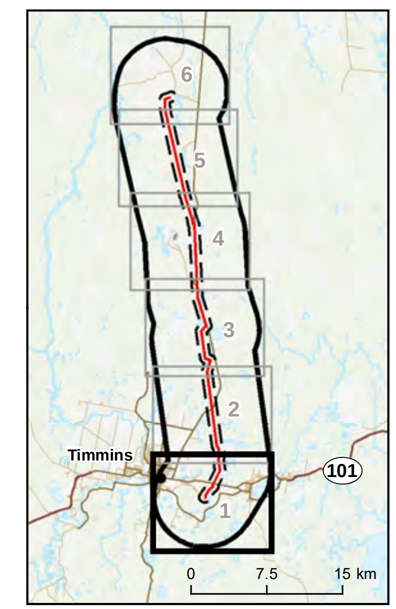
Anthropologically Disturbed Upland Communities and Areas
Rock Ecosites

Project Component

New 230 kV Transmission Line

Infrastructure and Facilities

Substation
Principal Road
Local Road
Transmission Line



TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

TIP-1 Transmission Project
Timmins, Ontario

Map 4-1
Vegetation Communities

Sources:
Ontario Road Network (ORN), Ontario Ministry of Natural Resources and Forestry, June 2023
Wetlands, Ontario Ministry of Natural Resources and Forestry, April 2024
Forest Resources Inventory, Ontario Ministry of Natural Resources and Forestry, June 2023
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Project Data, BBA, 2024

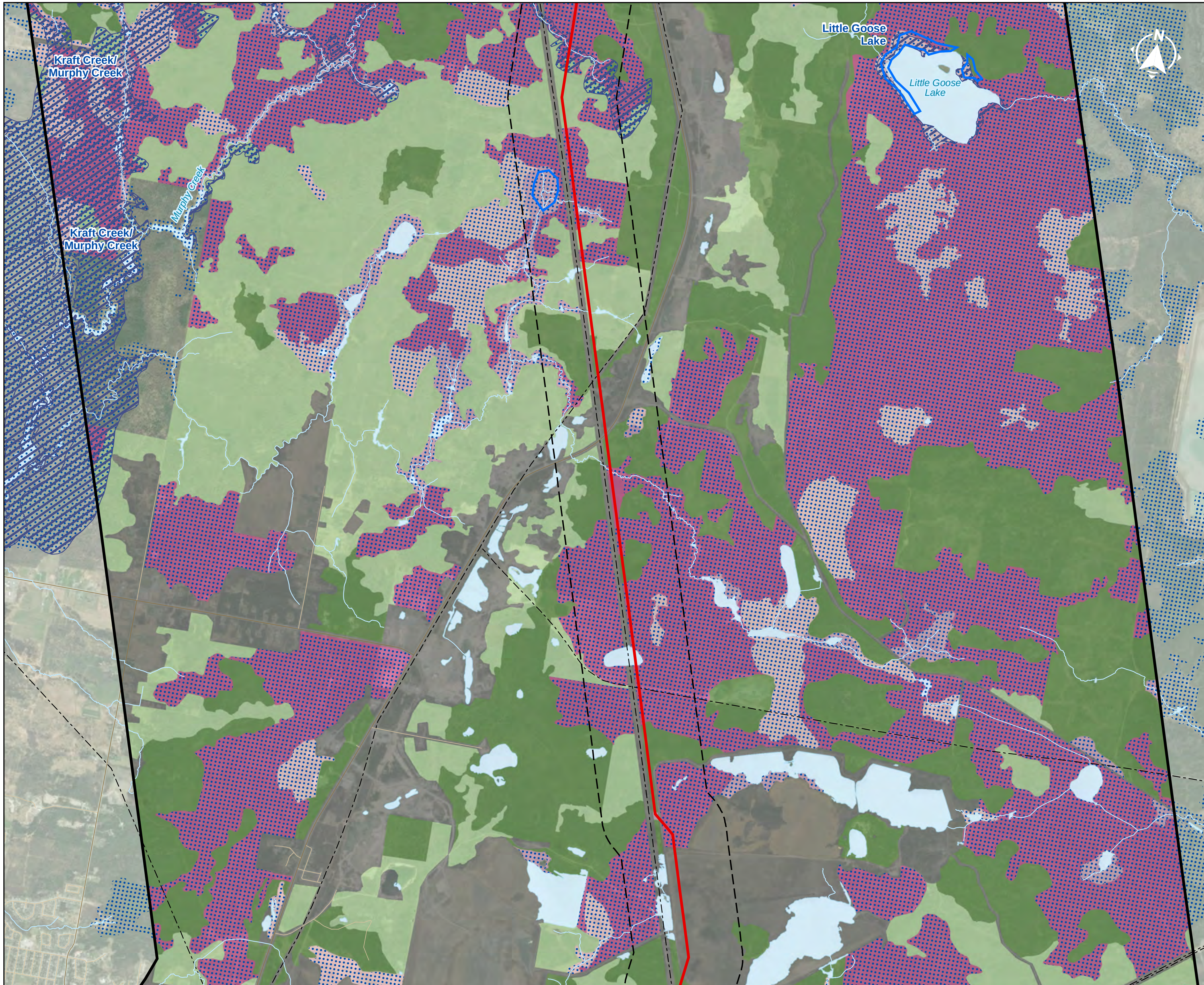
BBA Project Number: 7311004-000000-4E

2024-10-01

0 400 800 m
UTM, Zone 17, NAD 83

Prepared by: M.-N. Chouinard
Drawn by: A. Monnard
Verified by: F. Karcha

File: 7311004_000000_4E_D20_0015_R00_Map4.mxd



Regional Study Area (RSA)
Local Study Area
Provincially Significant Wetland (Evaluated)
Wetland
Wetland (City of Timmins Official Plan)

Project Component
New 230 kV Transmission Line

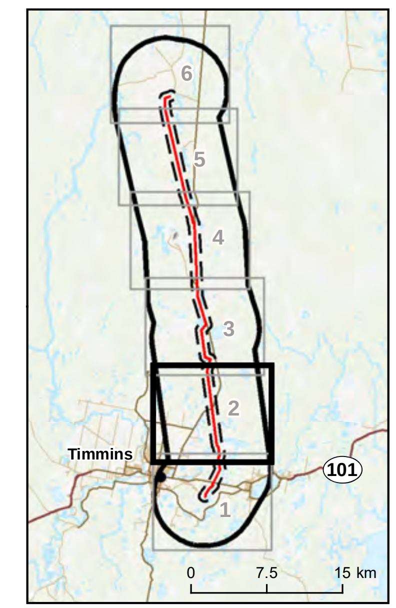
Infrastructure and Facilities
Principal Road
Local Road
Transmission Line

Ecosites

Wetlands
Bogs and Fens
Marshes
Swamps

Terrestrial Communities
Coniferous Forest
Deciduous Forest

Others
Anthropologically Disturbed Upland Communities and Areas
Rock Ecosites



TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

TIP-1 Transmission Project
Timmins, Ontario

Map 4-2
Vegetation Communities

Sources:
Ontario Road Network (ORN), Ontario Ministry of Natural Resources and Forestry, June 2023
Wetlands, Ontario Ministry of Natural Resources and Forestry, April 2024
Forest Resources Inventory, Ontario Ministry of Natural Resources and Forestry, June 2023
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Project Data, BBA, 2024

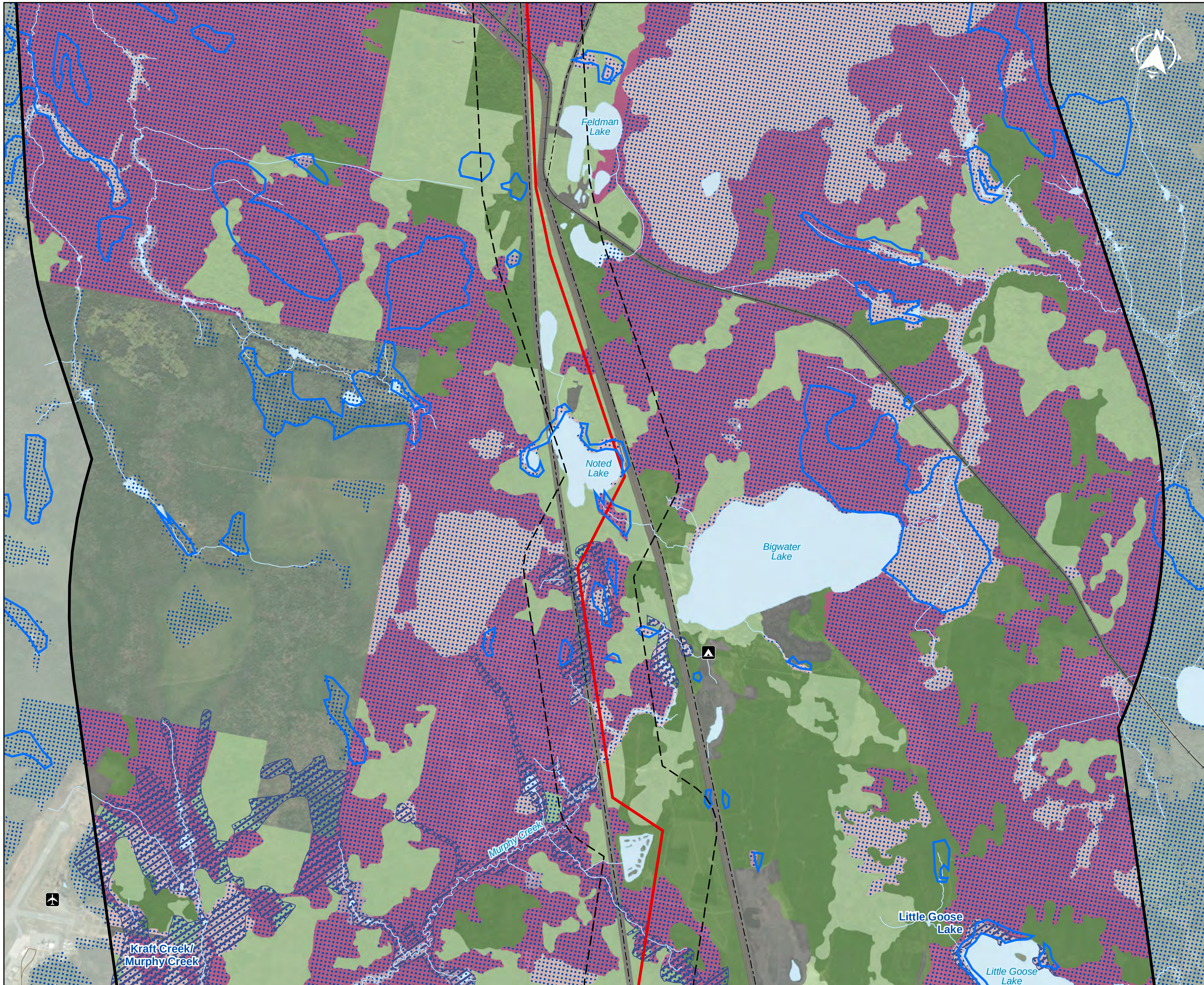
BBA Project Number: 7311004-000000-4E

2024-10-01

0 400 800 m
UTM, Zone 17, NAD 83

Prepared by: M.-N. Chouinard   Drawn by: A. Monnard   Verified by: F. Karcha

File: 7311004_000000_4E_D20_0015_R00_Map4.mxd



Regional Study Area (RSA)
Local Study Area (LSA)
Provincially Significant Wetland (Evaluated)
Wetland
Wetland (City of Timmins Official Plan)

Ecosites

Wetlands

Bogs and Fens
Marshes
Swamps

Terrestrial Communities

Coniferous Forest
Deciduous Forest

Others

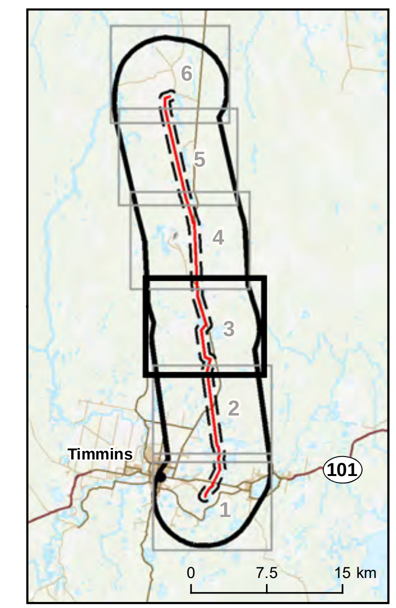
Anthropologically Disturbed Upland Communities and Areas
Rock Ecosites

Project Component

New 230 kV Transmission Line

Infrastructure and Facilities

Principal Road
Local Road
Railway
Transmission Line
Timmins / Victor M. Power Airport
Big Water Campground



TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

TIP-1 Transmission Project
Timmins, Ontario

Map 4-3
Vegetation Communities

Sources:
Ontario Road Network (ORN), Ontario Ministry of Natural Resources and Forestry, June 2023
Wetlands, Ontario Ministry of Natural Resources and Forestry, April 2024
Forest Resources Inventory, Ontario Ministry of Natural Resources and Forestry, June 2023
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Project Data, BBA, 2024

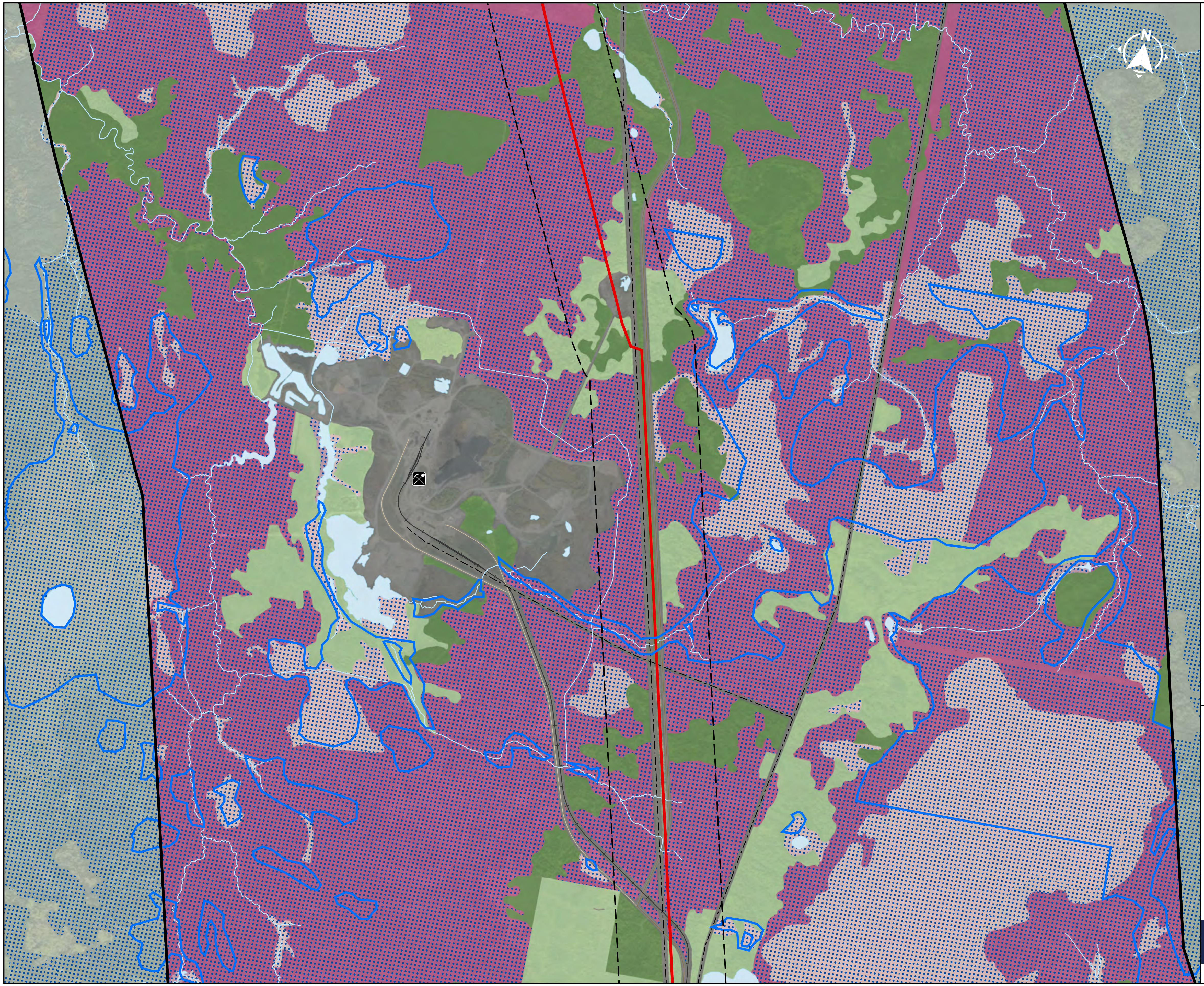
BBA Project Number: 7311004-000000-4E

2024-10-01

0 400 800 m
UTM, Zone 17, NAD 83

Prepared by: M.-N. Chouinard
Drawn by: A. Monnard
Verified by: F. Karcha

File: 7311004_000000_4E_D20_0015_R00_Map4.mxd



Regional Study Area (RSA)

Local Study Area

Wetland

Wetland (City of Timmins Official Plan)

Ecosites

Wetlands

Bogs and Fens

Marshes

Swamps

Terrestrial Communities

Coniferous Forest

Deciduous Forest

Others

Anthropologically Disturbed Upland Communities and Areas

Rock Ecosites

Project Component

New 230 kV Transmission Line

Infrastructure and Facilities

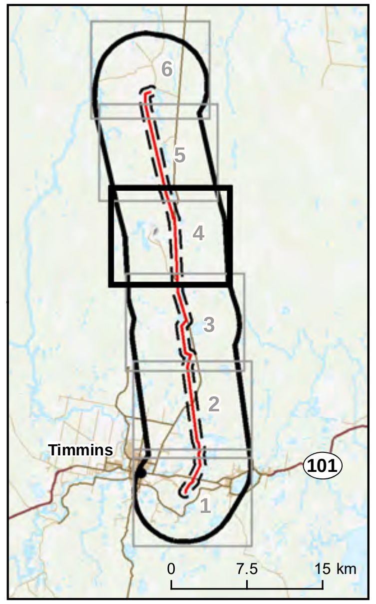
Principal Road

Local Road

Railway

Transmission Line

Kidd Creek Mine



TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

TIP-1 Transmission Project
Timmins, Ontario

Map 4-4
Vegetation Communities

Sources:
Ontario Road Network (ORN), Ontario Ministry of Natural Resources and Forestry, June 2023
Wetlands, Ontario Ministry of Natural Resources and Forestry, April 2024
Forest Resources Inventory, Ontario Ministry of Natural Resources and Forestry, June 2023
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Project Data, BBA, 2024

BBA Project Number: 7311004-000000-4E

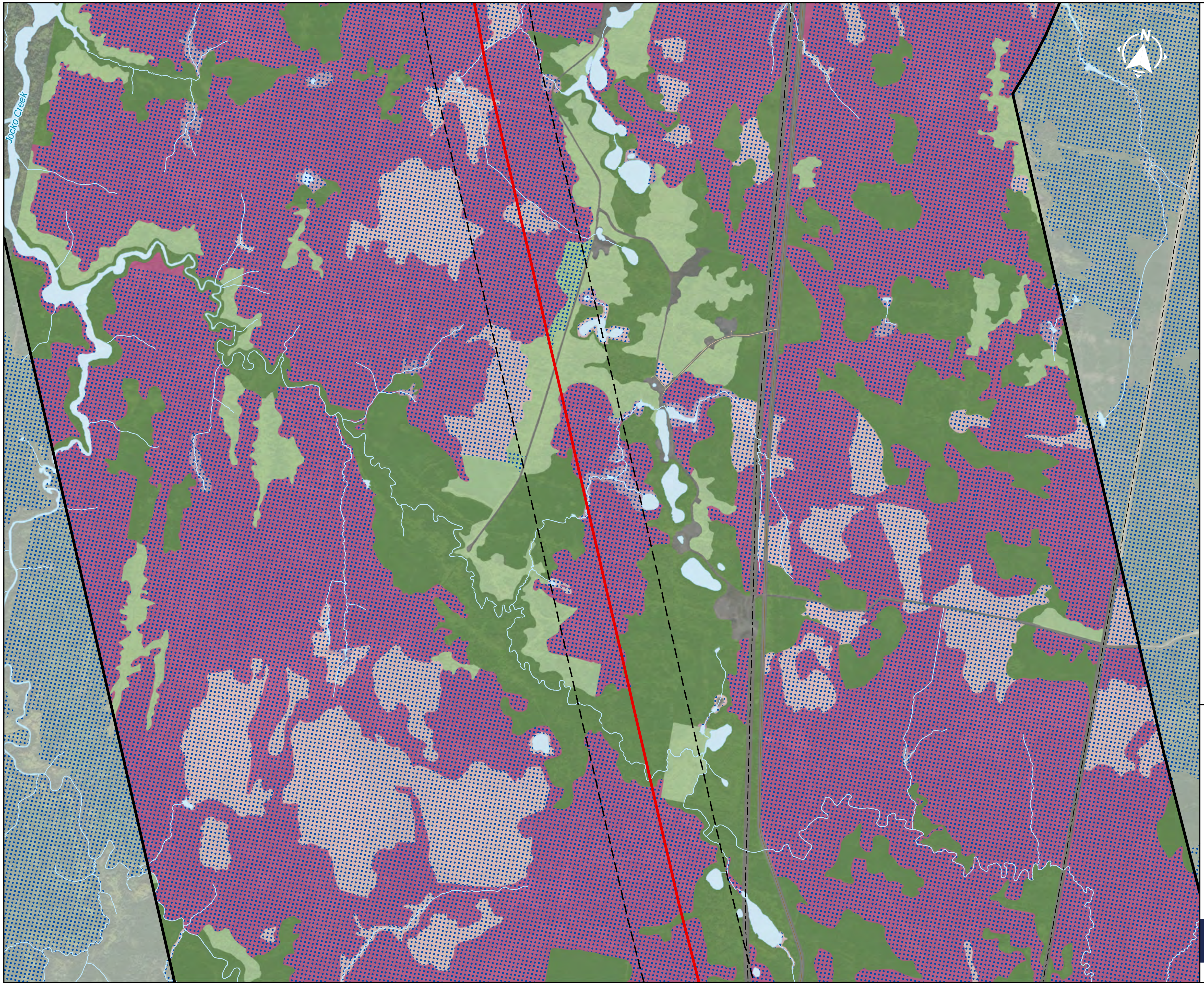
2024-10-01

0 400 800 m
UTM, Zone 17, NAD 83

BBA

Prepared by: M.-N. Chouinard Drawn by: A. Monnard Verified by: F. Karcha

File: 7311004_000000_4E_D20_0015_R00_Map4.mxd



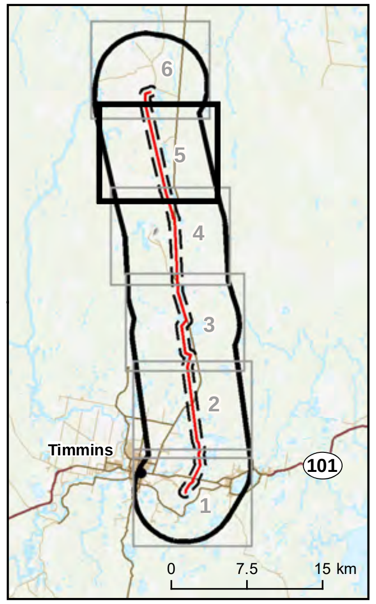
File: 7311004_000000_4E_D20_0015_R00_Map4.mxd

Regional Study Area (RSA)
Local Study Area
Wetland

Ecosites
Wetlands
Bogs and Fens
Marshes
Swamps
Terrestrial Communities
Coniferous Forest
Deciduous Forest
Others
Anthropologically Disturbed Upland Communities and Areas
Rock Ecosites

Project Component
New 230 kV Transmission Line

Infrastructure and Facilities
Principal Road
Local Road
Transmission Line



TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

TIP-1 Transmission Project
Timmins, Ontario

Map 4-5
Vegetation Communities

Sources:
Ontario Road Network (ORN), Ontario Ministry of Natural Resources and Forestry, June 2023
Wetlands, Ontario Ministry of Natural Resources and Forestry, April 2024
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Project Data, BBA, 2024

BBA Project Number: 7311004-000000-4E

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BBA

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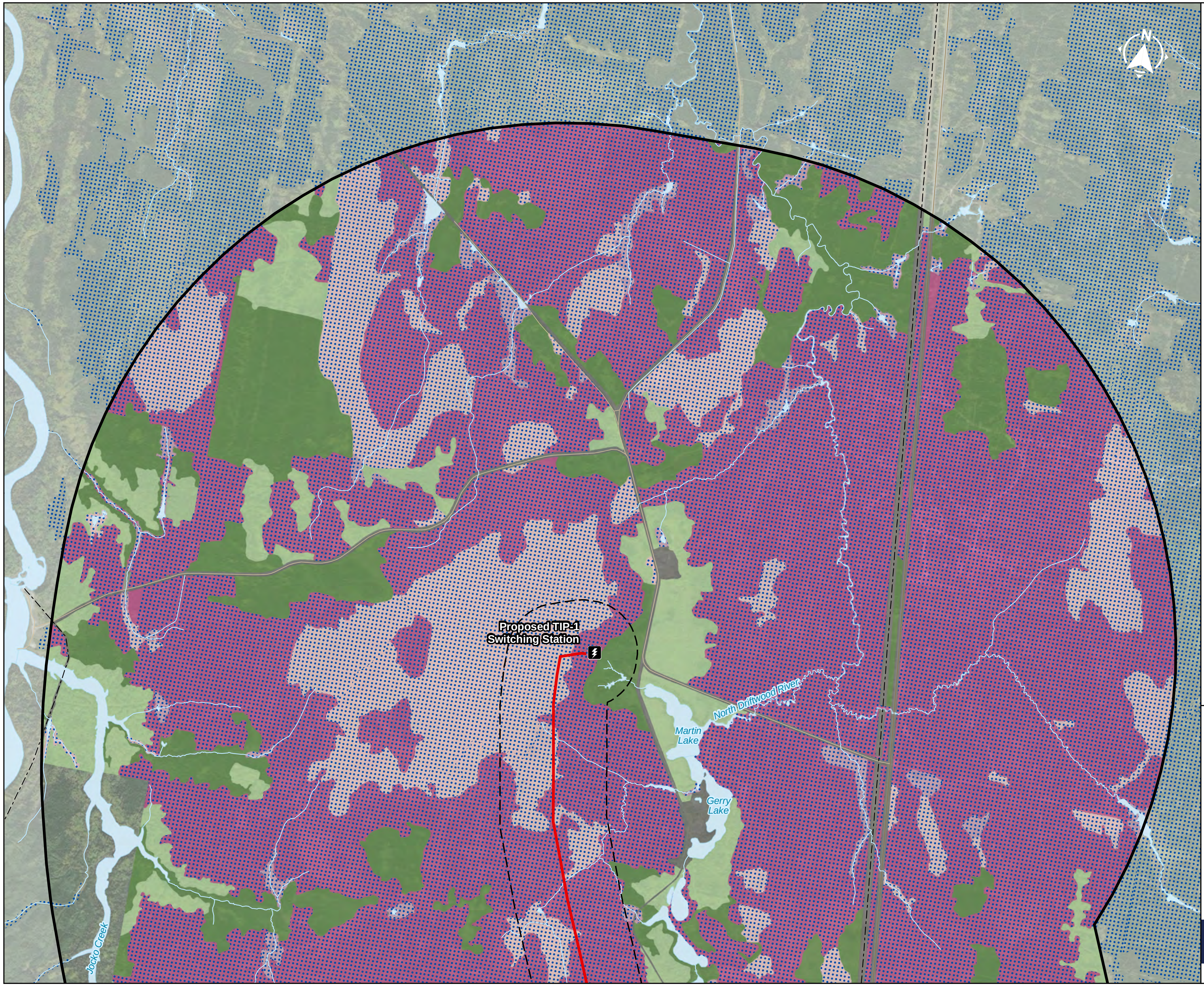


Regional Study Area (RSA)

Local Study Area (LSA)

Wetland

Ecosites

Wetlands

Bogs and Fens

Marshes

Swamps

Terrestrial Communities

Coniferous Forest

Deciduous Forest

Others

Anthropologically Disturbed Upland Communities and Areas

Rock Ecosites

Project Component

New 230 kV Transmission Line

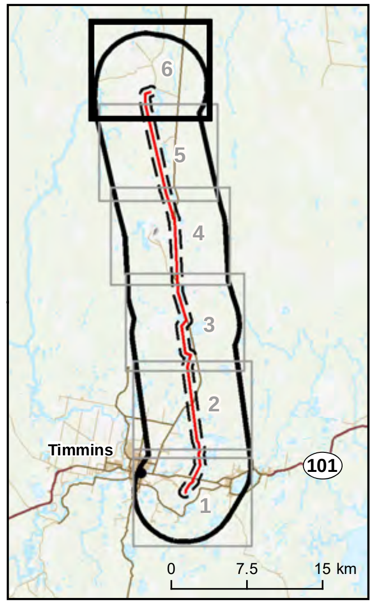
Infrastructure and Facilities

Substation

Principal Road

Local Road

Transmission Line



TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

TIP-1 Transmission Project
Timmins, Ontario

Map 4-6
Vegetation Communities

Sources:
Ontario Road Network (ORN), Ontario Ministry of Natural Resources and Forestry, June 2023
Wetlands, Ontario Ministry of Natural Resources and Forestry, April 2024
Forest Resources Inventory, Ontario Ministry of Natural Resources and Forestry, June 2023
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Project Data, BBA, 2024

BBA Project Number: 7311004-000000-4E

2024-10-01

0 400 800 m
UTM, Zone 17, NAD 83

BBA

Prepared by: M.-N. Chouinard Drawn by: A. Monnard Verified by: F. Karcha

File: 7311004_000000_4E_D20_0015_R00_Map4.mxd

4.1.1. Wetland communities

Wetland communities consist of bog, fen, swamp, and marsh. The following wetland communities are present within the RSA.

4.1.1.1. Bogs and fens

Bogs and fens are wetlands that accumulate peat (poorly decomposed organic matter). They typically have abundant sphagnum moss and otherwise may have abundant sedges, low shrubs, and/or stunted coniferous trees. Fens receive nutrients from groundwater, while bogs are isolated from groundwater and only receive nutrients from rainwater. As a result, bogs have a very low diversity of plants that tolerate low nutrient levels.

Eight (8) communities of bogs and fens, described below, are present throughout the RSA, covering around 10% of its surface area. They are less present within the LSA, covering 6 % of its surface area.

- **B126 - Treed Bog**: Conifer canopy consisting of black spruce with <10% of other species. Often pure conifer. Abundant ericaceous shrubs. Herb poor. Ground surface mostly moss with conifer litter.
- **B137 - Sparse Treed Bog**: Conifer canopy consisting of black spruce with <10% of other species. Understory tree species consisting of black spruce and balsam fir. Ericaceous shrub and sedge rich. Herb poor. Ground surface mostly moss.
- **B138 - Open Bog**: Low shrub, bryophyte, or graminoid communities. Tree poor. Shrubs when present are ericaceous. Herb poor. Ground surface mostly sphagnum and deciduous litter.
- In the LSA, fens are mostly present around lakes, ponds and watercourses.
- **B136 - Sparse Treed Fen**: Conifer canopy consisting mostly of black spruce (> 50%) with tamarack (≥ 10%) and/or presence of fen indicators. Understory tree species consisting of black spruce and tamarack. Shrub, herb, and moss moderately rich. Ground surface mostly moss with standing water and conifer litter.
- **B139 - Poor Fen**: Bryophyte, graminoid, or low shrub communities. Tree and herb poor. Shrubs when present typically ericaceous. Ground surface mostly sphagnum and deciduous litter.
- **B140 - Open Moderately Rich Fen**: Graminoid or low shrub communities. Tree poor. Shrubs when present typically ericaceous. Herb moderately poor. Ground surface mostly sedge and deciduous litter and sphagnum.

- **B146 - Open Shore Fen**: Graminoid dominated community on floating mats adjacent to ponds, lakes, and streams. Tree poor. Herb moderately poor. Permanent surface pools and small hummocks with sphagnum and ericaceous shrubs may be present. Ground surface mostly sedge litter, water, bare peat and sphagnum mosses.
- **B147 - Shrub Shore Fen**: Low shrub community on floating mats adjacent to ponds, lakes, and streams. Tree poor. Ground surface mostly leaf and sedge litter.

4.1.1.2. Swamps

Swamps may be peat-accumulating (organic) or mineral wetlands with extensive tree or shrub cover. Coniferous swamps cover vast, low-lying portions of the RSA. Swamps communities represent 41.55% of the RSA, 94.5% of them being coniferous swamps.

- **B127 - Poor Conifer Swamp**: Conifer canopy consisting of black spruce with <10% of other species. Often pure conifer. Abundant ericaceous shrubs. Herb poor. Ground surface mostly moss.
- **B128 - Intermediate Conifer Swamp**: Conifer canopy consisting of black spruce and presence of tamarack, speckled alder and/or intermediate and rich swamp indicators. May be mixed with balsam fir. Understory tree species consisting of black spruce and balsam fir. Shrub, herb, and moss moderately rich. Abundant alder. Ground surface mostly moss with woody debris and conifer litter.
- **B129 - Rich Conifer Swamp**: Conifer canopy consisting of eastern white cedar and/or presence of rich swamp indicators. Often mixed with black spruce, tamarack, eastern white cedar, and balsam fir. Understory tree species consisting of balsam fir, black spruce, and eastern white cedar. Sparse shrubs. Herb and moss moderately rich. Ground surface mostly moss with conifer litter, woody debris, broadleaf litter, and water.
- **B222 - Mineral Poor Conifer Swamp**: Conifer canopy consisting of black spruce with <10% of other species. Often pure conifer. Understory tree species consisting of black spruce and balsam fir. Abundant ericaceous shrubs. Herb poor.
- **B223 - Mineral Intermediate Conifer Swamp**: Conifer canopy consisting of black spruce and presence of tamarack, speckled alder, and/or intermediate and rich indicator species. Understory tree species consisting of black spruce and balsam fir. Shrub, herb, and moss moderately rich. Abundant alder.

- **B130 - Intolerant Hardwood Swamp**: Hardwood canopy consisting of poplar and/or ash (> 50%), such as trembling aspen, balsam poplar, and black ash. Often mixed with balsam fir, white birch, black spruce, and white spruce. Understory tree species consisting of balsam fir, trembling aspen, white spruce, black spruce, and white birch. Shrub, herb, and graminoid rich. Ground surface mostly broadleaf litter with moss, woody debris, conifer litter, and humus. Evidence of vernal pools and/or standing water common.
- **B133 - Hardwood Swamp**: Hardwood canopy consisting of white birch and/or a mixture of other hardwood species. Shrub, herb, and graminoid rich. Ground surface mostly broadleaf litter with woody debris.

  Thicket swamps are swamps dominated by shrubs, especially speckled alder, but may also contain red-osier dogwood, white meadowsweet, and willows. There may be rare to occasional trees along the margins, usually black spruce, tamarack, trembling aspen and/or white birch. ground vegetation may be dense to sparse, depending upon the intensity of shade from the shrubs, or disturbance regime from periodic watercourse flooding. This other vegetation is often composed of facultative wetland species which can tolerate disturbance, such as Canada bluejoint, reed canary grass, raspberries, goldenrods, and asters.

  Thicket swamps occur throughout the RSA but are often small or narrow, typically being found along watercourses. Thicket swamps are generally adjacent to and not clearly separated from meadow marshes and conifer swamps, generally functioning as an ecotone between the two wetland types.
- **B134 - Mineral Thicket Swamp**: Tall shrub community. Tree poor. Herb moderately rich. Ground surface mostly broadleaf litter, dead wood, and mineral material. Evidence of vernal pools or presence of standing water common.
- **B135 - Organic Thicket Swamp**: Tall shrub community. Tree poor. Herb moderately rich. Ground surface mostly broadleaf litter, dead wood, and sphagnum. Evidence of vernal pools or presence of standing water common.

4.1.1.3. Marshes

Meadow marshes are marsh communities where water levels drop below the substrate surface for part of the year. Meadow marshes are rare throughout the RSA (1.12% of its surface area), only occurring along watercourses and in drained beaver ponds, but they are at high likelihood of being underrepresented by FRI polygons due to limitations with the detection of aquatic vegetation and discerning water depth.

Most commonly, the dominant species in meadow marshes is Canada bluejoint. Still, other species that are commonly present or occasionally dominant include black-girdled bulrush, Canada mannagrass, lake sedge, lenticular sedge, marsh cinquefoil, northern beaked sedge, water sedge and woolly-fruit sedge. Common shrubs include bog birch, leatherleaf, speckled alder, sweetgale and several species of willow. Black spruce and tamarack may be present in small amounts. Meadow marsh often grades into thicket swamps and several forms of fen, often making these communities indistinct.

- **B142 - Mineral Meadow Marsh**: Graminoid, or less frequently, forb dominated community. Dominated by sedges and grasses. Ground surface mostly sedge litter.
- **B144 - Organic Meadow Marsh**: Graminoid, or less frequently, forb dominated community. Dominated by sedges and grasses. Ground surface mostly sedge litter.

4.1.2. Significant wetlands

Significant wetlands are areas identified as provincially significant by the MNRF. The wetland evaluation system was created to inform Ontario's land use planning process. The Ontario Wetland Evaluation System (OWES) Northern Manual 2nd Edition (MNRF, 2022) applies to the RSA. However, the OWES manual notes that in the boreal forest extensive wetlands, often covering hundreds of square kilometres, dominate the landscape. OWES cannot be used to evaluate these extensive wetlands and they must be protected through other mechanisms such as Provincial Parks, Conservation Reserves, and ANSIs, etc. (MNRF 2022).

The Timmins Official Plan Schedule B mapping (2010) identifies the presence of three (3) designated Provincial Significant Wetlands (PSW) within the RSA. The PSWs identified are the Kraft Creek/Murphy Creek Wetland, the Little Goose Lake Wetland, and the Porcupine Lake Wetland (Map 4). Other unnamed wetlands occur throughout the RSA which have not been evaluated for Provincial Significance.

4.1.3. Upland communities

Upland communities are grouped into deciduous treed and coniferous treed forests. They both represent around 15 % of the RSA.

Upland forests are typically dominated by Jack pine - black spruce conifer stand or dominated by deciduous species, mainly trembling aspen and paper birch. Other tree species that were inventoried within the LSA are balsam fir (very common), eastern white cedar, tamarack and balsam poplar.

4.1.3.1. Deciduous forest

Deciduous forests within the RSA are composed primarily of trembling aspen and paper birch (>50% cover of hardwood species). Seven (7) different deciduous forest communities are present within the RSA.

- **B016 - Very Shallow, Dry to Fresh, Aspen - Birch Hardwood**: Hardwood canopy consisting of birch and/or aspen species (> 50%). Often mixed with black spruce, white spruce, and balsam fir. Understory tree species consisting of balsam fir, black spruce, white birch, and white spruce. Varies from shrub and herb poor to moderately rich.
- **B040 - Dry, Sandy, Aspen - Birch Hardwood**: Hardwood canopy comprised mostly of trembling aspen and white birch (> 50%). Often mixed with jack pine, black spruce, balsam fir, and white spruce. Understory tree species consisting of balsam fir, trembling aspen, black spruce, white birch, and white spruce. Shrub and herb moderately rich.
- **B055 - Dry to Fresh, Coarse, Aspen - Birch Hardwood**: Hardwood canopy consisting of trembling aspen and/or white birch (> 50%). May be a near pure stand of trembling aspen or white birch. Often mixed with balsam fir, black spruce, and white spruce. Understory tree species consisting of balsam fir, trembling aspen, white birch and black spruce. Shrub rich. Herb poor, increasing richness on loamy substrates.
- **B070 - Moist, Coarse, Aspen - Birch Hardwood**: Hardwood canopy consisting mostly of trembling aspen and/or white birch (> 50%). Often mixed with balsam fir, white spruce, black spruce, and jack pine. Understory tree species consisting of balsam fir, trembling aspen, white birch, and black spruce. Shrub and herb moderately rich.
- **B088 - Fresh, Clayey, Aspen - Birch Hardwood**: Hardwood canopy consisting of trembling aspen and/or birch species (> 50%). Often mixed with balsam fir, black spruce, white birch, and white spruce. Understory tree species consisting of balsam fir, trembling aspen, white birch, white spruce, and black spruce. Shrub and herb rich.
- **B104 - Fresh, Silty to Fine Loamy, Aspen - Birch Hardwood**: Hardwood canopy consisting mostly of aspen and/or birch (> 50%). Often mixed with balsam fir, white spruce, and black spruce. Understory tree species consisting of balsam fir, trembling aspen, black spruce, white birch, and white spruce. Shrub and herb rich.
- **B119 - Moist, Fine, Aspen - Birch Hardwood**: Hardwood canopy consisting of aspen and/or birch species (> 50%), including balsam poplar and yellow birch. May be mixed with balsam fir, black spruce, white birch, and white spruce. Understory tree species consisting of balsam fir, trembling aspen, black spruce, balsam poplar and black ash. Shrub and herb moderately rich.

4.1.3.2. Coniferous forest

Coniferous forests in the RSA are typically dominated by black spruce and jack pine. A total of 23 different ecosite types are present in the RSA, and 15 of them have been documented within the LSA.

- **B012 - Very Shallow, Dry to Fresh, Pine - Black Spruce Conifer**: Conifer canopy consisting mostly of black spruce and/or jack pine (> 50%). May be mixed with balsam fir and white birch. Shrub and herb poor.
- **B014 - Very Shallow, Dry to Fresh, Conifer**: Conifer canopy consisting of balsam fir, white spruce and/or a mixture of other coniferous species. May be mixed with white birch and trembling aspen. Understory tree species consisting of balsam fir, black spruce, and trembling aspen. Shrub and herb poor.
- **B024 - Very Shallow, Humid, Black Spruce - Pine Conifer**: Conifer canopy consisting mostly of black spruce and/or jack pine (> 50%). Often mixed with balsam fir, eastern white cedar, and tamarack. Understory tree species consisting of black spruce and balsam fir. Shrub and herb poor.
- **B034 - Dry, Sandy, Jack Pine - Black Spruce Dominated**: Conifer canopy consisting of jack pine and/or black spruce (> 80% of the total tree species with white birch limited to ≤ 20%). May be a near pure stand of jack pine or black spruce. Understory tree species consisting of black spruce, white birch, and balsam fir. Abundant ericaceous shrub. Herb poor.
- **B035 - Dry, Sandy, Pine - Black Spruce Conifer**: Conifer canopy consisting of jack pine and/or black spruce (> 50%). Often mixed with trembling aspen, white birch, and balsam fir. Understory tree species consisting of black spruce, balsam fir, white birch, and trembling aspen. Varies from shrub and herb poor to moderately rich.
- **B048 - Dry to Fresh, Coarse, Red Pine - White Pine Conifer**: Conifer canopy consisting mostly of red pine and/or eastern white pine (≥ 20%). May be a near pure stand of red pine or eastern white pine. Often mixed with white birch, balsam fir, and trembling aspen. Understory tree species consisting of balsam fir, white birch, eastern white pine, black spruce, trembling aspen, and red pine. Varies from shrub and herb poor to rich.
- **B049 - Dry to Fresh, Coarse, Jack Pine - Black Spruce Dominated**: Conifer canopy consisting of jack pine and/or black spruce (> 90% cover of total tree species with white birch limited to ≤ 20%). May be a near pure stand of jack pine or black spruce. Understory tree species consisting of black spruce, balsam fir, and white birch. Shrub and herb poor.

- **B050 - Dry to Fresh, Coarse, Pine - Black Spruce Conifer**: Conifer canopy consisting of black spruce and/or jack pine (> 50%). Often mixed with trembling aspen, white birch, balsam fir, and white spruce. Understory tree species consisting of black spruce, balsam fir, white birch, and trembling aspen. Shrub and herb poor.
- **B052 - Dry to Fresh, Coarse, Spruce - Fir Conifer**: Conifer canopy mostly comprised of balsam fir and white spruce (> 50%). Often mixed with white birch, trembling aspen, and black spruce. Understory tree species consisting of balsam fir, trembling aspen, white birch, and white spruce. Shrub and herb poor.
- **B065 - Moist, Coarse, Pine - Black Spruce Conifer**: Conifer canopy consisting of black spruce and/or jack pine (> 50%). Understory tree species consisting of black spruce and balsam fir. Shrub and herb moderately poor.
- **B067 - Moist, Coarse, Spruce - Fir Conifer**: Conifer canopy mostly consisting of Balsam fir, black spruce, and white spruce (> 50%). Often mixed with trembling aspen, white birch, jack pine, and balsam poplar. Understory tree species consisting of balsam fir, white birch, and black spruce. Shrub and herb moderately poor.
- **B082 - Fresh, Clayey, Jack Pine - Black Spruce Dominated**: Conifer canopy consisting mostly of black spruce and/or jack pine (> 90% cover of the total tree species with white birch limited to ≤ 20%). May be a near pure stand of black spruce or jack pine. Understory tree species consisting of black spruce and balsam fir. Shrub and herb poor.
- **B083 - Fresh, Clayey, Pine - Black Spruce Conifer**: Conifer canopy consisting mostly of black spruce and/or jack pine (> 50%). Often mixed with trembling aspen and balsam fir. Understory tree species consisting of balsam fir, black spruce, and trembling aspen. Shrub and herb poor.
- **B085 - Fresh, Clayey, Spruce - Fir Conifer**: Conifer canopy consisting mostly of balsam fir and white spruce (> 50%). Often mixed with trembling aspen, black spruce, and white birch. Understory tree species consisting of balsam fir, trembling aspen, white spruce, and white birch. Shrub and herb rich.
- **B098 - Fresh, Silty to Fine Loamy, Jack Pine - Black Spruce Dominated**: Conifer canopy consisting of black spruce and/or jack pine (> 90% cover of tree species with white birch ≤ 20%). May be a near pure stand of black spruce or jack pine. Understory tree species consisting of black spruce, balsam fir, and white birch. Shrub and herb poor.
- **B099 - Fresh, Silty to Fine Loamy, Pine - Black Spruce Conifer**: Conifer canopy consisting mostly of black spruce and/or jack pine (> 50%). Often mixed with trembling aspen, balsam fir, and white birch. Understory tree species consisting of balsam fir, black spruce, white birch, and trembling aspen. Shrub and herb poor.

- **B100 - Fresh, Silty to Fine Loamy, Hemlock - Cedar Conifer**: Conifer canopy consisting mostly of eastern white cedar and/or eastern hemlock (> 50%). Eastern hemlock rare. May be mixed with balsam fir, white birch, white spruce, trembling aspen, and black spruce. Shrub and herb rich.
- **B101 - Fresh, Silty to Fine Loamy, Spruce - Fir Conifer**: Conifer canopy consisting mostly of balsam fir and white spruce (> 50%). Often mixed with black spruce, trembling aspen, white birch, and jack pine. Understory tree species consisting of balsam fir, white birch, trembling aspen, white spruce, and black spruce. Shrub and herb rich.
- **B102 - Fresh, Silty to Fine Loamy, Conifer**: Conifer canopy consisting of tamarack and/or a mixture of other species. Shrub and herb rich.
- **B114 - Moist, Fine, Pine - Black Spruce Conifer**: Conifer canopy consisting of black spruce and/or jack pine (> 50%). Often mixed with trembling aspen, balsam fir, and white birch. Understory tree species consisting of balsam fir, black spruce, and trembling aspen. Shrub and herb moderately poor.
- **B115 - Moist, Fine, Hemlock - Cedar Conifer**: Conifer canopy consisting mostly of eastern white cedar and/or eastern hemlock (> 50%). Eastern hemlock rare. May be mixed with white spruce, balsam fir, white birch, black spruce, and balsam poplar. Shrub and herb moderately rich.
- **B116 - Moist, Fine, Spruce - Fir Conifer**: Conifer canopy consisting mostly of balsam fir and white spruce (> 50%). Often mixed with trembling aspen, black spruce, and white birch. Understory tree species consisting of balsam fir, white birch, and trembling aspen. Shrub and herb moderately rich.
- **B117 - Moist, Fine, Conifer**: Conifer canopy mostly consisting of black spruce and a mixture of other coniferous species. Shrub and herb moderately rich.

4.1.4. Rock ecosites

Exposed bedrock is not common in the RSA and covers very small areas which are included in other ecosites. Plant species diversity in areas of exposed bedrock is relatively low. Typical species growing where the soil has accumulated include Jack pine, paper birch, black spruce and blueberries. Lichens and mosses are abundant. Two (2) rock ecosites are present within the RSA, including a Rock Barren ecosite (B164) that was inventoried within the LSA.

- **B164 – Rock Barren**: Sparsely vegetated tree or shrub communities on horizontal or slightly sloping bedrock exposures and dominated by exposed acidic bedrock. Herb moderately poor. Vascular plants restricted to cracks, crevices, and depressions where a thin veneer of mineral or organic material has accumulated. Ground surface mostly lichens and exposed bedrock.
- **B165 - Open Rock Barren**: Sparsely vegetated not-woody communities on horizontal to sloping bedrock exposures. Herb moderately poor. Vascular plants restricted to cracks, crevices, and depressions where a thin veneer of mineral or organic material has accumulated.

4.1.5. Anthropologically disturbed communities and areas

Disturbed areas in the RSA are from two (2) general types:

- Anthropogenic ecosites: Constructed - aggregate sites, landfills, pavement/concrete surface (**B189-B200**), and;
- Unclassified - commercial industrial (**U997**), utilities (**U998**), and residential (**U999**).

These sites that have significant physical and/or chemical alteration by human activity, and pose unique conditions, or are inhibitive to the establishment and growth of natural vegetation assemblages.

Other sites subjected to lesser alterations like, recreation (e.g. parks), agricultural practices, and sand/gravel excavation are also present to a lesser extent, within the RSA. These three (3) types of perturbed ecosites are :

- **B007 - Active Mineral Barren**: Exposed mineral material communities associated with seasonal water erosion events or other large scale vegetation removal process. These communities support limited vascular vegetation, bryophytes, and lichens due to active processes. B007 ecosites are present within the RSA, generally close to Highway 655 and along unnamed local roads where aggregate exaction has occurred. These sites are associated with disturbed areas and are considered under the FRI categories as Sand/Gravel/Mine Tailings land use.

- **B031 - Dry, Sandy, Sparse Shrub**: Scattered tall and/or short shrub community. Tree poor, and herb moderately poor. Sites are typically disturbed areas such as former farmlands, burns, gas/hydro corridors or logged areas. Maintenance of structure and composition associated with low to moderate disturbance (i.e., fire, grazing, vegetation control). In the absence of disturbance this ecosite will succeed to a denser shrub (B032) or treed system. One (1) B031 ecosite is present within the RSA, adjacent to Porcupine Lake. It is part of the Northern College grounds.
- **B093 - Fresh, Silty to Fine Loamy, Field**: Herbaceous vegetation community maintained by continuous human alteration. Trees and shrubs generally absent. Sites are typically farmlands that are hayfields, heavily grazed pastures or cultivated for crops. Areas of B093 ecosites are found north of Timmins agglomeration and near Porcupine Lake.

These habitats are diverse, depending on the topography and the nature and history of disturbance. If the disturbance is not ongoing, shrubs and trees regrow, particularly black spruce, blueberries, jack pine, Labrador tea, speckled alder, trembling aspen, and white birch. Herbaceous vegetation is generally rare in communities with abundant shrubs and trees but may be the dominant plant form in open communities. A very wide array of herbaceous plants may be found in anthropogenic and disturbed areas, often dominated by grasses. Unlike other communities, these habitats often contain a variety of non-native plants.

4.2. Wildlife

The following subsections provide the results of the desktop review of existing information, including the field surveys of terrestrial wildlife carried out between 2021 and 2023 in relation to CNC's Project (WSP E&I Canada Limited, 2024).

4.2.1. Amphibians and reptiles

4.2.1.1. Amphibians

Six (6) species of amphibians were detected during WSP's 2021 and 2022 amphibian call surveys (WSP E&I Canada Limited, 2024a). These species were mink frog, spring peeper, American toad, green frog, boreal chorus frog, and wood frog. Spring peeper was detected in most of the wetlands surveyed within the CNC Project Study Area. Boreal chorus frog and green frog were uncommon, detected at only two (2) survey stations each, in the northern part of the Project RSA, north of the TLA.

Frogs and toads were found to have evidence of breeding in most of the wetlands that were surveyed, but none of them achieved the thresholds for significant wildlife habitat (SWH), which consider species abundance and diversity (see Section 4.2.5 for SWH). Targeted surveys for salamanders were not completed, though incidental records were documented of an unidentified salamander (*Ambystoma sp.*), and a blue-spotted salamander (WSP E&I Canada Limited, 2024a), both located in the northern part of the Project RSA, north of the TLA.

4.2.1.2. Reptiles

Candidate turtle basking habitat was found throughout the CNC Project Study Area in lakes, ponds, and rivers with suitable basking features (e.g., stable rocks, logs, and mounds above the surface of the water). Turtle basking surveys were conducted at 17 locations in 2022 within the CNC Project 10 km Study Area, which covers about 60 % of the Project RSA. The southernmost survey station was located near Bigwater Lake. No turtles were observed (WSP E&I Canada Limited, 2024a).

Three (3) locations of Blanding's turtles were shared with CNC from the communities: one (1) on Kidd Creek, one (1) on Prosser Lake Outlet and a third one on West Buskegau River. Those three (3) sites are all located outside the Project RSA, but less than 3 km away from the limit.

The three (3) sites were preliminarily investigated in 2022, due to poor ground access, and fully surveyed in 2023 (WSP E&I Canada Limited, 2024a). These areas were targeted for eDNA sampling in 2023 as MECP has indicated that they consider Blanding's turtles to have a high probability of occurrence in the CNC Study Area. The CNC Study Area is considered to be the northern limit of the species' range.

Blanding's turtle typically occupies large wetlands and shallow lakes (less than 2 m deep) with abundant submergent, floating, and emergent vegetation (MECP, 2021a). Terrestrial habitat is also important for the species life processes. Blanding's turtle are disturbance-sensitive with life history limitations (e.g., low recruitment rates, low annual survival of juveniles), resulting in sensitivity to even minor changes in mortality risk. The province has developed technical, science-based descriptions of the habitats protected for Blanding's turtle under the Endangered Species Act:

- Category 1: Nest and/or Overwintering Sites and area within 30 m
- Category 2: Wetland Complex (All suitable waterbodies within 500 m of each other) that extends up to 2 km from an occurrence, and the area within 30 m around those suitable waterbodies

- Category 3: Area between 30 m and 250 m around suitable waterbodies identified in Category 2, within 2 km from an occurrence

Category habitat based on the General Habitat Description (GHD) for Blanding's turtle (MECP, 2021a) was mapped at the three (3) locations shared by communities (WSP E&I Canada Limited, 2024a). To be conservative, the provided observations was assumed to be the centre of Category 1 habitat. In addition to the habitat assessments at locations of recorded observations, aerial transect surveys were completed across the CNC Project Study Area in 2023, and areas that were identified as having moderate or high habitat suitability were selected for field assessments to ground-truth the identified suitability classification.

The field assessments on the ground allowed confirmation of one or more habitat features suitable for Blanding's turtle at each of the three (3) sites with documented observations. However, no turtles were seen, and all 20 samples yielded zero detection of Blanding's turtle eDNA.

The eastern garter snake was accidentally observed on several occasions within the RSA.

4.2.2. Birds

WSP conducted Breeding Bird, Crepuscular Bird, Marsh Bird, Nocturnal Owl, Migratory Bird, SAR Bird, and Stick Nest Surveys between 2021 and 2023 to characterize the extent of avian presence, abundance, and density within the CNC Project Study Area. ARUs were deployed to further document the presence/no detection of bird species (WSP E&I Canada Limited, 2024a).

A total of 132 bird species were recorded during targeted surveys (breeding bird point counts, marsh bird surveys, and nocturnal owl surveys) during other investigations (aerial surveys, migratory bird surveys, incidental observations, and ARUs) between 2021 and 2023 (WSP E&I Canada Limited, 2024a). The complete list of birds surveyed with their highest breeding evidence and status in Ontario is presented in Appendix C. Other bird species mentioned by secondary sources (NHIC, OBBA, iNaturalist) as possibly present in the Study Area include: bank swallow, common goldeneye, common merganser, European starling, great gray owl, horned lark, peregrine falcon, rock pigeon, and turkey vulture. Those species were not observed in the Study Area during all the different surveys (WSP E&I Canada Limited, 2024a).

Two (2) species at risk (SAR) and species of five (5) special concern (SCC) were documented in the CNC Project Study Area (WSP E&I Canada Limited, 2024a):

- **SAR**: Chimney swift and lesser yellowlegs

- **SCC**: Canada warbler, common nighthawk, evening grosbeak, olive-sided flycatcher, and rusty blackbird

Eastern whip-poor-will, a threatened species in Ontario, was not noted during any nocturnal surveys (i.e., amphibian calling surveys, marsh bird surveys, or crepuscular bird surveys). Short-eared owl, also threatened in Ontario, was not detected during any surveys across the Study Area. A candidate yellow rail was detected in 2021 during a marsh bird survey, but the species was not confirmed (truncated call that was not repeated). Long-tailed duck, a species identified as provincially rare when on breeding grounds, was recorded at two ARU stations. The species was documented outside of the standard breeding period and is thus not considered to be a species of conservation concern for the purposes of these results (WSP E&I Canada Limited, 2024a). SAR and SCC are further discussed in section 4.3.

The most abundant and frequently observed species recorded were representative of the avifauna and habitats expected to be found in the boreal coniferous forest and wetlands: White-throated Sparrow (84.4% of the point counts stations), Ruby-crowned Kinglet (65.4% of point count stations), and Tennessee Warbler (51.7% of the point count stations).

Eight (8) species (Canada goose, Canada jay, common grackle, common loon, common raven, dark-eyed junco, green-winged teal, and northern flicker) were confirmed breeding in the Study Area, and 50 species were noted as “probable” breeding. Most of the probable breeding codes were assigned due to the birds being on territory, which means the species was observed with a probable breeding code across two (2) breeding bird surveys within the safe breeding period. Possible breeding was recorded in 44 species, and seven (7) species (American wigeon, eastern kingbird, gadwall, merlin, mourning dove, redhead, and semipalmated plover) were observed during the breeding season, with no evidence of breeding noted (WSP E&I Canada Limited, 2024a).

Migratory bird/waterfowl surveys recorded 66 species of bird, most of which were believed to be migrating through the Study Area. Habitat searches did not find diverse or large groups of birds. SWH for migratory birds including shorebird migratory stopover area, waterfowl stopover and staging area (terrestrial), and waterfowl stopover and staging area (aquatic) were not found in the CNC Project Study Area, though candidate sites remain within the RSA in the area that was not covered by WSP (2024a); SWH is discussed further in Section 4.2.5. The geography of the Study Area is not believed to be suitable to funneling migratory songbirds. The best feature on the landscape that would be expected to result in congregations of migratory birds is the Mattagami River valley.

Two (2) bald eagles were recorded at one (1) location along the Mattagami River, near the Lower Sturgeon dam, during targeted aerial surveys for stick nests in 2021-2022. A bald eagle nest was found approximately 550 m southwest of where the two (2) bald eagles were observed. 15 sharp-tailed grouse were observed during aerial surveys, and at two (2)of these sites, located in the northern part of the RSA, the numbers present and timing of the aerial survey suggested that the area could be potential lekking sites (WSP E&I Canada Limited, 2024a). Candidate sharp-tailed grouse lek sites are discussed further in Section 4.2.5.3.

4.2.3. Mammals

4.2.3.1. Bats

Bat maternity roost habitat

In Ontario, bats use two (2) strategies for roosting during the day. Most species roost in small spaces or crevices found in loose bark, hollow trees, rock faces and human structures such as attics, walls and bat boxes. Maternity roosts are not found in caves and mines in Ontario but can be found in buildings. Other bat species roost in foliage in small groups or individually very high up in the tree canopy and as such are often difficult to detect (OMNR, 2011).

OMNRF's SWH criterion schedules for Ecoregion 3E (OMNRF, 2015) states that bat maternity colonies are found in 50 treed ecosites that are mature (dominant tree >80 yrs old) deciduous or mixed forest stands with >10 ha large diameter (>25 cm dbh) wildlife trees. Female bats prefer wildlife trees (snags), and silver-haired bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred. If snag/ cavity tree density is ≥10 snags per hectare of trees ≥25 cm dbh, then the site is a candidate for maternity colony roosts (OMNR, 2011).

A total of 119 plots were surveyed at 42 locations within the CNC Project Study Area between 2021 and 2023 (WSP E&I Canada Limited, 2024a). Survey locations targeted mature mixed and deciduous forests to assess the suitability of forests for bat maternity roosting habitat.

Snag density was highly variable; the number of suitable cavity trees in each plot varied from 0 to 360 trees per hectare and the average snag density was 65.6 snags/ha. The more abundant were white birch (50.0%), followed by trembling aspen (27.5%). Average snag density across the sampled ecosites ranged between 15 and 213.3 snags/ha, with the highest densities in ecosites B101 and B115, followed, in descending order, of B116, B129, B119, B128, B114, B136 and B127 (WSP E&I Canada Limited, 2024a) (Table 2).

Snag density surveys revealed potentially high-quality maternity roosting habitat for SAR bats, however a very low number of passes were identified to SAR species relative to the total number of recorded passes.

Table 2. Snag density across the LSA.

Ecosite	Hectares	Snag density (snags/ha)	Potential # of snags[1]
Wetlands	**1770.8**		**68756**
Bogs and Fens	**96.3**	**20.0**	**1926**
Sparse Treed Fen (B136)	96.3	20.0	1926
Swamps	**1674.6**		**66830**
Organic Poor Conifer Swamp (B127)	172.2	15.0	2584
Organic Intermediate Conifer Swamp (B128)	1374.2	40.6	55794
Organic Rich Conifer Swamp (B129)	128.1	66.0	8453
Upland Communities	**521.7**		**69733**
Deciduous Forest	**114.0**		**5862**
Moist, Fine: Aspen – Birch Hardwood (B119)	114.0	51.4	5862
Coniferous Forest	**407.65**		**63871**
Fresh, Silty to Fine Loamy: Spruce – Fir Conifer (B101)	266.49	213.3	56842
Moist, Fine: Pine – Black Spruce Conifer (B114)	92.9	36.7	3409
Moist, Fine: Spruce – Fir Conifer (B116)	48.26	75.0	3620
TOTAL	**2292.5**		**138489**

Acoustic bat activity was monitored at 45 locations in total in 2021, 2022 and 2023, for a total of 1,018 detector nights (WSP E&I Canada Limited, 2024a). During these acoustic surveys, a total of 14,967 bat passes were recorded in 2021, 32,538 bat passes were recorded in 2022, and 3,706 bat passes were recorded in 2023. Of these, only 0.4% (53 passes in 2021 and 122 passes in 2022, and eight (8) passes in 2023) were confirmed to be by SAR bat species. The most frequently recorded species was the silver-haired bat, followed by the hoary bat. Passes that were classified as an unknown low-frequency species may have been produced by either a silver-haired, a hoary, or a big brown bat.

Only a single pass in 2021, and 10 in 2022 (none in 2023) could be accurately identified as little brown myotis, while the remaining passes could only be classified as belonging to a Myotis species. An additional 28 passes in 2021, 26 passes in 2022, and 13 passes in 2023 were by an

[1] Number of snags provides indication of the relative potential for bat roosting but not all trees will be occupied at the same time, some are lost over time, and some are recruited as trees age.

unknown high-frequency species, which may be either a SAR bat species or the eastern red bat. Although snag density surveys revealed potentially high-quality maternity roosting habitat for SAR bats, the very low number of passes identified to SAR species relative to the total number of recorded passes suggests very few SAR bats are using this habitat.

Although the presence of northern myotis could not be confirmed, its presence cannot be ruled out. In most instances, the northern myotis emits echolocation calls that resemble those of the little brown myotis, making recordings of calls identifiable as northern myotis exceedingly rare (WSP E&I Canada Limited, 2024a). This species occurs throughout southern Ontario, to the north shore of Lake Superior and occasionally as far north as Moosonee in Cochrane District)

The tricolored bat was not recorded in 2021, 2022, or 2023. While we cannot discount the likelihood that tricolored bats might summer within or near the Study Area, it is unlikely that tricolored bats hibernate within or near the CNC Project Study Area (WSP E&I Canada Limited, 2024a). In Ontario it is considered uncommon, although population sizes are not well known.

Bat hibernacula

Five (5) locations of exposed bedrock were identified in 2021 and surveyed in 2021 and in 2022 to assess their suitability as overwintering habitat for bats. None of them were suitable for hibernating bats (WSP E&I Canada Limited, 2024a).

Seven (7) additional areas of exposed rock were identified in 2022 during aerial surveys and assessed for presence of potentially suitable cracks, crevices or talus formations for hibernating bats. Two (2) of these sites were found to have potentially suitable features for overwintering bats, one (Rock Barren 8-3) situated within the RSA to the northeast of Kidd Creek Mine (WSP E&I Canada Limited, 2024c). Acoustic bat activity was collected at candidate hibernacula and control sites at these two (2) sites. Acoustic monitoring ran in May and June 2022, and from July 10 to September 10, 2023, to detect any seasonal peaks in activity that characterizes pre-hibernation bat behaviour that occurs at hibernacula in late summer/early fall (WSP E&I Canada Limited, 2024a).

A total of 1,979 passes were recorded in May-June 2022. Of these, only four (4) passes belonged to a Myotis species and one to an unknown high-frequency species. Two (2) of the passes by a Myotis species were recorded at a control site. No passes could be accurately classified to an at-risk bat species. A total of 1,456 bat passes were recorded during hibernacula surveys in 2023. Nine (9) passes by at-risk bat species were recorded across the sites and none of this activity was concentrated in the late summer/fall period (WSP E&I Canada Limited, 2024a).

These results confirm that none of the identified candidate hibernacula are being used as hibernacula (WSP E&I Canada Limited, 2024a).

The Ontario Abandoned Mines Information System (AMIS; Ministry of Mines 2022) was used to identify the locations of abandoned mines that might harbour suitable habitat features for hibernating bats. They are all located in the southern part of the RSA (Maps 5-1 and 5-2), outside of the CNC Project Study Area and than were not part of the Bat Hibernacula Habitat Surveys. Only one (1) of these structures is located within the LSA, approximately 3 km from the Porcupine substation.

4.2.3.2. Moose

Evidence of moose was observed throughout the Study Area during aerial surveys, including 27 individual sightings and 57 separate sets of moose tracks during the winter aerial surveys of 2021 and 2022. Areas of relatively high moose density were mapped in 2021, and the general relative moose density (from low to high), was mapped for the totality of Aerial Survey Study Area in 2022 (WSP E&I Canada Limited, 2024a).

Moose sightings and tracks were typically associated with clearcuts, regenerating forest, and riparian areas, particularly those dominated by aspen and abundant young hardwood saplings and shrubs that provide a browse forage source to moose; these habitats, in proximity to adjacent thermal and hiding cover, are preferred by moose in northern Ontario (WSP E&I Canada Limited, 2024a).

4.2.3.3. Woodland caribou

The northern part of the RSA intersects with the most southern portion of the Kesagami Woodland Caribou Range (ON8; ECCC 2020). This Range was last assessed provincially in 2010 (MNRF 2014) and was characterized at the time as 43.8% disturbed, with a minimum animal count of 178 caribou and a declining population trend (low calf recruitment).

Provincially, woodland caribou (boreal population) are listed as threatened and receive individual and general habitat protection under the ESA. Woodland caribou (boreal population) habitat has been categorized by the province through the General Habitat Description for the Forest-dwelling woodland caribou (MECP 2021b) to support the implementation of the general habitat definition in the ESA. The habitat has been categorized as follows:

- Category 1: Nursery Areas, Winter Use Areas, Travel Corridors

- Category 2: Seasonal Ranges
- Category 3: Remaining Areas within the Range

The Kesagami Woodland Caribou Range overlapping the RSA is all considered Category 3 (remaining area within Range) habitat.

The 2021 and 2022 aerial surveys (WSP E&I Canada Limited, 2024a) overlapped the southeastern extent of the Kesagami Woodland Caribou Range; the area of overlap is currently a low likelihood occupied habitat for Woodland Caribou as a consequence of current habitat characteristics (early successional vegetation and has incurred significant forestry disturbance) and presence of alternate prey (moose) which typically attracts a known predator of woodland caribou, wolves. No woodland caribou or tracks were documented during aerial surveys (WSP E&I Canada Limited, 2024a).

4.2.3.4. Wolves

Wolf tracks were documented at 21 locations during the 2021 and 2022 aerial surveys. 16 observations of wolf tracks consisted of more than one set of tracks, with one instance where five (5) sets of wolf tracks were observed together. No wolves were observed during aerial surveys (WSP E&I Canada Limited, 2024a).

In 2021, areas of relatively high wolf density were located northwest of the CNC Project Location, and at the southwest edge of the 2021 aerial survey study area. Several areas within the 2022 aerial survey area exhibited sufficient evidence of wolf sign to be classified as medium-high to high relative wolf density.

Only one (1) area of medium and medium/low wolf density is present within the RSA, around Jocko Creek.

The wolves in the Study Area are considered gray wolf (WSP E&I Canada Limited, 2024a). The eastern wolf is largely restricted in Ontario to Algonquin Provincial Park plus surrounding areas, some of which are protected. These include an area from Killarney Provincial Park south to Kawartha Highlands Signature Site. More distant records are relatively infrequent and likely attributable to occasional long-distance dispersal events,

4.2.3.5. Furbearers

Furbearing species detected across 2021 and 2022 surveys and incidental observations include North American river otter, American marten, Canada lynx, red fox, American beaver, American black bear, and snowshoe hare.

Evidence of snowshoe hare was only formally recorded at two (2) locations during the aerial surveys, and none inside the RSA. However, this should not be interpreted as low density occurrence; this species occurs frequently and is largely ubiquitous across the aerial survey Study Area, as such documenting all occurrences of tracks is unmanageable (WSP E&I Canada Limited, 2024a).

Evidence of American beaver was observed at four (4) locations within the RSA, of which two (2)observations were of both a lodge and a dam. The closest to the LSA is located 600 m west of the transmission line that runs parallel to Highway 655.

Several dozens of American marten tracks and evidence of North American river otter (tracks and ice holes) were observed in the aerial survey Study Area, but very few of them (two and four respectively) were located within the RSA.

Canada lynx and red fox were the most abundant furbearers observed during aerial surveys, with respectively 91 and 179 tracks or equivalent occurrences (WSP E&I Canada Limited, 2024a). Many observations are also listed in the RSA.

4.2.4. Fish habitat

Watercourses and waterbodies represent an area of 1,440.2 ha within the RSA, or approximately 3% of its surface area.

Aquatic baseline studies undertaken 2021 and 2023 on the CNC Project site and nearby, include the West Buskegau River watershed, the North Driftwood River watershed, the Jocko Creek watershed, and the Mattagami River (WSP E&I Canada Limited, 2024b).

The fish habitat within the river systems in the area of the CNC Project is typical of northeastern Ontario, composed of channels with dense shrubby riparian vegetation, wetland segments with ponds, as well as abundant evidence of beaver activity. The substrate is primarily composed of fine-grained sediment with high organic content attributed to the wetland habitats and also beaver inputs. Beaver dams provide some seasonal fragmentation of these watercourses; however, they do not pose year-round barriers to fish passage as demonstrated by fish presence throughout the sampled areas of the Project (WSP E&I Canada Limited, 2024b).

Surveys have documented the presence fish communities that predominantly include forage (baitfish) species, as well as coarse fish (e.g., sucker) and upper trophic predatory species (e.g., Northern Pike). No aquatic SAR were anticipated within the inland watercourses and waterbodies, and none were encountered during the 2021 to 2023 studies (WSP E&I Canada Limited, 2024b). Lake sturgeon of the Southern Hudson Bay – James Bay population are listed as Special Concern under the federal *Species at Risk Act* and are known to occur within the Mattagami River. The eDNA surveys results confirmed lake sturgeon presence within the Mattagami River; however, eDNA surveys within the North Driftwood River did not detect lake sturgeon (WSP E&I Canada Limited, 2024b).

The characterization of the aquatic habitat and surface water quality was carried out by BBA at 18 inventory stations in the watercourses and water bodies located within the LSA in August 2023 (Map 3-2). The results of this characterization are presented in Appendix D.

4.2.5. Significant wildlife habitat

In May 1996, the Provincial Policy Statement (PPS) was issued under the *Planning Act*. This document identified matters of provincial interest to be considered as part of the land use planning process in the province of Ontario.

Among other things, Section 2.3 of the PPS requires that "natural heritage features and areas will be protected from incompatible development" and that development and site alteration will be permitted on or adjacent to these areas "if it can be demonstrated that there will be no negative impact on the natural features or ecological functions for which the area is identified." Significant Wildlife Habitat (SWH) has been identified as a natural heritage area for the purposes of Section 2.3 of the PPS.

Wildlife habitat is defined as areas where plants, animals, and other organisms live and can find adequate amounts of food, water, shelter, and space needed to sustain their populations. Specific wildlife habitats of concern may include areas where species concentrate at a point in their annual life cycle and those areas which are important to migratory and non-migratory species. Wildlife habitat is considered significant where it is ecologically important in terms of features, functions, representation or amount, and contributing to the quality and diversity of an identifiable geographic area or Natural Heritage System. Criteria for determining significance may be recommended by the province, but municipal approaches that achieve the same objective may also be used.

According to the *Significant wildlife habitat ecoregional criteria schedules: Ecoregion 3E* (OMNRF 2015), SWH may consist of:

- Seasonal concentration areas for animals;
- Rare vegetation communities;
- Specialized habitat for wildlife; and
- Habitat for species of conservation concern.

Other provincial documents used to identify and assess SWH are the Natural Heritage Reference Manual (MNR 2010), the SWH Technical Guide (OMNR 2000), and the Significant Wildlife Habitat Mitigation Support Tool (OMNRF 2014).

The SWH discussed below have been determined to be either candidate or confirmed. Habitats not discussed below were evaluated as not present as either the ecosite or species requirements were not documented, or it has been confirmed through field surveys not to be present.

4.2.5.1. Seasonal concentration areas for animals

Seasonal concentration areas are those where wildlife species occur annually in aggregations at certain times of the year. Such areas are sometimes highly concentrated with members of a given species, or several species, within relatively small areas. Some wildlife species will concentrate where they can rest and feed, and other wildlife species require habitats where they can survive winter (OMNRF 2015).

Candidate and confirmed seasonal concentration areas occurring within the RSA are discussed below and presented on Map 5.

Waterfowl stopover and staging areas (terrestrial) – Candidate

Waterfowl stopover and staging areas are open ecosites where water floods during the spring melt. Migrating waterfowl use these areas to rest and forage. Three (3) areas of a candidate ecosite, B093, are present in the Project RSA. One of them, near Noted Lake, is present within the LSA, but field investigations have not found congregations nearing the defining criteria to consider this candidate SWH, although indicators species were observed (WSP E&I Canada Limited, 2024). Two (2) other locations within the RSA are considered candidate SWH.

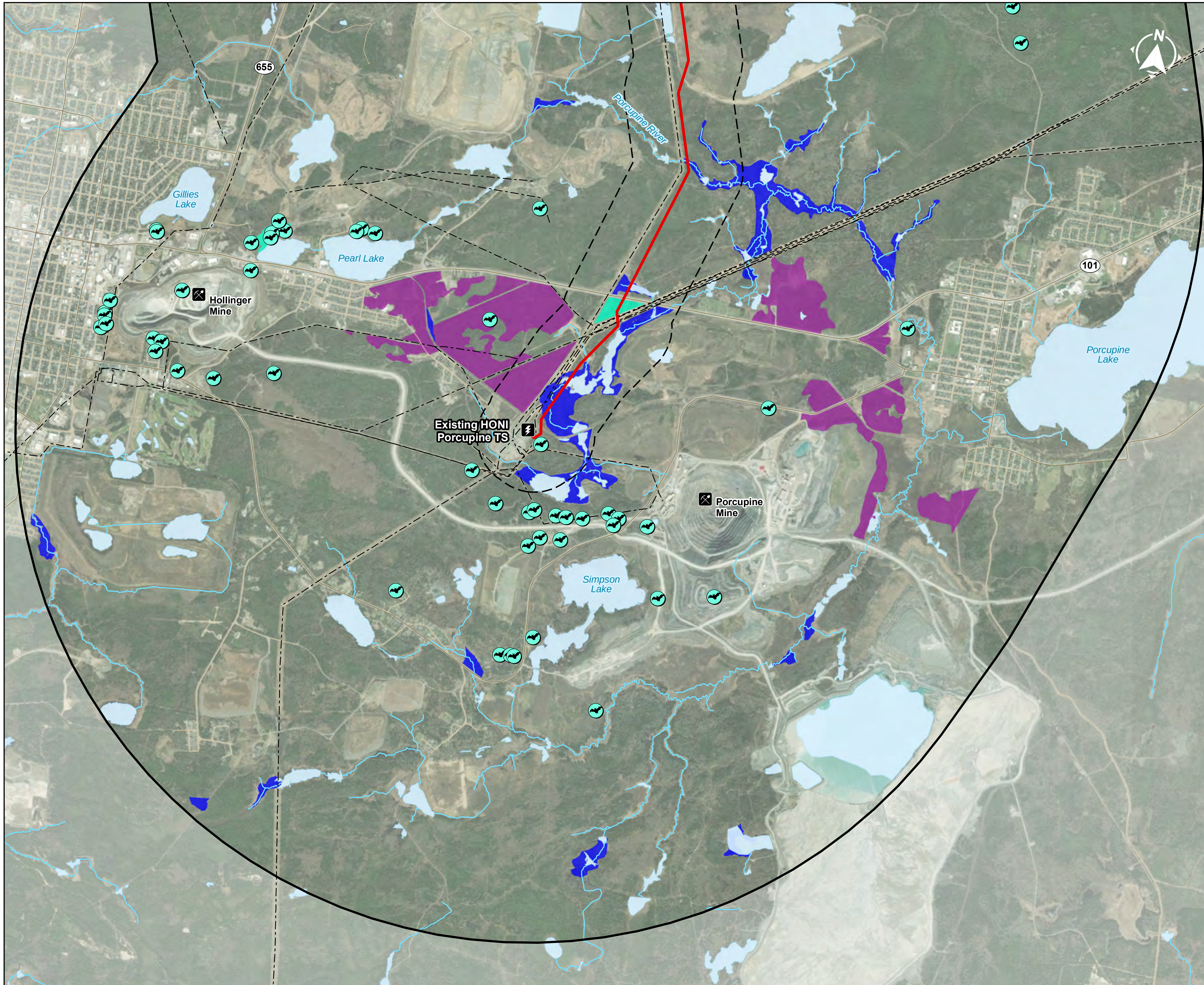
Waterfowl stopover and staging areas (aquatic) – Candidate

The aquatic waterfowl stopover and staging areas included ponds, marshes, and lakes. Like the terrestrial version of the SWH these waterbodies are used for foraging and resting. Three (3) candidate ecosites, B142, B144, and B146 are present in the RSA. In the RSA that overlaps with the Mine Project Study Area, candidate SWH were not considered although indicator species were present.

Bat hibernacula – Candidate

Bat hibernacula may be found in abandoned caves and mine shafts as well as underground foundations and some ecosites associated as components of either cliff or rock barren. Mine shafts located on non active mine sites within RSA were identified through the Ontario Abandoned Mines Information System (AMIS; MNDMNRF 2018). They are all located in the southernmost part of the RSA. Two (2) indicator ecosites, B164 and B165, were identified in the RSA.

Aerial and ground surveys conducted in 2021 and 2022 to identify and assess potential bat hibernacula sites did not monitor the presence of indicator species (tricolored bat and big brown bat) with ARU, thus the potential bat hibernacula SWH remains categorized as candidate.



Regional Study Area (RSA)

Local Study Area

Seasonal Concentration Areas for Animals

Candidate Bat Hibernacula (Mine Shaft)

Seasonal Concentration Areas for Animals

Candidate Bat Maternity Colonies

Candidate Bat Hibernacula

Candidate Waterfowl Stopover and Staging Areas (Aquatic)

Project Component

New 230 kV Transmission Line

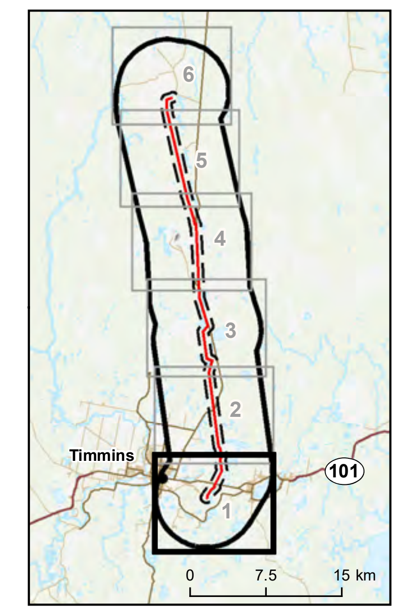
Infrastructure and Facilities

Producing Mine

Principal Road

Local Road

Transmission Line



TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

Crawford Nickel Project - TIP-1 Transmission Project Timmins, Ontario

Map 5-1
Significant Wildlife Habitat – Seasonal Concentration Areas for Animals

Sources:
Ontario Road Network (ORN), Ontario Ministry of Natural Resources and Forestry, June 2023
Forest Resources Inventory, Ontario Ministry of Natural Resources and Forestry, June 2023
Principal Mineral Areas, Natural Resources Canada, 2023
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Project Data, BBA, 2024 and WSP, 2021-2022

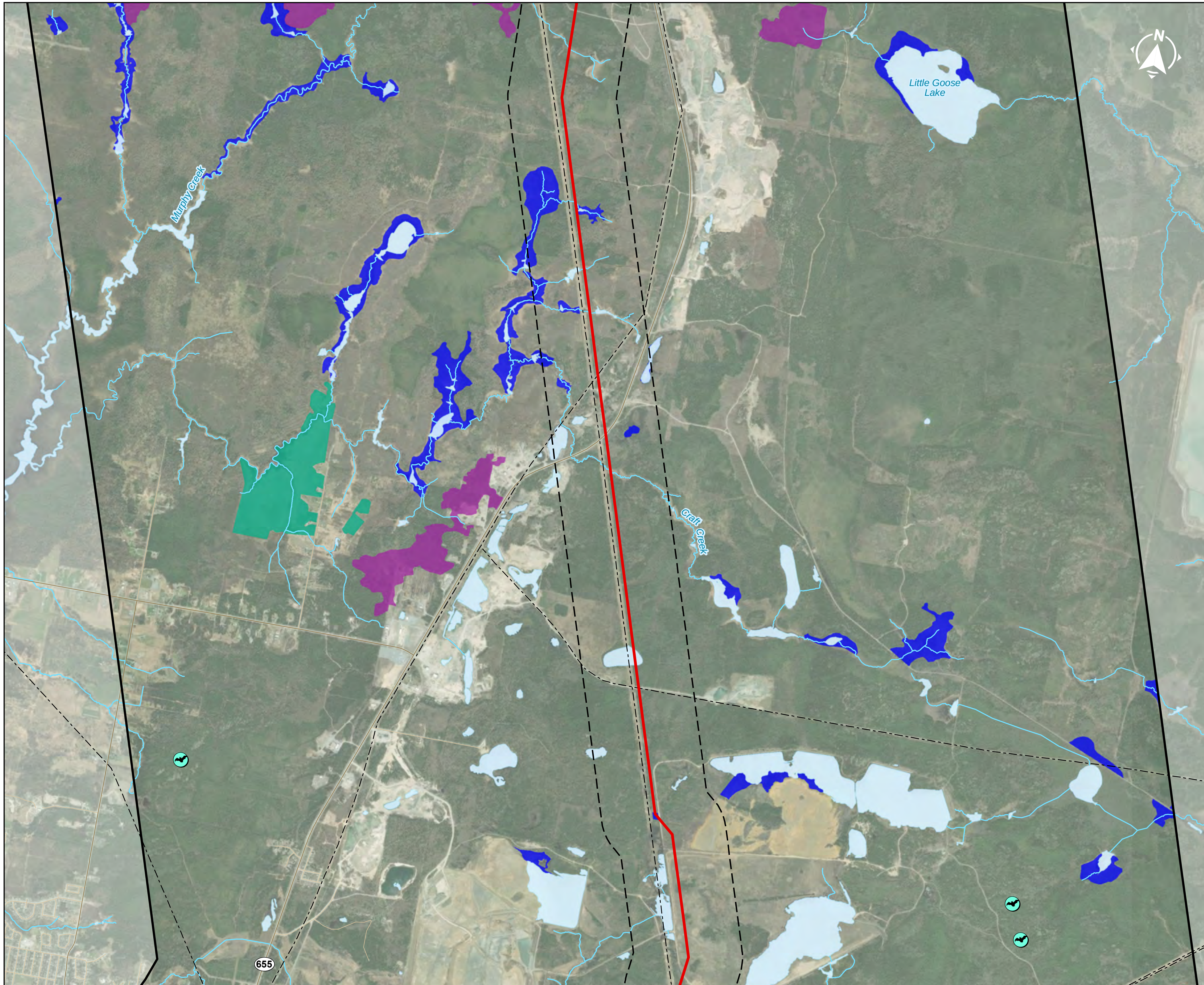
BBA Project Number: 7311004-000000-4E

2024-09-26

0 400 800 m
UTM, Zone 17, NAD 83

Prepared by: M.-N. Chouinard Drawn by: A. Monnard Verified by: D. Lambert

File: 7311004_000000_4E_D20_0016_R00_Map5.mxd



Regional Study Area (RSA)

Local Study Area

Seasonal Concentration Areas for Animals

Candidate Bat Hibernacula (Mine Shaft)

Candidate Waterfowl Stopover and Staging Areas (Terrestrial)

Seasonal Concentration Areas for Animals

Candidate Bat Maternity Colonies

Candidate Waterfowl Stopover and Staging Areas (Aquatic)

Project Component

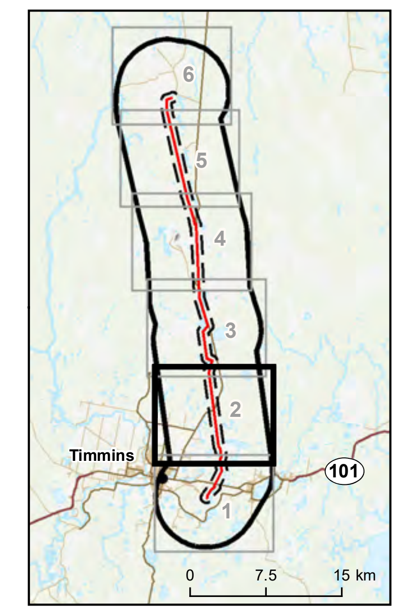
New 230 kV Transmission Line

Infrastructure and Facilities

Principal Road

Local Road

Transmission Line



TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

Crawford Nickel Project - TIP-1 Transmission Project Timmins, Ontario

Map 5-2

Significant Wildlife Habitat – Seasonal Concentration Areas for Animals

Sources:
Ontario Road Network (ORN), Ontario Ministry of Natural Resources and Forestry, June 2023
Forest Resources Inventory, Ontario Ministry of Natural Resources and Forestry, June 2023
Principal Mineral Areas, Natural Ressources Canada, 2023
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Project Data, BBA, 2024 and WSP, 2021-2022

BBA Project Number: 7311004-000000-4E

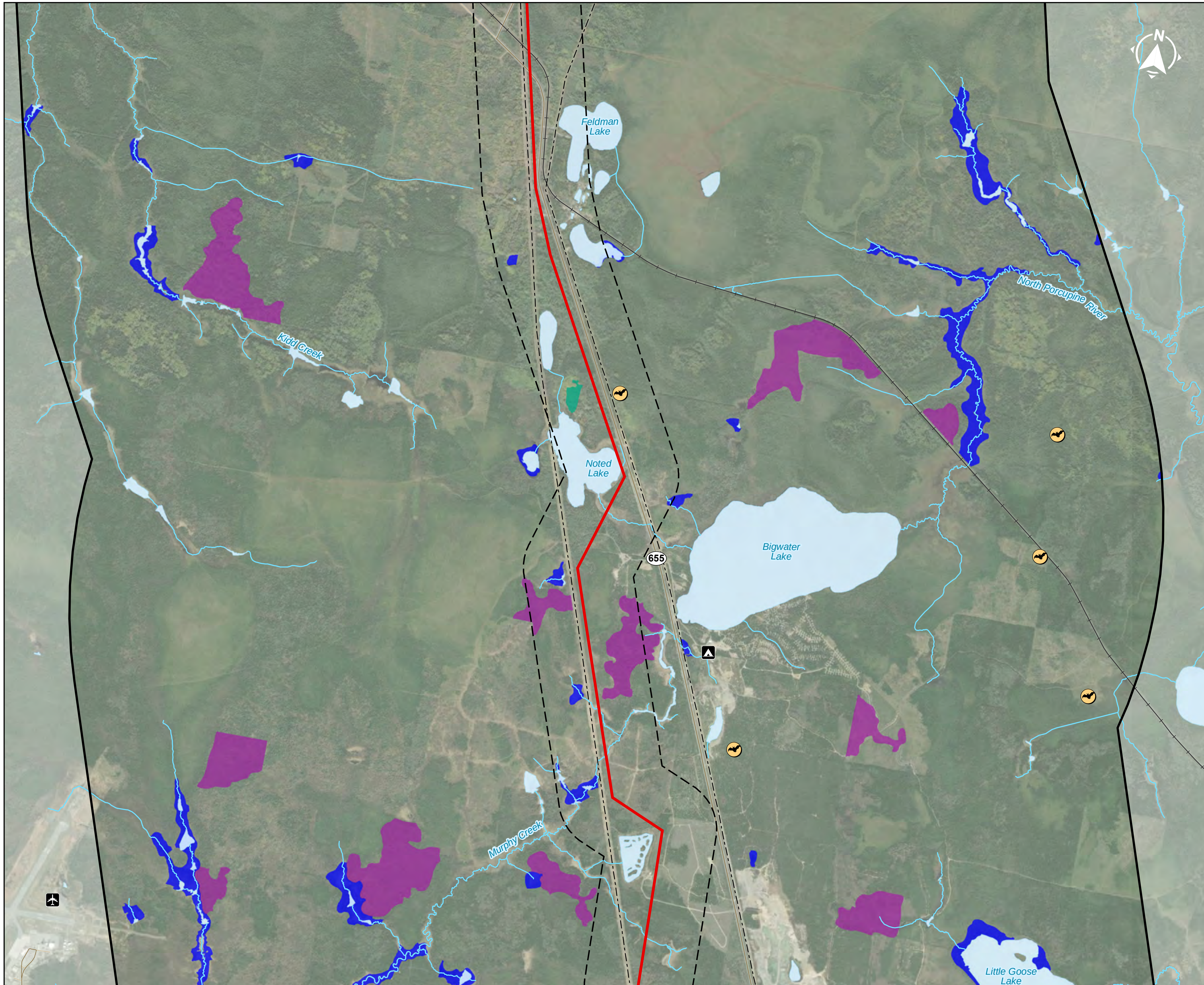
2024-09-26

0 400 800 m

UTM, Zone 17, NAD 83

Prepared by: M.-N. Chouinard Drawn by: A. Monnard Verified by: D. Lambert

File: 7311004_000000_4E_D20_0016_R00_Map5.mxd



Regional Study Area (RSA)

Local Study Area

Seasonal Concentration Areas for Animals

Candidate Bat Hibernacula (WSP, 2021-2023)

Candidate Waterfowl Stopover and Staging Areas (Terrestrial)

Seasonal Concentration Areas for Animals

Candidate Bat Maternity Colonies

Candidate Waterfowl Stopover and Staging Areas (Aquatic)

Project Component

New 230 kV Transmission Line

Infrastructure and Facilities

Timmins / Victor M. Power Airport

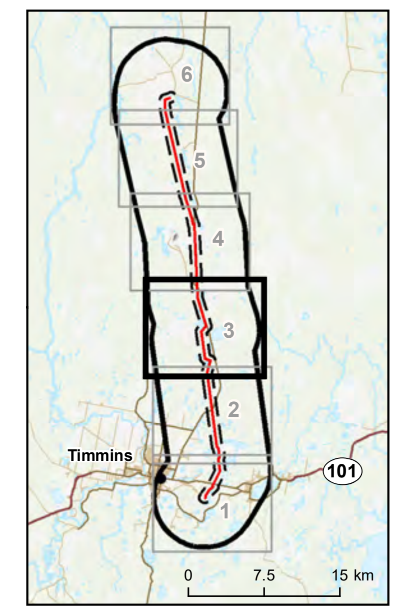
Big Water Campground

Principal Road

Local Road

Railway

Transmission Line



TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

Crawford Nickel Project - TIP-1 Transmission Project Timmins, Ontario

Map 5-3

Significant Wildlife Habitat – Seasonal Concentration Areas for Animals

Sources:
Ontario Road Network (ORN), Ontario Ministry of Natural Resources and Forestry, June 2023
Forest Resources Inventory, Ontario Ministry of Natural Resources and Forestry, June 2023
Principal Mineral Areas, Natural Resources Canada, 2023
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Project Data, BBA, 2024 and WSP, 2021-2022

BBA Project Number: 7311004-000000-4E

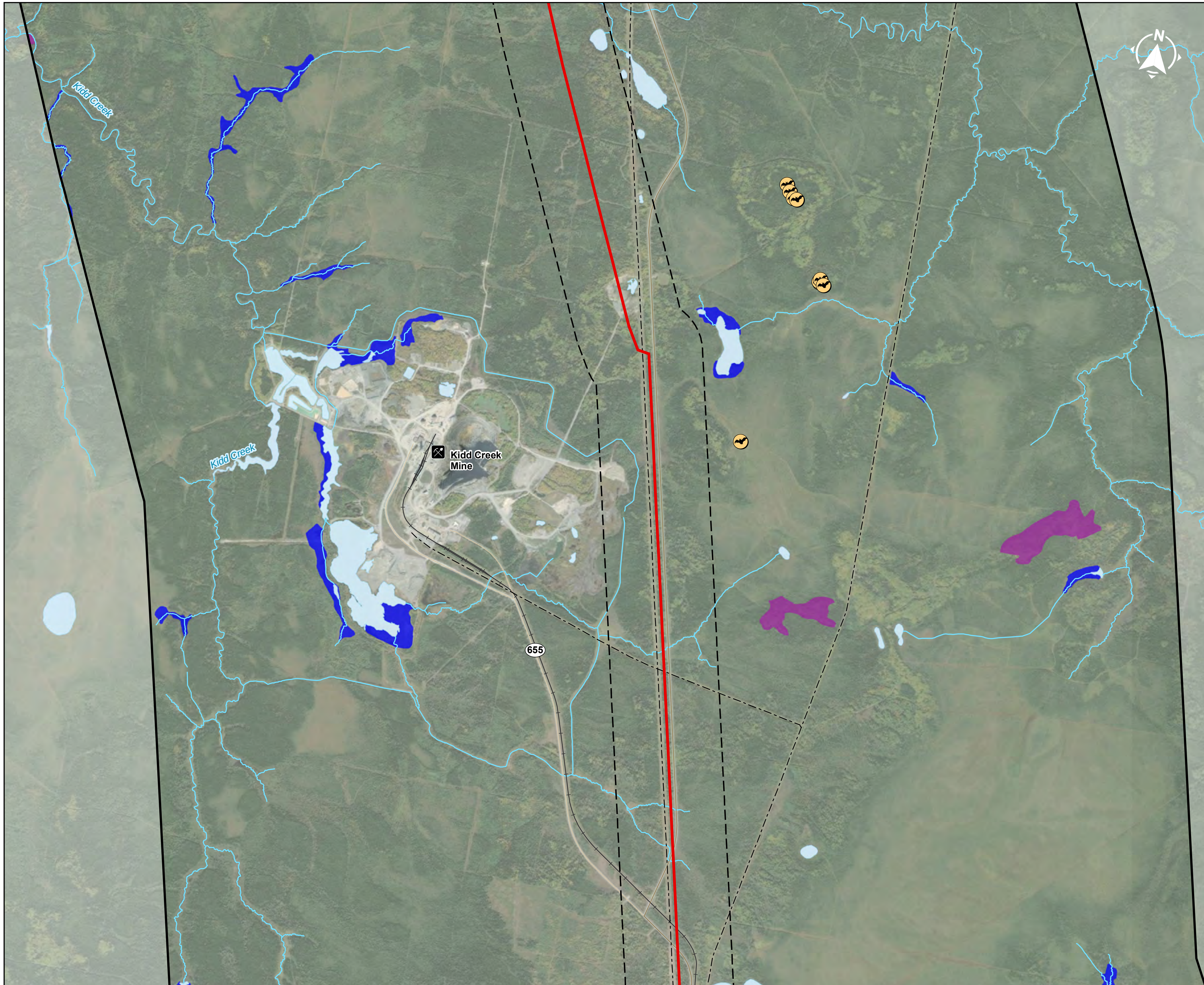
2024-09-26

0 400 800 m

UTM, Zone 17, NAD 83

Prepared by: M.-N. Chouinard Drawn by: A. Monnard Verified by: D. Lambert

File: 7311004_000000_4E_D20_0016_R00_Map5.mxd



Regional Study Area (RSA)

Local Study Area

Seasonal Concentration Areas for Animals

Candidate Bat Hibernacula (WSP, 2021-2023)

Seasonal Concentration Areas for Animals

Candidate Bat Maternity Colonies

Candidate Waterfowl Stopover and Staging Areas (Aquatic)

Project Component

New 230 kV Transmission Line

Infrastructure and Facilities

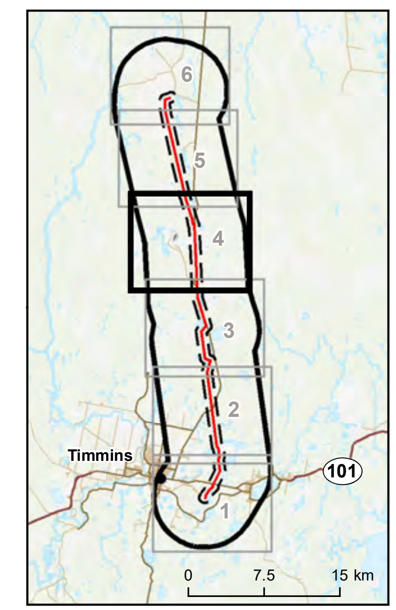
Producing Mine

Principal Road

Local Road

Railway

Transmission Line



TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

Crawford Nickel Project - TIP-1 Transmission Project Timmins, Ontario

Map 5-4

Significant Wildlife Habitat – Seasonal Concentration Areas for Animals

Sources:
Ontario Road Network (ORN), Ontario Ministry of Natural Resources and Forestry, June 2023
Forest Resources Inventory, Ontario Ministry of Natural Resources and Forestry, June 2023
Principal Mineral Areas, Natural Resources Canada, 2023
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Project Data, BBA, 2024 and WSP, 2021-2022

BBA Project Number: 7311004-000000-4E

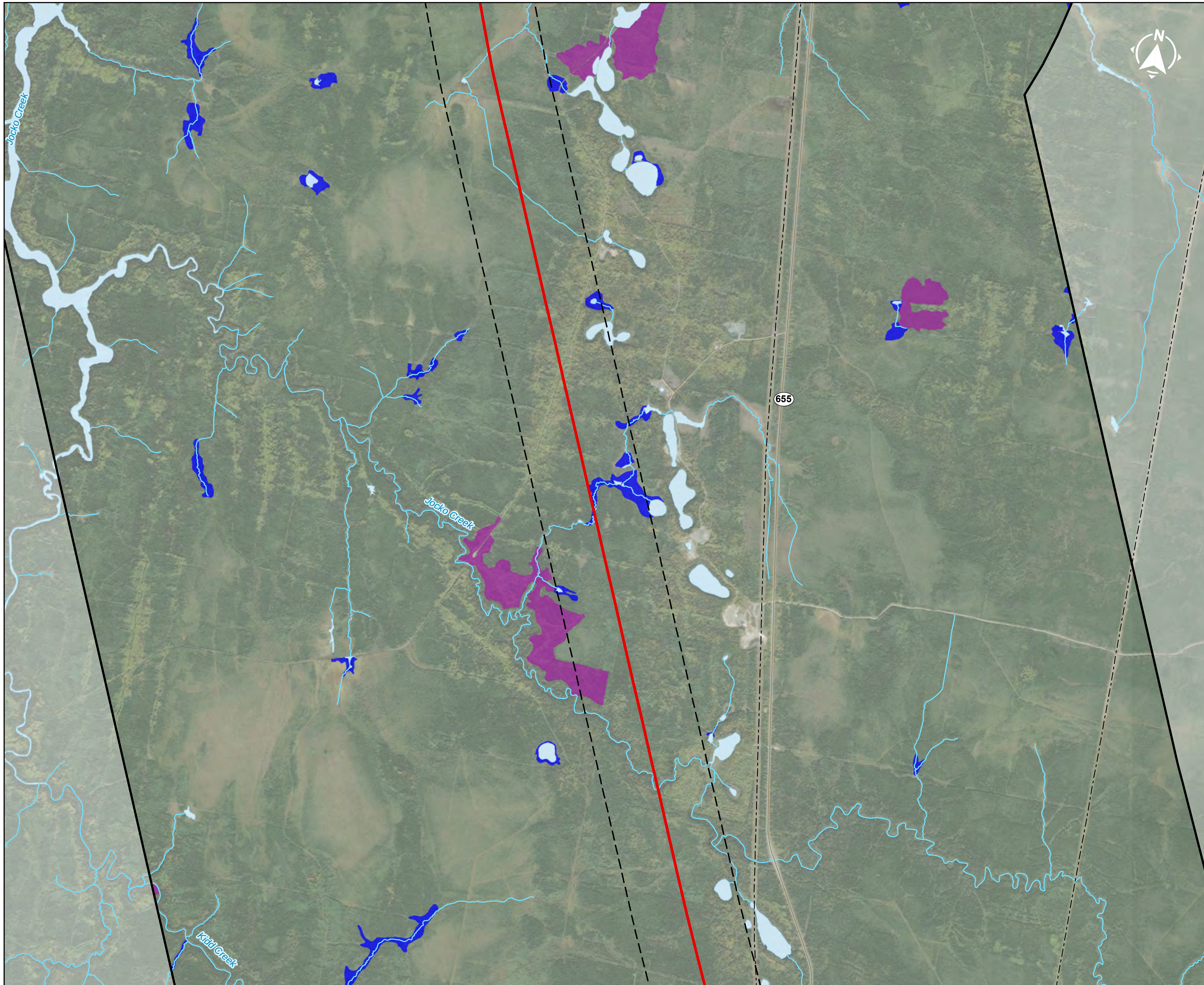
2024-09-26

0 400 800 m

UTM, Zone 17, NAD 83

Prepared by: M.-N. Chouinard Drawn by: A. Monnard Verified by: D. Lambert

File: 7311004_000000_4E_D20_0016_R00_Map5.mxd



Regional Study Area (RSA)

Local Study Area

Seasonal Concentration Areas for Animals

Candidate Bat Maternity Colonies

Candidate Waterfowl Stopover and Staging Areas (Aquatic)

Project Component

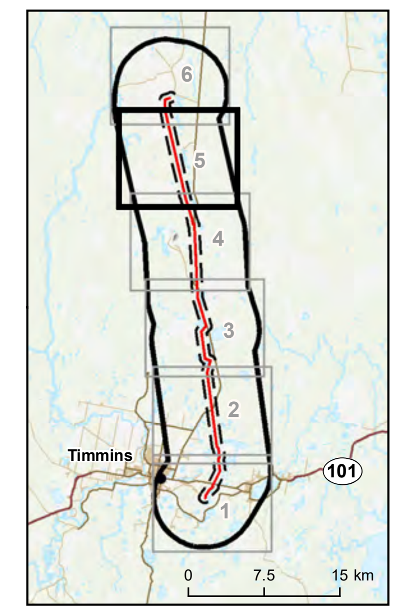
New 230 kV Transmission Line

Infrastructure and Facilities

Principal Road

Local Road

Transmission Line



TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

Crawford Nickel Project - TIP-1 Transmission Project Timmins, Ontario

Map 5-5
Significant Wildlife Habitat – Seasonal Concentration Areas for Animals

Sources:
Ontario Road Network (ORN), Ontario Ministry of Natural Resources and Forestry, June 2023
Forest Resources Inventory, Ontario Ministry of Natural Resources and Forestry, June 2023
Principal Mineral Areas, Natural Ressources Canada, 2023
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Project Data, BBA, 2024 and WSP, 2021-2022

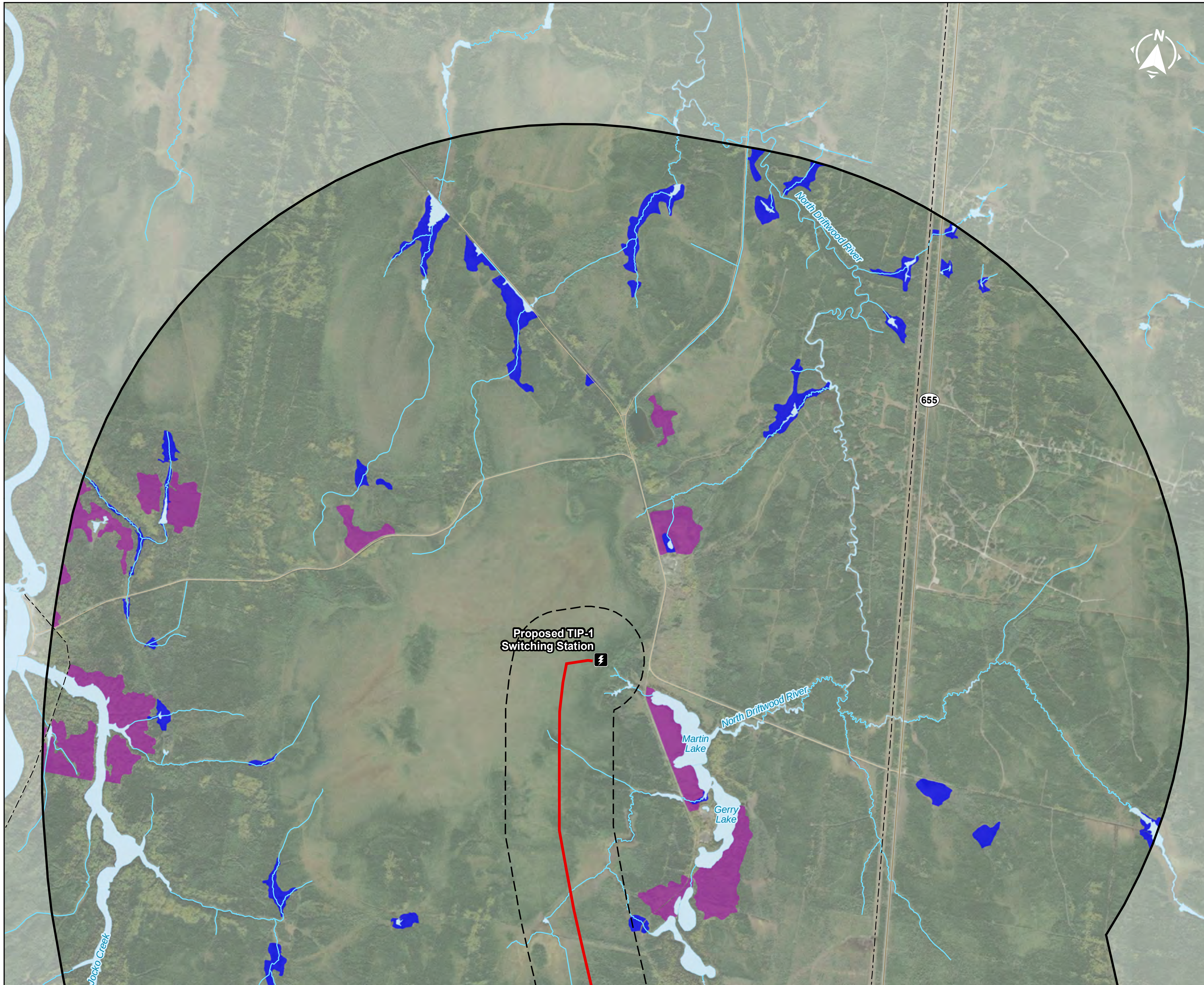
BBA Project Number: 7311004-000000-4E

2024-09-26

0 400 800 m
UTM, Zone 17, NAD 83

Prepared by: M.-N. Chouinard Drawn by: A. Monnard Verified by: D. Lambert

File: 7311004_000000_4E_D20_0016_R00_Map5.mxd



Regional Study Area (RSA)

Local Study Area

Seasonal Concentration Areas for Animals

Candidate Bat Maternity Colonies

Candidate Waterfowl Stopover and Staging Areas (Aquatic)

Project Component

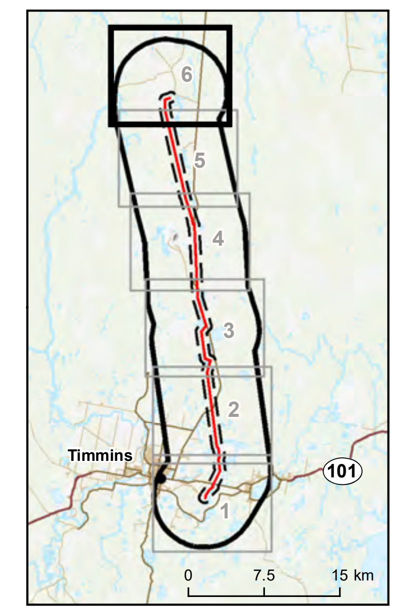
New 230 kV Transmission Line

Infrastructure and Facilities

Principal Road

Local Road

Transmission Line



TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

Crawford Nickel Project - TIP-1 Transmission Project Timmins, Ontario

Map 5-6

Significant Wildlife Habitat – Seasonal Concentration Areas for Animals

Sources:
Ontario Road Network (ORN), Ontario Ministry of Natural Resources and Forestry, June 2023
Forest Resources Inventory, Ontario Ministry of Natural Resources and Forestry, June 2023
Principal Mineral Areas, Natural Ressources Canada, 2023
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Project Data, BBA, 2024 and WSP, 2021-2022

BBA Project Number: 7311004-000000-4E

2024-09-26

0 400 800 m
UTM, Zone 17, NAD 83

Prepared by: M.-N. Chouinard Drawn by: A. Monnard Verified by: D. Lambert

File: 7311004_000000_4E_D20_0016_R00_Map5.mxd

Bat maternity colonies – Candidate

Maternity colonies can be found in tree cavities, vegetation, and often in buildings (although buildings are not considered to be SWH). Maternity roosts are not found in caves and mines in Ontario but in mature (dominant trees > 80 years old) deciduous or mixed forest stands with >10 large diameters (>25 cm diameter breast height; dbh) wildlife trees/ha (snags) in the early stages of decay. Females of many bat species are colonial in the breeding season, leaving their young in tree cavities while they forage. Several qualifying ecosites occur in the RSA (B024, B040, B055, B070, B088, B104 and B119).

Bat habitat surveys (snag surveys) completed by WSP between 2021 and 2023 found an average snag density of 49 trees per hectare in deciduous and mixed forests in the Mine Project Study Area, which is supposed to be sufficient cavities to support bat maternity roosts (WSP E&I Canada Limited, 2024). About 40% of the habitat trees found were paper birch, and about 20% of the snags were so decayed species could not be identified. The most frequently recorded species within the Mine Project Study Area was silver-haired bat (an indicator species for this SWH type), followed by hoary bat (WSP E&I Canada Limited, 2024). Therefore, all mixed treed and deciduous treed forests in the FRI data over 80 years old are considered candidate SWH.

Colonially nesting bird breeding habitat (tree/shrubs) – Candidate

Colonially nesting bird breeding habitat occurs in different habitats depending on the indicator species that are great blue heron, Bonaparte's gull, and double-breasted cormorants. Surveys reported great blue heron in the Study Area (WSP E&I Canada Limited, 2024) and other sources also report Bonaparte's gull and double-breasted cormorants to occur near Porcupine Lake in the south of the RSA (iNaturalist). Many candidate ecosites are found in the RSA, but defining criteria have not been confirmed, thus this SWH type remains candidate.

Colonially nesting bird breeding habitat (ground) – Candidate

Colonially nesting bird breeding habitat (grounds) occurs in different habitats depending on the indicator species that are herring gull, ring-billed gull, common tern, double-breasted cormorant, and Brewer's blackbird. Candidate ecosites (B142 and B144) are present within the RSA, but only one indicator species, herring gull, was reported to breed in the study area from the *Ontario Breeding Bird Atlas*. Herring gull was observed in 2023 during migratory bird surveys (WSP E&I Canada Limited, 2024), but was not confirmed breeding.

Turtle wintering area - Candidate

Turtle wintering areas include permanent waterbodies, large wetlands, bogs, or fens with soft substrates, water deep enough not to freeze through to the bottom, and year-round standing or flowing water. Given the extent of wetlands throughout the RSA, candidate turtle wintering area is similarly extensive and are found in the RSA in ecosites B128-B130, B133-B140, B142, and B146-B147. Wintering areas are in the same general area as core habitat, thus overwintering areas may be identified by searching for congregations of basking turtles on warm sunny days in spring and/or fall. Two (2) records of the snapping turtle, one of the indicator species with the painted turtle, are presented near Timmins in the *Ontario Reptiles and Amphibians Atlas*. Turtle basking surveys and other fieldwork in the Mine Project Study Area did not document any turtle (WSP E&I Canada Limited, 2024).

Reptile hibernaculum – Candidate

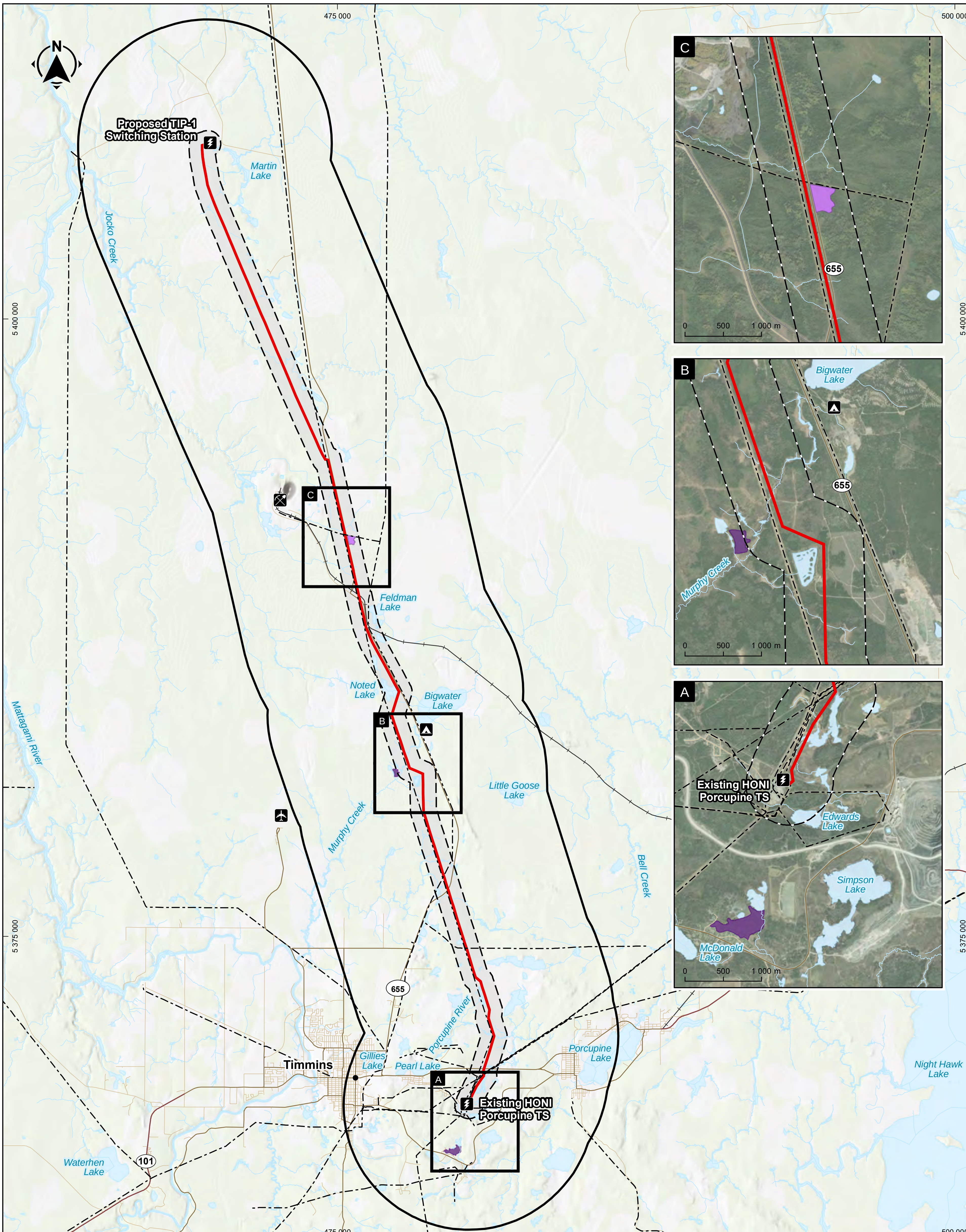
Reptile hibernaculum, for snakes, occurs in sites located below the frost line in burrows, rock crevices, and other natural locations, particularly in areas with broken and fissured rocks as they provide access to subterranean sites. Indicator ecosites for reptile hibernaculum are numerous in the RSA: B012, B014, B016, B024, B128-B130, B133-B139, and B164-B165. Targeted field surveys for reptile congregations did not occur for the Mine Project and no SWH were confirmed.

4.2.5.2. Rare vegetation communities

Rare vegetation communities often contain rare species, particularly plants and small invertebrates, which depend on such habitats for their survival and cannot readily move to or find alternative habitats. One of the most important criteria for determining a rare vegetation community is the current representation of the community within a planning area based on its area relative to the total landscape or the number of examples within the planning area. NHIC uses a system that considers the provincial rank of a species or community type as a tool to prioritize protection efforts (the sub-national or s-rank) (OMNRF 2015).

Hardwood swamps – Confirmed

Hardwood swamps are forests dominated by a hardwood canopy located in a lower topographic position and subject to flooding. The ecosites B130 and B133 are present at three (3) locations within the RSA, one of which was confirmed in 2022 as Hardwood Swamp SWH (WSP E&I Canada Limited, 2024) and two (2) that remain candidate (Map 6).



Regional Study Area

Local Study Area

Project Component

New 230 kV Transmission Line

Rare Vegetation Communities

Hardwood Swamps (confirmed)

Hardwood Swamps (candidate)

Infrastructure and Facilities

Substation

Timmins / Victor M. Power Airport

Big Water Campground

Kidd Creek Mine

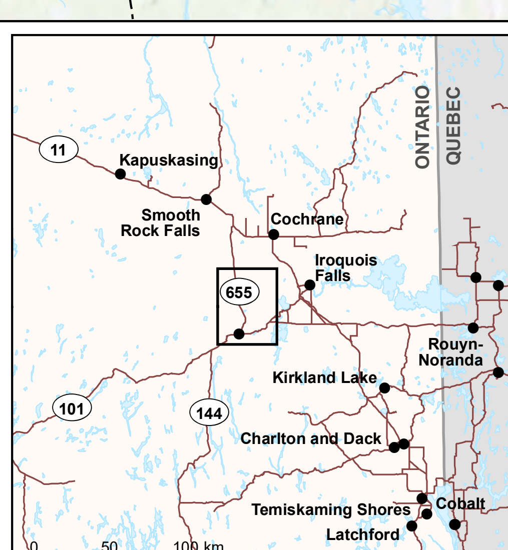
Highway

Principal Road

Local Road

Railway

Transmission Line



TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

TIP-1 Transmission Project
Timmins, Ontario

Map 6
Significant Wildlife Habitat – Rare Vegetation Communities

Sources:
CanVec, 1/250 000, NRCan, 2017
Forest Resources Inventory, Ontario Ministry of Natural Resources and Forestry, June 2023
Official Airports, Ontario Ministry of Natural Resources and Forestry, March 2012
SDA, 1/20 000, MERN Quebec, June 2022
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Project Data, BBA, 2024

BBA Project Number: 7311004-007000-4E

2024-09-27

0 1.5 3 km
UTM, zone 17, NAD 83

Prepared by: M.-N. Chouinard Drawn by: A. Monnard Verified by: F. Karcha

Fichier : 7311004_000000_4E_D40_0017_R00_Map6.mxd

4.2.5.3. Specialized habitat for wildlife

Some wildlife species require large areas of suitable habitat for their long-term survival. Many wildlife species require substantial areas of suitable habitat for successful breeding. Their populations decline when habitat becomes fragmented and reduced in size (OMNRF 2015). Specialized habitat for wildlife is a community or diversity-based category, therefore, the more wildlife species a habitat contains, the more significant the habitat becomes to the planning area. The largest and least fragmented habitats within a planning area will support the most significant populations of wildlife (OMNRF 2015).

Candidate and confirmed habitats occurring within the RSA are discussed below and presented on **Map**.

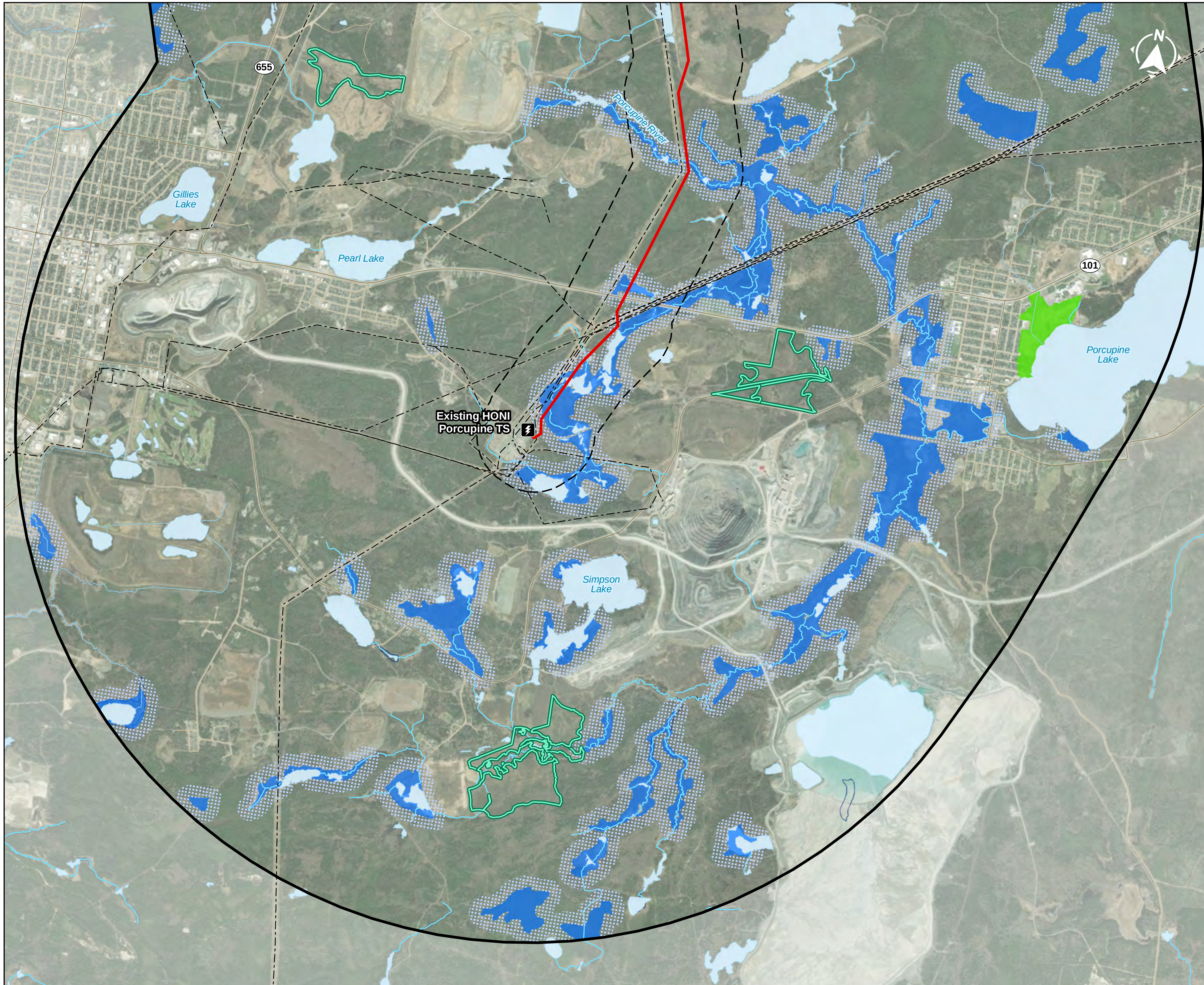
Waterfowl nesting area - Candidate

Important to local waterfowl populations, sites with the greatest number of species and the highest number of individuals are significant. All upland habitats located adjacent to suitable ecosites are also candidate SWH. Candidate waterfowl nesting areas are found throughout the RSA in indicator ecosites B129, B130, B133-B135, B140, B142, B144, B146, and B147. 10 indicator species (American black duck, American widgeon, Canada goose, common goldeneye, common merganser, gadwall, green-winged teal, wood duck, mallard, and hooded merganser) have been documented within the Mine Project Study Area (WSP E&I Canada Limited, 2024), but defining criteria have not been met to confirm SWH.

Bald eagle and osprey nesting habitat – Confirmed

Bald eagles and ospreys forage primarily around lakes and large rivers and nest in large trees nearby. SWH habitat is confirmed if surveys document one (1) or more active osprey or bald eagle nest(s) in use or suspected to have been in use within the past five (5) years, unless there is documentation that the nest and other associated nests in the nesting area have been unoccupied for the past three (3) consecutive years.

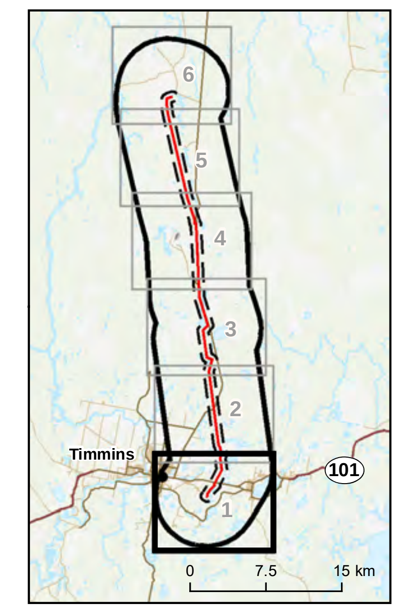
A bald eagle nest and three (3) bald eagles were observed during aerial surveys (WSP E&I Canada Limited, 2024). It is assumed that this pair nested during 2021 at the nest location near the observation, thus confirming this SWH type within the RSA. For a bald eagle, the active/main nest and a 400 to 800m radius around the nest is the SWH. The area of the habitat from 400 to 800 m is dependent on sightlines from the nest to the development and inclusion of perching and foraging habitat.



Local Study Area (LSA)
Regional Study Area (RSA)
Sharp-tailed Grouse lek (candidate)
Turtle Nesting Area (candidate)
Moose Aquatic Feeding Area (confirmed)
Waterfowl Nursery Area
Waterfowl Nesting Area (120 m)

Project Component
New 230 kV Transmission Line

Infrastructure and Facilities
Substation
Principal Road
Local Road
Transmission Line



TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

Crawford Nickel Project - TIP-1 Transmission Project Timmins, Ontario

Map 7-1

Significant Wildlife Habitat - Specialized Habitat for Wildlife and Animal Movement Corridors

Sources:
Forest Resources Inventory, Ontario Ministry of Natural Resources and Forestry, June 2023
Ontario Road Network (ORN), Ontario Ministry of Natural Resources and Forestry, June 2023
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Project Data, BBA, 2024 and WSP, 2021-2022

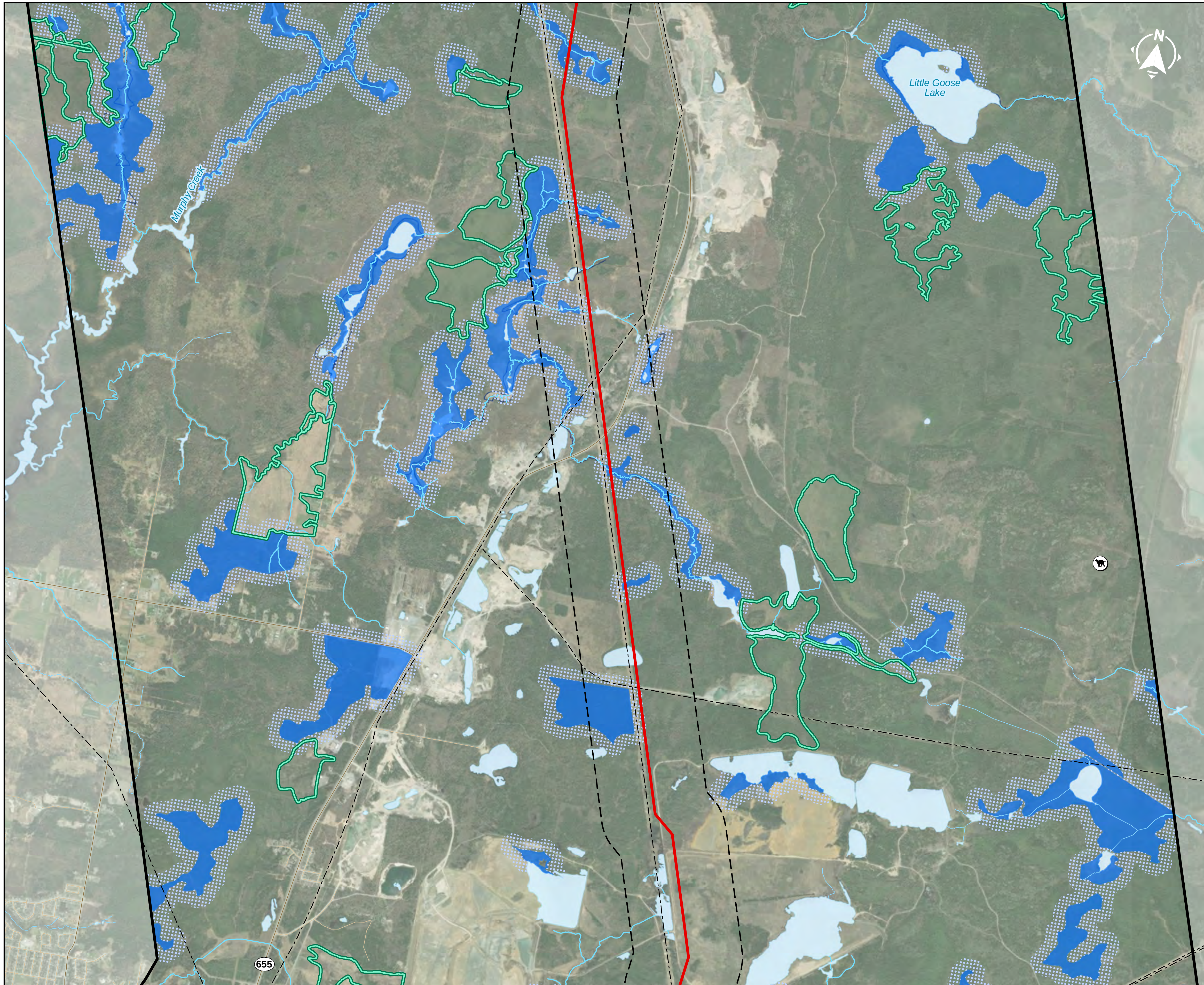
BBA Project Number: 7311004-000000-4E

2024-09-26

0 380 760 m
UTM, Zone 17, NAD 83

Prepared by: M.-N. Chouinard Drawn by: A. Monnard Verified by: F. Karcha

File: 7311004_000000_4E_D40_0018_R00_Map7.mxd



Local Study Area
Regional Study Area (RSA)
Sharp-tailed Grouse lek (candidate)
Moose Aquatic Feeding Area (confirmed)
Waterfowl Nursery
Waterfowl Nesting Area (120 m)

Denning Sites - Indicator Species (candidate)

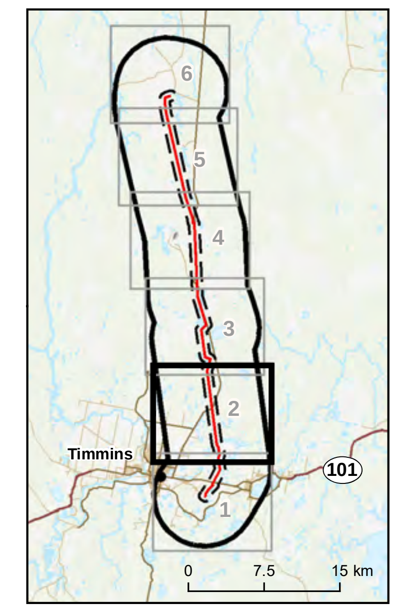
Canada Lynx

Project Component

New 230 kV Transmission Line

Infrastructure and Facilities

Principal Road
Local Road
Transmission Line



TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

Crawford Nickel Project - TIP-1 Transmission Project Timmins, Ontario

Map 7-2

Significant Wildlife Habitat - Specialized Habitat for Wildlife and Animal Movement Corridors

Sources:
Forest Resources Inventory, Ontario Ministry of Natural Resources and Forestry, June 2023
Ontario Road Network (ORN), Ontario Ministry of Natural Resources and Forestry, June 2023
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Project Data, BBA, 2024 and WSP, 2021-2022

BBA Project Number: 7311004-000000-4E

2024-09-27

0 400 800 m
UTM, Zone 17, NAD 83

BBA

Prepared by: M.-N. Chouinard
Drawn by: A. Monnard
Verified by: F. Karcha

File: 7311004_000000_4E_D40_0018_R00_Map7.mxd

Local Study Area (LSA)
Regional Study Area (RSA)
Sharp-tailed Grouse lek (candidate)
Moose Aquatic Feeding Area (confirmed)
Waterfowl Nursery Area
Waterfowl Nesting Area (120 m)
Bald Eagle Nest
Bald Eagle (Observation)

Denning Sites - Indicator Species (candidate)

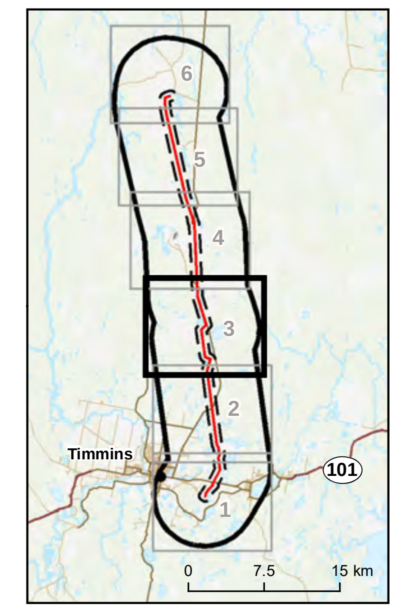
American River Otter
Canada Lynx

Project Component

New 230 kV Transmission Line

Infrastructure and Facilities

Timmins / Victor M. Power Airport
Big Water Campground
Principal Road
Local Road
Railway
Transmission Line



TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

Crawford Nickel Project - TIP-1 Transmission Project Timmins, Ontario

Map 7-3

Significant Wildlife Habitat - Specialized Habitat for Wildlife and Animal Movement Corridors

Sources:
Forest Resources Inventory, Ontario Ministry of Natural Resources and Forestry, June 2023
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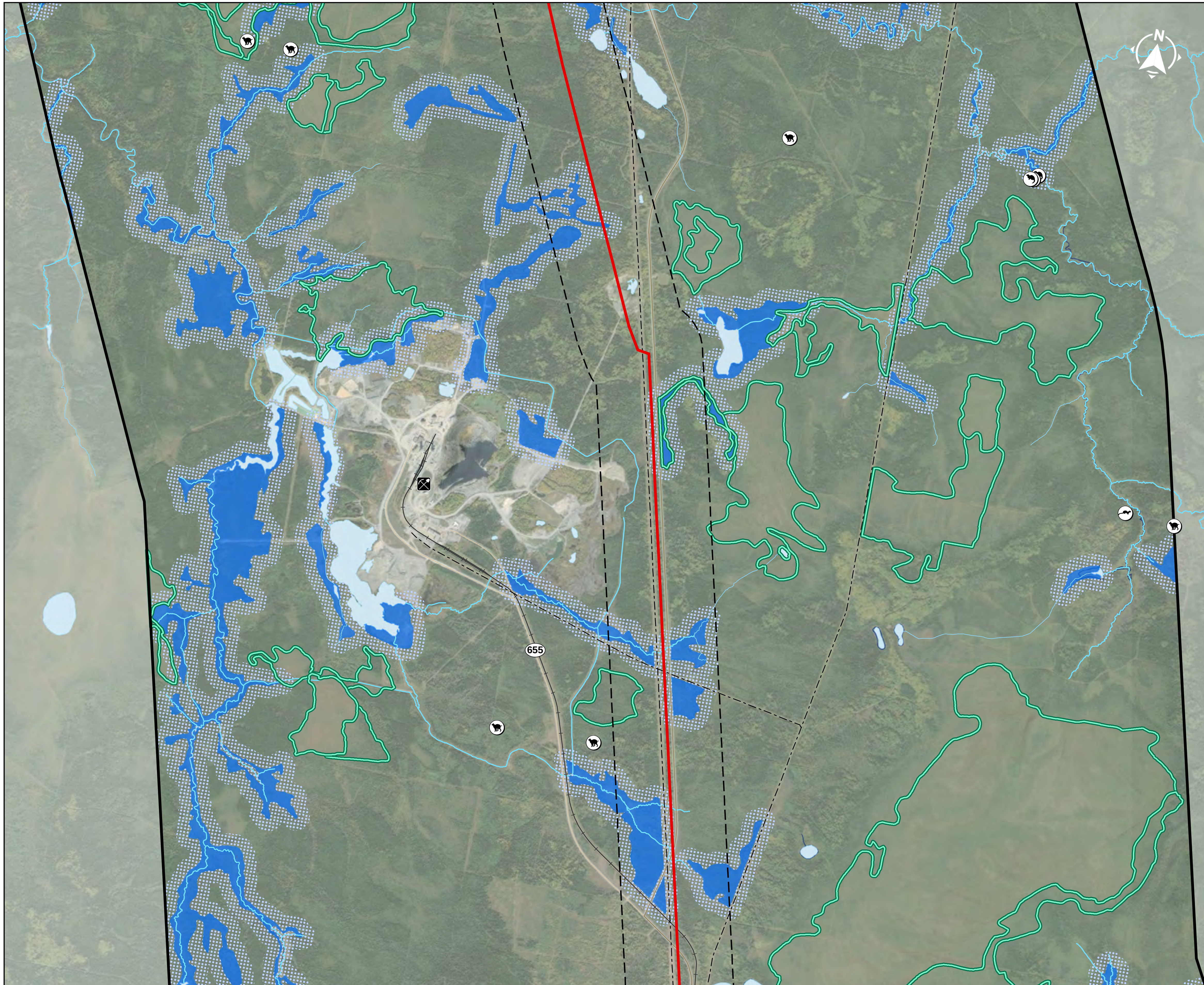
BBA Project Number: 7311004-000000-4E

2024-09-27

0 400 800 m
UTM, Zone 17, NAD 83

Prepared by: M.-N. Chouinard Drawn by: A. Monnard Verified by: F. Karcha

File: 7311004_000000_4E_D40_0018_R00_Map7.mxd



Local Study Area (LSA)
Regional Study Area (RSA)
Sharp-tailed Grouse lek (candidate)
Moose Aquatic Feeding Area (confirmed)
Waterfowl Nursery Area
Waterfowl Nesting Area (120 m)

Denning Sites - Indicator Species (candidate)

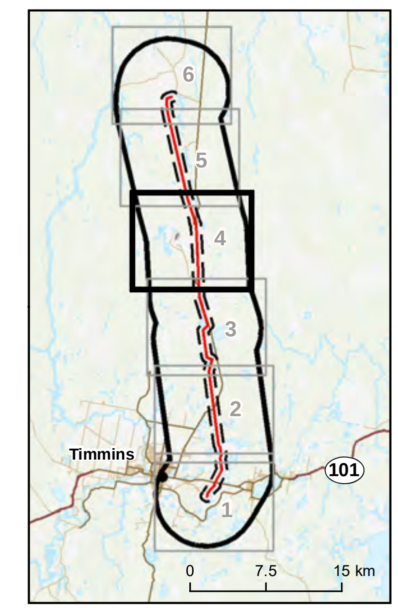
American Marten
American River Otter
Canada Lynx

Project Component

New 230 kV Transmission Line

Infrastructure and Facilities

Kidd Creek Mine
Principal Road
Local Road
Railway
Transmission Line



TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

Crawford Nickel Project - TIP-1 Transmission Project Timmins, Ontario

Map 7-4

Significant Wildlife Habitat - Specialized Habitat for Wildlife and Animal Movement Corridors

Sources:
Forest Resources Inventory, Ontario Ministry of Natural Resources and Forestry, June 2023
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Project Data, BBA, 2024 and WSP, 2021-2022

BBA Project Number: 7311004-000000-4E

2024-09-27

0 400 800 m
UTM, Zone 17, NAD 83

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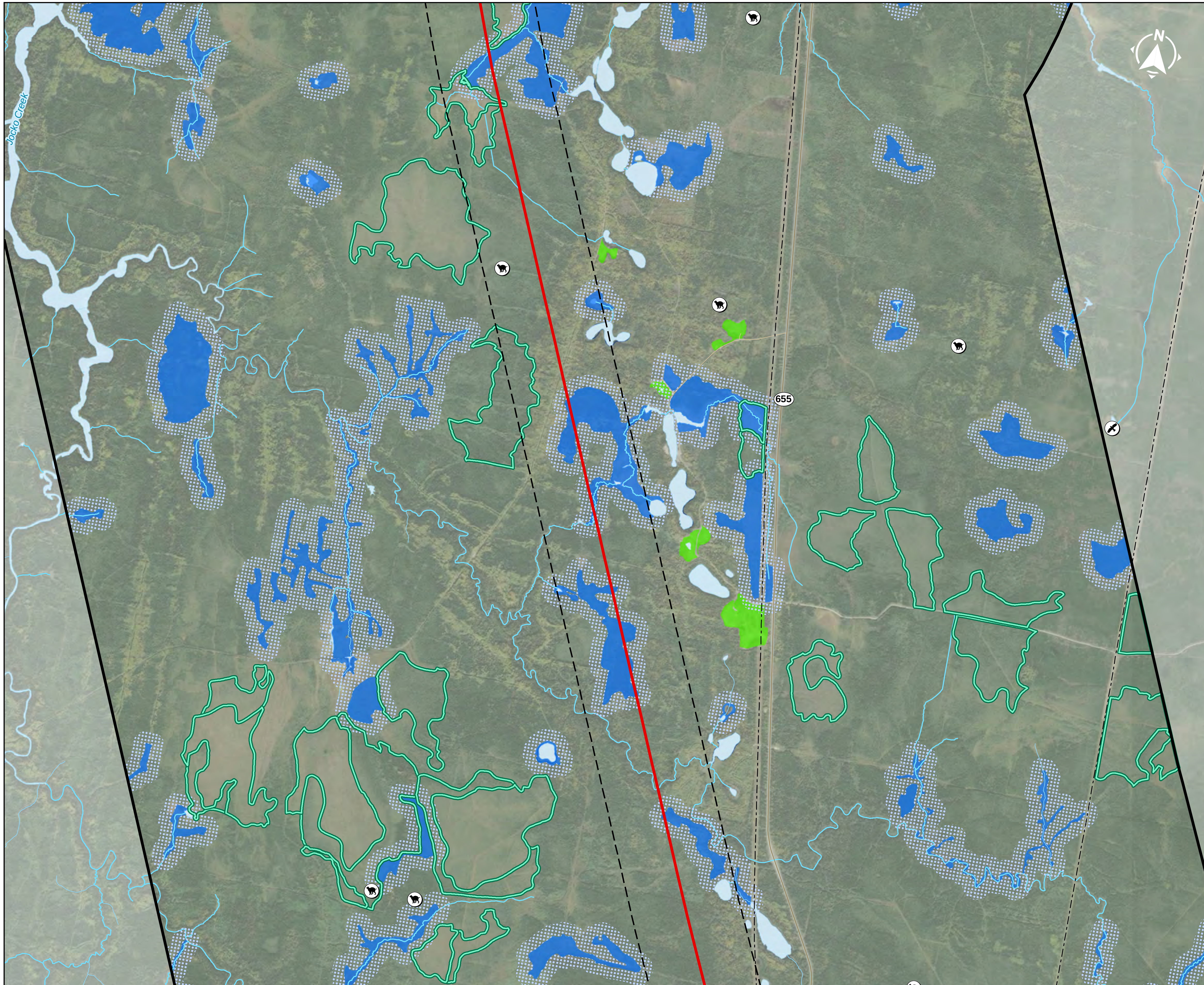
File: 7311004_000000_4E_D40_0018_R00_Map7.mxd



Local Study Area (LSA)
Regional Study Area (RSA)
Sharp-tailed Grouse lek (candidate)
Turtle Nesting Area (candidate)
Moose Aquatic Feeding Area (confirmed)
Waterfowl Nursery Area
Waterfowl Nesting Area (120 m)
Bald Eagle Nest

Denning Sites - Indicator Species (candidate)

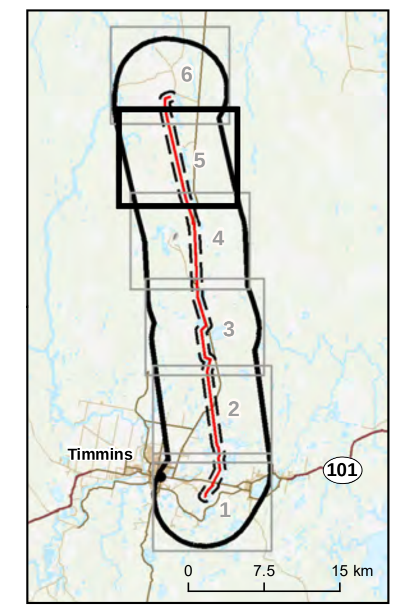
Canada Lynx

Project Component

New 230 kV Transmission Line

Infrastructure and Facilities

Principal Road
Local Road
Transmission Line



TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

Crawford Nickel Project - TIP-1 Transmission Project Timmins, Ontario

Map 7-5
Significant Wildlife Habitat - Specialized Habitat for Wildlife and Animal Movement Corridors

Sources:
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BBA Project Number: 7311004-000000-4E

2024-09-27

0 400 800 m
UTM, Zone 17, NAD 83

BBA

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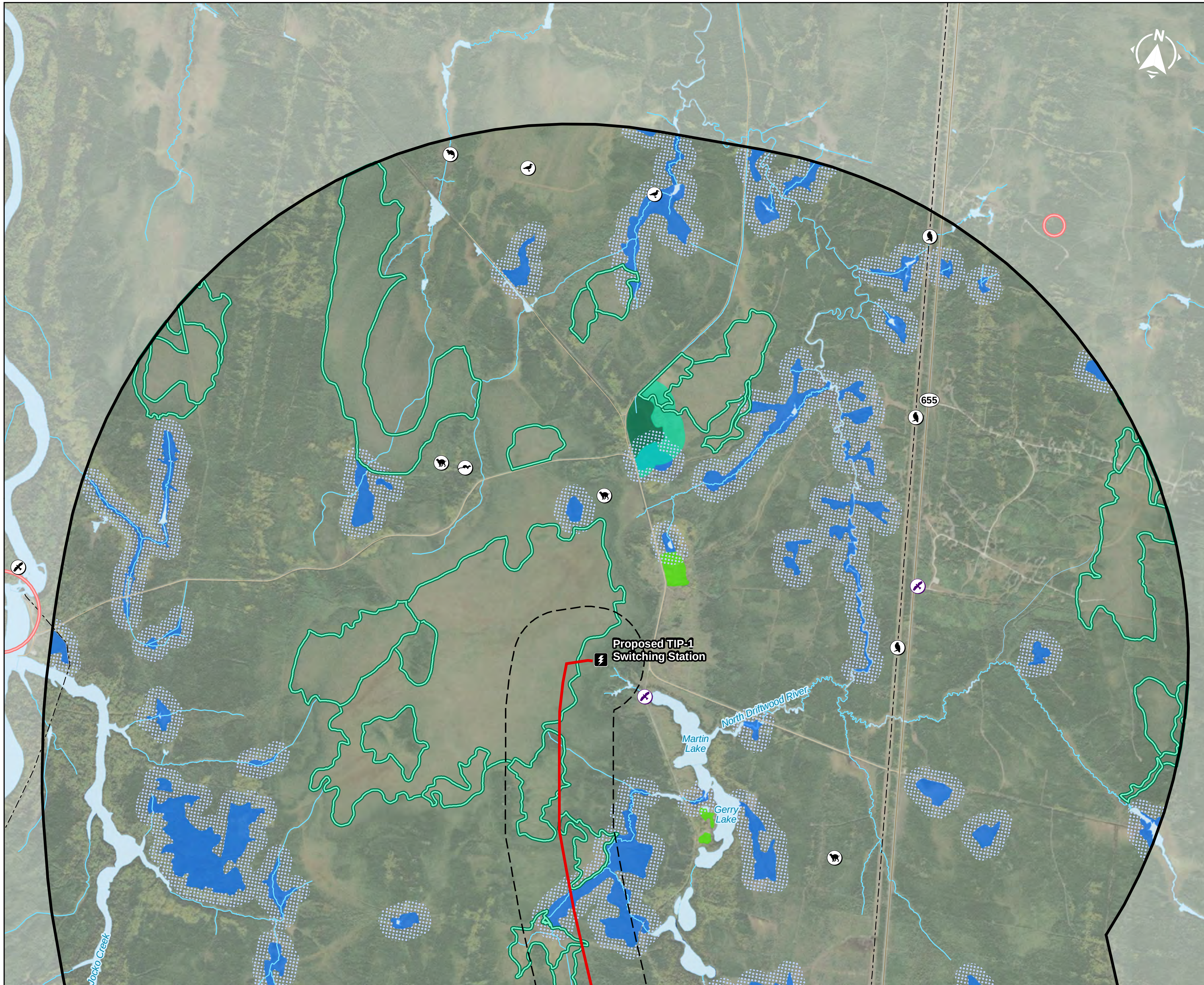
File: 7311004_000000_4E_D40_0018_R00_Map7.mxd



Local Study Area (LSA)
Regional Study Area (RSA)

Project Component

New 230 kV Transmission Line

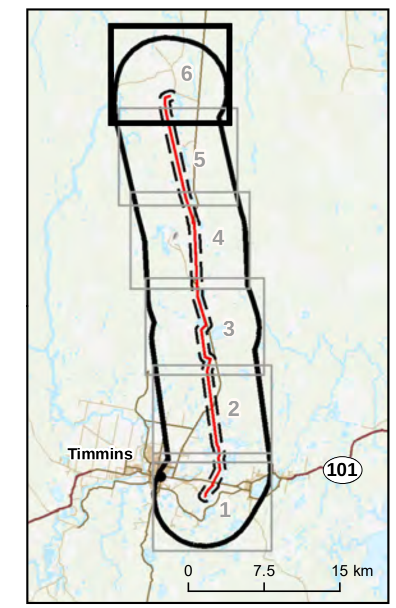
Infrastructure and Facilities

Substation
Principal Road
Local Road
Transmission Line

Denning Sites - Indicator Species (candidate)

American Marten
American River Otter
Canada Lynx

Woodland Raptor Nesting Habitat
Sharp-tailed Grouse lek (candidate)
Turtle Nesting Area (candidate)
Amphibian movement corridor (confirmed)
Amphibian Breeding Habitat Wetland (confirmed)
Moose Aquatic Feeding Area (confirmed)
Waterfowl Nursery
Waterfowl Nesting Area (120 m)
Common Raven Nesting Site
Sharp-tailed Grouse
Bald Eagle Nest
Bald Eagle (Observation)



TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

Crawford Nickel Project - TIP-1 Transmission Project Timmins, Ontario

Map 7-6

Significant Wildlife Habitat - Specialized Habitat for Wildlife and Animal Movement Corridors

Sources:
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BBA Project Number: 7311004-000000-4E

2024-09-27

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UTM, Zone 17, NAD 83

Prepared by: M.-N. Chouinard   Drawn by: A. Monnard   Verified by: F. Karcha

File: 7311004_000000_4E_D40_0018_R00_Map7.mxd

Woodland raptor nesting habitat – Confirmed and candidate

Many species of hawk and owl nest in trees within forests and are vulnerable to disturbance. Seven (7) indicator species were identified in the Mine Project Study Area: American kestrel, boreal owl, broad-winged hawk, common raven, merlin, sharp-shinned hawk, and red-tailed hawk. Three (3) Common raven nests were identified during aerial surveys, confirming SWH (WSP E&I Canada Limited, 2024). Any forested ELC ecosite is candidate habitat.

Seeps and springs - Candidate

Seeps/springs are typical of headwater areas and are often at the source of cold-water streams. Seeps/springs are not associated with any particular ecosite type; any forested ecosite with <25% meadow/field/pasture within the headwaters of a stream or river system may be candidate SWH. Although they were not documented it is likely seeps/springs occur within the RSA. The indicator species ruffed grouse and moose are found in the RSA.

Aquatic feeding habitat – Confirmed

Aquatic feeding habitats are an extremely important habitat component for moose and other wildlife as they supply important nutrients. This SWH type includes the ecosite and adjacent stands (120 m buffer) of mixed or conifer forest, particularly those that provide thermal cover and/or travel corridors to other habitat features. Numerous locations occur in the RSA, according to MNRF data, which lists habitat as terms such as Low, Moderate, and High. Areas in the RSA are almost all listed as Very High and are considered confirmed.

Mineral licks – Candidate

Mineral licks provide a concentrated source of essential mineral nutrients to ungulates. Mineral licks are a valuable habitat component but are also very rare on the landscape and are difficult to find; field investigations should be conducted in early spring before leaf-out. This habitat component is found in upwelling groundwater and the soil around these seepage areas, typically occurring in areas of sedimentary and volcanic bedrock. In areas of granitic bedrock, the site is usually overlain with calcareous glacial till. Mineral licks likely occur somewhere in the RSA, although they were not documented.

Denning sites for mink, otter, gray wolf, Eastern wolf, Canada lynx, marten, fisher, black bear – Candidate

Important fur-bearing mammals and den sites can be a limiting factor in sustaining populations. American mink prefer shorelines dominated by coniferous or mixed forests with dens usually underground. American mink will often use old muskrat lodges. American mink may den in root masses along shorelines of water bodies. North American river otter prefer undisturbed shorelines along water bodies that support productive fish populations with abundant shrubby vegetation and downed woody debris for denning. They often use old beaver lodges or log jams and crevices in rock piles. American marten and fisher share the same general habitat, requiring large tracts of coniferous or mixed forests of mature or older age classes. Denning sites are often in cavities in large trees or under large, downed woody debris.

Wolves prefer a more interior forest condition for locating their den sites. Wolves often select sandy sites sloped for excavation (esker areas should be examined as potentially key sites). Wolf dens are often located near wetlands. Canada lynx den sites are most often associated with the presence of downed woody debris. Black bear, particularly sub-adults, will often den in the base of hollow trees. Such trees are rare and primarily consist of large diameter cedar or sometimes large White Spruce.

The indicator species confirmed during surveys were North American river otter, wolf, Canada lynx, and American marten; however, no denning sites were confirmed (WSP E&I Canada Limited, 2024).

Rendezvous sites – Candidate

Rendezvous sites may be found in a variety of habitats such as isolated areas including open bogs, burns, fens, other wetlands, meadows, and clear-cuts. No locations are provided in provincial data, but wolf tracks were seen around the Study Area during aerial surveys (WSP E&I Canada Limited, 2024). Rendezvous sites are often used by wolf packs for multiple years and may be used as den sites in a subsequent year.

Amphibian breeding habitat: Wetland – Confirmed and candidate

Wetlands and pools (including vernal pools) > 500 m^2 (about 25 m diameter) supporting high species diversity are significant; some small or ephemeral habitats may not be identified on mapping and could be important amphibian breeding habitats. Wetlands and pools need to persist until mid-July for this SWH type. The presence of shrubs and logs increases the pond’s significance for some amphibian species because of the available structure for calling, foraging, escape, and concealment from predators. Candidate ecosites (B128, B129, B133, B134, B135, B142, B144, and B146) occur in the RSA.

Amphibian calling surveys and incidental observations during other field work documented eight (8) indicator species in the Mine Project Study Area: American toad, blue-spotted salamander, boreal chorus frog, green frog, mink frog, northern leopard frog, wood frog, and spring peeper (WSP E&I Canada Limited, 2024). One area of amphibian breeding habitat (wetland) was confirmed in ecosite B128. The associated amphibian movement corridor was also identified and is shown on **Map 7** (WSP E&I Canada Limited, 2024).

Amphibian breeding habitat: Woodland – Candidate

These habitats are extremely important to amphibian biodiversity within Northern Ontario landscapes. They may include swamps and thickets, vernal/seasonal pooling, riparian and a variety of wetland interiors and margins. A variety of suitable woodland ecosites occur in the RSA. Indicator species, including adult American toad, spring peeper, blue-spotted salamander, and wood frog, were documented in the Mine Project Study Area (WSP E&I Canada Limited, 2024).

To confirm this SWH, wetlands and pools (including vernal pools) >500 m^2 (about 25 m diameter) persisting until mid-July must support a breeding population of one (1) or more newt/salamander species or two (2) or more of the listed frog/toad species and at least 100 breeding individuals (adults juveniles, eggs/larval masses), or two (2) or more of the listed frog species with call level codes of 3. Despite the required variety of indicator species being present in suitable ecosites, the defining criteria were not met during WSP inventories.

Turtle nesting areas – Candidate

This SWH type is rare, and when identified will often be the only breeding site for local populations of turtles. Turtle nesting areas are typically found in open sunny areas near water, with gravel or loose substrates that turtles can dig into for nest-making. Sand and gravel beaches adjacent to shallow weedy areas of lakes, rivers, or marshes are frequently used. Any confirmed turtle nesting area includes the area or collection of sites within an area of exposed mineral soils used for nesting, a 30-100 m radius dependent on slope and vegetation, and the travel route from wetland to nest. Ecosite B007 provides candidate SWH for turtle nesting areas within the RSA (**Map 7**), and ecosite B031, adjacent to Porcupine Lake, represents a candidate ecosite as well.

Mast producing areas – Candidate

Mast producing areas are significant to wildlife because they produce a large amount of food for their size. Significant tree species include mountain ash and pin cherry, and significant shrub species include Blueberry sp., Raspberry sp., beaked hazel, and choke cherry. Areas that have been disturbed by humans, such as transmission corridors and logged forests, may be considered significant at the discretion of the MNRF. Additionally, areas with recent fires, large bedrock outcroppings, forest openings or utility corridors >1 ha provide excellent sites for mast producing shrubs. Candidate mast producing areas in the RSA included the transmission corridor and ecosite B114, which produced abundant blueberry sp. Two (2) indicator species, black bear and ruffed grouse, have been documented in the Mine Project Study Area (WSP E&I Canada Limited, 2024).

Sharp-tailed grouse leks – Candidate

Leks are an important habitat feature required to maintain populations of sharp-tailed grouse. leks are typically a grassy field/meadow separated by >15ha from adjacent shrublands and >30ha from adjacent treed areas. Sharp-tailed grouse was observed during field surveys (WSP E&I Canada Limited, 2024) and candidate ecosites B093, B126, and B136-B140 are present in the RSA.

4.2.5.4. Habitat for species of conservation concern

Habitats of Species of Conservation Concern include wildlife species that are listed as Special Concern, or rare, that are declining, or are featured species. Habitats of Species of Conservation Concern do not include habitats of Endangered or Threatened species (i.e., SAR species). Candidate and confirmed habitat found within the RSA are discussed below and depicted on Map 8.

Marsh bird breeding habitat – Candidate

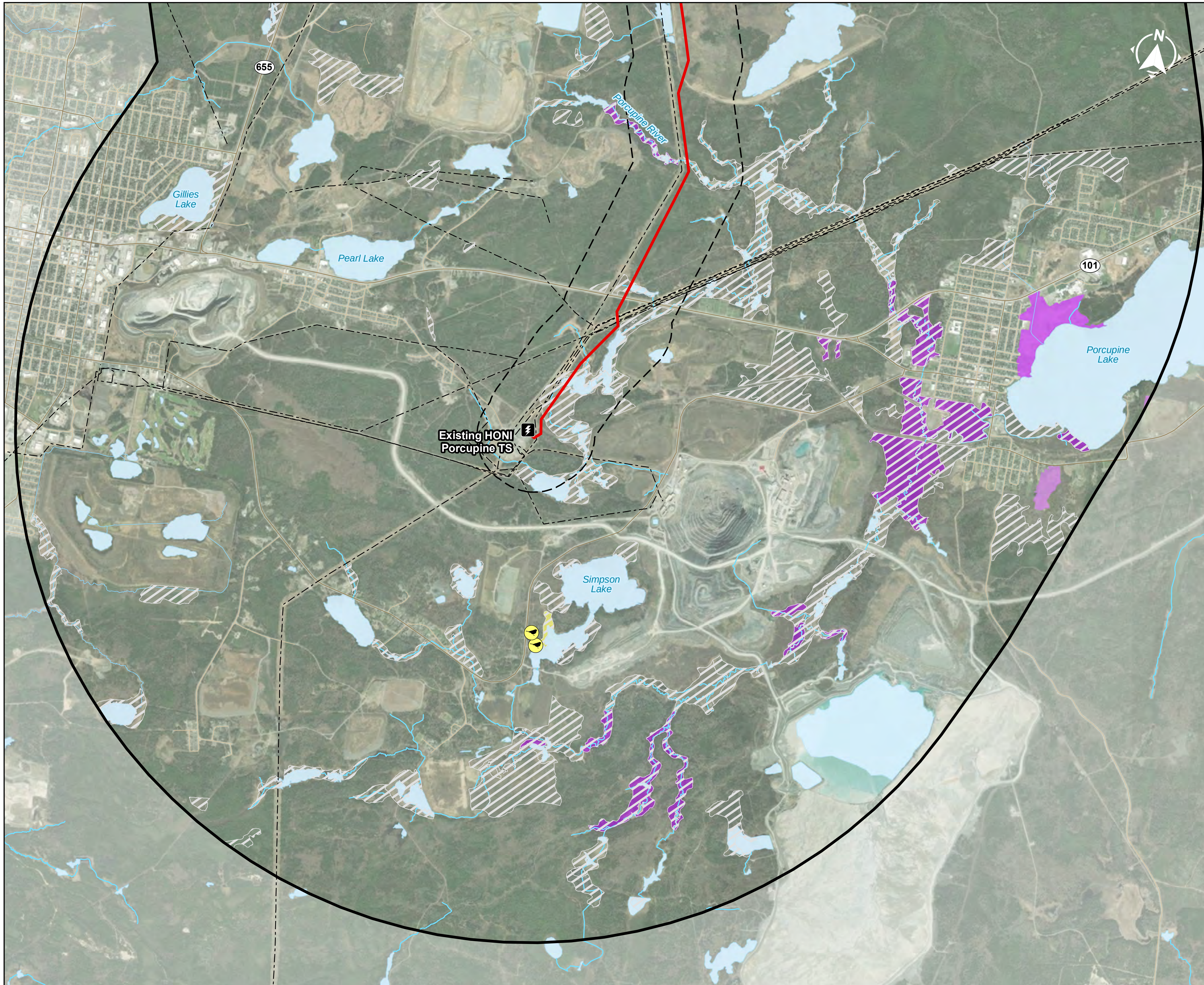
Marsh bird breeding habitat is rare in Northern Ontario and is very productive for marsh bird populations. Marsh bird surveys (WSP E&I Canada Limited, 2024) documented the following indicator species: a possible yellow rail, three (3) sora and one (1) Virginia rail. They were not confirmed as breeding and as such do not confirm SWH. Candidate ecosites within the RSA (B134-B140, B142, B144, and B146-B147) have been identified as candidate marsh bird breeding habitat. Other indicator species such as American bittern, pied-billed grebe, ring-necked duck, sandhill crane, and trumpeter swan, were also found in the CNC Project Study Area (WSP E&I Canada Limited, 2024).

Open country bird breeding habitat – Candidate

This wildlife habitat is declining throughout Ontario and North America. Candidate SWH are large field/meadow areas (includes natural and cultural fields and meadows) >30 ha. Ecosites B031 and B093 are found in the RSA. Indicator species such as northern harrier, Savannah sparrow and LeConte's sparrow were documented during bird surveys (WSP E&I Canada Limited, 2024). No short-eared owl have been documented in any filed surveys, including targeted Short-eared Owl surveys in June 2023 (WSP E&I Canada Limited, 2024). Ecosite B093 located within the LSA was surveyed and no indicator species was documented (WSP E&I Canada Limited, 2024) so this ecosite is not meeting the criteria for confirmed SWH. The other ecosites remain candidates.

Shrub or early successional breeding bird habitat – Candidate

Shrub or early successional breeding bird habitat is also declining in Ontario and North America. Indicator species of this SWH that were observed included American woodcock, ruffed grouse, and eastern kingbird (WSP E&I Canada Limited, 2024). No breeding evidence was recorded for the eastern kingbird, and the habitat was not greater than 30 ha. The shrub areas need to be larger than 30 ha to meet the criteria for shrub breeding bird habitat. Other candidate ecosites (B134 and B135) are found along watercourses in the RSA.



Regional Study Area (RSA)

Local Study Area (LSA)

Project Component

New 230 kV Transmission Line

Infrastructure and Facilities

Substation

Principal Road

Local Road

Transmission Line

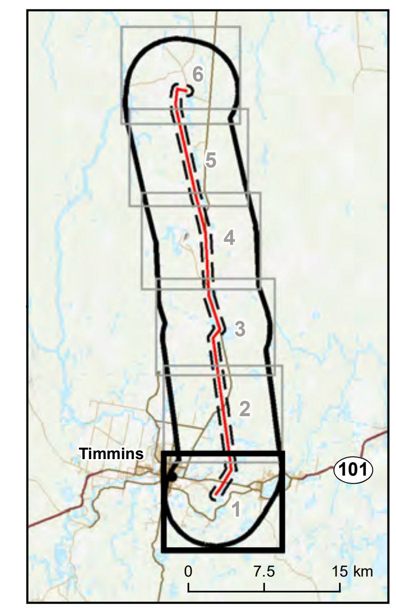
Marh Bird Breeding Habitat (candidate)

Open Country Bird Breeding Habitat (candidate)

Shrub or Early Successional Breeding Bird Habitat (candidate)

Special Concern and Rare Wildlife Species

Barn Swallow (confirmed)



TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

Crawford Nickel Project - TIP-1 Transmission Project Timmins, Ontario

Map 8-1

Significant Wildlife Habitat – Habitat for Species of Conservation Concern

Sources:
Forest Resources Inventory, Ontario Ministry of Natural Resources and Forestry, June 2023
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Project Data, BBA, 2024 and WSP, 2021-2022

BBA Project Number: 7311004-000000-4E

2024-09-27

0 400 800 m

UTM, Zone 17, NAD 83

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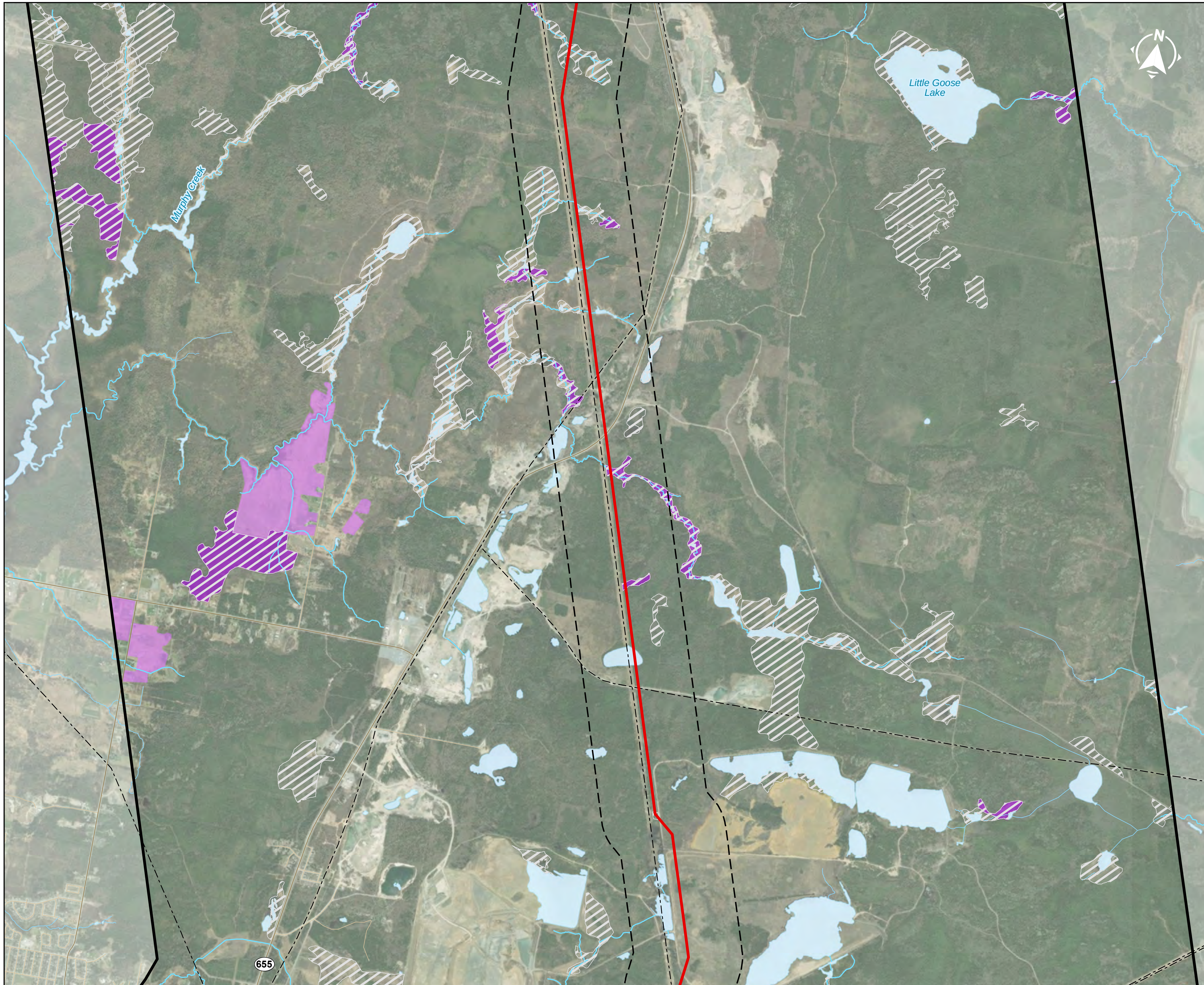


Regional Study Area (RSA)

Local Study Area (LSA)

Project Component

New 230 kV Transmission Line

Infrastructure and Facilities

Principal Road

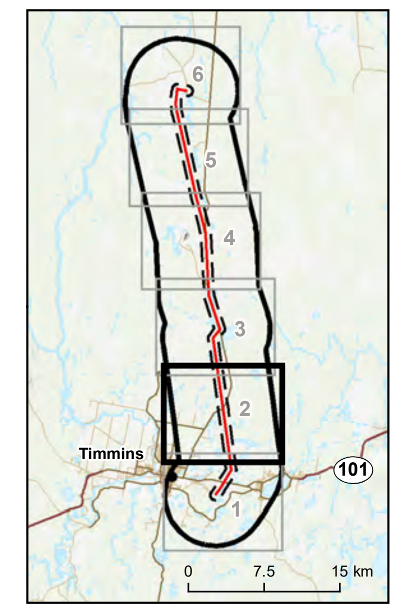
Local Road

Transmission Line

Marh Bird Breeding Habitat (candidate)

Open Country Bird Breeding Habitat (candidate)

Shrub or Early Successional Breeding Bird Habitat (candidate)



TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

Crawford Nickel Project - TIP-1 Transmission Project Timmins, Ontario

Map 8-2

Significant Wildlife Habitat – Habitat for Species of Conservation Concern

Sources:
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BBA Project Number: 7311004-000000-4E

2024-09-27

0 400 800 m

UTM, Zone 17, NAD 83

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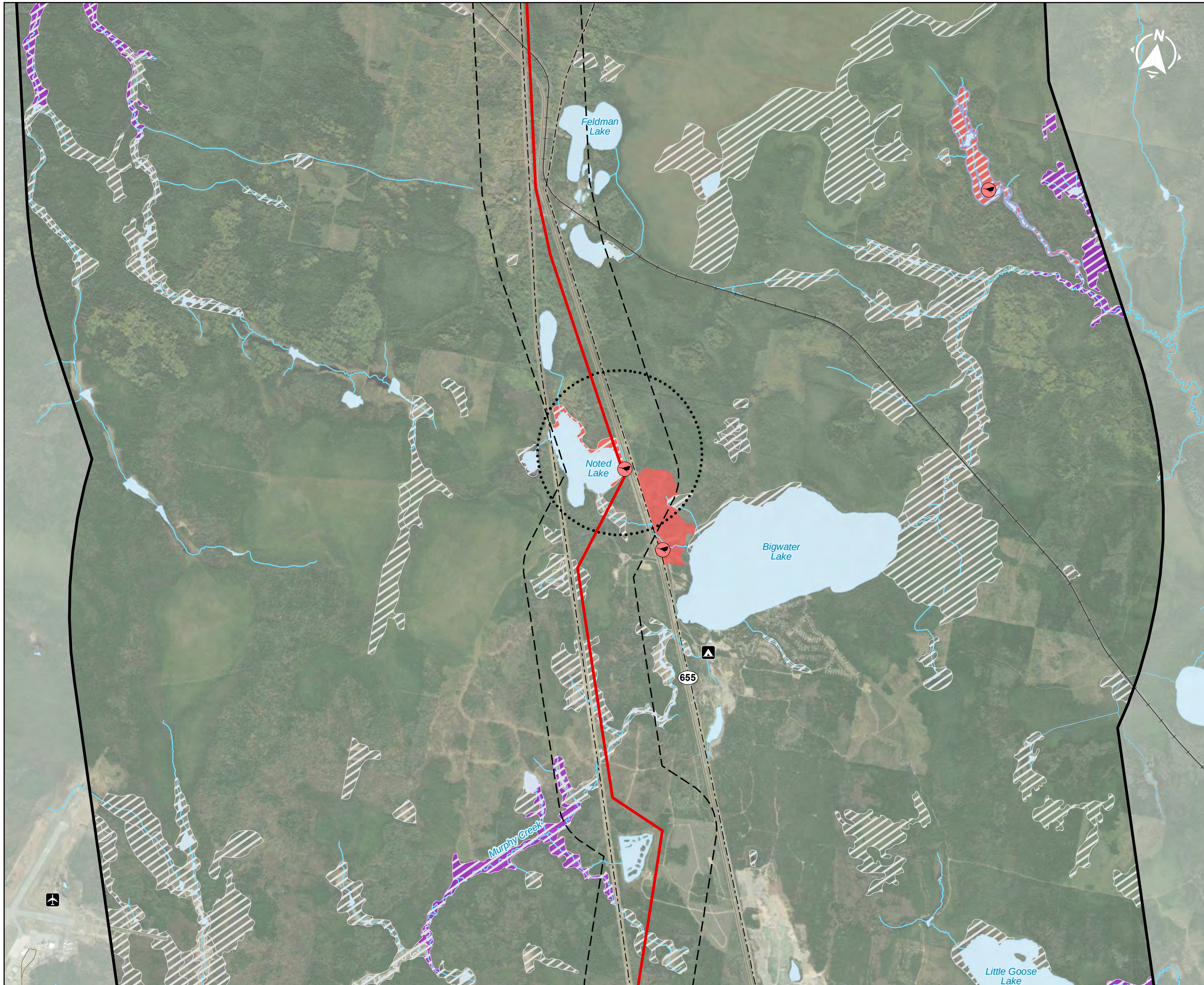
File: 7311004_000000_4E_D40_0019_R00_Map8.mxd



Regional Study Area (RSA)

Local Study Area (LSA)

Project Component

New 230 kV Transmission Line

Infrastructure and Facilities

Timmins / Victor M. Power Airport

Big Water Campground

Principal Road

Local Road

Railway

Transmission Line

Bald Eagle Habitat (confirmed)

Marh Bird Breeding Habitat (candidate)

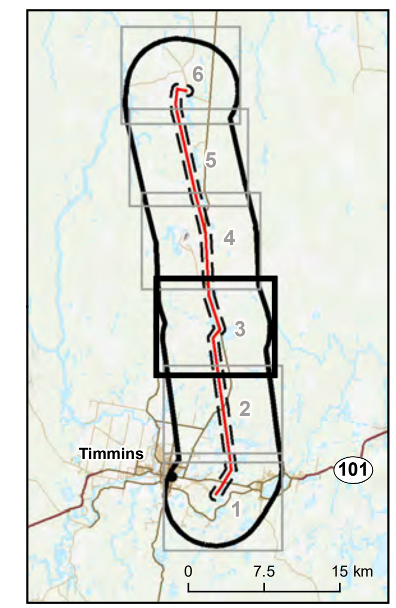
Shrub or Early Successional Breeding Bird Habitat (candidate)

Special Concern and Rare Wildlife Species

Common Nighthawk (confirmed)

Olive-sided Flycatcher (confirmed)

Common Nighthawk and Olive-sided Flycatcher



TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

Crawford Nickel Project - TIP-1 Transmission Project Timmins, Ontario

Map 8-3

Significant Wildlife Habitat – Habitat for Species of Conservation Concern

Sources:
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BBA Project Number: 7311004-000000-4E

2024-09-27

0 400 800 m

UTM, Zone 17, NAD 83

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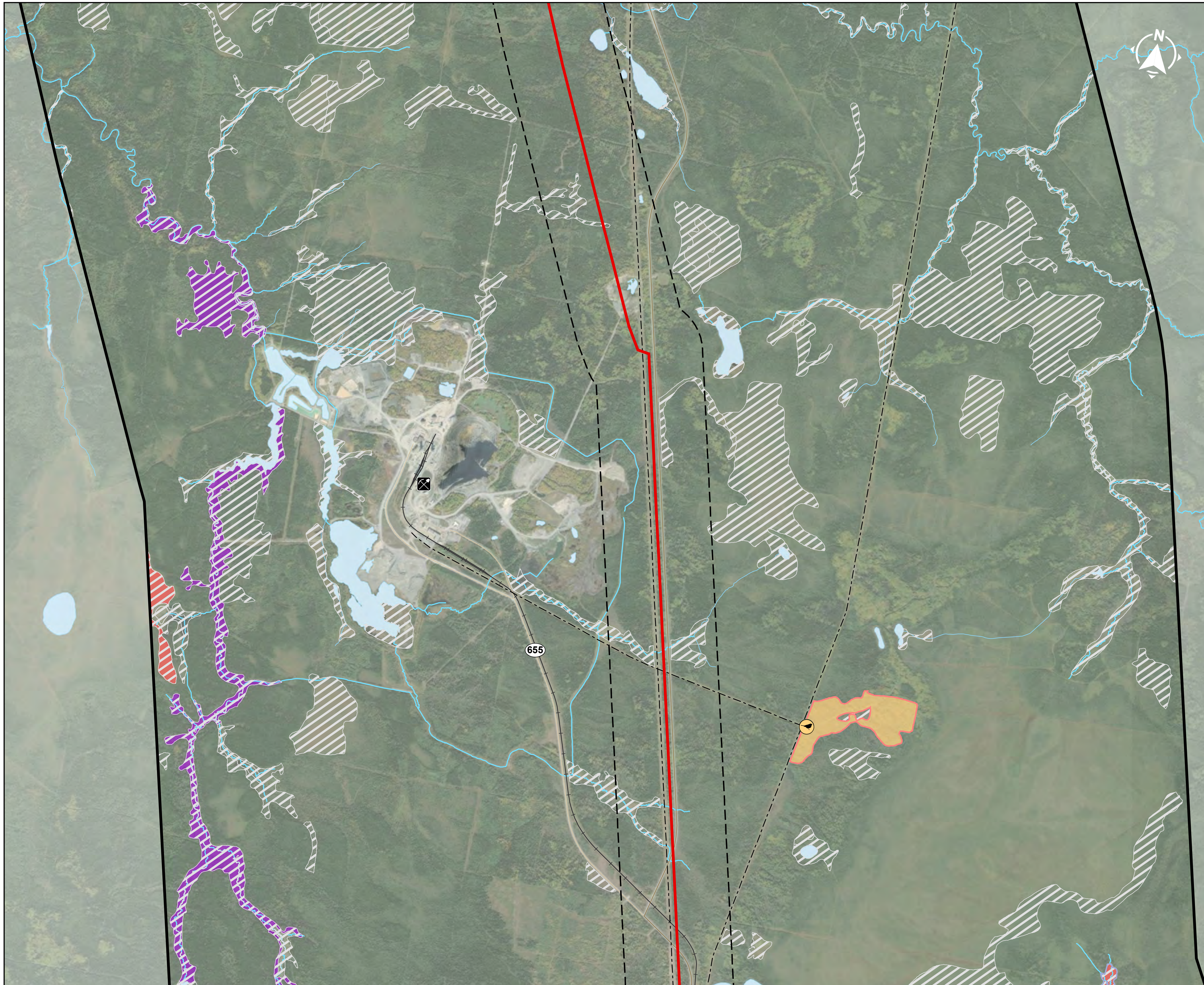


Regional Study Area (RSA)

Local Study Area (LSA)

Project Component

New 230 kV Transmission Line

Infrastructure and Facilities

Kidd Creek Mine

Principal Road

Local Road

Railway

Transmission Line

Marh Bird Breeding Habitat (candidate)

Shrub or Early Successional Breeding Bird Habitat (candidate)

Special Concern and Rare Wildlife Species

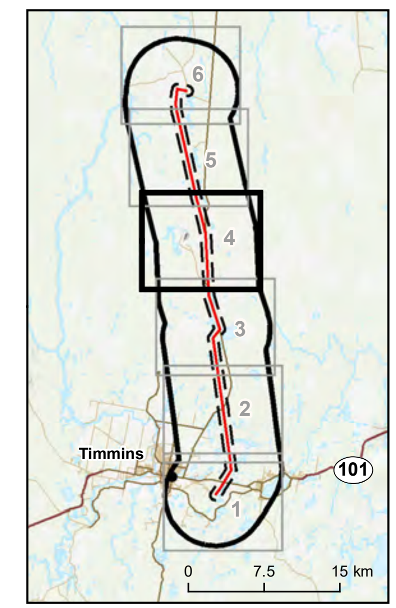
Canada Warbler (confirmed)

Common Nighthawk (confirmed)

Rusty Blackbird (confirmed)

Canada Warbler, Common Nighthawk and Rusty Blackbird

Common Nighthawk and Olive-sided Flycatcher



TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

Crawford Nickel Project - TIP-1 Transmission Project Timmins, Ontario

Map 8-4

Significant Wildlife Habitat – Habitat for Species of Conservation Concern

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2024-09-27

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UTM, Zone 17, NAD 83

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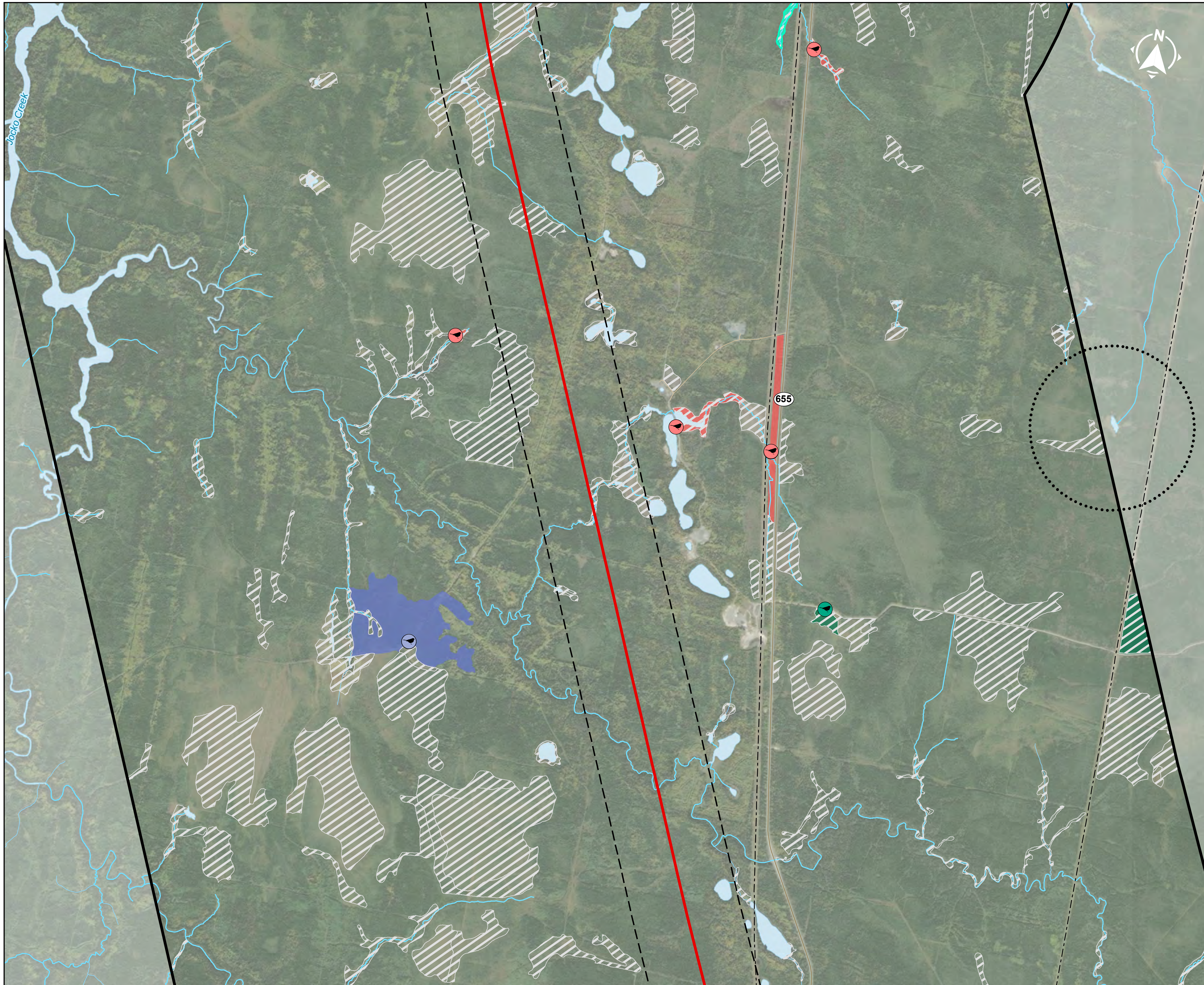


Regional Study Area (RSA)

Local Study Area (LSA)

Project Component

New 230 kV Transmission Line

Infrastructure and Facilities

Principal Road

Local Road

Transmission Line

Bald Eagle Habitat (confirmed)

Marh Bird Breeding Habitat (candidate)

Special Concern and Rare Wildlife Species

Common Nighthawk (confirmed)

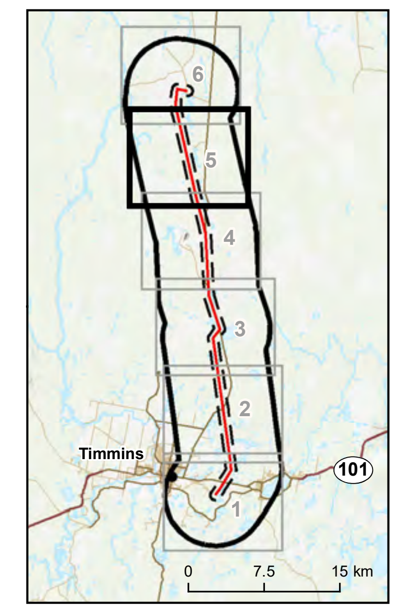
Olive-sided Flycatcher (confirmed)

Rusty Blackbird (confirmed)

Common Nighthawk and Potential Yellow Rail

Common Nighthawk, Olive-sided Flycatcher and Rusty Blackbird

Potential Yellow Rail (candidate)



TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

Crawford Nickel Project - TIP-1 Transmission Project Timmins, Ontario

Map 8-5

Significant Wildlife Habitat – Habitat for Species of Conservation Concern

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BBA Project Number: 7311004-000000-4E

2024-09-27

0 400 800 m

UTM, Zone 17, NAD 83

BBA

Prepared by: M.-N. Chouinard Drawn by: A. Monnard Verified by: F. Karcha

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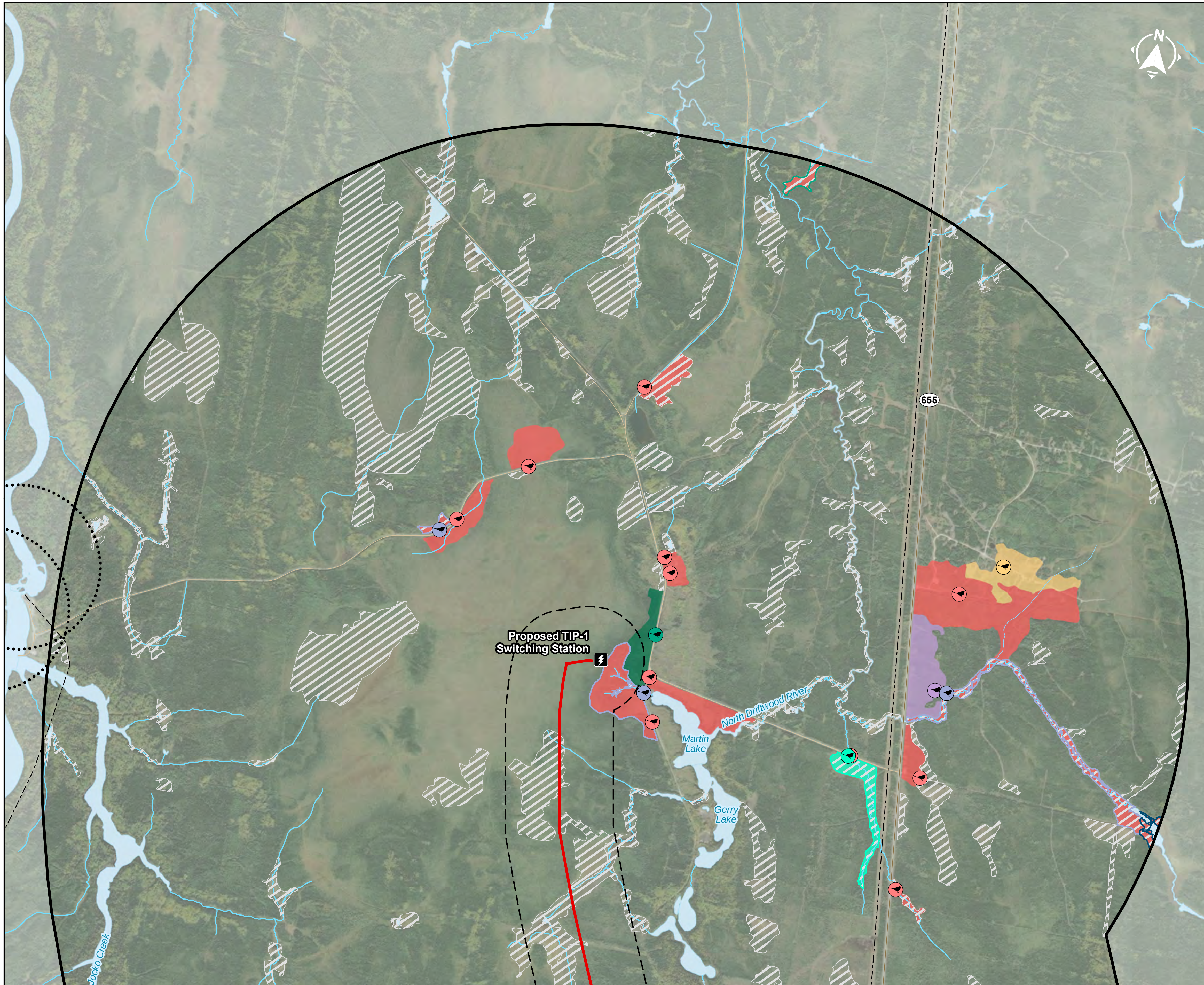


Regional Study Area (RSA)
Local Study Area (LSA)
Bald Eagle Habitat (confirmed)
Marh Bird Breeding Habitat (candidate)

Project Component

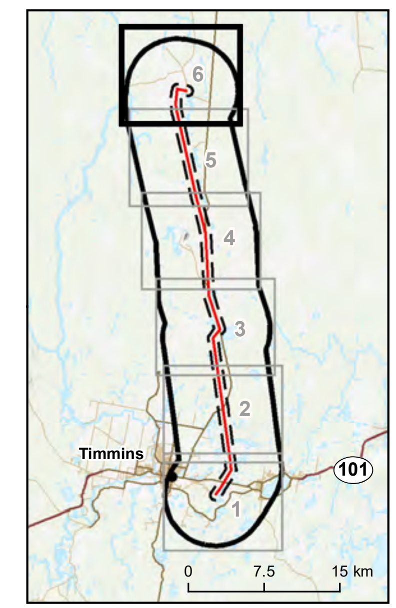
New 230 kV Transmission Line

Infrastructure and Facilities

Substation
Principal Road
Local Road
Transmission Line

Special Concern and Rare Wildlife Species

Canada Warbler (confirmed)
Common Nighthawk (confirmed)
Evening Grosbeak (confirmed)
Olive-sided Flycatcher (confirmed)
Rusty Blackbird (confirmed)
Potential Yellow Rail (candidate)
Common Nighthawk and Olive-sided Flycatcher
Common Nighthawk and Rusty Blackbird
Common Nighthawk and Potential Yellow Rail
Common Nighthawk, Olive-sided Flycatcher and Rusty Blackbird



TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

Crawford Nickel Project - TIP-1 Transmission Project Timmins, Ontario

Map 8-6
Significant Wildlife Habitat – Habitat for Species of Conservation Concern

Sources:
Forest Resources Inventory, Ontario Ministry of Natural Resources and Forestry, June 2023
Ontario Road Network (ORN), Ontario Ministry of Natural Resources and Forestry, June 2023
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Project Data, BBA, 2024 and WSP, 2021-2022

BBA Project Number: 7311004-000000-4E

2024-09-27

0 400 800 m
UTM, Zone 17, NAD 83

Prepared by: M.-N. Chouinard Drawn by: A. Monnard Verified by: F. Karcha

Special concern and rare wildlife species – Confirmed and candidate

Several species documented in secondary sources are designated Special Concern or Provincially Rare (endangered or threatened).

Candidate species include:

- yellow rail
- peregrine falcon
- monarch
- yellow-banded bumble bee

Confirmed species include (WSP E&I Canada Limited, 2024):

- barn swallow
- Canada warbler
- common nighthawk
- evening grosbeak
- rusty blackbird
- olive-sided flycatcher

The SWH for these species is the area of the habitat to the finest ELC scale that protects the habitat form and function. Element occurrences and habitat mapping for these species has been completed for the LSA and is shown on Map 8.

4.2.5.5. Animal movement corridors

Animal movement corridors are elongated areas used by wildlife to move from one habitat to another. They are important to ensure genetic diversity in populations, to allow seasonal migration of animals (e.g., deer moving from summer to winter range) and to allow animals to move throughout their home range from feeding areas to cover areas (OMNRF 2015). The SWH Criteria Schedules for Ecoregion 3E identifies the following animal movement corridors:

- Amphibian movement corridors;
- Cervid movement corridors; and
- Furbearer movement corridors.

Where a confirmed or candidate Specialized Habitat for Wildlife has been identified, animal movement corridors must also be identified. No mineral lick habitat, or denning sites for American mink, North American river otter, American marten, fisher, or wolf have been confirmed to date (WSP E&I Canada Limited, 2024).

Confirmed and candidate movement corridors occurring within the RSA are described below and presented on **Map 7**.

Amphibian movement corridors – Confirmed

An amphibian movement corridor, corresponding to the confirmed amphibian breeding habitat: wetland, was identified within the Project RSA (WSP E&I Canada Limited, 2024), and the movement corridor consists of a 200 m area to the east of the amphibian breeding habitat which connects the wetland to surrounding undeveloped areas.

Cervid movement corridors – Candidate

This SWH is considered candidate as Moose Aquatic Feeding Area was confirmed in the Project RSA. Corridors typically follow riparian areas, woodlots, and areas of physical geography such as ravines or ridges. These corridors will be multi-functional in that they also function for smaller mammal species. To confirm this SWH, studies must be conducted form May to July when moose are moving to aquatic feeding areas and should include descriptions of surrounding forest matrices for determination of significance.

Furbearer movement corridor – Candidate

Given the high potential for mink and otter denning sites within the RSA, this SWH type is also considered candidate. Studies must be conducted between March-June when mink or otter are using denning sites. All treed ecosites adjacent to or within shoreline habitats are considered candidates.

4.3. Species of Conservation Concern, including Species at Risk

In Ontario, Species of Conservation Concern (SCC) commonly include SAR and rare and rapidly declining species. Standard definitions vary across provincially available resources; for the purpose of this report SCC are defined as:

- Species classified as Extirpated (EXT), Endangered (END), Threatened (THR), or Special Concern (SC), by COSSARO
- Species classified as Extirpated (EXT), Endangered (END), Threatened (THR), or Special Concern (SC), by COSEWIC.

- Species classified as Extirpated (EXT), Endangered (END), Threatened (THR), or Special Concern (SC) under the provincial ESA.
- Species classified as Extirpated (EXT), Endangered (END), Threatened (THR), or Special Concern (SC) under the federal SARA.
- Provincially rare species with a provincial rank (sub-national rank) of S1 (critically imperiled), S2 (imperiled), or S3 (vulnerable). These species are tracked by the NHIC and are called SCC, though in this document the definition is more encompassing.
- Species of concern as identified by Indigenous Nations.

Based on the results of field investigations for CNC Project (WSP E&I Canada Limited, 2024a) and desktop screening, a list of species protected under the provincial ESA and the federal SARA that may occur within the RSA. For each species classified as Endangered, Threatened, or Special Concern under the ESA or SARA, an assessment was made as to the likelihood of habitat occurrence based on the biology of the species and the results of field investigations. Each species was classified into one (1) of five (5) probabilities of occurrence (Table 3).

1. **Confirmed –** Species for which suitable habitat is present in the RSA and the species was confirmed using habitat for life functions during field investigations or is confirmed in secondary sources (e.g., consultation with MECP).
2. **High –** Species recorded in the vicinity of the RSA during field surveys or typically within 10 km and recorded in the past 20 years in secondary sources. The preferred habitat is abundant within the RSA. Species with a high probability of occurrence would be expected to breed within or frequently use the habitats available within the RSA and would be known to have a high relative abundance within the region (i.e., compared to other regions in Ontario).
3. **Moderate –** Species for which suitable habitat is present but limited or uncommon in the RSA and breeding in the area is rare. However, species with moderate probabilities of occurrence may intermittently use the area for foraging, migration, or movement to other parts of their home range and therefore may have been documented in secondary sources or field surveys.
4. **Low –** Those species recorded in the vicinity of the RSA, but whose preferred habitat does not occur or is extremely limited within the RSA. These species may intermittently move through the RSA but are unlikely to become permanent residents. These species have likely not been documented in secondary sources or field surveys, but historical records are possible.
5. **None –** Those species whose preferred habitat is completely absent from the RSA. Unlikely these species have been documented. However, historical or vagrant records (e.g., a species that is currently outside their wintering and breeding area) may exist.

Species identified as Extirpated, Endangered, and Threatened are protected under the ESA. Those species identified as Special Concern are not afforded protection under Sections 9 and 10 of the ESA; however, they are assessed as part of SWH.

Table 3: Species at Risk Habitat Assessment and Potential Occurrence in the RSA

Species	Status	Preferred Habitat	Potential for Habitat/ Species occurrence in RSA
Plants			
black ash *Fraxinus nigra*	COSSARO: Endangered ESA: Endangered COSEWIC: Threatened SARA: Not listed, under consideration	Predominantly a wetland species found in swamps, floodplains, fens. *The prohibitions set out in clause 9 (1) (a) of the Act do not apply with respect to a black ash if it is not located in a municipality or territorial district set out in Schedule 1 to this Regulation. Schedule 1 does not include City of Timmins.	**Not at risk in the RSA**
Birds			
bank swallow *Riparia riparia*	COSSARO: Threatened ESA: Threatened COSEWIC: Threatened SARA: Threatened	Nests colonially in nesting burrows excavated in vertical silt and sand banks. Nests in a wide variety of naturally and anthropogenically created vertical banks, which often erode and change over time; many nests are in active or former aggregate pits.	**Moderate** – Neither the species nor nests of the species were observed during targeted field investigations for CNC Project (WSP E&I Canada Limited, 2024a). Some occurrences of the species are listed in secondary sources in the southern part of the RSA, near Timmins (Porcupine Lake and north of McIntyre Mine headframe). Suitable habitat (sand and gravel pits) is present but limited or uncommon in the RSA.
barn swallow *Hirundo rustica*	COSSARO: Special concern ESA: Special concern COSEWIC: Special concern SARA: Threatened (under consideration for status change)	Nest in artificial structures including barns and other outbuildings, garages, houses, bridges, and road culverts. They prefer open habitats for foraging especially fields and agricultural lands.	**Confirmed** – One (1) barn swallow was documented during breeding bird surveys in 2023 (WSP E&I Canada Limited, 2024a). Suitable habitat is present in the RSA.
bobolink *Dolichonyx oryzivorus*	COSSARO: Threatened ESA: Threatened COSEWIC: Special concern SARA: Threatened (under consideration for status change)	Nests in hayfields and pastures dominated by non-native herbaceous plants such as clover, Timothy, tall grasses and broad-leaved plants. Nests are built on the ground at the base of tall forbs.	**Low** – The species was not observed during field investigations for CNC Project (WSP E&I Canada Limited, 2024a). Some occurrences of the species are listed in secondary sources in the southern part of the RSA, near Timmins (Porcupine Lake and Gillies Lake). Suitable habitat (hayfields and pastures) is present but extremely limited in the RSA.
Canada warbler *Cardellina canadensis*	COSSARO: Special concern ESA: Special concern COSEWIC: Special concern SARA: Threatened (under consideration for status change)	Wet, mixed deciduous-coniferous forests with a well-developed shrub layer. Also uses riparian shrub forest on slopes and in ravines, and in stands regenerating after natural and anthropogenic disturbances.	**Confirmed** – Documented at multiples breeding bird survey points and recorded at seven ARU stations in 2021-2023 surveys (WSP E&I Canada Limited, 2024a). Suitable habitat is present in the RSA.
chimney swift *Chaetura pelagica*	COSSARO: Threatened ESA: Threatened COSEWIC: Threatened SARA: Threatened	Associated with developed areas, where artificial vertical cavities, specifically chimneys, are used as a substitute for the species' natural roosting and nesting of large hollow trees. Still breed in natural tree cavities where they are available.	**Low** – The species was not observed during field investigations for CNC Project (WSP E&I Canada Limited, 2024a). Suitable habitat is present in the RSA but this is the edge of their range.
common nighthawk *Chordeiles minor*	COSSARO: Special concern ESA: Special concern COSEWIC: Special concern SARA: Special concern (since 2023-02-03, previously threatened))	Breeding habitat includes open forests (cuts, burns, or rock outcrops), prairie with short grass or bare patches, dry bogs, rocky areas, sandy coastal habitats, and settled areas such as railways, gravel roads, cultivated fields, parks, urban areas with gravel roofs. In boreal regions, outcrops and post-burn habitats may provide important nesting areas.	**Confirmed** – Recorded at 28 ARU stations (WSP E&I Canada Limited, 2024a). Suitable habitat is present in the RSA.

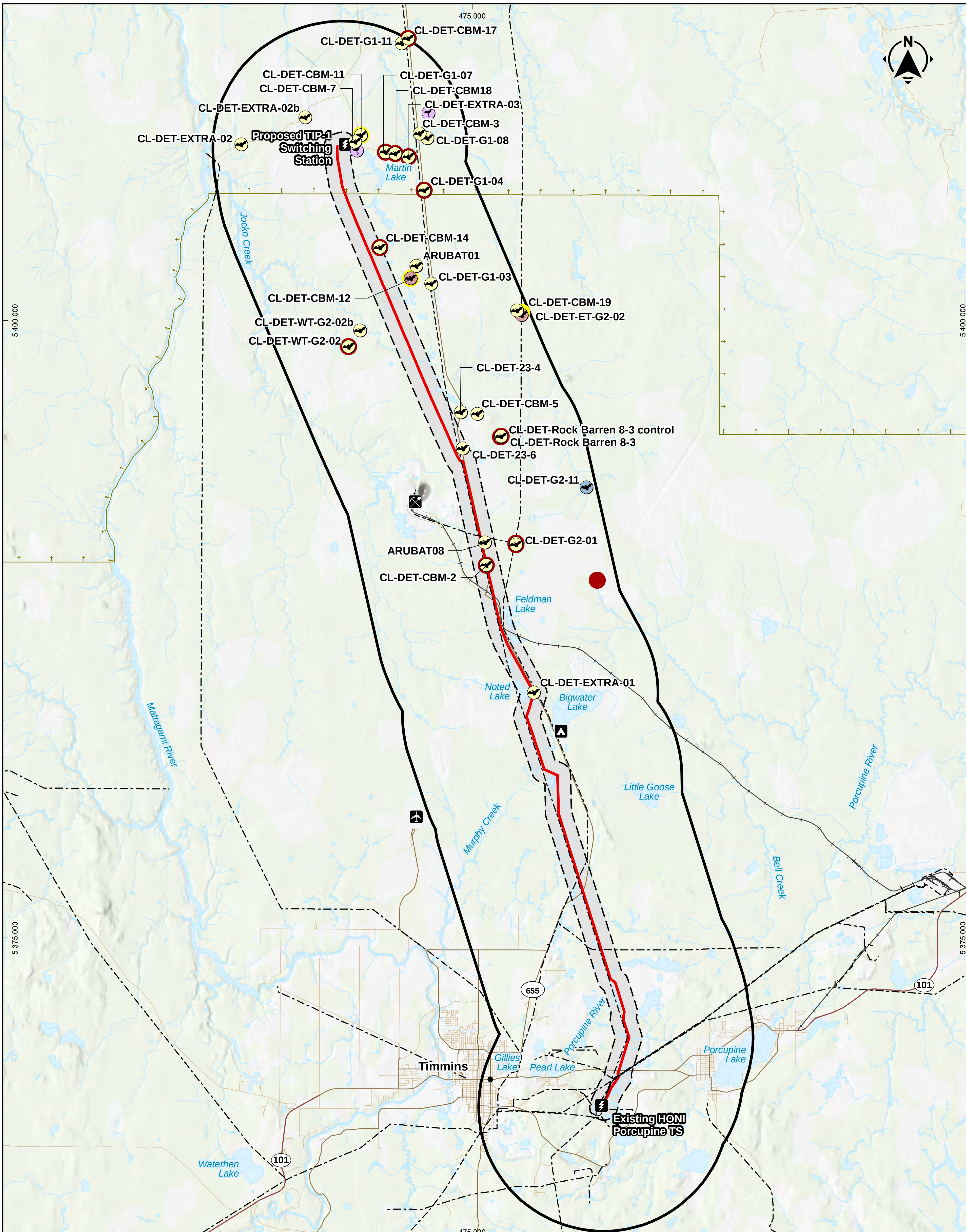
Species	Status	Preferred Habitat	Potential for Habitat/ Species occurrence in RSA
Eastern meadowlark *Sturnella magna*	COSSARO: Not listed ESA: Threatened COSEWIC: Threatened SARA: Threatened	Prefer grassland habitats, including native prairies and savannahs, as well as non-native pastures, hayfields, weedy meadows, herbaceous fencerows and airfields.	**Low** – The species was not observed during field investigations for CNC Project (WSP E&I Canada Limited, 2024a), and no occurrence is listed in the RSA by secondary sources. Suitable habitat is present but extremely limited in the RSA.
Eastern whip-poor-will *Antrostomus vociferus*	COSSARO: Not listed ESA: Threatened COSEWIC: Special concern SARA: Threatened (under consideration for status change)	Avoids both wide-open spaces and closed-canopy forests, favouring areas with little ground cover in semi-open or patchy forests with clearings, such as barrens or regenerating woodlands. Forest structure is more important than composition, although common tree associations are pine and oak.	**Low** – The species was not observed during field investigations for CNC Project (WSP E&I Canada Limited, 2024a), and no occurrence is listed in the RSA by secondary sources. Suitable habitat is present but extremely limited in the RSA.
evening grosbeak *Coccothraustes vespertinus*	COSSARO: Special concern ESA: Special concern COSEWIC: Special concern SARA: Special concern	Nests in conifer-dominated forests across northern Ontario.	**Confirmed** – Two (2) evening grosbeak were recorded within the RSA during breeding bird surveys in 2023 (WSP E&I Canada Limited, 2024a). Suitable habitat is present in the RSA.
lesser yellowlegs *Tringa flavipes*	COSSARO: Threatened ESA: Threatened COSEWIC: Threatened SARA: Not listed (under consideration for addition)	The breeding range of Lesser Yellowlegs is limited to northern Ontario, including the Taiga Shield and Hudson Plains Bird Conservation Region (BCR 7) and the northern Boreal Softwood Shield (BCR 8). Within its breeding range, Lesser Yellowlegs typically nests on dry ground near wetland areas used for foraging	**Confirmed** –Lesser yellowlegs were recorded at four (4) ARU stations and documented during breeding bird surveys. No breeding evidence has been found for this species (WSP E&I Canada Limited, 2024a). Suitable habitat is present in the RSA.
olive-sided flycatcher *Contopus cooperi*	COSSARO: Special concern ESA: Special concern COSEWIC: Special concern SARA: Special concern (since 2023-02-03)	Associated with the boreal forests of northern Canada. It is distributed widely across Ontario's forested regions, primarily from the southern Canadian Shield north to the Hudson Bay Lowlands, with highest densities in northern Ontario.	**Confirmed** – Olive-sided flycatcher were recorded at nine (9) ARU stations, and accidentally observed during vegetation surveys (WSP E&I Canada Limited, 2024a). Suitable habitat is present in the RSA.
peregrine falcon *Falco peregrinus anatum/tundrius*	COSSARO: Special concern ESA: Special concern COSEWIC: NAR SARA: Not listed	Nests on high steep cliffs in northern Ontario, and some cliffs but mostly tall anthropogenic structures in urban centers in southern Ontario.	**Moderate** – Neither the species nor nests of the species were observed during field surveys for CNC Project (WSP E&I Canada Limited, 2024a). The RSA lacks appropriate nest sites for the species. This species likely migrates through the RSA between breeding and wintering grounds.
rusty blackbird *Euphagus carolinus*	COSSARO: Special concern ESA: Special concern COSEWIC: Special concern SARA: Special concern	Breeds in wet forests, including areas with fens, bogs, muskeg, and beaver ponds.	**Confirmed** – Rusty blackbird were recorded at four (4) ARU stations and documented during breeding bird and migratory bird surveys (WSP E&I Canada Limited, 2024a). Suitable habitat is present in the RSA.
short-eared owl *Asio flammeus*	COSSARO: Threatened ESA: Threatened COSEWIC: Threatened SARA: Special concern (under consideration for status change)	Nests in large open habitat types (grasslands, tundra and wetlands), also in agricultural areas in southern Ontario. This species is considered to be sensitive to habitat fragmentation.	**Low** – The species was not observed during field investigations for CNC Project (WSP E&I Canada Limited, 2024a). No occurrence is listed in the RSA by secondary sources, but in the vicinity. Suitable habitat is present but extremely limited in the RSA.

Species	Status	Preferred Habitat	Potential for Habitat/ Species occurrence in RSA
yellow rail *Coturnicops noveboracensis*	COSSARO: Not listed ESA: Special concern COSEWIC: Special concern SARA: Special concern	Nests in wet marshy areas of short, grass-like vegetation, usually sedge, which have an overlying dry mat of dead vegetation.	**Moderate** – A possible yellow rail was heard in 2021 at a breeding bird station within the RSA, but not well enough to confirm the presence (WSP E&I Canada Limited, 2024a). No occurrence is listed in the RSA by secondary sources. Suitable habitat is abundant in the RSA.
Reptiles			
Blanding's turtle *Emydoidea blandingii*	COSSARO: Threatened ESA: Threatened COSEWIC: Endangered SARA: Endangered	In the Great Lakes/St. Lawrence population, however, Blanding's turtles are often observed using clear water eutrophic wetlands. Blanding's turtles have strong site fidelity but may use several connected water bodies throughout the active season. Turtles of all ages occur primarily in shallow water habitats. Females nest in a variety of substrates including sand, organic soil, gravel, cobblestone, and soil-filled crevices of rock outcrops.	**High** – Three (3) community observations located in the vicinity of the RSA. Turtle basking surveys and Blanding's turtle habitat assessments did not find any turtles, with no detection of Blanding's turtle eDNA. There is highly suitable habitat within the RSA (WSP E&I Canada Limited, 2024a).
midland painted turtle *Chrysemys picta marginata*	COSSARO: Not listed ESA: Not listed COSEWIC: Special concern SARA: Special concern	Typically found in slow moving, relatively shallow and well-vegetated wetlands. Also in lakes, rivers, creeks, and streams where abundant basking sites are present. Submergent aquatic plants are used for cover and feeding.	**High** – Turtle basking surveys did not find any turtles (WSP E&I Canada Limited, 2024a). There is abundant suitable habitat within the RSA.
snapping turtle *Chelydra serpentina*	COSSARO: Not listed ESA: Special concern COSEWIC: Special concern SARA: Special concern	Slow-moving water with a soft mud bottom and dense aquatic vegetation. Established populations are most often located in ponds, sloughs, shallow bays or river edges and slow streams, or areas combining several of these wetland habitats.	**High** – Turtle basking surveys did not find any turtles (WSP E&I Canada Limited, 2024a). There is abundant suitable habitat within the RSA.
Mammals			
boreal caribou *Rangifer tarandus*	COSSARO: Threatened ESA: Threatened COSEWIC: Threatened SARA: Threatened	Caribou typically occur in low densities, ranging widely over mature, conifer-dominated forests. In the far north, boreal caribou overlap with migratory caribou, with forest-associated boreal caribou moving north and intermingling with tundra-associated migratory caribou that have moved south.	**Low** – The RSA has low habitat suitability due to anthropogenic disturbance. No caribous were observed during aerial surveys (WSP E&I Canada Limited, 2024).
Eastern red bat *Lasiurus borealis*	COSSARO: Endangered ESA: Endangered COSEWIC: Endangered SARA: Not listed	Migrate long distances to warmer climes over winter. Roosts alone or in small groups in or under foliage, rocks, rock outcrops, buildings, bridges, caves, mines, or hollow trees during spring and summer, often changing roosting location daily.	**Moderate** – High-frequency bats, possibly the Eastern red bat, were recorded at bat detector stations (WSP E&I Canada Limited, 2024a).
hoary bat *Lasiurus cinereus*	COSSARO: Endangered ESA: Not listed COSEWIC: Endangered SARA: Not listed	Typically roost alone or in small groups in or under foliage, Migrate long distances to warmer climes over winter.	**Confirmed** – Hoary bat were the second most common species recorded at bat detector stations (WSP E&I Canada Limited, 2024a).
little brown myotis *Myotis lucifugus*	COSSARO: Not listed ESA: Endangered COSEWIC: Endangered SARA: Endangered	Overwinters in cold and humid hibernacula (caves/mines). Foraging occurs over water, along waterways, and forest edges. Large open fields or clearcuts generally are avoided. In autumn, bats return to hibernacula, which may be hundreds of kilometres from their summering areas.	**Confirmed** – Little brown myotis were recorded at four bat detector stations, including three located within the RSA (WSP E&I Canada Limited, 2024a).

Species	Status	Preferred Habitat	Potential for Habitat/ Species occurrence in RSA
northern myotis *Myotis septentrionalis*	COSSARO: Not listed ESA: Endangered COSEWIC: Endangered SARA: Endangered	Overwinters in cold and humid hibernacula (caves/mines). Foraging occurs along waterways, forest edges, and in gaps in the forest. Large open fields or clearcuts generally are avoided. In autumn, bats return to hibernacula, which may be hundreds of kilometres from their summering areas.	**High** – Although the presence of northern myotis could not be confirmed, presence of this species cannot be ruled out.
silver-haired bat *Lasionycteris noctivagans*	COSSARO: ESA: Not listed COSEWIC: Endangered SARA: Not listed	Typically roost alone or in small groups in or under foliage, Migrate long distances to warmer climes over winter.	**Confirmed** – Silver-haired bat were the most commonly recorded species at bat detector stations (WSP E&I Canada Limited, 2024a).
tricolored bat *Perimyotis subflavus*	COSSARO: Endangered ESA: Endangered COSEWIC: Endangered SARA: Endangered	Tricolored bats feed on insects, and foraging occurs over water and along waterways and forest edges; large open fields or clear cuts are generally avoided. Roost in rock crevices, caves, buildings and tree foliage. Hibernate in caves or abandoned mines.	**None** – No tricolored bats were identified in bat surveys conducted for the CNC Project however, the presence of tricolored bat cannot be ruled out. (WSP E&I Canada Limited, 2024)
Fish			
lake sturgeon (Southern Hudson Bay - James Bay populations) *Acipenser fulvescens*	COSSARO: Special concern ESA: Special concern COSEWIC: Special concern SARA: Special concern	Lake sturgeon is widely distributed in large lakes and rivers. It has a broad distribution in Ontario, occurring in all major watersheds across the province.	**None** – Lake sturgeon was not surveyed in the inland watercourses and waterbodies. The eDNA surveys results confirmed lake sturgeon presence only within the Mattagami River (WSP E&I Canada Limited, 2024b).
Arthropods			
monarch *Danaus plexippus*	COSSARO: Special concern ESA: Special concern COSEWIC: Endangered SARA: Endangered (since 2023-12-08)	Monarchs breed and occur throughout Canada, with a distribution that largely reflects the distribution of its larval host plants, milkweed species (*Asclepias* spp.).	**Moderate** – Suitable habitat is present but limited in the RSA. The species is documented in secondary sources in the southern part of the RSA, near Timmins.
yellow-banded bumble bee *Bombus terricola*	COSSARO: Special concern ESA: Special concern COSEWIC: Special concern SARA: Special concern	Historically, the yellow-banded bumble bee occurred throughout much of the province. This species is a habitat and forage generalist. Nesting sites (abandoned rodent burrows) may be limiting and are directly related to the status of rodent populations throughout its range.	**Moderate** – Suitable habitat is present but limited in the RSA. The species is documented in secondary sources in the southern part of the RSA, near Timmins.

Nine (9) SAR were confirmed by WSP surveys within the RSA: Barn Swallow, Canada warbler, chimney swift, common nighthawk, evening grosbeak, lesser yellowlegs, olive-sided flycatcher, rusty blackbird, and little brown myotis. The locations of confirmed SAR are presented on Map 9.

The following seven (7) species have a potential occurrence rating of moderate or higher: bank swallow, peregrine falcon, yellow rail, Blanding's turtle, midland painted turtle, snapping turtle, northern myotis, monarch, and yellow-banded bumble bee.



Regional Study Area (RSA)

Local Study Area (LSA)

Project Component

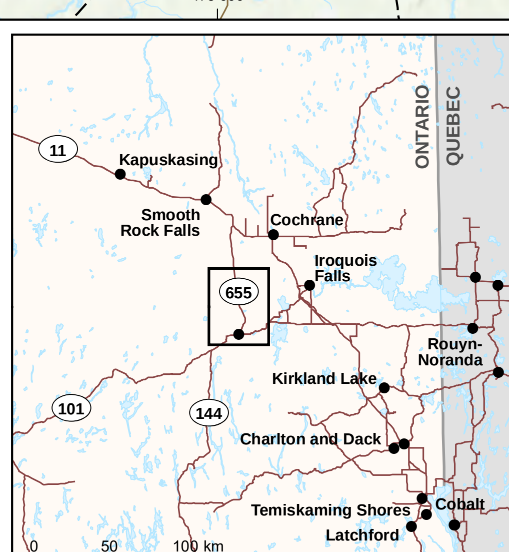
New 230 kV Transmission Line

Species at Risk

- Silver-haired Bat
- Hoary Bat and Silver-haired Bat
- Hoary Bat, Eastern red Bat and Silver-haired Bat
- Lesser Yellowlegs
- Little Brown Myotis
- Myotis sp.
- Caribou Range Boundary

Infrastructure and Facilities

- Substation
- Timmins / Victor M. Power Airport
- Big Water Campground
- Kidd Creek Mine
- Highway
- Principal Road
- Local Road
- Railway
- Transmission Line



TRANSMISSION INFRASTRUCTURE PARTNERSHIPS

TIP-1 Transmission Project
Timmins, Ontario

Map 9
Species at Risk observations

Sources:
CanVec, 1/250 000, NRCan, 2017
SDA, 1/20 000, MERN Quebec, June 2022
Official Airports, Ontario Ministry of Natural Resources and Forestry, March 2012

Project Data, BBA, 2024 and WSP, 2021, 2022 and 2023

BBA Project Number: 7311004-007000-4E

2024-10-25

0 1.5 3 km
UTM, zone 17, NAD 83

Prepared by: M.-N. Chouinard Drawn by: A. Monnard Verified by: F. Karcha

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Committee on the Status of Species at Risk in Ontario (COSSARO). November 2017. COSSARO Candidate Species at Risk Evaluation for Rusty Blackbird (*Euphagus carolinus*). 14 pp.

Committee on the Status of Species at Risk in Ontario (COSSARO). August 2020. COSSARO Candidate Species at Risk Evaluation for Olive-sided Flycatcher (*Contopus cooperi*). 19 pp.

Committee on the Status of Species at Risk in Ontario (COSSARO). September 2020. COSSARO Candidate Species at Risk Evaluation for Chimney Swift (*Chaetura pelagica*). 17 pp.

Committee on the Status of Species at Risk in Ontario (COSSARO). September 2020. COSSARO Candidate Species at Risk Evaluation for Common Nighthawk (*Chordeiles minor*). 17 pp.

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Appendix A: Vascular Plants inventoried in the LSA (August 2023)

Scientific name	Common name	Note
Abies balsamea	Balsam fir	
Acer pensylvanicum	Striped maple	
Acer spicatum	Mountain maple	
Achillea millefolium	Common yarrow	
Actaea rubra	Red baneberry	
Agrostis gigantea	Redtop	Introduced
Agrostis scabra	Rough bentgrass	
Alnus incana subsp. *rugosa*	Speckled alder	
Amelanchier sp.	Serviceberry	
Anaphalis margaritacea	Pearly everlasting	
Andromeda polifolia	Bog rosemary	
Apocynum androsaemifolium	Spreading dogbane	
Aralia nudicaulis	Wild sarsaparilla	
Aronia melanocarpa	Black chokeberry	
Athyrium filix-femina	Common lady fern	
Betula papyrifera	Paper birch	
Betula pumila	Bog birch	
Botrypus virginianus	Rattlesnake fern	
Brachyelytrum erectum	Southern shorthusk	
Bromus ciliatus	Fringed brome	
Calamagrostis canadensis var. *canadensis*	Bluejoint reedgrass	
Callitriche palustris	Spring water-starwort	
Caltha palustris	Yellow marsh marigold	
Carex aquatilis	Water sedge	
Carex arctata	Drooping woodland sedge	
Carex aurea	Golden sedge	
Carex bebbii	Bebb's sedge	
Carex canescens	Hoary sedge	
Carex disperma	Two-seeded sedge	
Carex echinata	Star sedge	
Carex gracillima	Graceful sedge	
Carex intumescens	Bladder sedge	

Scientific name	Common name	Note
Carex magellanica	Boreal bog sedge	
Carex projecta	Necklace sedge	
Carex pseudocyperus	Cyperus-like sedge	
Carex retrorsa	Retrorse sedge	
Carex stipata	Awl-fruited sedge	
Carex stricta	Tussock sedge	
Carex trisperma	Three-seeded sedge	
Carex utriculata	Northern beaked sedge	
Carex viridula	Greenish sedge	
Cerastium arvense subsp. *strictum*	Matted field chickweed	
Chamaedaphne calyculata	Leatherleaf	
Chamaenerion angustifolium subsp. *angustifolium*	Fireweed	
Cicuta bulbifera	Bulbous water-hemlock	
Cinna latifolia	Drooping woodreed	
Circaea alpina	Small enchanter's nightshade	
Cirsium arvense	Canada thistle	Introduced
Claytosmunda claytoniana	Interrupted fern	
Clintonia borealis	Yellow clintonia	
Comarum palustre	Marsh cinquefoil	
Comptonia peregrina	Sweet-fern	
Coptis trifolia	Goldthread	
Cornus canadensis	Bunchberry	
Cornus sericea	Red-osier dogwood	
Corylus cornuta	Beaked hazelnut	
Cypripedium acaule	Pink lady's-slipper	
Danthonia spicata	Poverty oatgrass	
Dendrolycopodium dendroideum	Round-branched tree-clubmoss	
Diervilla lonicera	Northern bush-honeysuckle	
Diphasiastrum complanatum	Northern ground-cedar	
Drosera rotundifolia	Round-leaved sundew	
Dryopteris carthusiana	Spinulose wood fern	
Dryopteris cristata	Crested wood fern	

Scientific name	Common name	Note
Dryopteris intermedia	Evergreen wood fern	
Eleocharis palustris	Common spikerush	
Epigaea repens	Trailing arbutus	
Epilobium ciliatum	Northern willowherb	
Epilobium leptophyllum	Narrow-leaved willowherb	
Epilobium palustre	Marsh willowherb	
Epipactis helleborine	Broad-leaved helleborine	Introduced
Equisetum arvense	Field horsetail	
Equisetum fluviatile	Water horsetail	
Equisetum pratense	Meadow horsetail	
Equisetum scirpoides	Dwarf scouring-rush	
Equisetum sylvaticum	Woodland horsetail	
Equisetum variegatum	Variegated scouring-rush	
Erigeron philadelphicus	Philadelphia fleabane	
Erigeron strigosus	Rough fleabane	
Eurybia macrophylla	Large-leaved aster	
Euthamia graminifolia	Grass-leaved goldenrod	
Eutrochium maculatum var. *maculatum*	Spotted Joe Pye weed	
Fallopia cilinodis	Fringed black bindweed	
Fragaria vesca	Woodland strawberry	
Fragaria virginiana	Virginia strawberry	
Galearis rotundifolia	Small round-leaved orchid	
Galeopsis tetrahit	Brittle-stemmed hemp-nettle	Introduced
Galium asprellum	Rough bedstraw	
Galium trifidum	Three-petalled bedstraw	
Galium triflorum	Three-flowered bedstraw	
Gaultheria hispidula	Creeping snowberry	
Gaultheria procumbens	Eastern teaberry	
Geum aleppicum	Yellow avens	
Geum rivale	Water avens	
Glyceria canadensis	Canada mannagrass	
Glyceria striata	Fowl mannagrass	

Scientific name	Common name	Note
Gymnocarpium dryopteris	Common oak fern	
Hypopitys monotropa	Pinesap	
Impatiens capensis	Spotted jewelweed	
Iris versicolor	Harlequin blue flag	
Kalmia angustifolia	Sheep laurel	
Kalmia polifolia	Pale bog laurel	
Lactuca biennis	Tall blue lettuce	
Larix laricina	Tamarack	
Leucanthemum vulgare	Oxeye daisy	Introduced
Linnaea borealis subsp. *longiflora*	Long-tube twinflower	
Linum medium	Stiff yellow flax	
Lobelia kalmii	Kalm's lobelia	
Lonicera canadensis	Canada fly-honeysuckle	
Lonicera hirsuta	Hairy honeysuckle	
Lonicera oblongifolia	Swamp fly-honeysuckle	
Lonicera villosa	Mountain fly-honeysuckle	
Lotus corniculatus	Garden bird's-foot trefoil	Introduced
Luzula acuminata subsp. *acuminata*	Hairy woodrush	
Lycopodium clavatum	Running clubmoss	
Lycopus americanus	American water-horehound	
Lycopus uniflorus	Northern water-horehound	
Lysimachia borealis	Northern starflower	
Maianthemum canadense	Wild lily-of-the-valley	
Maianthemum trifolium	Three-leaved false Solomon's seal	
Melampyrum lineare	American cow-wheat	
Mentha canadensis	Canada mint	
Menyanthes trifoliata	Bog buckbean	
Mitella nuda	Naked mitrewort	
Monotropa uniflora	Indian pipe	
Muhlenbergia uniflora	Late-flowering muhly	
Myriophyllum sp.	Water-milfoil	
Onoclea sensibilis	Sensitive fern	

Scientific name	Common name	Note
Orthilia secunda	One-sided wintergreen	
Oryzopsis asperifolia	Rough-leaved Mountain rice	
Oxalis montana	White wood-sorrel	
Palustricodon aparinoides	Marsh bellflower	
Parnassia palustris	Marsh grass-of-Parnassus	
Pastinaca sativa	Wild parsnip	Introduced
Persicaria amphibia	Water smartweed	
Phalaris arundinacea	Reed canary grass	
Phegopteris connectilis	Northern beech fern	
Phleum pratense	Common timothy	Introduced
Picea mariana	Black spruce	
Pilosella aurantiaca	Orange hawkweed	Introduced
Pilosella caespitosa	Meadow hawkweed	Introduced
Pinus banksiana	Jack pine	
Platanthera aquilonis	Tall northern green orchid	
Populus balsamifera	Balsam poplar	
Populus tremuloides	Trembling aspen	
Potamogeton sp.	Pondweed	
Potentilla norvegica	Rough cinquefoil	
Prunella vulgaris	Common self-heal	
Prunus pensylvanica	Pin cherry	
Prunus virginiana	Chokecherry	
Pteridium aquilinum	Bracken fern	
Rhamnus cathartica	European buckthorn	Introduced
Rhododendron groenlandicum	Common Labrador tea	
Ribes americanum	American black currant	
Ribes glandulosum	Skunk currant	
Ribes lacustre	Bristly black currant	
Ribes triste	Swamp red currant	
Rosa acicularis	Prickly rose	
Rubus chamaemorus	Cloudberry	
Rubus hispidus	Bristly dewberry	

Scientific name	Common name	Note
Rubus idaeus	Red raspberry	
Rubus pubescens	Dwarf raspberry	
Rumex triangulivalvis	Triangular-valve dock	
Sagittaria latifolia	Broad-leaved arrowhead	
Salix bebbiana	Bebb's willow	
Salix discolor	Pussy willow	
Salix lucida	Shining willow	
Salix pedicellaris	Bog willow	
Salix planifolia	Tea-leaved willow	
Salix pyrifolia	Balsam willow	
Salix serissima	Autumn willow	
Sambucus canadensis	Common elderberry	
Schizachne purpurascens	purple false melic	
Scirpus atrocinctus	Black-girdled bulrush	
Scutellaria galericulata	Marsh skullcap	
Scutellaria lateriflora	Mad-dog skullcap	
Solidago canadensis	Canada goldenrod	
Solidago juncea	Early goldenrod	
Solidago macrophylla	Large-leaved goldenrod	
Solidago puberula	Downy goldenrod	
Solidago rugosa	Rough-stemmed goldenrod	
Solidago uliginosa	Bog goldenrod	
Sonchus arvensis	Field sow-thistle	Introduced
Sorbus americana	American mountain-ash	
Sparganium angustifolium	Narrow-leaved burreed	
Sparganium eurycarpum	Broad-fruited burreed	
Spinulum annotinum	Stiff clubmoss	
Spiraea alba var. latifolia	Broad-leaved meadowsweet	
Symphoricarpos albus	Thin-leaved snowberry	
Symphyotrichum ciliolatum	Lindley's aster	
Symphyotrichum cordifolium	Heart-leaved aster	
Symphyotrichum lanceolatum	White panicled aster	

Scientific name	Common name	Note
Symphyotrichum puniceum	Purple-stemmed aster	
Taxus canadensis	Canada yew	
Thalictrum pubescens	Tall meadow-rue	
Thuja occidentalis	Eastern white cedar	
Trichophorum alpinum	Alpine clubrush	
Trillium erectum	Red trillium	
Tussilago farfara	Coltsfoot	Introduced
Typha angustifolia	Narrow-leaved cattail	
Typha latifolia	Broad-leaved cattail	
Vaccinium angustifolium	Early lowbush blueberry	
Vaccinium myrtilloides	Velvet-leaved blueberry	
Vaccinium oxycoccos	Small cranberry	
Vaccinium uliginosum	Bog bilberry	
Viburnum edule	Squashberry	
Vicia cracca	Tufted vetch	
Viola sp.	Violet	
Woodsia ilvensis	Rusty woodsia	

Appendix B: Photographs of Vegetation Communities and Aquatic Habitat Surveys (August 2023)

Wetland communities

230802 ELC1 – B223

230802 ELC1 – B223

230804 ELC3 -

20230805 ELC U998

Appendix C: Birds Surveyed in the CNC Project Study Area (WSP E&I Canada Limited, 2024a)

Scientific Name	Common Name	Breeding Evidence	SAR/SCC Status
Accipiter gentilis	(Northern) American Goshawk	n.a.	
Accipiter striatus	Sharp-shinned Hawk	Possible	
Actitis macularius	Spotted Sandpiper	Probable	
Aegolius funereus	Boreal Owl	Possible	
Agelaius phoeniceus	Red-winged Blackbird	Probable	
Aix sponsa	Wood Duck	Possible	
Ammospiza leconteii	LeConte's Sparrow	n.a.	
Anas americana	American Wigeon	Observed	
Anas crecca	Green-winged Teal	Confirmed	
Anas discors	Blue-winged Teal	Possible	
Anas platyrhynchos	Mallard	Possible	
Anas rubripes	American Black Duck	Possible	
Anas strepera	Gadwall	Observed	
Anthus rubescens	American Pipit	n.a.	
Antigone canadensis	Sandhill Crane	Probable	
Archilochus colubris	Ruby-throated Hummingbird	n.a.	
Ardea herodias	Great Blue Heron	Possible	
Aythya americana	Redhead	Observed	
Aythya collaris	Ring-necked Duck	Probable	
Bombycilla cedrorum	Cedar Waxwing	Probable	
Bonasa umbellus	Ruffed Grouse	Probable	
Botaurus lentiginosus	American Bittern	Possible	
Branta canadensis	Canada Goose	Confirmed	
Buteo jamaicensis	Red-tailed Hawk	n.a.	
Buteo lagopus	Rough-legged Hawk	n.a.	
Buteo platypterus	Broad-winged Hawk	Possible	
Canachites canadensis	Spruce Grouse	n.a.	
Cardellina pusilla	Wilson's Warbler	Possible	
Catharus fuscescens	Veery	Probable	
Catharus guttatus	Hermit Thrush	Possible	
Catharus ustulatus	Swainson's Thrush	Probable	

Scientific Name	Common Name	Breeding Evidence	SAR/SCC Status
Certhia americana	Brown Creeper	Possible	
Chaetura pelagica	Chimney Swift	n.a.	Threatened
Charadrius semipalmatus	Semipalmated Plover	Observed	
Charadrius vociferus	Killdeer	Probable	
Chordeiles minor	Common Nighthawk	n.a.	Special Concern
Circus hudsonius	Northern Harrier	Possible	
Clangula hyemalis	Long-tailed Duck	n.a.	Provincially rare
Coccothraustes vespertinus	Evening Grosbeak	Possible	Special Concern
Coccyzus erythropthalmus	Black-billed Cuckoo	Possible	
Colaptes auratus	Northern Flicker	Confirmed	
Contopus cooperi	Olive-sided Flycatcher	n.a.	Special Concern
Corvus brachyrhynchos	American Crow	Probable	
Corvus corax	Common Raven	Confirmed	
Cyanocitta cristata	Blue Jay	Possible	
Cygnus buccinator	Trumpeter Swan	Possible	
Dryocopus pileatus	Pileated Woodpecker	Possible	
Dumetella carolinensis	Gray Catbird	n.a.	
Empidonax alnorum	Alder Flycatcher	Probable	
Empidonax flaviventris	Yellow-bellied Flycatcher	Probable	
Empidonax minimus	Least Flycatcher	Probable	
Euphagus carolinus	Rusty Blackbird	Possible	Special Concern
Falco columarius	Merlin	Observed	
Falco sparverius	American Kestrel	Possible	
Gallinago delicata	Wilson's Snipe	Probable	
Gavia immer	Common Loon	Confirmed	
Geothlypis philadelphia	Mourning Warbler	Probable	
Geothlypis trichas	Common Yellowthroat	Probable	
Haemorhous purpureus	Purple Finch	Possible	
Haliaeetus leucocephalus	Bald Eagle	n.a.	
Hirundo rustica	Barn Swallow	Possible	Special Concern
Junco hyemalis	Dark-eyed Junco	Confirmed	

Scientific Name	Common Name	Breeding Evidence	SAR/SCC Status
Larus argentatus	Herring Gull	n.a.	
Larus philadelphia	Bonaparte's Gull	Possible	
Lophodytes cucullatus	Hooded Merganser	n.a.	
Loxia curvirostra	Red Crossbill	Possible	
Loxia leucoptera	White-winged Crossbill	Possible	
Megaceryle alcyon	Belted Kingfisher	Probable	
Melospiza georgiana	Swamp Sparrow	Probable	
Melospiza lincolnii	Lincoln's Sparrow	Probable	
Melospiza melodia	Song Sparrow	Probable	
Mniotilta varia	Black-and-white Warbler	Probable	
Oporornis agilis	Connecticut Warbler	Possible	
Oreothlypis celata	Orange-crowned Warbler	Possible	
Oreothlypis peregrina	Tennessee Warbler	Probable	
Oreothlypis ruficapilla	Nashville Warbler	Probable	
Pandion haliaetus	Osprey	n.a.	
Parkesia noveboracensis	Northern Waterthrush	Probable	
Passerculus sandwichensis	Savannah Sparrow	Possible	
Perisoreus canadensis	Canada Jay	Confirmed	
Pheucticus ludovicianus	Rose-breasted Grosbeak	Possible	
Picoides arcticus	Black-backed Woodpecker	n.a.	
Picoides pubescens	Downy Woodpecker	Possible	
Picoides villosus	Hairy Woodpecker	Possible	
Podilymbus podiceps	Pied-billed Grebe	Possible	
Poecile atricapillus	Black-capped Chickadee	Probable	
Poecile hudsonicus	Boreal Chickadee	Possible	
Porzana carolina	Sora	Probable	
Quiscalus quiscula	Common Grackle	Confirmed	
Rallus limicola	Virginia Rail	Probable	
Regulus calendula	Ruby-crowned Kinglet	Probable	
Regulus satrapa	Golden-crowned Kinglet	Probable	
ringa solitaria	Solitary Sandpiper	Probable	

Scientific Name	Common Name	Breeding Evidence	SAR/SCC Status
Sayornis phoebe	Eastern Phoebe	Possible	
Scolopax minor	American Woodcock	Probable	
Seiurus aurocapilla	Ovenbird	Probable	
Setophaga americana	Northern Parula	Possible	
Setophaga castanea	Bay-breasted Warbler	Probable	
Setophaga coronata	Yellow-rumped Warbler	Probable	
Setophaga fusca	Blackburnian Warbler	Probable	
Setophaga magnolia	Magnolia Warbler	Probable	
Setophaga palmarum	Palm Warbler	Possible	
Setophaga pensylvanica	Chestnut-sided Warbler	Probable	
Setophaga petechia	Yellow Warbler	Probable	
Setophaga pinus	Pine Warble	Possible	
Setophaga ruticilla	American Redstart	Probable	
Setophaga striata	Blackpoll Warbler	Possible	
Setophaga tigrina	Cape May Warbler	Probable	
Setophaga virens	Black-throated Green Warbler	n.a.	
Sialia sialis	Eastern Bluebird	n.a.	
Sitta canadensis	Red-breasted Nuthatch	Probable	
Sphyrapicus varius	Yellow-bellied Sapsucker	Possible	
Spinus pinus	Pine Siskin	Possible	
Spinus tristis	American Goldfinch	Probable	
Spizella passerina	Chipping Sparrow	Probable	
Spizelloides arborea	American Tree Sparrow	n.a.	
Strix varia	Barred Owl	Possible	
Tachycineta bicolor	Tree Swallow	Probable	
Thryothorus ludovicianus	Canada Warbler	Possible	Special Concern
Toxostoma rufum	Brown Thrasher	Possible	
Tringa flavipes	Lesser Yellowlegs	Probable	Threatened
Tringa melanoleuca	Greater Yellowlegs	Possible	
Troglodytes hiemalis	Winter Wren	Probable	
Turdus migratorius	American Robin	Probable	

Scientific Name	Common Name	Breeding Evidence	SAR/SCC Status
Tympanuchus phasianellus	Sharp-tailed Grouse	n.a.	
Tyrannus tyrannus	Eastern Kingbird	Observed	
Vireo olivaceus	Red-eyed Vireo	Probable	
Vireo philadelphicus	Philadelphia Vireo	Possible	
Vireo solitarius	Blue-headed Vireo	Probable	
Zenaida macroura	Mourning Dove	Observed	
Zonotrichia albicollis	White-throated Sparrow	Probable	
Zonotrichia leucophrys	White-crowned Sparrow	n.a.	

Notes:

Observed: Species observed in their breeding season (no evidence of breeding).

Possible: Species observed or singing male present in its breeding season in suitable nesting habitat.

Probable: Pair observed, territory and/or courtship displays, agitated behaviour/anxiety calls in the breeding season in suitable nesting habitat.

Confirmed: Distraction displays, nest or eggs, fledged young, and adults carrying food or nesting materials.

n.a.: Breeding Evidence not available for species observed during migratory bird surveys, incidental observations, and ARUs.

Appendix D: Aquatic Habitat Characterization (August 2023)

Station ID	Waterbody	Habitat	Stream Type	Channel morphology		Substrate	Macrophyte coverage (%)	Water Quality				Streamside vegetation	Notes
				Average width (m)	Average depth (m)			T (°C)	Cond. (µS/cm)	pH	DO (mg/L)		
AQ-01	No Name Stream - Craft Creek Tributary	Stream	Permanent	0,95	0,4	Organic	1-25	16	167	7.22	3.9	Meadow within TL corridor, shrub swamp and coniferous forest outside corridor	Fish observed
AQ-02	No Name Stream - Craft Creek Tributary	Stream	Permanent	2	0.5	Organic	26-50	15	107	7.15	4.9	Meadow within TL corridor, shrub swamp and coniferous forest outside corridor	Fish (brook stickelback) and leech observed
AQ-03	No Name Stream - Craft Creek Tributary	Stream	Permanent	2.5	0.4	Organic	51-75	17	384	7.86	4.7	Meadow within TL corridor, shrub swamp outside corridor	Fish observed, two beaver dams in the section
AQ-04	No Name Stream - Porcupine River Tributary	Stream	Permanent	2.6	0.45	Organic	1-25	17	539	7.38	2.1	Wet meadow, large floodplain	Fish observed, beaver activity
AQ-05	No Name Stream - Porcupine River Tributary	Stream	Permanent	4	0.7	Organic	76-100	18.5	292	6.85	5.8	Meadow	Fish (brook stickelback) and mink frog observed. Old beaver dam downstream
AQ-06	No Name Stream - Porcupine River Tributary	Stream	Intermittent	Diffuse water		Organic	76-100	-	-	-	-	Cattail marsh	American bittern observed
AQ-07	No Name Stream – Kidd Creek Tributary	Stream	Permanent	1.7	0.5	Sand and organic	26-50	14.3	108	6.34	11.2	Marsh and shrub swamp	
AQ-08	No Name Stream – Kidd Creek Tributary	Stream	Permanent	2	0.4	Organic	1-25	17.1	162	6.62	10.7	Wet meadow and shrub swamp	Beaver activity
AQ-09	No Name Stream – Kidd Creek Tributary	Stream	Intermittent	1.6	0.15	Organic	0	15.2	162	6.62	10.7	Cattail marsh and shrub swamp	
AQ-10	Noted Lake	Lake	-	-	-	-	26-50	25.4	145	7.98	8.9	Shore Fen	
AQ-11	No Name Stream - Murphy Creek Tributary	Stream	Permanent	1.5	0.15	Organic	1-25	14.1	61	6.8	10.3	Shrub swamp	
AQ-12	No Name Lake	Lake	-	-	-	Organic	-	20.8	52	8.28	9.1	Shrub swamp within TL corridor, coniferous forest outside corridor	

Station ID	Waterbody	Habitat	Stream Type	Channel morphology		Substrate	Macrophyte coverage (%)	Water Quality				Streamside vegetation	Notes
				Average width (m)	Average depth (m)			T (°C)	Cond. (µS/cm)	pH	DO (mg/L)		
AQ-13	No Name Stream - Craft Creek Tributary	Stream	Intermittent	1.45	0.1	Organic	51-75	13.2	106	6.6	-	Shrub swamp	
AQ-14	Craft Creek	Stream	Permanent	1	0.5	Organic	1-25	17.4	104	7.44	9.3	Meadow	Fish observed. Multiple channels.
AQ-15	No Name Stream - Porcupine River Tributary	Lake	-	-	-	Cobble and sand	1-25	21.5	217	7.52	8.4	Cattail marsh	Beaver lodge, garter snake (>30cm) seen
AQ-16	No Name Stream - Porcupine River Tributary	Stream	Permanent	6	0.4	Sand	51-75	17.3	220	7.47	9.4	Shrubs and coniferous forest	Beaver activity
AQ-17	Porcupine River	Stream	Permanent	2.4	0.5	Sand and silt	26-50	20.8	937	8	8.5	Cattail marsh	Wood frog seen
AQ-18	No Name Stream - Murphy Creek Tributary	Stream	Permanent	6	0.1	Organic	1-25	13.8	224	7.65	9.6	Wet meadow within TL corridor, coniferous forest outside corridor	Fish observed

Appendix D: Stage 1 Archaeological Resource Assessment

Woodland Heritage Northeast
Archaeological and Heritage Consulting Services

Stage 1 Archaeological Resource Assessment (original)

Transmission Infrastructure Partnerships' Proposed TIP-1 230 kV Transmission Line, in Parts of Kidd, Wark, Murphy, and Tisdale Townships, in the City of Timmins; and Crawford and Carnegie Townships, All in the District of Cochrane, Ontario

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MCM PIF # P208-0330-2023
Our Project # R2023-37

October 15, 2024

Woodland Heritage Northeast
Archaeological and Heritage Consulting Services

Executive Summary

Woodland Heritage Northeast Ltd. was retained by BBA Inc. to conduct a Stage 1 archaeological resource assessment prior to the proposed development of a 230kV transmission line in parts of Crawford and Carnegie Townships, as well as Kidd, Wark, Murphy and Tisdale Townships, in the City of Timmins; all in the District of Cochrane, Ontario. All of the work detailed in this report conforms to the 2011 Ministry of Citizenship and Multiculturalism's *Standards and Guidelines for Consultant Archaeologists*. Additionally, this work has been undertaken and described without prejudice, and in conformance to the ethical principles of the Society for American Archaeology, the Canadian Archaeological Association, and the Ontario Archaeological Society.

The Stage 1 assessment included background research as well as a property inspection to evaluate the existing ground conditions within the study area. At the conclusion of the Stage 1 assessment, archaeological potential was associated with level and well-drained areas in the vicinity of features of potential, namely in Areas 1 to 9, and 11. These areas were recommended for a Stage 2 sub-surface survey. The remaining areas were considered to have low archaeological potential due to the presence of saturated terrain, previously disturbed soils, or as features of archaeological potential could not be confirmed nearby (Maps 13 to 23).

Recommendation excerpted from sub-section 4.4.3:

1. If future developments are anticipated within any areas with archaeological potential, as illustrated on Maps 13 to 23, a Stage 2 sub-surface survey of the of the areas of proposed impacts is recommended.

2. Additional archaeological work outside of the areas with archaeological potential, as illustrated on Maps 13 to 23, is not recommended.

Woodland Heritage Northeast
Archaeological and Heritage Consulting Services

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Acknowledgements

Woodland Heritage Northeast would like to acknowledge the assistance of BBA Inc. for providing maps, background information and overall project support throughout the development of this report. We would also like to thank Canada Nickel Company and Taykwa Tagamou Nation for providing background information and ground assistance during the Stage 1 fieldwork.

We acknowledge multiple complimentary ways of understanding the past; two of which are: Indigenous-based knowledge, and archaeologically-based knowledge. The archaeological-based knowledge of the past is informed largely by the material culture where sufficient deposits are detectable through archaeological methods. This report does not attempt to replace or minimise Indigenous knowledge of the study area, but instead focusses on the archaeological knowledge of the past.

Whenever archaeological work is initiated by Woodland Heritage Northeast, it begins with an understanding that Indigenous people have occupied the landscape since time immemorial; this is, the human settlement of the uncovered and emergent lands beginning soon after the recession of the Laurentide Ice Sheet. The history of the area begins with the ancestors of modern First Nations people.

Disclaimer on Word Usage from Outside Texts

Woodland Heritage Northeast Limited recognises that some historical sources, which may have been excerpted and presented in this report, may contain terms and descriptions of Indigenous individuals or groups which are influenced by the original author's temporal context and potential biases, and / or society's view on Indigenous people. Woodland does not excuse or condone the use of hurtful terms or descriptions in these historical texts, or the opinions they may represent. This disclaimer is intended to notify the reader that the quotations and excerpts used in this text are included as they may offer beneficial descriptions of the study area or provide important historical context, and although Woodland does not censor the original text, it recognises that it may be incorrect, offensive, or potentially harmful.

List of Terms and Abbreviations

AAN – Apitipi Anicinapek Nation

CHVI – Cultural Heritage Value or Interest

MCM – Ministry of Citizenship and Multiculturalism

Matachewan FN – Matachewan First Nation

Mattagami FN – Mattagami First Nation

MNO – Métis Nation of Ontario

OASD – Ontario Archaeological Sites Database

OGS – Ontario Geological Survey

ROW – Right-Of-Way

S&Gs – 2011 MCM Standards and Guidelines for Consultant Archaeologists

TTN – Taykwa Tagamou Nation

WHNE – Woodland Heritage Northeast Ltd.

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1.0 Project Context

This report is intended to provide the reader with an overview of the project area, the requirement for undertaking the work, and the context of the project under the Ontario Heritage Act.

1.1 Location of Project

1.1.1 Geographic Description of the Location

The study areas are located in parts of Crawford and Carnegie Townships, as well as Kidd, Wark, Murphy, and Tisdale Townships, in the City of Timmins; all in the District of Cochrane, Ontario (Maps 1 to 5). The study areas are generally situated along Highway 655 between Timmins and Driftwood, Ontario. Generally, the limits of this assessment can be bounded by a polygon with the following corners:

Table 1. Approximate coordinates of the bounding box for the study areas.

Corner	UTM Coordinate (NAD 83 UTM17N)
NW Corner	469202 m E, 5407235 m N
NE Corner	471157 m E, 5407869 m N
SE Corner	482073 m E, 5368694 m N
SW Corner	480118 m E, 5368060 m N

1.2 Development Information

Woodland Heritage Northeast Limited (WHNE) was retained by BBA Inc. to complete a Stage 1 archaeological resource assessment prior to the development of a 230 kV transmission line in parts of Crawford and Carnegie Townships, as well as Kidd, Wark, Murphy, and Tisdale Townships, in the City of Timmins, all in the District of Cochrane.

1.2.1 Proposed Development

Specifically, the proposed development will include the establishment of a new 230 kV transmission line between the Porcupine Substation in Timmins and the proposed Crawford Substation approximately 40 kilometres to the north (Map 6). The proposed transmission line will follow along an existing transmission line linking the Porcupine Substation to the Kidd Creek Mine, where it will then diverge along a new alignment towards the proposed Crawford Substation, part of the overall Crawford Nickel Project. This archaeological assessment pertains specifically to the 50-metre right-of-way (ROW) for the proposed 230 kV transmission line.

1.2.2 Legislative Prompt

This archaeological work was required as a part of a Class Environmental Assessment for Transmission Facilities. It should be recognised that this Project does not meet the criteria to be screened under a Class EA archaeological screening (Appendix I of the Class ES 2024). Therefore, this additional effort is required.

1.2.3 Heritage Act Requirements

Under the Ontario Heritage Act, (R.S.O. 1990) anyone wishing to carry out archaeological fieldwork in Ontario must have a licence from the Ministry of Citizenship and Multiculturalism (MCM), file a report with the MCM containing details of the fieldwork that has been done for each project, and file information with the MCM about any archaeological sites documented for each project.

Under Ontario Regulation 8/06 of the Ontario Heritage Act, “consultant archaeologist” means “an archaeologist who enters into an agreement with a client to carry out or supervise archaeological fieldwork on behalf of the client, produce reports for or on behalf of the client and provide technical advice to the client”.

Refer to the section entitled “Legal Considerations” for more description of the limitations of this report, and additional information on the legal requirements once this report has been accepted by MCM.

1.2.4 Stages of Archaeological Assessments (MCM 2011 S&Gs)

The following text describes the four stages of archaeological assessments in the Province of Ontario as administered by MCM. This section has been provided to the reader for information purposes, and it should be recognised that not all stages of archaeological assessment described here apply to this report. Additional technical information concerning all four stages of assessment are available in Sections 1-4 of the 2011 MCM S&Gs.

Four stages of archaeological assessment exist in Ontario. They are regulated by the MCM by way of the *2011 Standards and Guidelines for Consultant Archaeologists* (S&Gs), under the authority of the Ontario Heritage Act (R.S.O. 1990). Generally, the assessments begin with the Stage 1 assessment of potential, proceeding onto the Stage 2 survey to identify any archaeological resources, through to the mitigation of those sites through Stage 3 and 4 work. Below are brief descriptions of the four stages of archaeological assessments in the province.

1.2.4.1 Stage 1 Assessment Background

A Stage 1 archaeological resource assessment is a comprehensive review of the geographic and historical characteristics of a property in order to determine how they contribute to the subject property's past suitability of for human use. This review and analysis serve to form the basis for an evaluation of archaeological potential on and around the property, with greater detail and accuracy than a determination of archaeological potential done by a non-specialist, or by way of the MCM Checklist for Archaeological Potential. The results of the Stage 1 may be used in place of a determination of archaeological potential by provincial or municipal approval authorities, and to determine whether the property requires a Stage 2 property survey, and to recommend legally compliant assessment strategies.

1.2.4.2 Stage 2 Assessment Background

A Stage 2 archaeological property survey tests the areas of archaeological potential identified during the Stage 1 assessment. This survey generally is comprised of the systematic sub-surface excavation of test pits along a five-metre grid, with all soils screened and the contents examined for any artifacts, or a pedestrian survey which surveys former agricultural areas through examining recently prepared and weathered ground. When archaeological resources have been identified, both forms of survey are intensified in order to both gain insight into the depth and complexity of the potential archaeological site, as well as to determine initial estimates of the site boundary.

A secondary goal of the Stage 2 when artifacts are found, is to determine the relative cultural heritage value or interest (CHVI) of the deposit. If it is determined through intensification of testing that the archeological resource has limited CHVI, the survey is terminated and the assessment process ends. However, if the CHVI is considered to be unknown or high, recommendations will be made to carry out a Stage 3 site-specific assessment.

1.2.4.3 Stage 3 Assessment Background

The goal of the Stage 3 site-specific assessment is to determine the maximal extent of the archaeological site, as well as to evaluate the cultural heritage value or interest (CHVI) of the archaeological site. This is generally accomplished through the excavation of 1x1 metre units at 5 or 10 metre intervals across and beyond the limits of the archaeological site as determined by the Stage 2 survey.

Depending on the results of the test excavation and the corresponding level of CHVI, recommendations will be made to either terminate the assessment process or to proceed with Stage 4 assessment work.

1.2.4.4 Stage 4 Assessment Background

The Stage 4 mitigation of development impacts generally involves either the protection of the identified archaeological site, or its excavation. The MCM holds the position that avoidance and protection is the preferred approach and, when feasible, often presents the most cost-effective option. When the Stage 4 avoidance and protection of an archaeological site is not possible, the complete or partial excavation of the site may be required.

When excavation is required, the archaeologists are responsible for the careful stratigraphic excavation of the site, recording the locations of all artifacts and features to be analysed in the lab, as well as collecting samples. The reporting requirements for Stage 4 work are sufficient to document all significant aspects of the archaeological site excavated, and generally are more stringent than the reporting requirements for Stage 1 to 3 assessments.

2.0 Geological and Historical Context

2.1 Pre-Pleistocene Environment

The bedrock geology of Ontario is comprised of rock first laid during Archaean Era, at the last part of the Precambrian Eon. Depending on the area of the province, rock types dating as late as the Cretaceous Period can be found. The following list describing various geologic time periods, most of which are discussed in this report:

- Precambrian Eon (4,600 to 541 million years ago [mya])
  - Archaean Era (4,000 to 2,500 mya)
  - Proterozoic Era (2,500 to 541 mya)
- Phanerozoic Eon (541 mya to present)
  - Paleozoic Era (541 to 252 mya)
    - Ordovician Period (485 to 444 mya)
    - Silurian Period (444 to 419 mya)
    - Devonian Period (419 to 359 mya)
  - Mesozoic Era (252 to 66 mya)
    - Cretaceous Period (145 to 66 mya)
  - Cenozoic Era (66 mya to present)
      - Pliocene Epoch (5.3 to 2.59 mya)
    - Quaternary Period (2.58 mya to present)
      - Pleistocene Epoch (2.58 mya to 11,700 ya)
      - Holocene Epoch (11,700 to present)

Archaean rocks are found principally to the south of the James Bay Lowlands, but feature sporadically in outcrops to the north. The southern boundary of the Archaean rocks is variable, but generally terminates around the Lake Simcoe area. This band of rock, known as the Canadian Shield, was formed between 2,500 and 4,000 million years ago and is the largest exposure of one of Earth's cratons. At varying times, Archaean rocks were overlain by various sedimentary or metamorphic material which, in places, has been eroded by repeated glacial cycles. Located roughly centrally in the province, the rocky Canadian Shield is flanked by the glacial tills dominating southern Ontario, and the expansive wetlands to the north which make up the James Bay Lowlands.

During the Proterozoic, between 2,500 to 541 million years ago, the Earth experienced its first glacial event, along with the Great Oxygenation Event which provided conditions more suitable for the development of aerobic life. It is these early rocks from the Archaean and Proterozoic which host the majority of the ore bodies, some of which are being explored or mined. Of archaeological interest are the hydrothermal vein deposits such as quartz, and types of volcanic deposits which produce tuffaceous rock and rhyolite. All three rock types have been found in archaeological contexts and were used to make various stone tools. Additionally, some metamorphic processes during this period produce quartzite, another toolstone.

Rocks of Phanerozoic age, especially those of the Paleozoic Era (Ordovician, Silurian, and Devonian Periods), are found throughout the James Bay Lowlands, southern Ontario, and sporadically across the Canadian Shield. The odd exception to the earlier Paleozoic deposits which make up most of the lowlands and almost all of southern Ontario are the Cretaceous rocks located near the Missinaibi River (Encyclopedia Britannica 2022c). Formed between 145 million and 66 million years ago, this rock unit is the youngest found in the province. Although it is not archaeological in nature, it is interesting that this rock unit may be the only type in the province which could host true dinosaur remains, although to the best of our knowledge, none have been located at this time.

This part of the pre-Pleistocene environment is archaeologically important as it is these Phanerozoic sedimentary deposits which hosted the development of cryptocrystalline silicates such as chert, chalcedony, and agate. These rock types appear to have been preferentially selected by past people as a toolstone due to their predictable conchoidal fracture pattern, and their ability to be worked into numerous artifact forms.

2.2 Pleistocene Environment

The Pleistocene is the earlier and lengthier of the two epochs which form the Quaternary Period. The Pleistocene began 2,588,000 years ago, and is informally referred to as the "Great Ice Age" (Encyclopedia Britannica 2022a). Earlier assessments placed the beginning of the Pleistocene at 1.8 million years ago with the onset of glaciation in Europe and North America, but in recognition of earlier glaciation elsewhere on the planet, the date was revised to 2.59 million years ago in 2009 (Encyclopedia Britannica 2022a).

From data derived from deep ocean core sampling, at least eight major glacial and interglacial events have occurred in the past 730,000 years, and analyses suggests that the first glaciation to have covered extensive portions of North America occurred approximately 850,000 years ago. In spite of the early Pleistocene's duration, only the last major glacial interval, the Wisconsinan, is of concern to archaeology in Ontario as it is during its waning phase that the first archaeological sites begin to be recorded.

The Wisconsinan is divided into three parts, with an early stade of glaciation, followed by a stable interstadial period, and then a late stade prior to the close of the Pleistocene. It was not until the late Wisconsinan when the ice sheets reached their maximum extent around 18,000 years ago. It is around this time, between 24,000 years ago to 12,000 years ago, that humans left sufficient archaeological evidence across the landscape to document their presence (Bennett et al. 2021:1528). Between 13,000 and 10,000 years ago, North America witnessed the extirpation or extinction of more than 50% of all mammal species greater than 32 kilograms, and 100% of species greater than 1,000 kilograms (Gill et al. 2009:1100). While the causes of the megafaunal extinction are poorly understood, drivers behind this extinction are thought to involve human hunting activities, as well as a loss of food sources (e.g. forbes) due to a changing vegetated landscape. In spite of the greater part of North America witnessing the extinction of the megafauna by about 13,000 years ago, isolated populations were able to persist until much later, from between 9,200 years ago and possibly until 5,700 years ago (Murchie et al. 2021).

2.3 Holocene Environment

As the Laurentide Ice Sheet began to withdraw at the terminal Wisconsinan, land began to become available in the southern and far western areas of the province, allowing the reestablishment of plants and animals in the newly deglaciated areas. It is widely considered that human populations followed the establishment of vegetation and animals into these newly available areas.

Studies suggest that a tundra-like environment was first established, followed by taiga and boreal conditions further from the receding ice front. As the ice sheet retreated, these floral and faunal populations would have moved northwards, populating the newly exposed parts of the landscape. This gradual change was hastened by the onset of the hypsothermal, a climatic warming event which allow warmer species to colonise areas which are now occupied by cooler weather species.

The effect the hypsothermal event had on human populations and culture is poorly understood at this time. Similarly, conclusions related to the rate and density of the peopling of the recently deglaciated areas also cannot be described with any certainty. These ongoing research questions will hopefully become better known as more archaeological work is undertaken.

2.4 Pre-Contact Historical Environment

Archaeologists generally divide the sequence of occupation or technological manifestations in Ontario into pre-European contact and post-European contact. The pre-contact historical sequence is further subdivided into temporal/cultural periods based on material culture traits and settlement patterns derived from archaeological data, and historical records. The pre-contact sequence is divided as follows:

- Terminal Pleistocene and Initial Holocene Cultural Periods (before 8,500 B.P.[1])
- Mid-Holocene Cultural Periods (circa 8,500–2,500 B.P.)
- Early and Middle Ceramic Periods (circa 2,500–800 B.P.)
- Late Ceramic Period (circa 800–350 B.P.)

2.5.1 Terminal Pleistocene and Initial Holocene Cultural Periods

As a result of recent archaeological work in the shield regions of Ontario, it is suspected that there is an Initial Holocene Cultural (>8,500 B.P.) component of human occupation in this part of Ontario. This contrasts with earlier interpretations, which seemed to suggest that it was not until the mid-Holocene which recorded the first peopling of the area. At this time, very little is known about the details of the Initial Holocene Cultural Period of the shield area of Ontario, although if similar to those reports outside of the region, the period may be characterised by finely worked projectile point forms (*e.g.* Agate Basin), and the predation of large game such as Barren Land Caribou (*Rangifer tarandus groenlandicus*). Elsewhere, Initial Holocene people predated the ancient Bison (*Bison antiquus*), though its presence in Ontario has yet to be confirmed.

Initial Holocene peoples may have also supplemented their diets with locally-available boreal subsistence resources such as woodland caribou, moose, beaver, hare, fish, and waterfowl. Faunal data from archaeological sites in the upper Great Lakes region suggests that Early- to Mid-Holocene populations had already developed a generalized foraging strategy, employing a

---

[1] *Before Present (B.P.) refers to the years before A.D. 1950.*

broad variety of faunal resources from a range of ecological settings, including large and small mammals, waterfowl, and fish (Kuehn 1988, Jackson and Hinshelwood 2004, Fidel 2007).

2.4.2 Mid-Holocene Cultural Periods

Formerly believed to be the earliest known inhabitants of Northeastern Ontario some 2,500–8,500 years ago were the Early/Mid-Holocene Cultures. Up until recently, archaeological material dating to the Early-Holocene was seen to be "largely restricted to the northwest, suggest[ing] that the major penetration into Ontario and eastward took place after the transition from an Agate Basin culture to a Shield Archaic culture [*Mid-Holocene]*," (Wright 1981:88).

In the shield areas of Ontario, this period represents about 6,000 years of occupation in an area stretching from Manitoba to Quebec. The Mid-Holocene cultural expressions may have evolved directly out of the preceding initial Holocene cultural period, although there are several key differences in material culture. Mid-Holocene quarry/workshop and habitation sites demonstrate a shift from higher quality toolstone toward the exploitation of greater percentages of metasediments such as greywacke. Additionally, it is considered that during the mid-Holocene Cultural Period the first groundstone tools were produced. During this time, the flaking of the tools appears to drop in quality as the period progresses, a change that can be seen from the highly-refined corner notched points through to the smaller side notched points of the later part of the Period. That said, this changing projectile point technology yielded a wider variety of projectile point styles in contrast to the terminal Pleistocene and initial Holocene, including various forms of stemmed and notched points. Of interest in the shield areas of Ontario is the rise in the use of native copper in the production of tools and decorative items, and its distribution throughout North America (Wright 1972a; Pollock 1975, 1976, 1984).

Similar to the earlier cultural expressions, the mid-Holocene groups appear to have been wide ranging big game hunters. As the environment stabilised following the glacial retreat, these people shifted to an economy of smaller game and fishing which required smaller tools and a more local, territorial seasonal round to exploit resources at different times of the year. This trend from big game to more diverse, local resources appears to have continued through the Mid-Holocene period to about 2,000-2500 years ago.

Depending on the location, some Mid-Holocene sites may be more closely associated with post glacial landscape features such as relict shorelines. As the environment stabilised, sites became more widely distributed, and associated with suitable occupation locations on modern lakes and rivers.

2.4.3 Early Ceramic Period

Earlier interpretations of archaeology in the northeast suggested that a true early Ceramic period was absent, with the exception of some artifacts located sporadically and seldom featured at archaeological sites in the northeast. Recent excavations in northeastern Ontario and northwestern Quebec challenge this earlier interpretation and suggest that cultures in the Canadian Shield formed part of the Meadowood Interaction Sphere (WHS 2011; WHS 2017; Taché 2008). It is now believed that an early Ceramic Period presence persisted in the shield areas and areas to the north as evidenced by a number of Meadowood artifacts and habitation sites, one of the markers of this period. Vinette 1 ceramics are strongly associated with this period, but not all sites with Meadowood points or cache blades feature ceramics. Generally, ceramics are less commonly found on areas of the Canadian Shield than in more southerly areas.

2.4.4 Middle Ceramic (Laurel) Period

In terms of material culture, the Middle Ceramic Period was similar to the preceding Mid-Holocene, but with the addition of fired clay pottery. As clay is a more plastic and malleable material than stone, distinct surface variations in decoration and structural variations in vessel construction allow archaeologists to develop refined distinctions between different ceramic types. Middle Ceramic vessels are characteristically thin-walled, with straight sided rims and pointed bases and decorations made using plain tool impressions (Wright 1967).

The Middle Ceramic Period economy appears to have been similar to the preceding period, with seasonal exploitation of a variety of subsistence resources the norm. Based on the distribution of sites, it is understood that extended family groups traversed hunting, fishing or gathering territories in pursuit of large and small game, and fish for subsistence during most of the year. In the summer, these groups may have come together into larger bands on larger lakes or rivers. The presence of a series of large ceremonial mounds containing burials, centred on the Rainy River in northwestern Ontario, also suggests that during some years, larger ceremony based gatherings also occurred (Arthurs 1986; Reid and Rajnovich 1991).

Other than the summer group campsites, Laurel sites are generally small, possibly reflecting the establishment of a seasonal round which saw the Laurel people break up into individual families during the fall, winter and spring periods of the year to more effectively exploit available resources. Laurel site distribution and settlement patterns differ from the inland site pattern noted for the mid-Holocene cultural period and set the pattern for settlement in the following late ceramic period. Laurel peoples showed a preference for large lakes and rivers with preferred campsites on sandy bays, portage ends, points, peninsulas, and locations near waterfalls, below rapids and at river mouths. These locations served for the establishment of small, seasonal hunting and fishing camps.

2.4.5 Late Ceramic Period (Blackduck and Selkirk) Period

The Middle Ceramic (Laurel) material culture appears to have gradually evolved into the late Ceramic. This transition is not as evident in the lithic and copper artifacts, but the pottery makes a notable change to thin walled, globular pots with constricted necks and widened lips decorated using a combination of plain and 'cord-wrapped' object impressions. Two main pottery types are noted by archaeologists who have speculated that a more southerly type (Blackduck) represents early Ojibwe culture, while the more northerly type (Selkirk) represents a Cree culture (Wright 1972b; MacNeish 1958).

Data from the Canadian shield areas of Ontario suggests a trend toward a growth in population during the late Ceramic period reflected in an increased frequency of sites recovered during archaeological surveys. Archaeological evidence suggests that a seasonal cycle of travelling to resource exploitation areas may have been well established during this era. Site locations follow an established pattern with preference given to level places on islands, peninsulas, narrow parts of lakes, sandy beaches and portage ends, as well as rapids and waterfalls on rivers. These people were the ancestors of present day regional cultural/social groups.

2.5 Post-Contact Historical Environment

Archaeologists' understanding of the post-European contact period is based in both archaeological and documentary research. The post-contact historical sequence can be described in terms of significant themes relating to the consecutive waves of influence from, primarily, eastern Canada. The post-contact historic sequence is generally subdivided according to the main Euro-Canadian economic or political trends. The major post-contact periods in northeastern Ontario are divided as follows:

- Early post-contact (circa 350–85 B.P.)
- Survey and Development (circa 85–10 B.P.)

2.5.1 Indigenous Land Use

It should be noted that one or more First Nation or Métis populations live and use the land in, and around the study area. It is not within the scope of a technical archaeological report to comment on the various First Nations and their respective involvement, land-use and traditional territories. Recent and modern First Nation histories are best addressed by the First Nations themselves.

Traditional knowledge regarding the historical use of the land by Indigenous people is often curated and passed down by Indigenous Elders and Knowledge Keepers. Areas of cultural and historical importance to Indigenous communities are best identified by the communities and members themselves. We encourage communities' participation in the archaeological process as several Native Values have overlap with archaeological values, but Native Values can also include ephemeral values which elude archaeologists (*e.g.* spiritual sites etc.).

2.5.1.1 The Effect of Early Post-Contact Period on Indigenous People

European contact in northern Ontario was disruptive to the natural evolution of material culture, traditional land use, and subsistence practice among indigenous populations. It is understood that traditional material cultural items were supplanted quite rapidly by corresponding trade items imported from Europe. As the pursuit of furs became increasingly important to the purchase and replacement of trade items, subsistence practices became displaced by exploitation of fur resources. Gradually, settlement patterns also changed, trading trips to fur trade posts were introduced, and in some cases settlement occurred at or near fur trade posts or, later, near the railways.

Historical documents also begin to name the indigenous occupants of the region. The northern interior shield areas were inhabited by *Anishinaabeg* (Ojibwe, Odawa, Mississauga, Nipissing, Algonquin, and Potawatomi), while farther north in Ontario was the traditional territory of the *Néhinaw/Ililiw/Ininiw* (Cree). Further south, the traditional Indigenous groups settled near Georgian Bay include the *Wendat* (Huron) and the *Tionontati* (Petun/Tobacco), with later additions of *Haudenosaunee* peoples (Iroquois). The first contact between Europeans and Indigenous people in the area was with the Recollects and Jesuit missionaries and other French explorers and traders during the early and middle part of the 17th century (Lytwyn 2002).

2.5.1.2 Indigenous Land Use Specific to the Study Area

No specific Indigenous land use information was sought out prior to the development of this report. For information on Indigenous land use, local First Nation and Métis communities should be contacted.

2.5.1.3 Existing Treaties

It is not within the scope of a technical archaeological report to comment on the social implications, intent, or fulfillment of the conditions of the various treaties which have been established in the province. First Nations should be consulted directly should additional information be sought on the following commentary on the Treaties.

The study area is located in an area covered by Treaty 9.

In 1905 and 1906, treaty commissioners operating on behalf of the Canadian government visited various Anishinaabe and Cree communities located north of the height of land in northern Ontario. With the signature of Treaty 9, these communities ceded their traditional land and reserves were set aside. Additional adhesions to Treaty 9 were made in 1929 and 1930, extending the treaty area from the Albany River to Hudson's Bay.

2.5.2 Euro-Canadian Survey and Development

The study area is located north of Timmins, in the upland area between the Mattagami and Frederick House Rivers. Due to their good hydrologic connectivity as well as the relatively easy passages over the Laurentian drainage divide, these rivers were part of canoe routes of primary importance during the fur trade.

2.5.2.1 The Fur Trade, a Post-Contact Interaction Between Indigenous People and Europeans

The first official trade posts in the northeastern Ontario were established in the 1670s by English and French traders, including the Hudson's Bay Company (HBC) post at the mouth of the Moose River, built in 1673, and the French posts near the height of land on Piscoutagami Lake (Night Hawk Lake), Lake Timiskaming, and Lake Abitibi, built in 1673, 1679, and 1686, respectively. Additional posts were constructed at strategic points on the Great Lakes during this period. From these posts, the French traders ventured upstream to trade *en dérouine* while the HBC relied on Indigenous people to travel to James Bay to trade.

After the French were defeated in the Seven Years' War in 1763, their traders were rapidly replaced by Scotch traders operating from Montreal. These many and disparate traders eventually formed the North West Company (NWC), initially a loose coalition of independent traders formed to facilitate the opposition to the HBC. In the mid-late 18th century, the HBC began to move inland, directly opposing NWC posts for the first time. In order to effectively compete with each other, trading posts were continually built and relocated to secure competitive trade advantages against their opponents. At this time, the nearest posts included the HBC and NWC posts on Frederick House Lake.

In 1821, the HBC and NWC merged and the area came under the sole command of the HBC, effectively granting them a trading monopoly in the area. During the late 19th century, the HBC again began to experience competition from small, independent traders. These traders became increasingly common as the access to northern areas improved with the advent of the railways and the establishment of Euro-Canadian communities further south. As a result, the HBC began opening additional posts to oppose them, first at river- or lake-based locations and eventually, as rail access improved, along the railway and in settlements. One such post was a subsidiary outpost of Fort Matachewan which operated seasonally between the 1860s and early 1900s on Night Hawk Lake.

The fur trade in the region began to decline in the late 19th century following the construction of the railways, the arrival of Euro-Canadian prospectors, settlers, and the beginnings of industrial development in the region. With these new developments, Indigenous settlement became dispersed along railways and concentrated towards reserves and urban centres, causing Fort Matachewan's importance to steadily decline. By the early 1900s, the outpost on Night Hawk Lake had closed, followed by the closure of Fort Matachewan around 1920, marking the end of the fur trade in the area.

2.5.3 Results of Land Title Search

Although a land title search was carried out using the Ontario Land Property Records Portal, no title records are readily available for the study areas.

3.0 Archaeological Assessment Background

3.1 Registered Archaeological Sites

Before the initiation of fieldwork, WHNE undertook a review of the Ontario Archaeological Sites Database (OASD) through the MCM's PastPortal to determine the number and nature of archaeological sites registered on or in the immediate vicinity of the subject property. The site files and catalogued reports at the WHNE office were also checked to confirm the database results and include updates which have not yet been entered into the database.

- No archaeological sites have been registered within three kilometres of the proposed transmission line.

3.2 Previous Archaeological Fieldwork

In 2008, a Stage 1 archaeological assessment was undertaken by Woodland Heritage Services Limited , entitled "Post Development Assessment of the Kidd Creek Mine Impact on Archaeological and Cultural Heritage Sites". Ultimately, the report concluded that the development of the Kidd Creek Mine had unlikely impacted any significant pre- or post-contact heritage resources:

> Three areas of pre-mine development archaeological potential were identified at the Kid Creek Mine site based on the Ministry of Culture Archaeological Potential Checklist and the Woodland Heritage Services Potential Checklist. The assessment of potential is primarily based on the presence of small creeks and elevated topography. However, as the area was not on or near a major pre-contact or historic travel route, and there is no destination point ie., a large lake at the headwaters and the creeks are located in a flat swampy terrain with water saturated organic soils overlying clay; the actual chance that any archaeological sites were impacted by the existing mine development is low. As the potential for pre-contact archaeological sites is low, the effect the Kidd Mine may have had on any historical and traditional land use would also have been low.

WHS 2009

According to the available information, no additional archaeological assessments have been carried out within three kilometres of the study area.

3.3 Assignment of Archaeological Potential

According to Section 1.3.1 of the S&Gs, a number of landforms are considered to be features archaeological potential. MCM considers these features to include previously identified archaeological sites, past and present primary (i.e. lakes, rivers, streams, etc.) and secondary (i.e. springs, marshes, swamps, etc.) water sources, elevated topography (e.g. hills, eskers, knolls, etc.), pockets of well-drained sandy soil, distinctive land formations (e.g. potentially spiritual places such as waterfalls, caverns, mounds, etc.), resource-gathering areas, areas of early Euro-Canadian settlement, early transportation routes (e.g. portages, overland routes along eskers, colonization roads, and railways), and properties with historic landmarks or which have been identified with historic sites and events.

It is important to note that the features suggesting archaeological potential described in Section 1.3.1 of the S&Gs must be evaluated based on their geographic and physiographic context. For example, an esker with good contiguity rising above a saturated terrain would have archaeological potential whereas a low-lying esker in an otherwise well-drained terrain at the same elevation as the esker would not. This principle applies to all features of archaeological potential, and to determine the overall archaeological potential of a study area, these factors must be considered.

While these characteristics are important in assessing the archaeological potential of the study area, the S&Gs also note that current land conditions must be considered. Section 1.3.2 notes that disturbances and deep land alterations may have removed the archaeological potential of an area. These disturbances include pipeline installation, quarrying, major landscaping involving grading below topsoil, building footprints, and sewage and infrastructure development. As such, these areas can be considered to have no archaeological potential. That said, farming, forestry, and minor surface site preparation activities may not necessarily affect archaeological potential, and therefore must be assessed on their own merit.

Lastly, in areas of northern Ontario, defined by the S&Gs as being from the Districts of Muskoka and Parry Sound north, and in areas underlain by pre-Cambrian rock (Canadian Shield), a modified approach to testing is provided in Section 2.1.5 of the S&Gs. Based on statistical analyses and over 50 years of archaeological prospecting, this modified approach serves to restrict the Stage 2 survey work to areas within 50 metres of modern water sources, 150 metres of relict water features, and 150 metres of structures (if nothing is found). If archaeological resources are located, the survey must continue. These areas are generally referred to as “Areas beyond the limit of northern testing,” on the associated archaeological potential mapping.

3.3.1 Considerations of Archaeological Potential Specific to the Study Area

In the context of this archaeological assessment, several features of archaeological potential were identified including: modern watercourses, early transportation routes, and potential relict shoreline features.

An examination of early historical maps and township surveys identified two early transportation routes intersecting the proposed transmission line: a portage between the upper Porcupine River and Pearl Lake (Map 7), likely used by pre-contact peoples as well as historical prospectors to access the Timmins area, as well as the original wagon road between Timmins and Bigwater Lake (Map 8).

Additionally, an examination of the surficial geology of the region suggested the presence of relict shorelines within the study area, likely created during the existence of Lake Ojibway prior to ca. 8,200 years B.P. Specifically, the Ontario Geological Survey’s MRD263 dataset for the Abitibi Region places several beach berms or nearshore bars along the sand and gravel ridge south of Bigwater Lake (Maps 9 and 10).

Along with waterbodies and watercourses which are passable via canoe or snowshoe, these aforementioned features were considered to be the features of archaeological potential along the proposed transmission line. Accordingly, this archaeological assessment focuses on the 11 areas where modern waterbodies and watercourses, historical transportation routes, and relict shorelines intersect the proposed transmission line (Map 11).

No other features indicating the presence of archaeological potential were documented during the background research or property inspection.

Lastly, as the study area is located on the Canadian Shield (Map 12), final archaeological recommendations will be made consistent with the alternative test pit strategies for northern Ontario and the Canadian Shield, outlined in Section 2.1.5 of the MCM S&Gs.

4.0 Archaeological Assessment

This property inspection and archaeological survey was undertaken to locate features of potential identified during the background research. The inspection also documented any landscape characteristics that would affect assessment strategies such as saturated soils, steep slopes, and exposed bedrock. Efforts were also made to identify and document additional features not visible on available mapping such as ridges or berms associated with relict shorelines, pockets of well-drained soil in otherwise saturated environments, pockets of level ground along steep slopes, pit features or conspicuous historical remains, as well as former clearings which may have hosted historical settlement.

4.1 Fieldwork Overview

4.1.1 Permission to Enter, Access, and Timing

The Stage 1 on-ground property inspection was undertaken on August 1, 2023 with Ryan Primrose (P208) as the designated field director and continued the following day with David Gadzala (P1040) as the designated field director.

The study areas were accessed by way of unpaved, informal access trails running along the existing transmission line.

Prior to the fieldwork, WHNE received permission to enter onto the property to carry out all activities related to archaeological assessments.

4.1.2 Technical and Safety Equipment Used

When working in the study area, the archaeological field crew used standard safety equipment and PPE including hi-visibility vests and CSA-certified work boots and gloves. Additionally, maps depicting the study area were produced in advance of field activities and used for both navigation purposes and to record field observations.

Additional navigation devices used were Suunto magnetic compasses and Garmin 64s GPS receivers with WAAS and GLONASS enabled.

A first aid kit was available, and light first aid supplies were carried on person during field activities. Sunscreen and insect repellant was available should they be needed.

Aerial imagery was obtained using a DJI Mini 2 drone. This drone is under the Transport Canada limit of 250 grams, and as such does not require the user to be a licenced drone pilot, nor do flight plans need to be registered with Transport Canada.

4.1.3 Spatial Control

For the purposes of ensuring spatial control through data collection, GPS coordinates were collected to document property assessment and particular landscape features, photographs, or areas of archaeological potential. GPS coordinates were taken using three Garmin GPSmap 64s GPS and GLONASS receivers with an error rated (with WAAS) to ± five metres on average. All coordinates are in UTM17N using NAD 83.

4.1.4 Inventory of Field Documentation

Field maps were drawn on-site and subsequently digitised. Field notes were collected to record the assessment process, to document the archaeological potential of the area, and to record photographic information.

Representative photographs were taken of the areas of potential, of the study area landforms and vegetation, of the areas to be impacted, and the field conditions encountered at the time of the assessment (Maps 24 to 27 and Images 1 to 16). Additionally, photographs in the report are referenced by site or locale, but also carry the photographic record number that is embedded in the digital file. Thus, an Image in this report may be indicated as “Image 1”, and include a reference to “Photograph 389”, indicating both the position of the photograph in the report and the number designating the photograph (assigned by the camera), and maintained within the documentation generated during fieldwork and analysis.

The project record documentation includes photographs, maps, field notes, GPS location data, and this report (Table 2).

Table 2. Documentary records for this project.

Documentation	***N***	***Description***	***Location***
Photographs	655	Digital images	Digital storage
GPS readings (Tracks and Waypoints)	>1000	Context, property survey	Digital storage
Field notes	1	Pages of notes	Digital storage
Report	1	Copy (.pdf)	Digital storage

The digital records relating to this project are stored at the WHNE office in New Liskeard and are backed up periodically from the source drive to ensure long term stability. Digital records will be maintained in contemporary software formats, updated as WHNE updates software or storage media.

4.2 Archaeological Assessment Fieldwork

4.2.1 Current Land Use

The proposed transmission line is located partly along an existing transmission right-of-way (ROW), and partly in undeveloped, forested areas that do not appear to be used for significant economic, transportation, or recreational purposes.

4.2.2 Weather and Lighting Conditions During Assessment

The archaeological fieldwork was undertaken under appropriate weather and lighting conditions. Weather conditions during the Stage 1 property inspection on August 1, 2023 were sunny, with good visibility, no precipitation, and temperatures between 10 and 25 degrees Celsius. On August 2, 2023, weather conditions consisted of overcast skies, light precipitation with good visibility, and temperatures between 8 and 25 degrees Celsius.

Fieldwork would have been suspended when weather and lighting conditions reduced the ability to identify and document any part of the subject lands, although no adverse weather conditions impeded the fieldwork activities.

4.2.3 Property Inspection

Based on the information obtained during the background research, the assessment was focused on 11 areas of archaeological interest identified within the proposed transmission line ROW (Map 11). These areas were assessed systematically, beginning with the southernmost (Area 11) and working northward, inspecting the ground conditions throughout the areas to be impacted. Additional field transects were made in peripheral areas in Areas 6 to 11 in order to identify ground features associated with potential relict shorelines, a portage, and a wagon road identified during the background research (see section 3.1.1).

Additionally, the study areas were examined with the use a DJI mini 2 drone, obtaining high-resolution near-ground imagery of the areas to be impacted. Where an on-ground field inspection could not be completed due to poor accessibility, notably in Areas 1, 2, 3, 4, 5, 8, and 10, the drone was used to remotely assess the ground conditions. Erring on the side of caution, only the visibly saturated swamplands with absent to light tree cover were considered to have low archaeological potential whereas any well-treed areas were considered to have potential. As such, all areas of interest along the proposed transmission line ROW were subjected to firsthand observation and/or aerial examination.

4.2.4 Disturbances Observed

Extensive ground disturbances were observed in Areas 6 and 7, the result of major aggregate extraction operations throughout the 20th and 21st centuries. The expansive nature of these operations were noted in 1937:

> To the north of Timmins, following a road that leads north from Toke Street, are great gravel and sand pits from which millions of tons of material have been removed. It's well worth the four-mile trip, for here is to be seen in action one of the most remarkable low-cost arrangements ever designed for supplying a mine with "fill" – the material that must be placed in the underground workings to take the place of the ore removed. Operations at these "sand claims" are easily followed. Transport to the Hollinger and McIntyre mines is achieved by a cable almost eight miles in length on which steel buckets travel in an endless round trip from the pits to the mine and return. Ingenious methods are used for dumping from this aerial tramway at many points.

The Lions Club 1937:69-70

Additional localised disturbances were observed along Highway 655 in Area 7. No additional significant ground disturbances or land alterations were identified during the property inspection of the remaining areas of interest.

4.2.5 Conclusions from Fieldwork

During the Stage 1 background assessment, it was determined that the proposed transmission line intersected 11 areas possibly containing features of archaeological potential such as modern and ancient water sources, a portage, and a wagon road (Map 11). As the proposed transmission line is situated on the Canadian Shield (Map 12), the areas beyond 50 metres of modern water sources, or 150 metres from other features of archaeological potential, were considered to have low archaeological potential due to their excessive distance to features of archaeological potential.

Areas 1 to 5 and 8 to 10 were remotely assessed with the support of a drone and satellite imagery, identifying low-lying, saturated terrain in the lands bordering the small lake and watercourses in Areas 1, 2, 3, 4, and 10, with apparently well-drained forested areas observed in all areas except Area 10. As an on-ground assessment could not be carried out in these areas, all forested areas were considered to be sufficiently drained to have archaeological potential, except in Area 10 where open black spruce forests and water-tolerant vegetation were clearly observed on the satellite imagery and confirmed with the drone (Images 1 and 11 to 14, as well as Maps 13 to 17 and 20 to 22).

The field inspection confirmed the presence of relict shoreline features in Areas 6, 7, and 11, with former shorelines represented by terrain rises followed by level, well-drained terrain

(Images 2 to 10, 15, and 16, as well as Maps 18 and 19). Although the relict shoreline mapped in Area 5 was not directly observed, it was considered to have archaeological potential due to the on-ground and drone observations which confirmed the presence of related shorelines nearby (Map 17).

The historical portage between the upper Porcupine River and Pearl Lake in Area 11 as well as the historical wagon road in Area 7 could not be confirmed during the on-ground inspection. Nonetheless, based on field discussions with members of the accompanying Indigenous communities which stressed the cultural importance of early transportation routes, all areas within 150 metres of these mapped historical transportation routes were considered to have archaeological potential (Maps 19 and 23).

Overall, level and well-drained areas were documented in Areas 1 to 9 and 11. These areas are considered to have confirmed archaeological potential and are candidates for Stage 2 testing. The remaining area (Area 10) was determined to have low archaeological potential due to the presence of permanently saturated ground conditions and due to the excessive distance from features of archaeological potential (Maps 13 to 23).

4.3 Recommendations

4.3.1 Support of Recommendations

The recommendations are supported by Section 2.1.2, Standards 1a, 5, 6, 7, 8, and 9 of the 2011 S&Gs. Specifically, after confirming the archaeological potential of an area, this includes a test pit survey in forested areas, with test pits 30 centimetres in diameter excavated by hand, extending a minimum of five centimetres into the subsoil. The pit contents should be screened using six-millimetre hardware mesh and the profiles examined for stratigraphy, cultural features, or evidence of fill, and subsequently backfilled. As the study area is located in northern Ontario and is underlain by the Canadian Shield, the recommendation is additionally supported by Section 2.1.5, Standard 1 of the 2011 S&Gs which requires testing at five-metre intervals between 0 and 50 metres from modern water sources, and at ten-metre intervals between 50 and 150 metres of features other than modern water sources such as historical transportation routes and registered archaeological sites.

4.3.2 Recommendations

As a result of the Stage 1 assessment of the study area, the recommendations are as follows:

1. If future developments are anticipated within any areas with archaeological potential, as illustrated on Maps 13 to 23, a Stage 2 sub-surface survey of the of the areas of proposed impacts is recommended.

2. Additional archaeological work outside of the areas with archaeological potential, as illustrated on Maps 13 to 23, is not recommended.

5.0 Legal Considerations

The following sections are designed to describe the limit of information and representation available in the archaeological assessment report, and to inform the reader of the ongoing legal obligations, as required by MCM.

5.1 Limitations of this Report

Some information in this report may be confidential, including any photos, maps, texts of narrative information concerning First Nation communities and / or private informants. The Freedom of Information and Protection of Privacy Act requires that this information be kept secure and not be distributed to unauthorized parties. Further, the MCM 2011 Standards and Guidelines for Consultant Archaeologists, Section 7.3.3 requires that such information is not contained in reports which may be entered into the Ontario Public Register of Archaeology Reports. As such, this information, although available to the report author, may not be transmitted as part of the report package except as required for MCM review.

Some information in this report may be sensitive, including the location of registered archaeological sites. Policy developed under the Ontario Heritage Act requires that this information be kept secure and not be distributed to unauthorized parties. Further, the MCM 2011 Standards and Guidelines for Consultant Archaeologists, Section 7.6.1, standard 1 requires that any information that identifies the location of an archaeological site be presented only in the supplementary documentation to the report. The supplementary documentation is excluded from the Ontario Public Register of Archaeology Reports. As such, this information, although available to the report author, may not be transmitted as part of the report package except as required for MCM review.

This report has been generated for the proponent named on the cover page of this report for their exclusive use, and for the explicit purposes defined in the Executive Summary. Further distribution, modification or publication of this report is not permitted without prior written agreement from Woodland Heritage Northeast Limited. While this document is believed to contain correct information, neither Woodland Heritage Northeast Limited, nor its affiliates makes any warranty, either expressed or implied, or assumes any legal responsibility for the completeness or usefulness of any results or any information disclosed. The interpretation of this and any other data related to this report is solely the responsibility of the client.

As set out in the Ontario Heritage Act and associated Regulations, archaeological assessment has as its focus only material remains of past human use and occupation of landscapes.

Archaeological assessments completed under the terms and conditions of a licence issued under the authority of the Ontario Heritage Act do not directly involve documenting Native values, traditional land use, traditional ecological knowledge or traditional territories. While this information is at times valuable in evaluating archaeological potential or interpreting archaeological sites, the use of such information does not render it part of the archaeological record. Control over the recording and use of this information rests solely with the individuals and communities wherein the knowledge resides.

5.2 Advice on Compliance with Legislation

1. Advice on compliance with legislation is not part of the archaeological record. However, for the benefit of the proponent and approval authority in the land use planning and development process, the report must include the following standard statements:

a. This report is submitted to the Minister of Citizenship and Multiculturalism as a condition of licensing in accordance with Part VI of the Ontario Heritage Act, R.S.O. 1990, c 0.18. The report is reviewed to ensure that it complies with the standards and guidelines that are issued by the Minister, and that the archaeological fieldwork and report recommendations ensure the conservation, protection and preservation of the cultural heritage of Ontario. When all matters relating to archaeological sites within the project area of a development proposal have been addressed to the satisfaction of the Ministry of Citizenship and Multiculturalism, a letter will be issued by the ministry stating that there are no further concerns with regard to alterations to archaeological sites by the proposed development.

b. It is an offence under Sections 48 and 69 of the Ontario Heritage Act for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed archaeological fieldwork on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest , and the report has been filed in the Ontario Public Register of Archaeological Reports referred to in Section 65.1 of the Ontario Heritage Act.

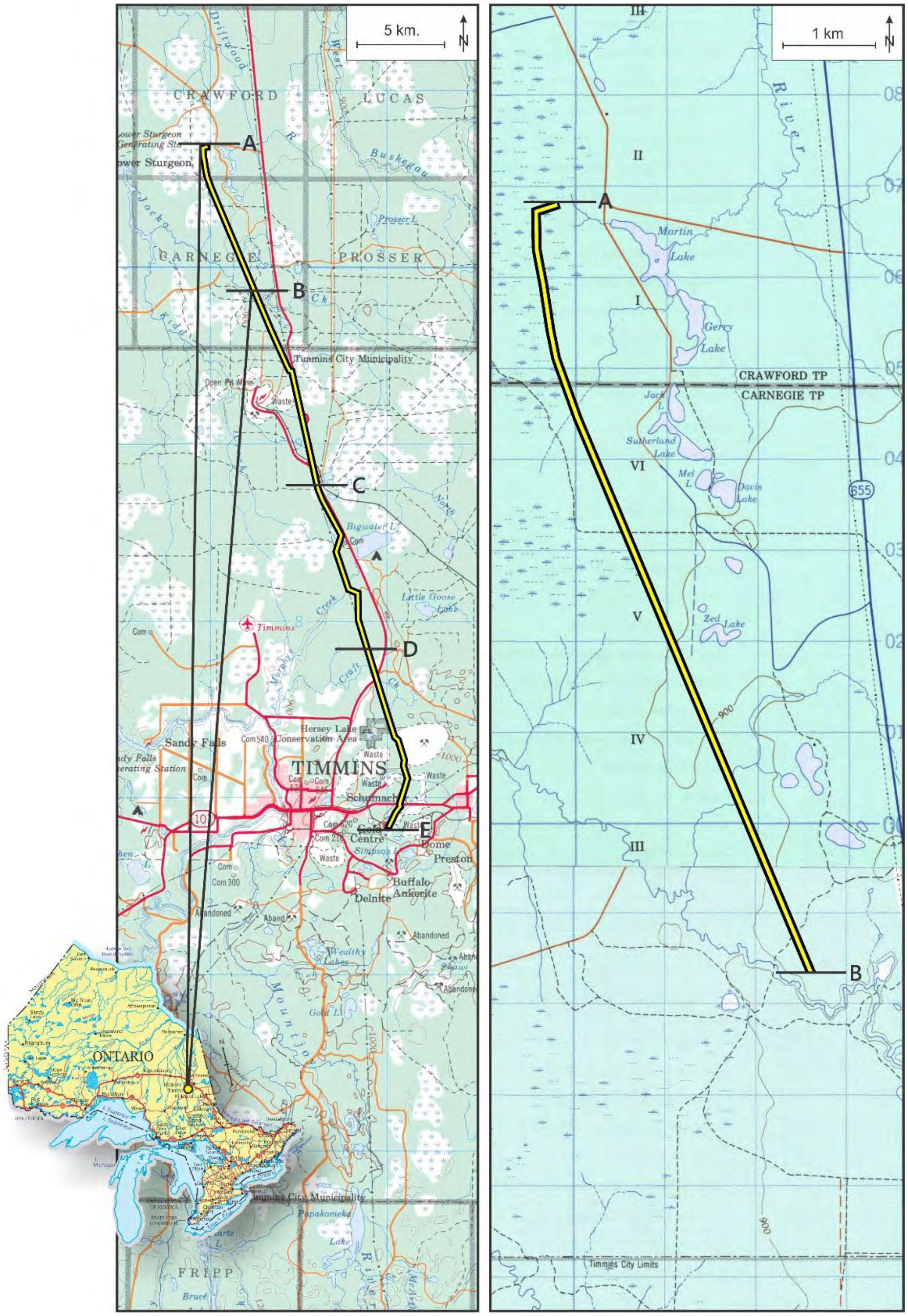
c. Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48 (1) of the Ontario Heritage Act. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with Section 48 (1) of the Ontario Heritage Act.

d. The Cemeteries Act, R.S.O. 1990 c. C.4 and the Funeral, Burial and Cremation Services Act, 2002, S.O. 2002, c.33 (when proclaimed in force) require that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ministry of Consumer Services.

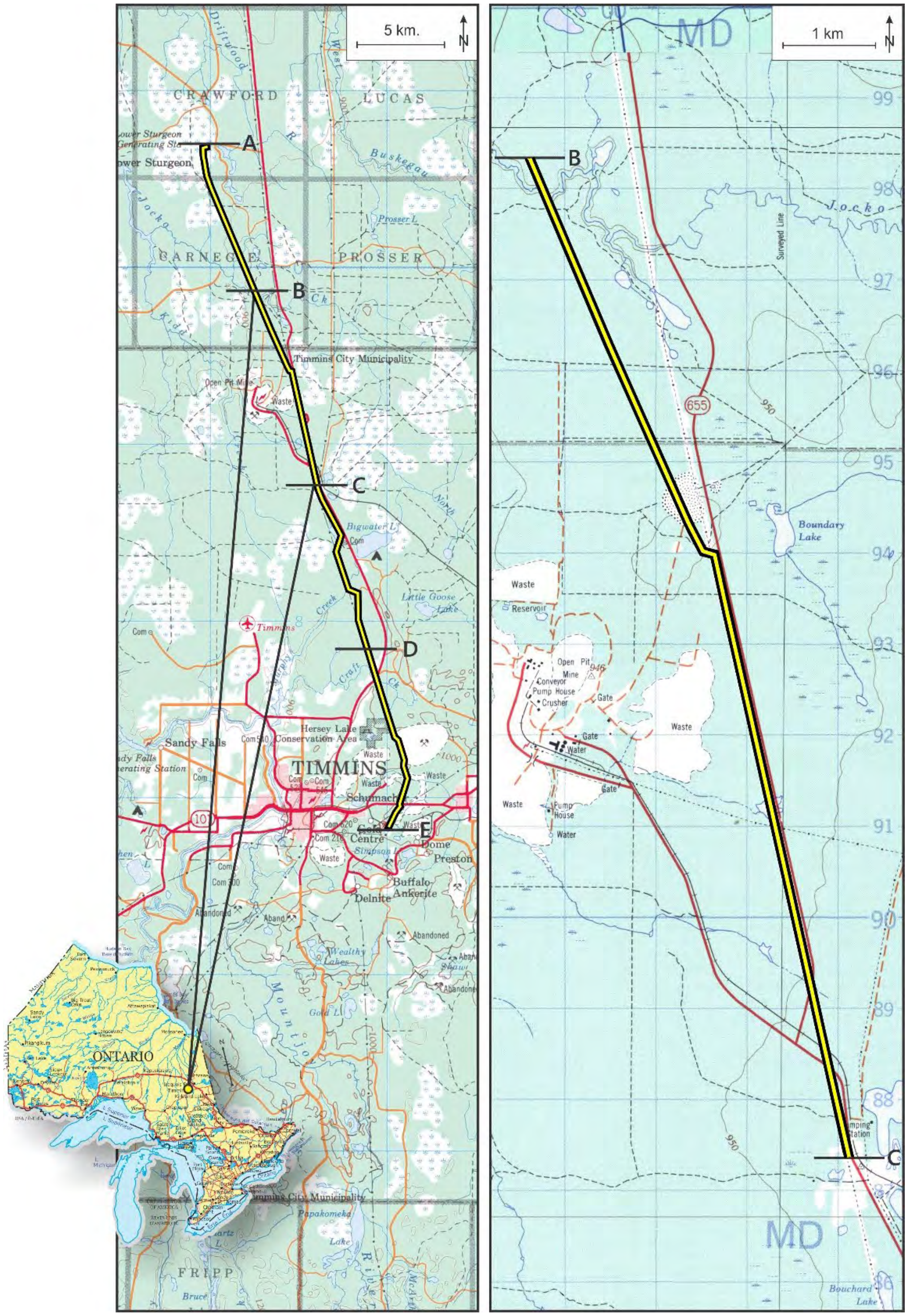
2. Reports recommending further archaeological fieldwork or protection for one or more archaeological sites must include the following standard statement: “Archaeological sites recommended for further archaeological fieldwork or protection remain subject to Section 48 (1) of the Ontario Heritage Act and may not be altered, or have artifacts removed from them, except by a person holding an archaeological licence.”

Woodland Heritage Northeast
Archaeological and Heritage Consulting Services

6.0 Maps



Map 1. Project location map.



Map 2. Project location map.

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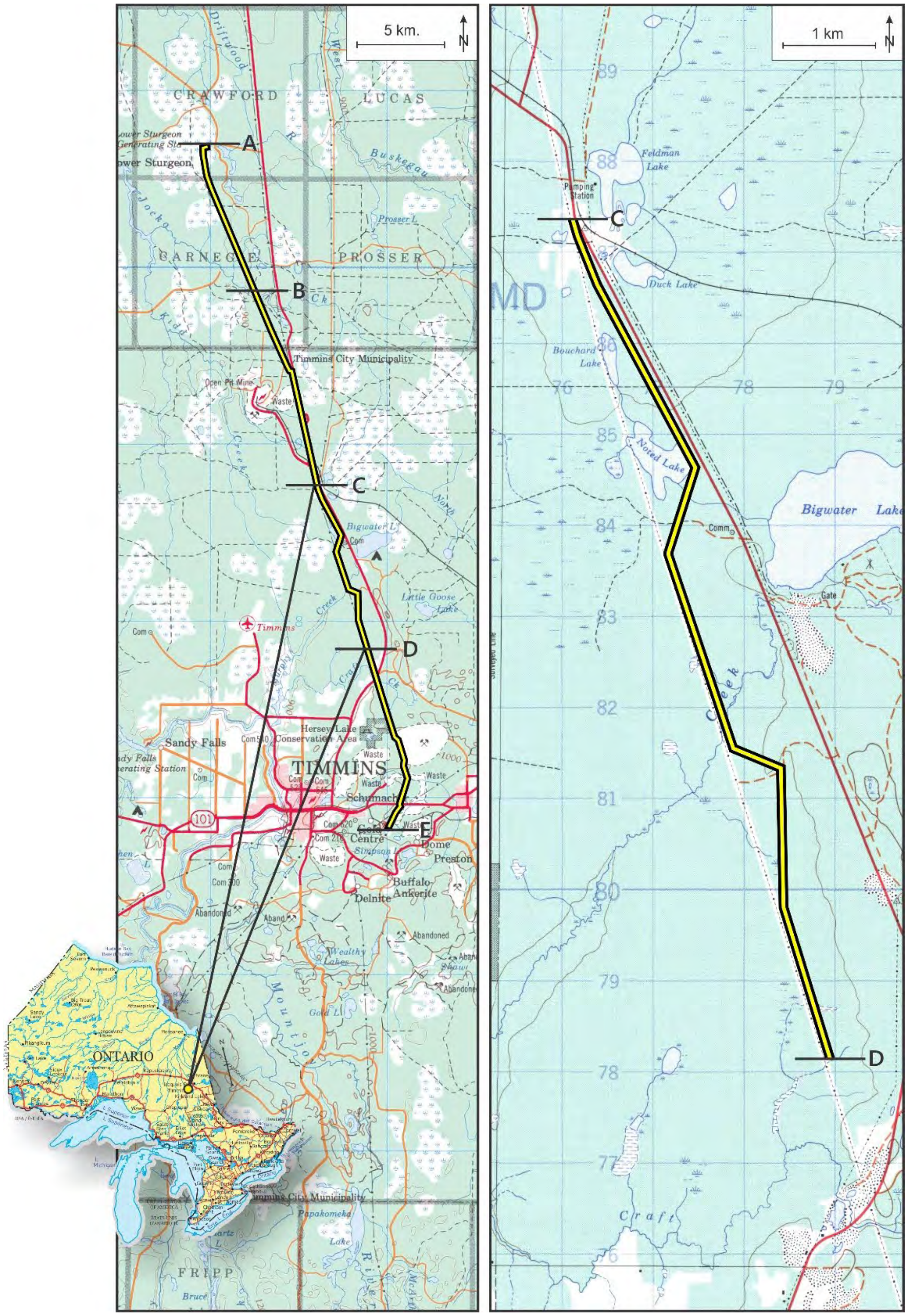
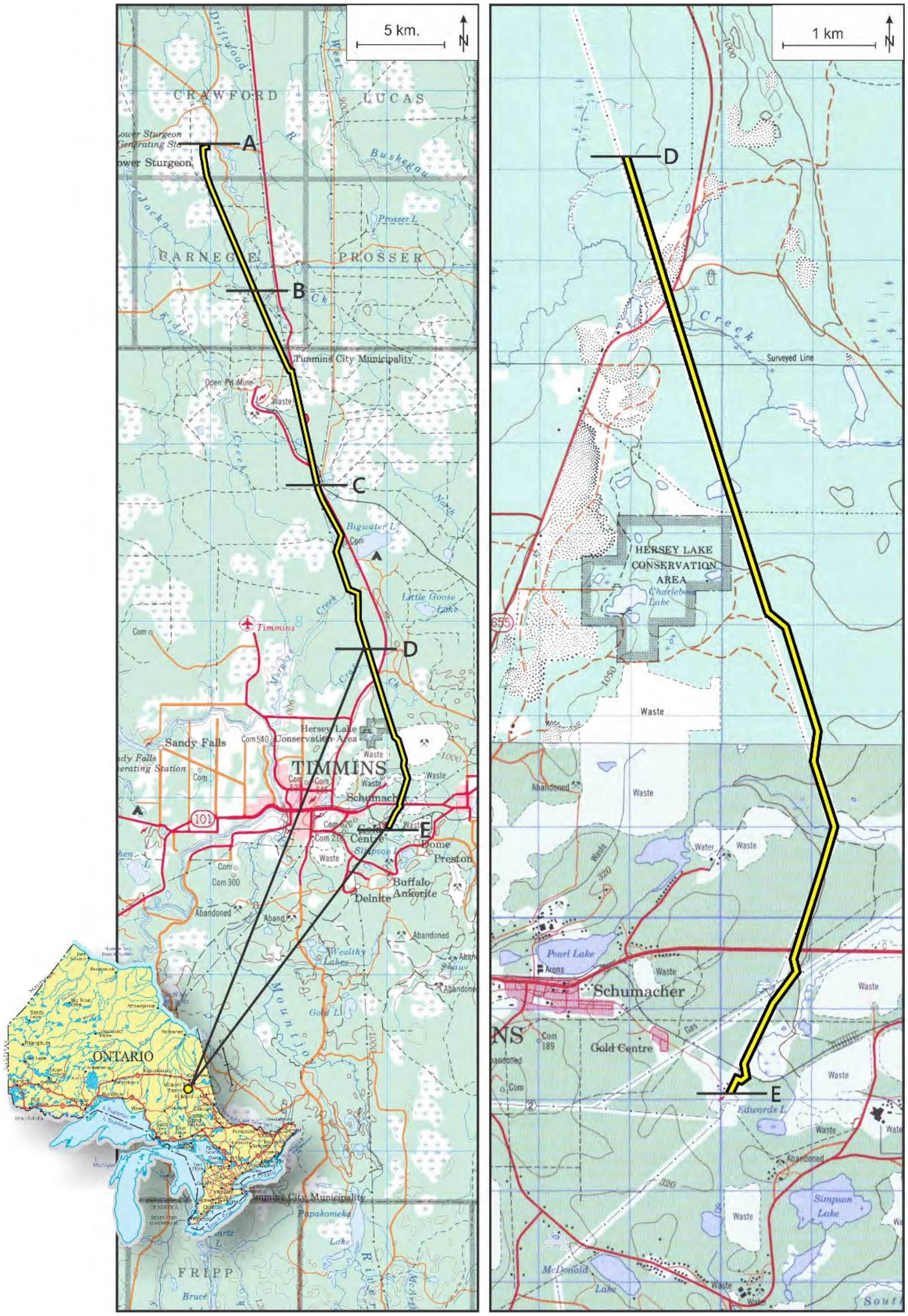


Map 3. Project location map.



Map 4. Project location map.

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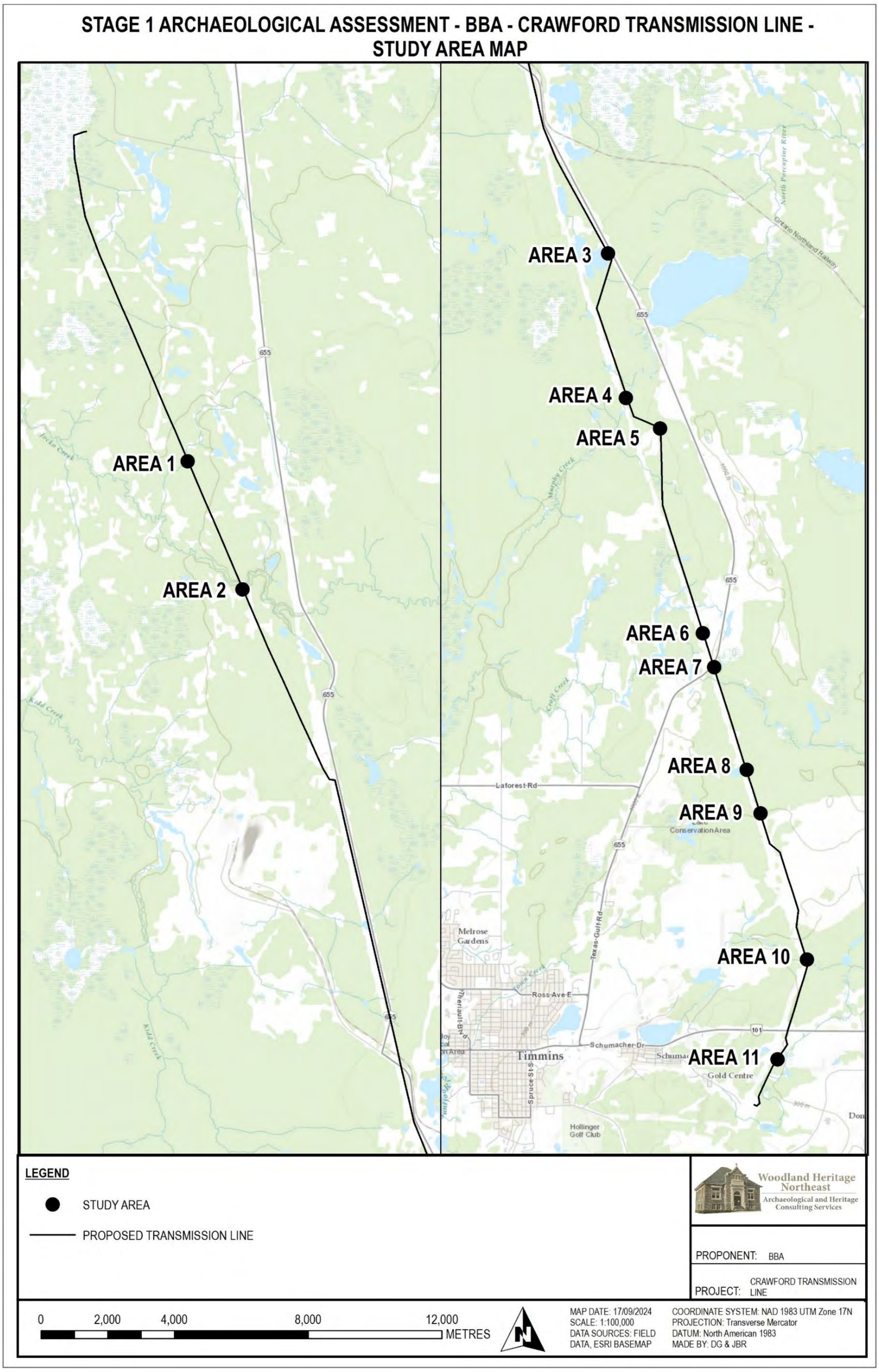

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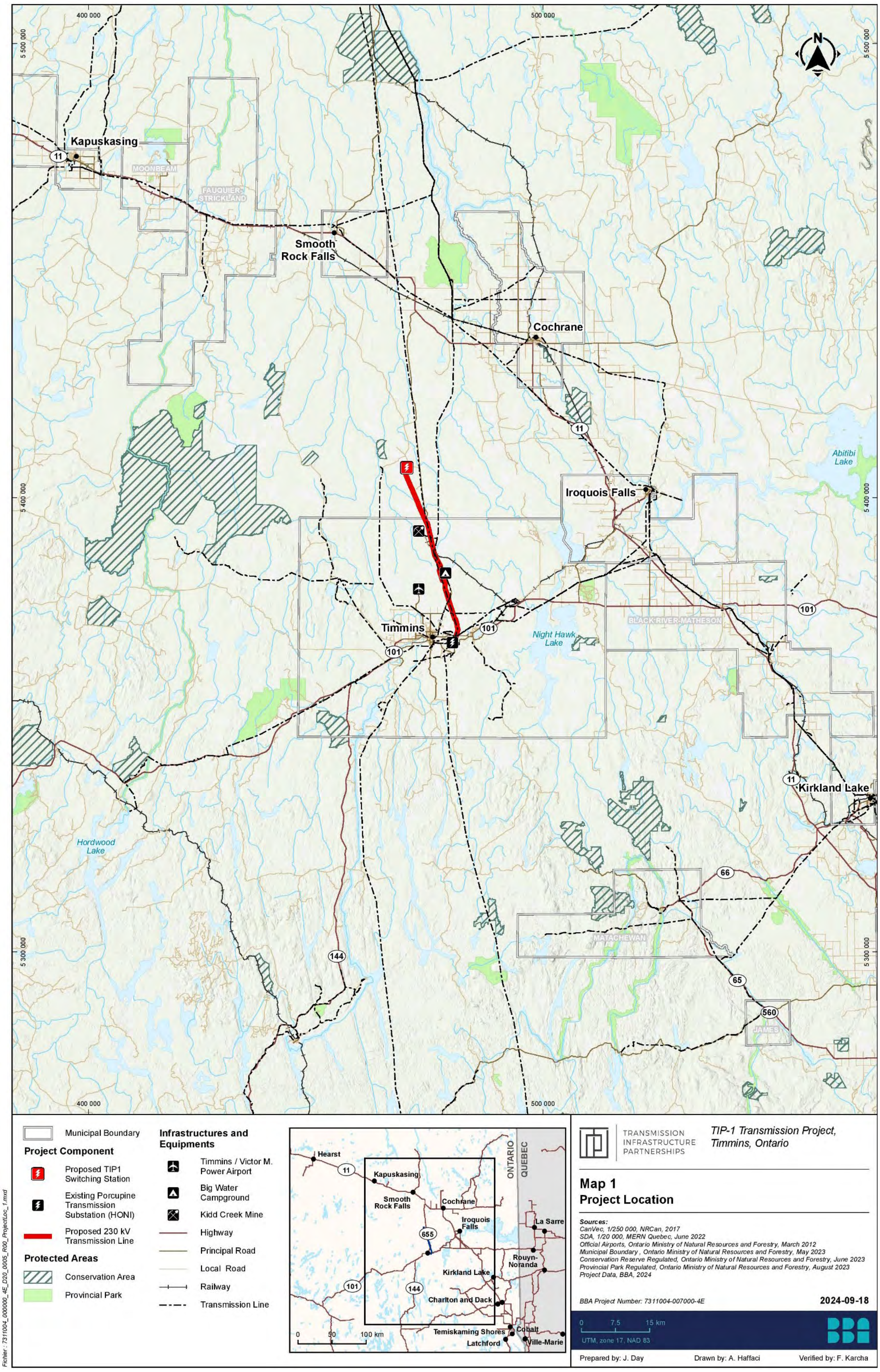

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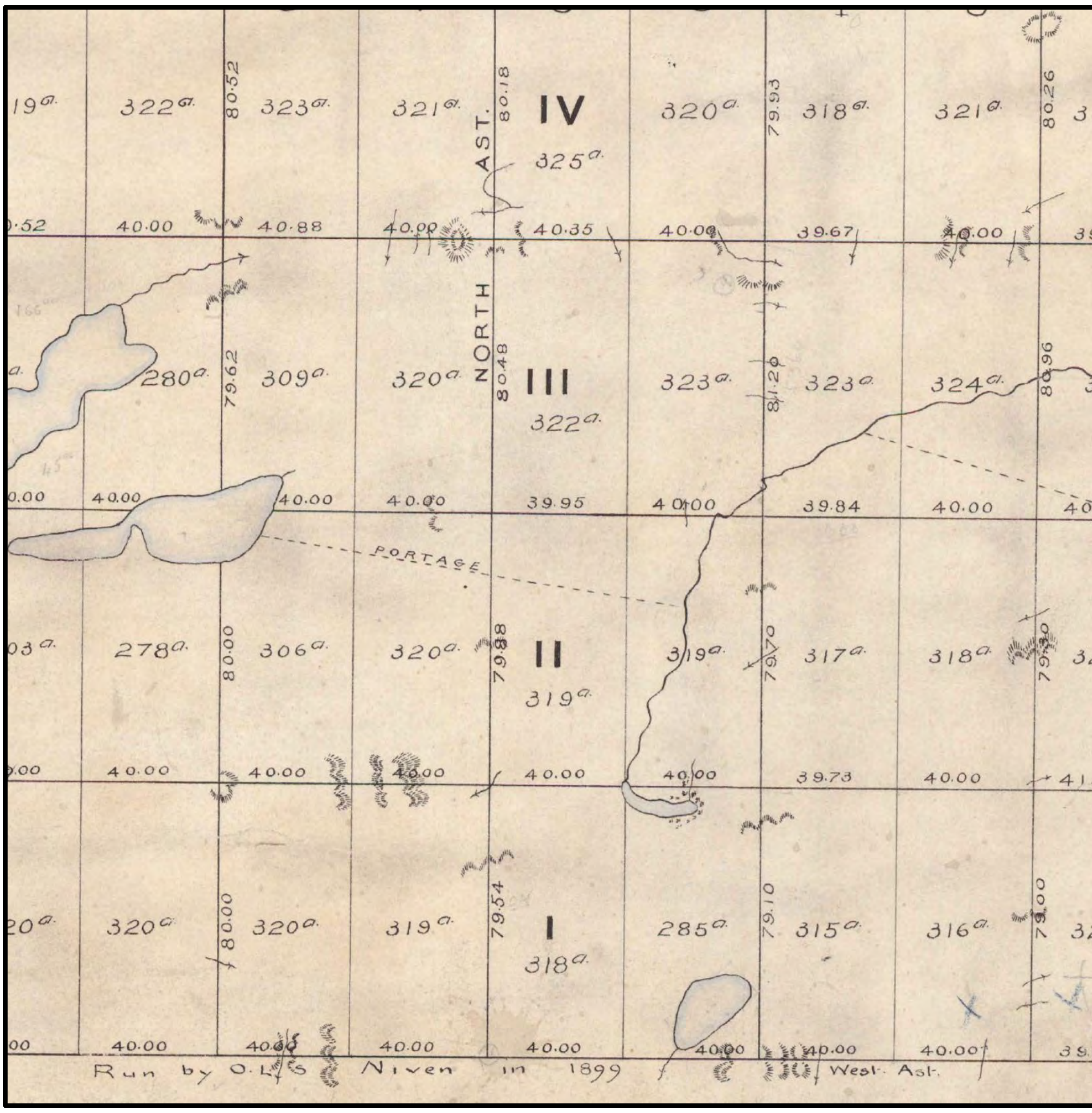

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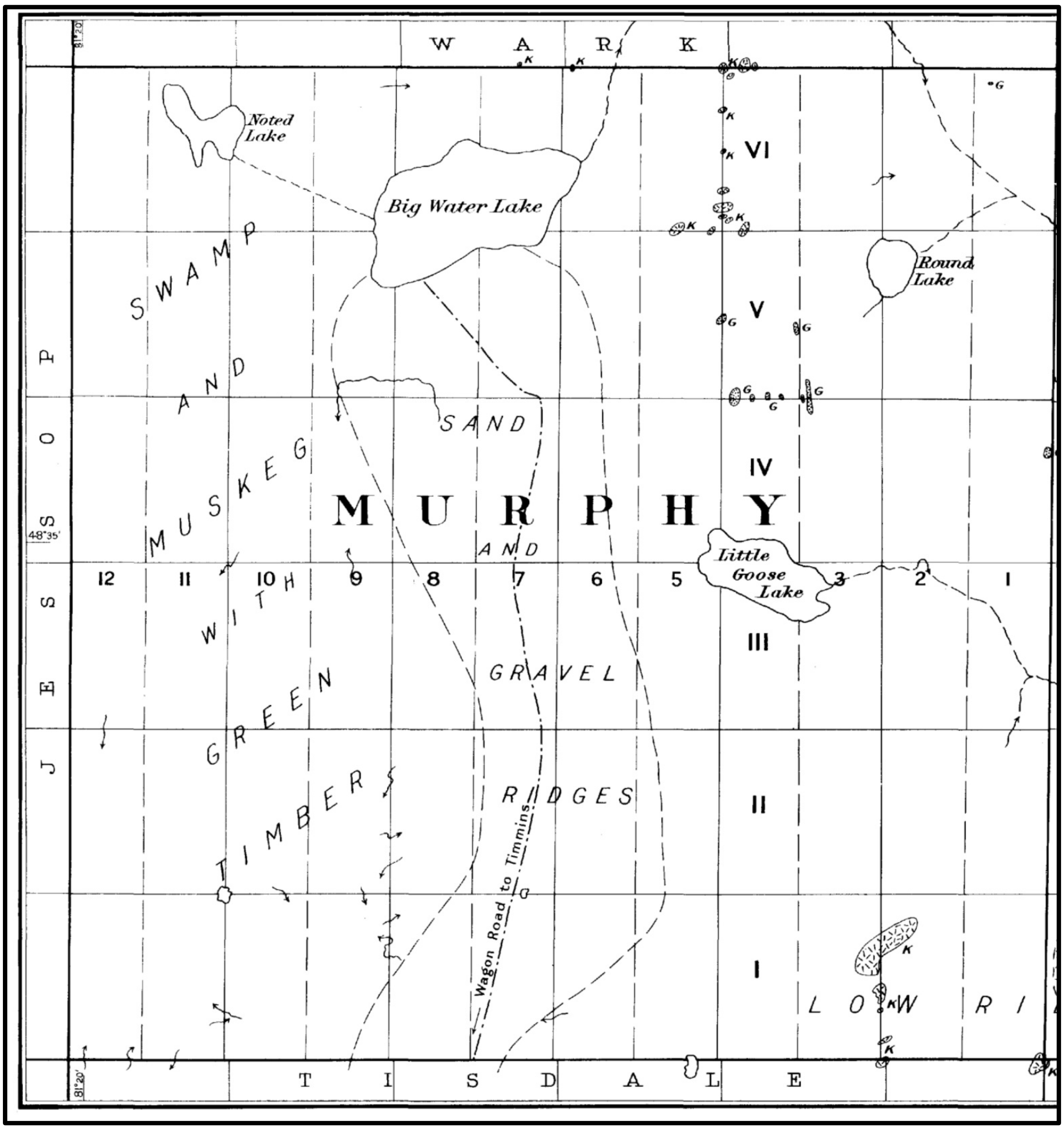

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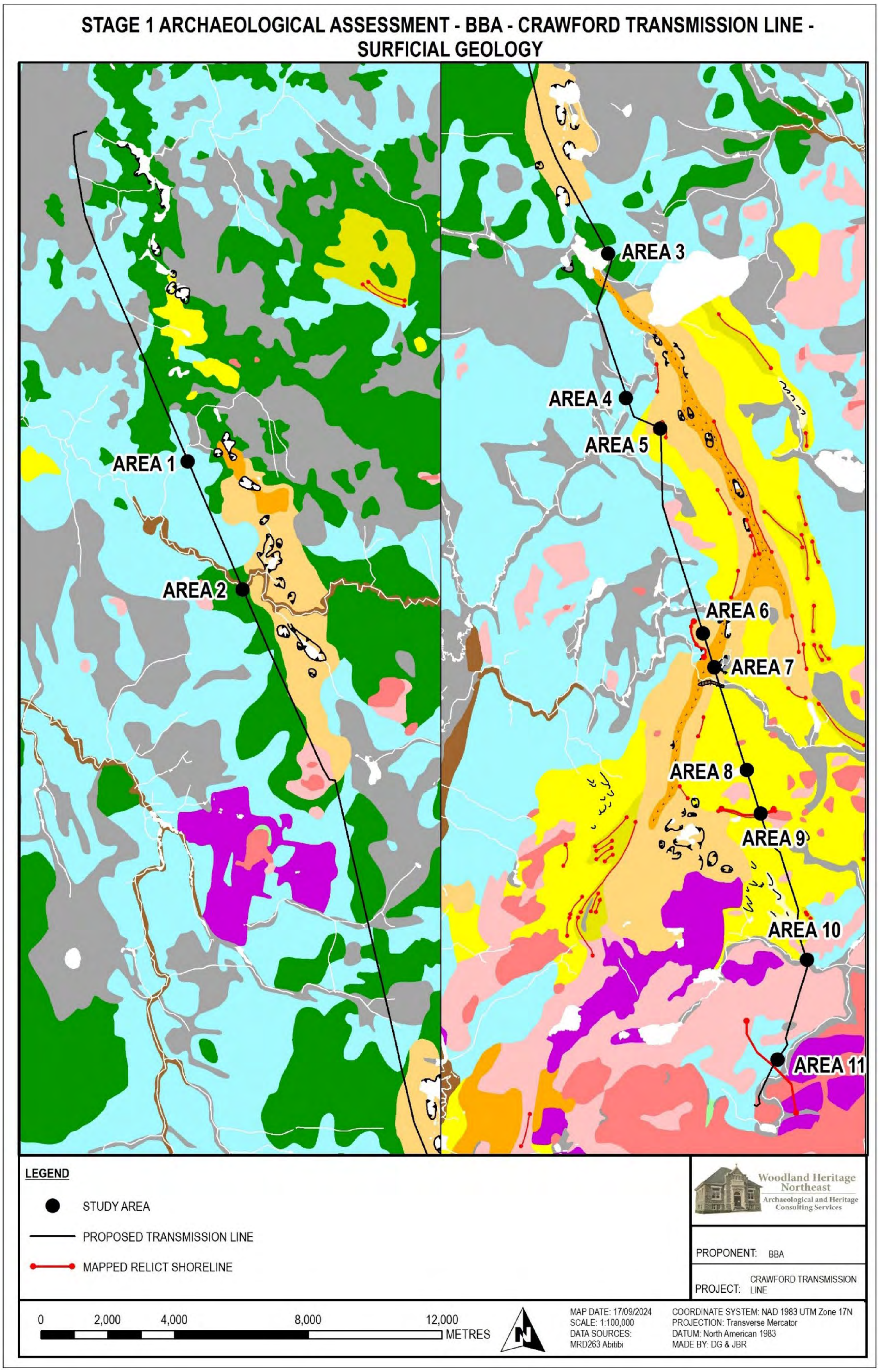

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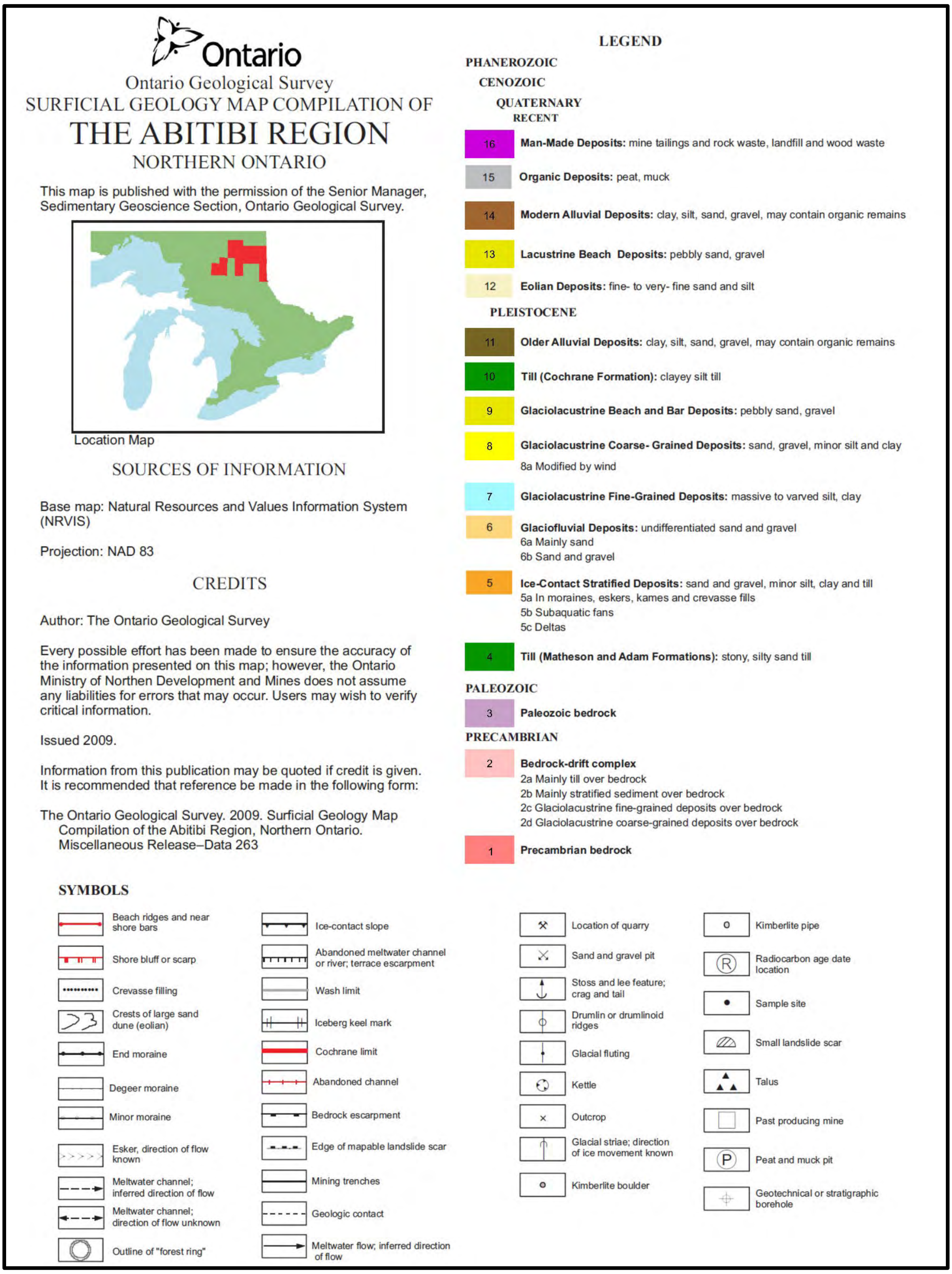

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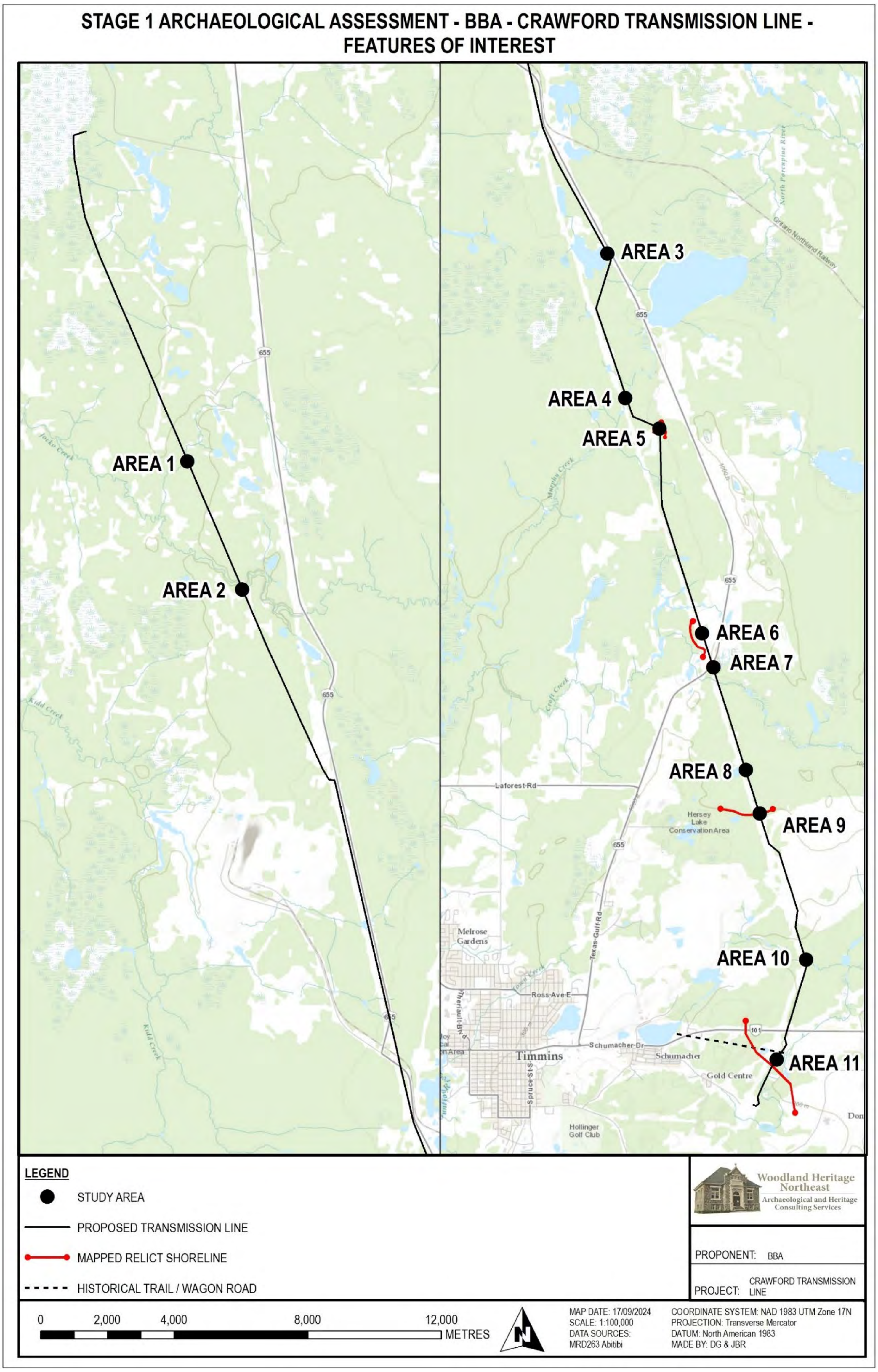

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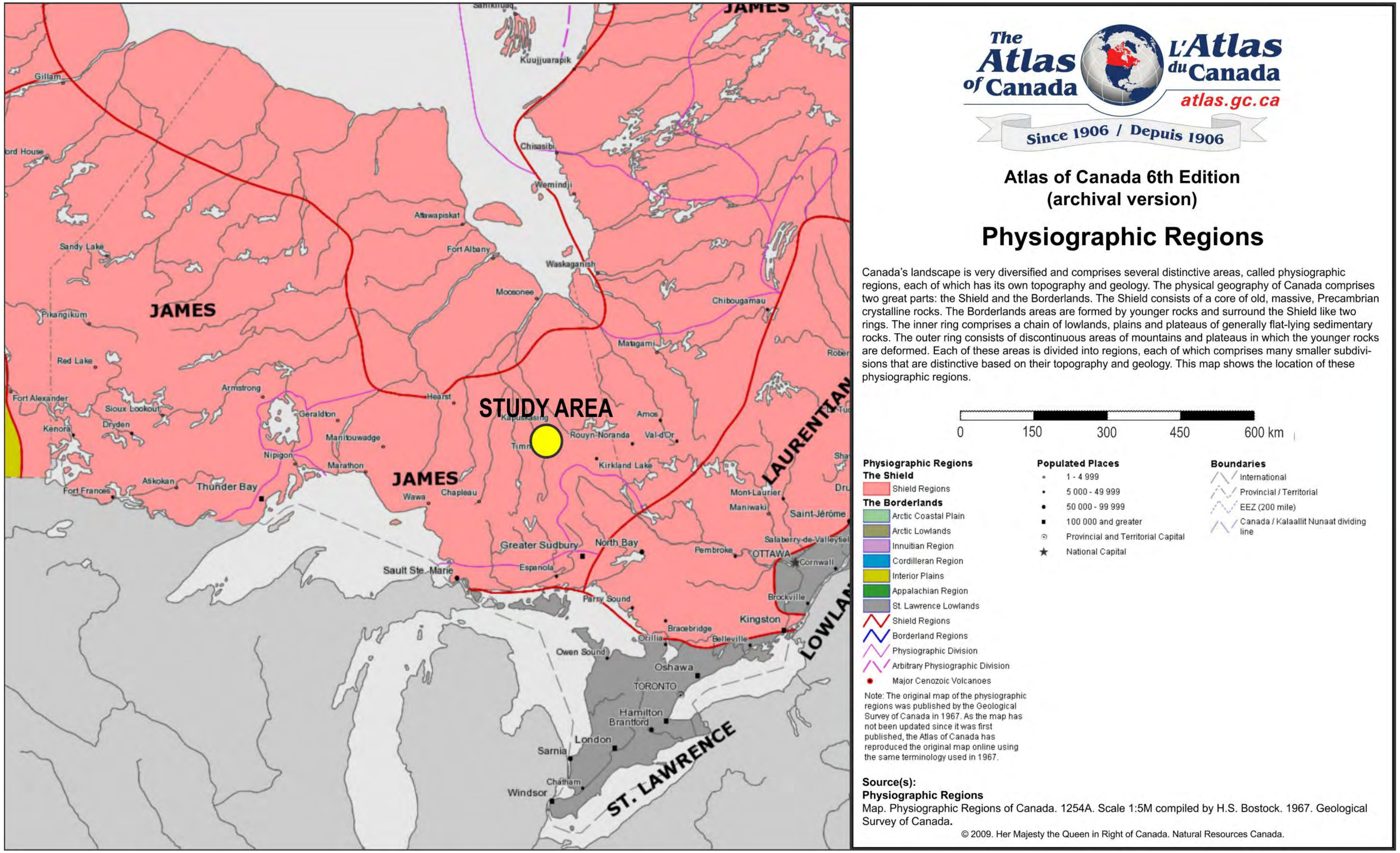

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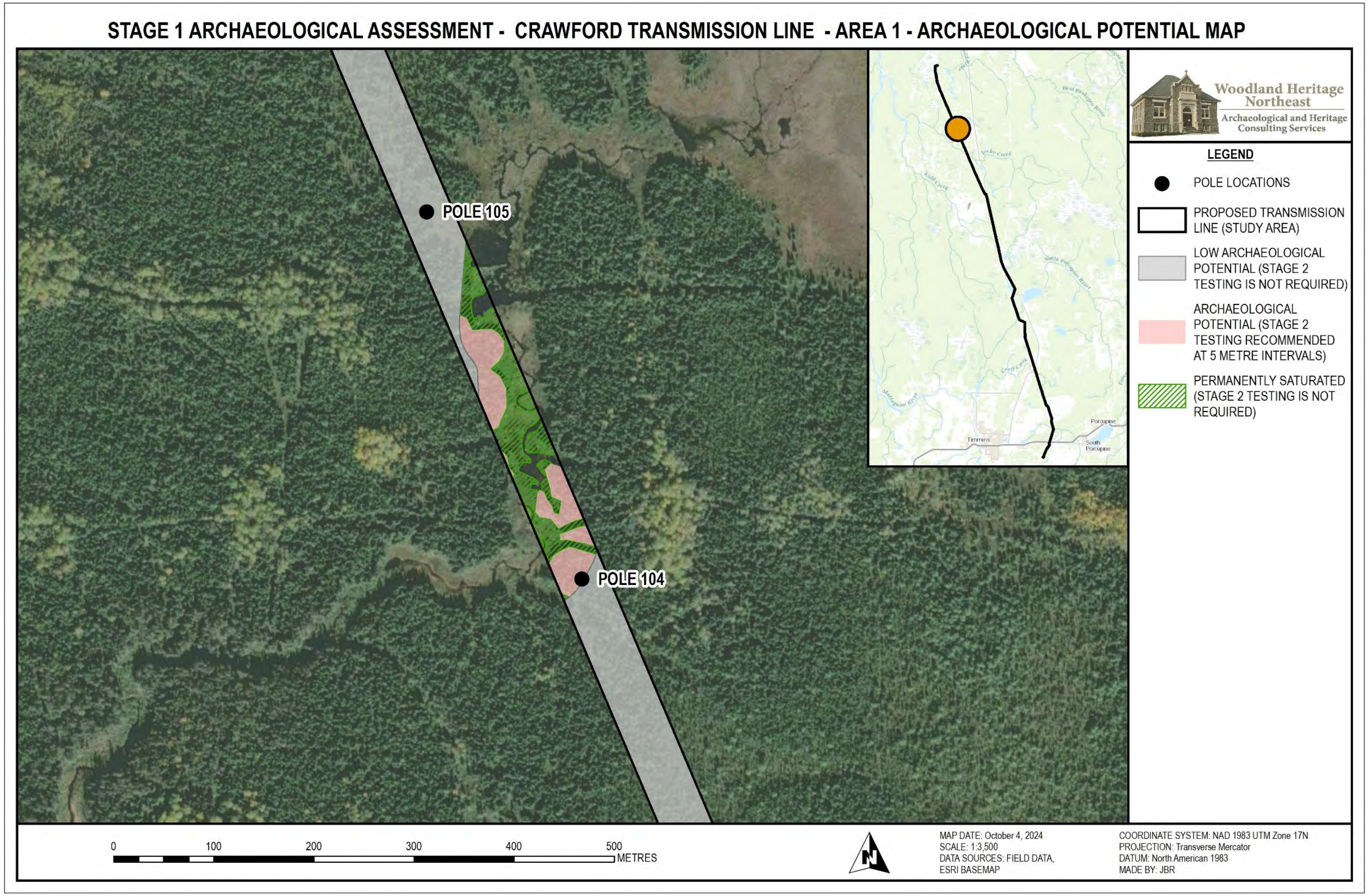

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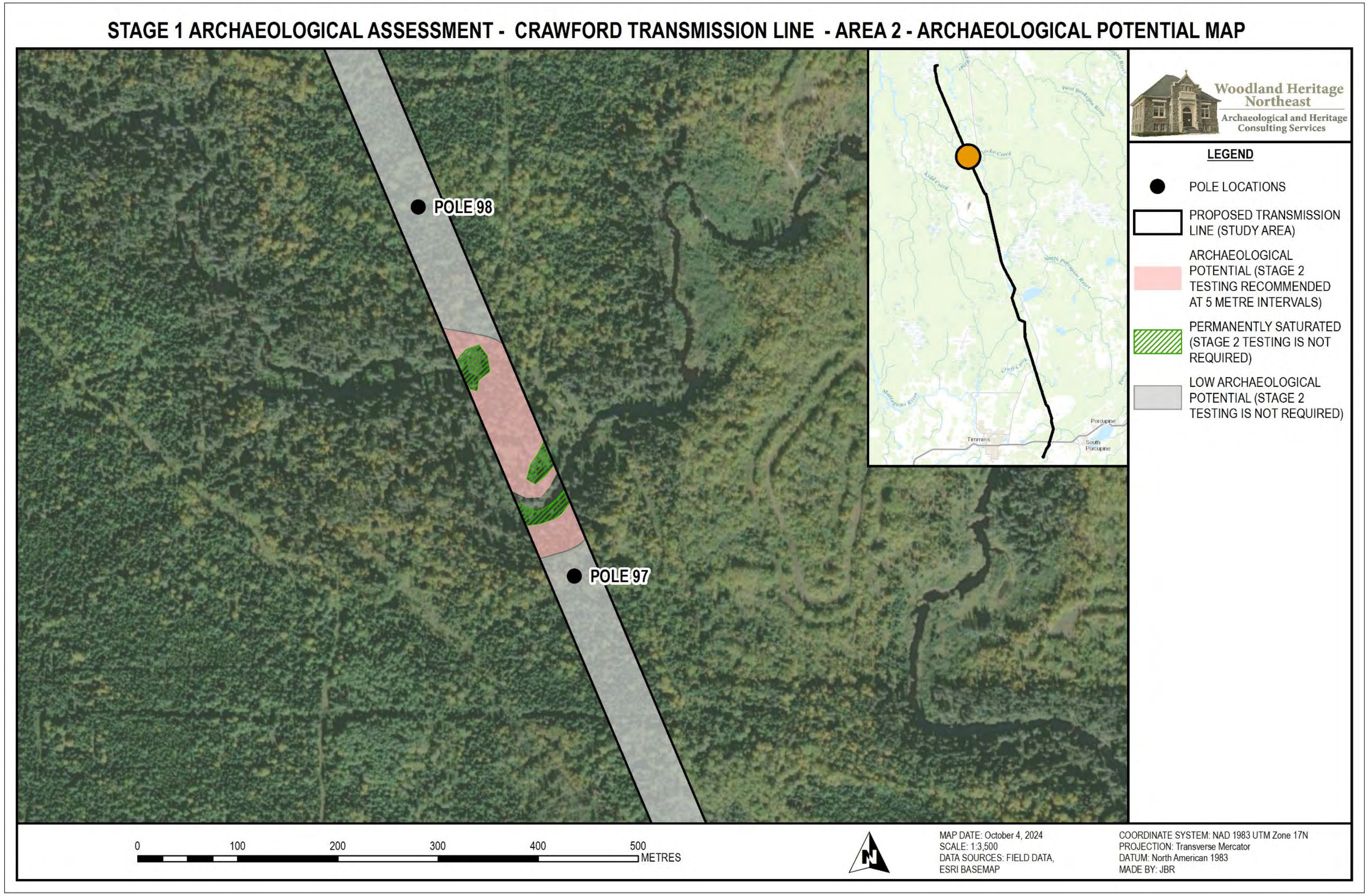

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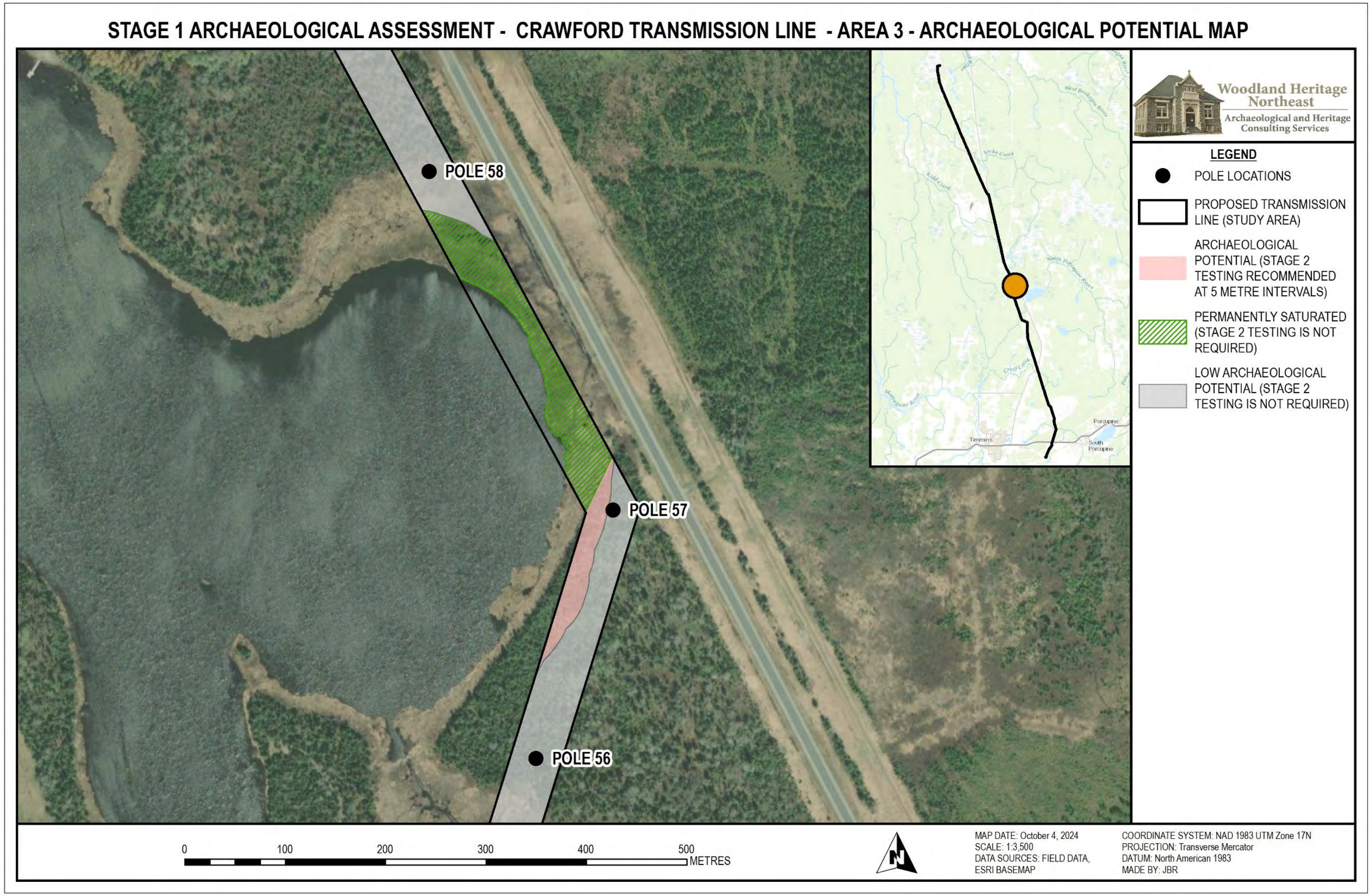

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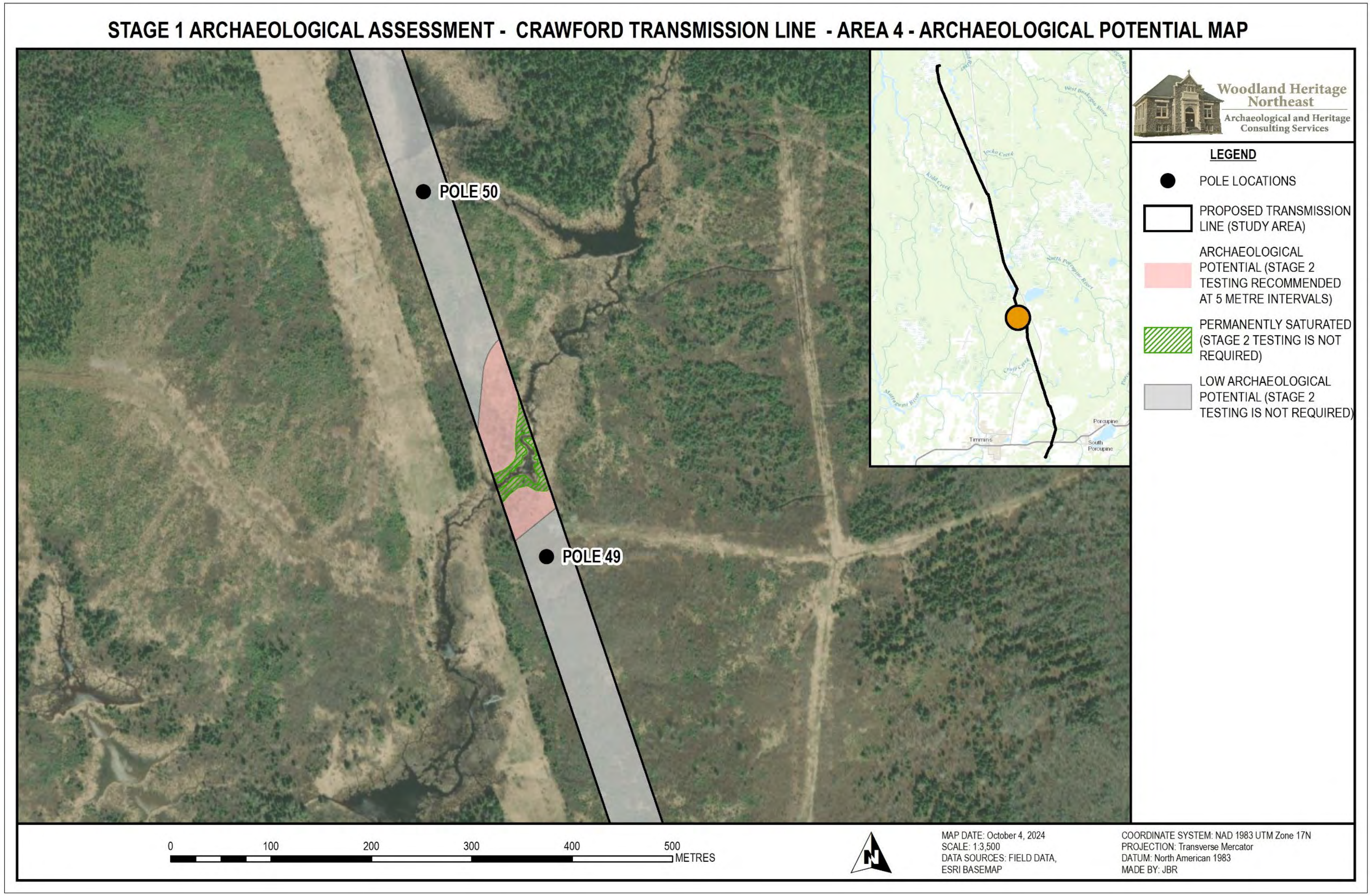
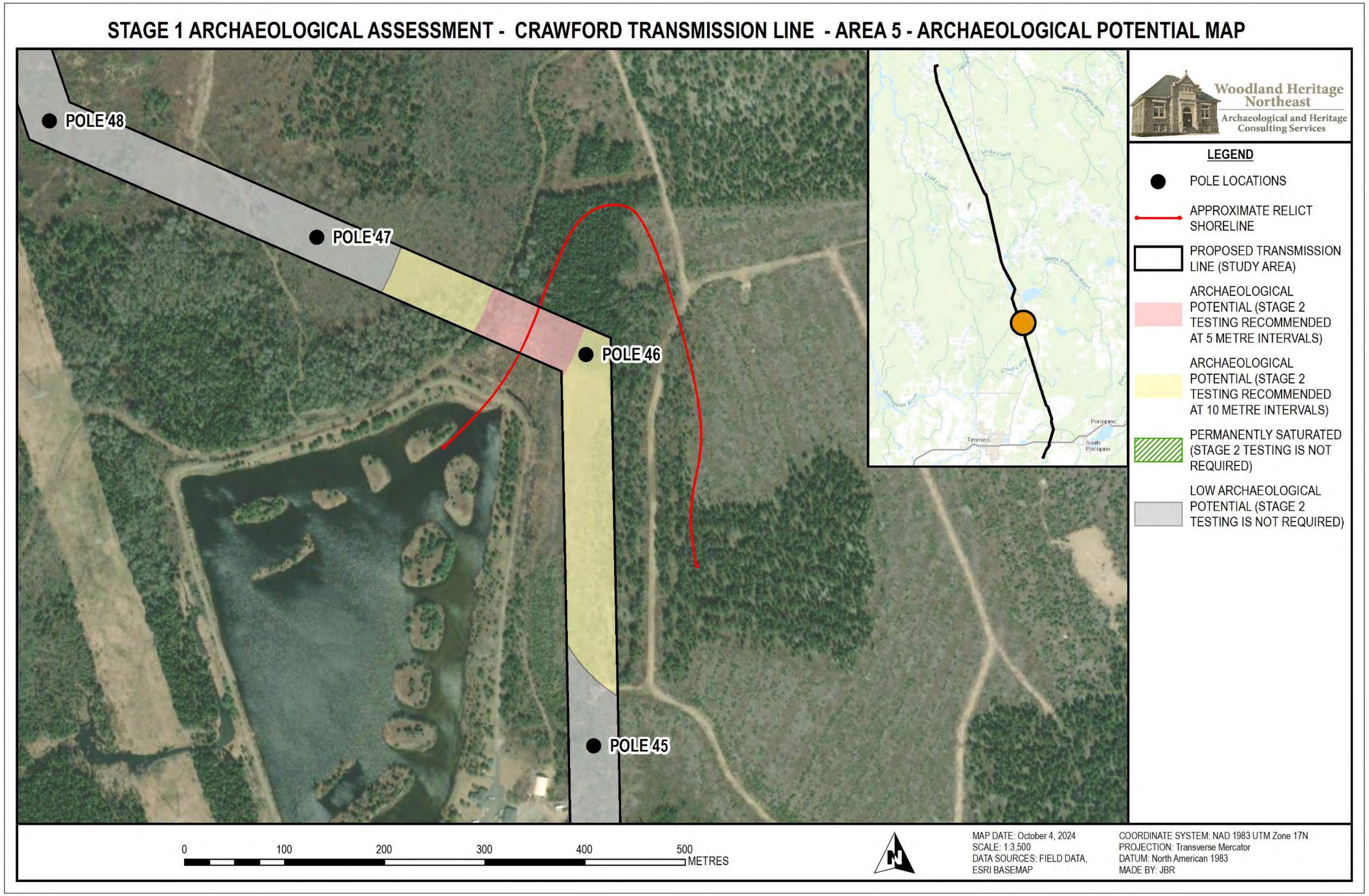


Map 16. Map showing the archaeological potential and survey strategies in Area 4.



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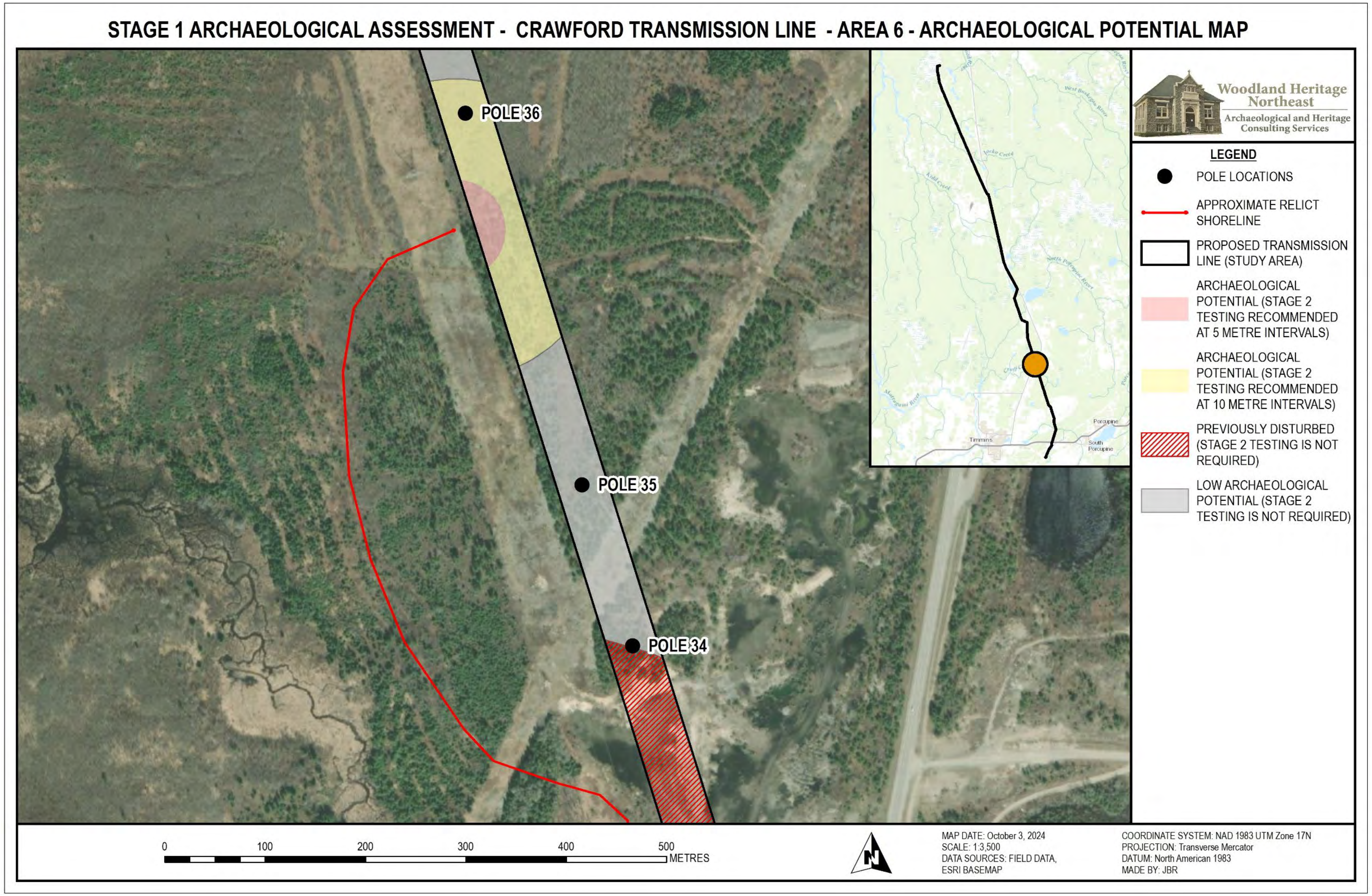

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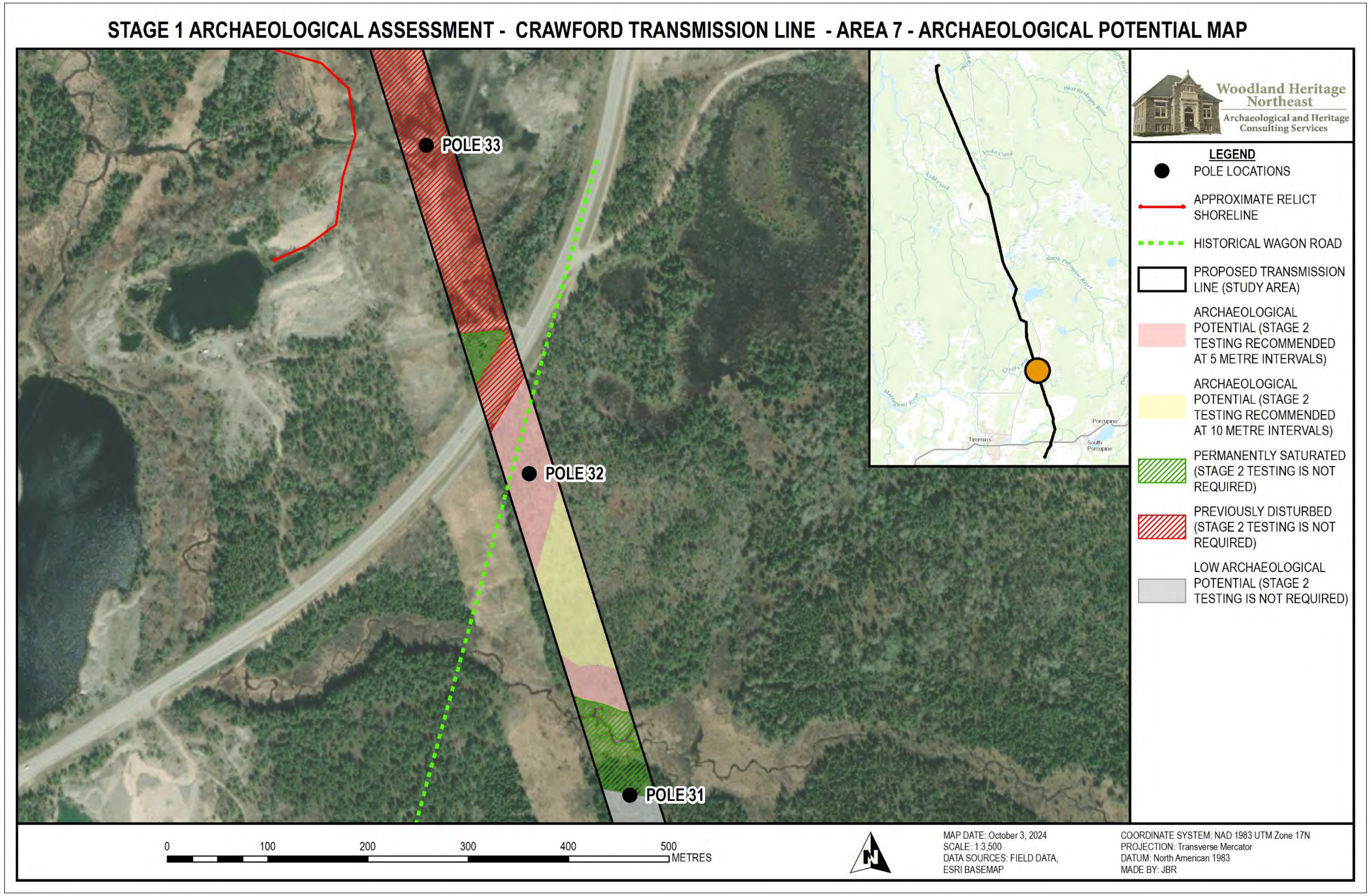

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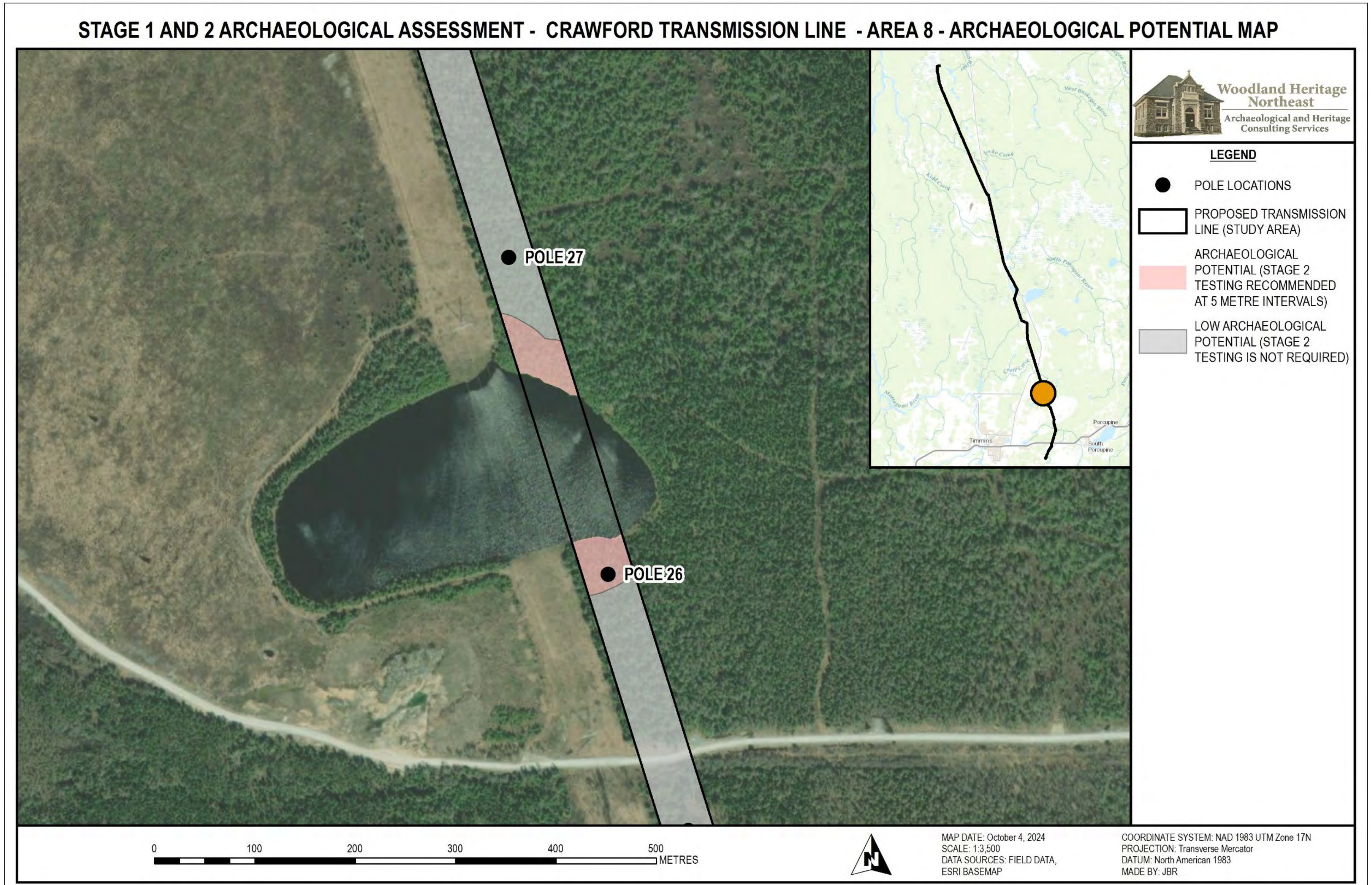

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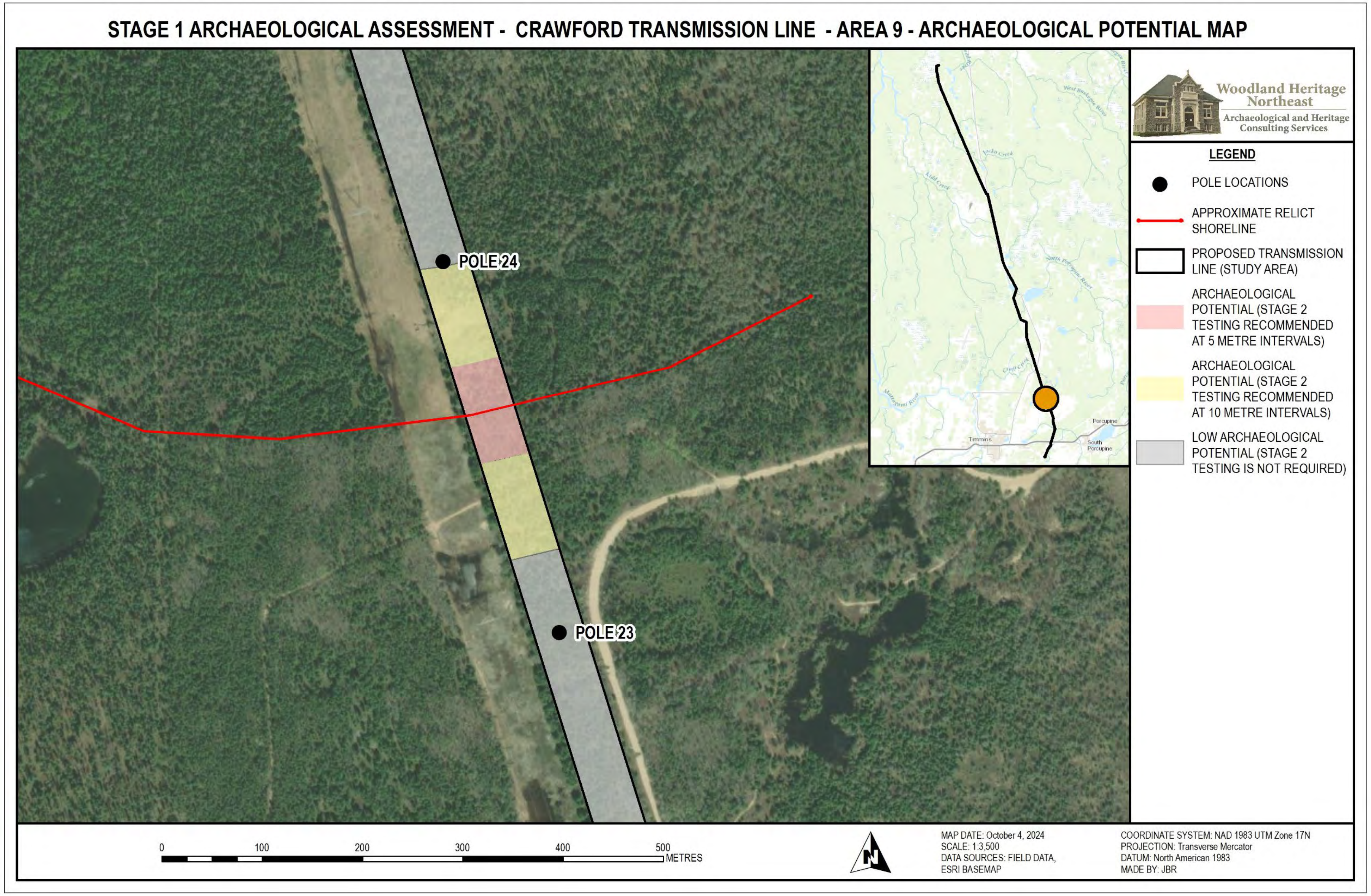

Map 21. Map showing the archaeological potential and survey strategies in Area 9.

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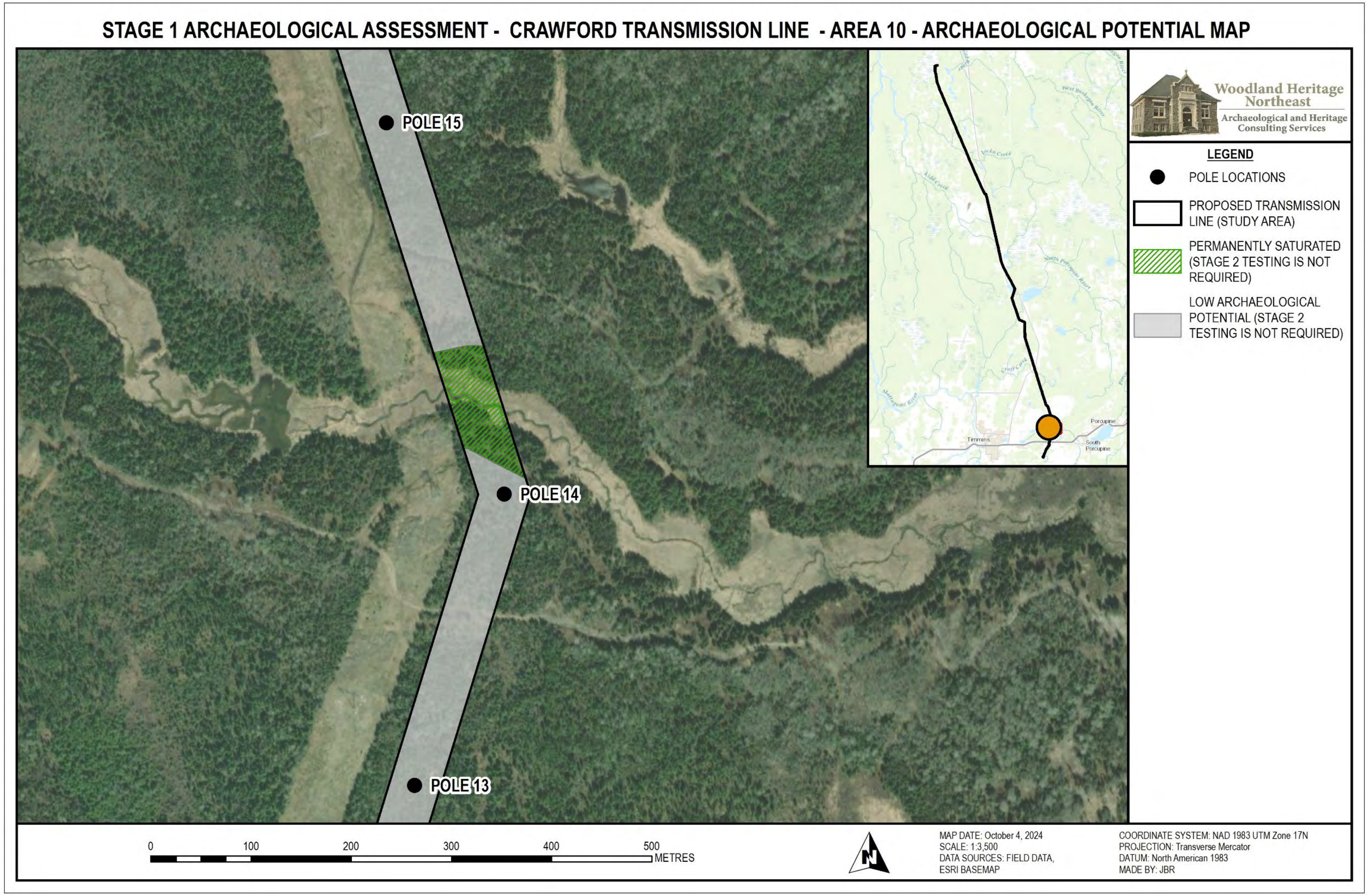
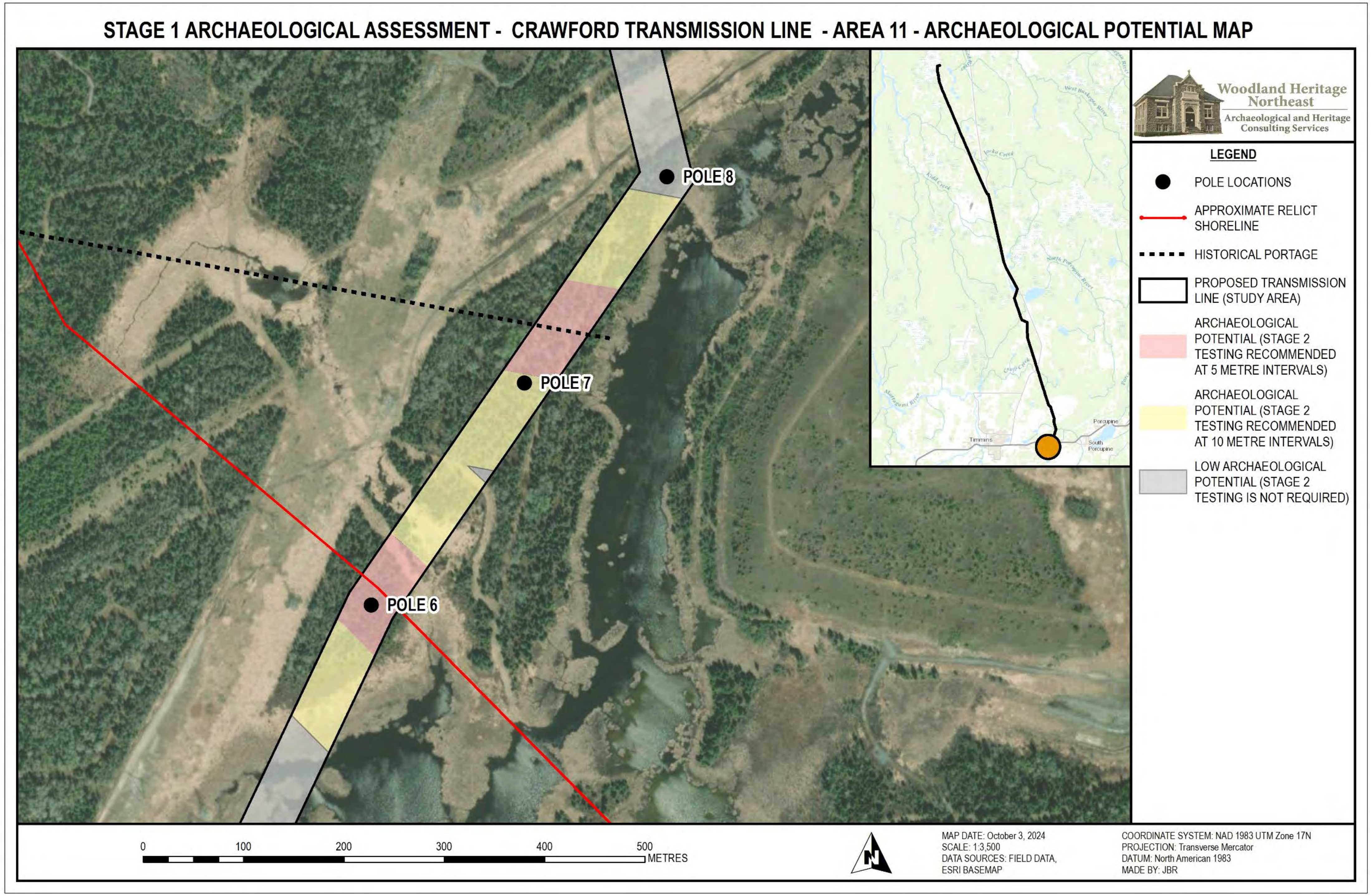


Map 22. Map showing the archaeological potential and survey strategies in Area 10.



Map 23. Map showing the archaeological potential and survey strategies in Area 11.

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Map 24. Map identifying the locations and directions of photographs used in this report.

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Map 25. Map identifying the locations and directions of photographs used in this report.

Map 26. Map identifying the locations and directions of photographs used in this report.

Map 27. Map identifying the locations and directions of photographs used in this report.

7.0 Images

Image 1. Photograph 4615 overlooking Area 4. Note the denser vegetation approaching the creek's edge in comparison with the surrounding land.

Image 2. Photograph 2065 overlooking Area 6.

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Image 12. Photograph 2002 overlooking Area 8.

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Image 14. Photograph 1304 overlooking Area 10.

Image 15. Photograph 5249 taken near the relict shoreline identified in the background research.

Image 16. Photograph 5263 taken near the historical portage identified in the background research.

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Appendix E: Cultural Heritage Screening Report

Cultural Heritage Screening Report (final)

Transmission Infrastructure Parnerships' Proposed TIP-1 230 kV Transmission Line, in Parts of Kidd, Wark, Murphy, and Tisdale Townships, in the City of Timmins; and Crawford and Carnegie Townships, All in the District of Cochrane, Ontario

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October 15, 2024

EXECUTIVE SUMMARY

Woodland Heritage Northeast Ltd. was retained by BBA Inc. to compile a cultural heritage screening report (CHSR) for a property (Maps 1 to 4), located in parts of Kidd, Wark, Murphy, and Tisdale Townships, in the City of Timmins; and Crawford and Carnegie Townships, all in the District of Cochrane, Ontario. This CHSR will evaluate the history and current use of the land for a proposed 230-kV transmission line (the Project) from Hydro One's Porcupine Substation to a proposed substation located within Canada Nickel Corporation's proposed Crawford Mine Project. Specifically, this report will screen for the potential of Built Heritage, Archaeological Heritage, and Cultural Heritage Landscapes.

The basis for this screening was accomplished through various means including:

- Research into available mapping;
- The collection and analysis of historical documentary sources;
- Online historical databases, and land tenure records;
- The Ontario Heritage Trust, the City of Timmins, and the Timmins Museum;
- A search of available archaeological reports; and
- A site visit to locate and assess the relative condition of the property, and to determine if any elements of cultural heritage landscapes, or built structures were present on the property.

Conclusions reached through the collection and analysis of above sources include:

1. Several areas of archaeological potential were identified through a Stage 1 archaeological assessment undertaken on the project footprint in 2023. These include several areas with archaeological potential for pre-contact settlement, and a series of portages between the Porcupine River and the Mattagami River. The ongoing archaeological concerns will be addressed through future Stage 2 archaeological assessment work.

2. At the conclusion of the Built Heritage component of this study, it was determined that no standing or collapsed structures were present within the study area boundary (transmission line R.O.W.). Various sources were contacted to inquire as to the property's heritage value and the responses received indicated that no previously identified cultural heritage values were present on the property. In addition, no evidence suggesting the presence of any built structure on the property, either standing or in ruins, was identified through the fieldwork, an examination of historical maps, or satellite imagery.

3. An analysis of the potential for Cultural Heritage Landscapes was undertaken based on guidance from the 0500E MCM Checklist, as well as the direction provided by UNESCO, and no evidence of cultural heritage landscapes was found to be associated with the footprint of the proposed TIP-1 transmission line study area.

4. Finally, the property was subjected to the 0500E_Built_Heritge_Checklist and a result of low potential was reached at its conclusion (see Appendix 1).

Recommendations:

1. It has been recommended in report P208-0330-2023 (the Stage 1 assessment of the TIP-1 cooridor), that the areas of archaeological potential identified during the assessment be surveyed and mitigated by way of undertaking Stage 2 archaeological assessment (survey) work on those identified areas of archaeological potential.

2. As no cultural heritage landscapes have been identified independently of the conclusions reached during the archaoelogical assessment, no further heritage investigations into cultural heritage landscapes are recommended.

3. As no standing structures or other structural remains were located within the right-of-way of the TIP-1 transmission line, no further built heritage work is recommended.

In sum, further Built Heritage and Cultural Heritage Landscape work is not recommended at this time. However, further Archaeological Heritage work is recommended for the parts of the property defined as having potential in the Stage 1 archaeological report prepared by WHNE under P208-0330-2023, for the proposed TIP-1 Transmission Line.

CORPORATE INFORMATION

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We would like to acknowledge the assistance of BBA Inc. in providing background information and project support through the development of this report.

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1.0 INTRODUCTION

The following report was produced to provide a basis for future built heritage or cultural heritage reports (if required). It is designed to be a screening tool and is designed to provide the reader with initial considerations regarding the heritage potential of the property in question.

1.1 Purpose of this Report

The Cultural Heritage Screening Report (CHSR) component is prepared to investigate the potential of archaeological values, cultural landscape values, and built heritage values being present within the proposed TIP-1 transmission line footprint, and to recommend appropriate assessment strategies to further identify and mitigate or preserve these values.

Criteria have been developed by ministries to assist those pursuing development activities, such as municipalities, corporate entities, and Government Ministries, in the evaluation of properties which have the potential to be considered Heritage Properties, to have archaeological values, or to be a part of cultural heritage landscapes. This document reviewed information collected through background research and field inspections, and compared the results against the established criteria to develop approapriatew recommendations and advice to manage the heritage aspects of the overall TIP-1 transmission line.

All accessible areas have been visited to undertake documentation of ground conditions, and heritage inventory work. To evaluate all areas which were not accessible, high resolution satellite imagery, low altitude UAV captures, and historical aerial photographs were used to evaluate the heritage potential of the land.

A set of recommendations has been provided to guide the proponent in the best way forward to adequately assess the overall Cultural Heritage of the study area.

1.2 Description of the Proposed Development

The proposed development (Maps 1 to 4) will include the establishment of a new 230 kV transmission line (TIP-1) between the Porcupine Substation in Timmins and the proposed Crawford Substation approximately 40 kilometres to the north. The proposed transmission line will follow along the existing transmission line linking the Porcupine Substation to the Kidd Creek Mine, as well as the 500 kV transmission line running from Pinard Transformer Station south to Toronto. Once north of the Kidd Creek Mine, the proposed transmission line diverges northwest along a new alignment west of both the 500 kV transmission line and Highway 655, where it then deviates eastwards towards the proposed Crawford Substation. The footprint of the proposed development is for a 50-metre right-of-way, where the structure locations will be grubbed, but all vegetation within the 50 m right-of-way will be brought to 30 cm for construction. A travel lane will be within the right-of-way (~3 m) which will require either matting, grubbing, or ice/snow roads, though this will be determined at a later date.

2.0 HISTORY OF THE PROPERTY

The overall history of the property can generally be divided into two broad categories, this history of First Nations prior to the continued contact with European populations, and the history of both the First Nations (and other Indigenous groups), and people of European descent after the contact period. An archaeological history of northeastern Ontario has been provided as an endnote[i]. This archaeological history discusses some of the changing settlement and technological manifestations archaeologists have identified, and as such it has relevance to the archaeological heritage potential of the property, but as it is not specifically related to the project, it is not included in the body of this report.

The following descriptions are both from a post-contact perspective and are included to form a basis of the overall Cultural Heritage Screening Report.

2.1 Indigenous Land Use

Traditional knowledge regarding the historical use of the land by Indigenous people is often curated and passed down by Indigenous Elders and Knowledge Keepers. Areas of cultural and historical importance to Indigenous communities are best identified by the communities and members themselves.

2.1.1 The Effect of Early Post-Contact Period on Indigenous People

European contact in northern Ontario was disruptive to the natural evolution of material culture, traditional land use, and subsistence practice among indigenous populations. It is understood that traditional material cultural items were supplanted quite rapidly by corresponding trade items imported from Europe. As the pursuit of furs became increasingly important to the purchase and replacement of trade items, subsistence practices became displaced by exploitation of fur resources. Gradually, settlement patterns also changed, trading trips to fur trade posts were introduced, and in some cases settlement occurred at or near fur trade posts or, later, near the railways.

Historical documents also begin to name the indigenous occupants of the region. The northern interior shield areas were inhabited by Anishinaabeg (Ojibwe, Odawa, Mississauga, Nipissing, Algonquin, and Potawatomi), while farther north in Ontario was the traditional territory of the Néhinaw/Iliiw/Ininiw (Cree). Further south, the traditional Indigenous groups settled near Georgian Bay include the Wendat (Huron) and the Tionontati (Petun/Tobacco), with later additions of Haudenosaunee peoples (Iroquois). The first contact between Europeans and

Indigenous people in the area was with the Recollects and Jesuit missionaries and other French explorers and traders during the early and middle part of the 17th century (Lytwyn 2002).

2.1.2 Indigenous Land Use Specific to the Study Area

The work developing the Archaeological Heritage component of this Cultural Heritage Screening Report was undertaken with the support and participation of Taykwa Tagamou Nation. That said, no specific locations were identified during the earlier fieldwork in 2023, but general discussions of the land use were helpful in forming part of the background research to this overall CHSR.

2.1.2.1 Discussions with Taykwa Tagamou Nation during Fieldwork

A representative from Taykwa Tagamou Nation was present during the fieldwork portion of this screening project. During the fieldwork the possibility of past settlement along the relict shorelines was discussed, and it was acknowledged that although no direct evidence of the occupations of the shorelines which intersect the transmission coordidor study area was available, there would have existed an opportunity for the settlement of these shorelines during the mid-Holocene.

In the southern portion of the study area, a mapped portage was identified through the background work. It was acknowledged by the TTN representative that it was likely that this portage existed during pre-contact times as it connected the Mattagami River with the Porcupine River.

As a result, both sets of features were incorporated into the considerations of the archaeological heritage potential of the study area. These areas have been recommended for future Stage 2 archaeological work in the Stage 1 archaeological report prepared under PIF P208-0330-2023.

2.1.3 Existing Treaties

It is not within the scope of this report to comment on the social implications, intent, or fulfillment of the conditions of the various treaties which have been established in the province. First Nations should be consulted directly should additional information be sought on the following commentary on the Treaties.

The study area is located in an area covered by Treaty 9, where in 1905 and 1906, treaty commissioners operating on behalf of the Canadian government visited various Anishinaabe and Cree communities located north of the height of land in northern Ontario. With the signing of Treaty 9, these communities ceded their traditional land and reserves for their settlement were set aside. Additional adhesions to Treaty 9 were made in 1929 and 1930, extending the treaty area from the Albany River to Hudson's Bay.

2.1.4 Euro-Canadian Land Use Specific to the Study Area

The Townships of Carnegie, Crawford, Kidd, Murphy, Tisdale, and Wark were first surveyed between 1903 and 1905 by Ontario Land Surveyors from the Surveys Branch of the Ontario Department of Lands and Forests (Maps 5 to 8). With the exception of a set of portages linking the Porcupine River to the Mattagami River, no cultural features were recorded in the townships (Map 8). The surveyor reports note that no settlers or improvements were present in the townships at the turn of the 20th century (Cavana and Watson 1903; Brown 1904; Fitton 1905; Fitzgerald 1905; and Holcroft 1905a, 1905b).

The post-contact land use of the study area began shortly after the mineral discoveries in the vicinity of Timmins. Some time prior to 1925, a wagon road (Map 9) was constructed along the sandy ridges towards Bigwater Lake and the "Sand Claims", described as "great gravel and sand pits from which millions of tons of material have been removed […] for supplying a mine with "fill" – the material that must be placed in the underground workings to take the place of the ore removed," (Noel et al. 1937:69). The road was later improved and paved as an access road to the Texas Gulf Sulphur Company's Kidd Creek operation. Major road work began in 1965 and the paved road to the mine was completed the following year. In order to facilitate access from Timmins to the far north, the Department of Transportation extended the highway northwards to Highway 11 at Driftwood in 1978, and the highway was renamed to Highway 655 (Ontario Department of Highways 1966; Mining Life & Exploration News 2016). Prior to the discovery at Kidd Creek and the construction of the highway, "access into those flat swampy lands north of Timmins was from seasonal logging roads and gravel roads originating off the Ice Chest Lake Road near Connaught and Frederickhouse Lake. One could also elect to travel by water craft on the back waters of the Mattagami River created by the Lower Sturgeon Generating Station built in 1923," (Mining Life & Exploration News 2016:26).

By the middle part of the 20th century, the mineral exploration activities in the Timmins area had expanded northwards, and much of the Crown land was patented or leased to mining companies for exploration purposes. In the immediate vicinity of the transmission line, the only developments of note include the Kidd Creek Mine in Kidd Township, first discovered in the early 1960s, and the ERG tailings basin, where historical tailings from the Timmins area were re-milled and stored in the late 1980s (The Northern Miner, 31 October 1988).

In 1961, construction began on a transmission line which would join the Pinard Transformer Station north of Cochrane to the future Porcupine Transformer Station:

> 36 miles of the transmission-line right of way were cleared. For the northern section, between Timmins and Pinard Transformer Station, the major part of the right of way was cleared, and 100 transmission towers were delivered to the site in preparation for the erection of the line.

> The use of guyed, V-type transmission towers on this line represents a significant change in the Commission's transmission tower design practice, and follows a trend which has been developing among electrical utilities, both in Europe and in North America. Design studies conducted by the Commission indicated that for the requirements of the extra-high-voltage line, with foundations and accessories included, a conventional self-supporting steel tower would weigh approximately 19,000 pounds, and a guyed steel tower only 11,000 pounds. This reduction in weight, and the relative ease with which the guyed towers can be transported and erected will be of distinct advantage in the remote and rugged area where the line is being constructed. In comparison with the self-supporting tower, the guyed tower is expected to result in an over-all saving in installed cost. Of the 828 towers to be installed on the line, 100 will be fabricated of aluminum, and the balance of steel. Though the cost of the aluminum tower members is greater, their lighter weight will permit savings in erection costs. The erection of both types of guyed towers on the same line will enable the Commission to make a detailed comparison of the installed costs of towers fabricated from the two materials.
>
> A program of full-scale tests in the field was conducted in order to develop guy anchorages and methods for their installation which will be suitable for use in the relatively inaccessible north country where maintenance costs must be kept at a minimum.
>
> Each phase of the single circuit to be carried on the line will consist of a bundle of four 0.9-inch-diameter conductors spaced 18 inches apart in a square pattern.

HEPCO 1961:82-83

A 60-metre-wide transmission line right-of-way (ROW) was established (Map 10), poles were erected (Images 1 and 2), and by 1967, the Porcupine Transformer Station was in service. At this new transformer station, the 500 kV line transmitted electricity from the hydroelectric stations in the James Bay watershed southwards to the Hanmer Transformer Station in Sudbury, and ultimately the Kleinburg Transformer Station in the Toronto area. By 1969, the transformer station was also upgraded to provide improved 115 kV supply in the Timmins area (HEPCO 1968). Through the installation of this high-voltage transmission line, Hydro One was able to centralize the power generated by the northern generating stations to send energy south, as well as gather additional energy to prepare for the lesser power-generating months (HEPCO 1967). Based on the available information, the transmission line ROW location and width have not been modified since the initial construction of the line. No information was found to suggest that cultural heritage concerns were present in the area prior to the development of the transmission line.

No additional details are readily available for the settlement history of the study area.

2.1.5 General History of the Timmins Area

The Timmins area is characterized by a mix of urban and industrial development superimposed on a background of coniferous and mixed deciduous coniferous boreal forest. The City of Timmins consists of a major downtown urban area, as well as a number of other smaller urban centres scattered throughout the area, with Schumacher, South Porcupine, and Connaught Hill being the more prominent of these smaller centres. Various other smaller hamlets also occur throughout the area, such as Gold Centre, the Aunor, Buffalo-Ankerite and Delnite areas, and several other small clusters of residences. Many or most of these communities have grown up around former mine sites. All of these areas, together with a much larger surrounding region, were amalgamated in 1973 to form the City of Timmins.

South Porcupine and other communities to the east are linked to Timmins by Highway 101, with a commercial strip occurring along this highway between downtown Timmins and Schumacher. Highway 655 extends north from Highway 101, with linkages to the Timmins airport via Airport Road, and linkages further north to Kidd Mine site, the proposed Canadian Nickel Company's Crawford Township Project, and Highway 11 at Driftwood. Several major transmission, gas, water, and sewer lines pass through the southern part of the study area area, ot supply local services.

The City of Timmins was founded as a mining centre, with the three prominent original mines being the Hollinger Mine, the McIntyre Mine, and the Dome Mine. Numerous other smaller mines also operated in the local area; many of which were or became linked to the three major mines at one time or another. Some of these smaller mines are currently active. Above and below grade tailings, associated with these active and former mine sites, are widespread throughout the study area. Prominent waste rock piles are associated with the Dome Mine, and are visible from Hwy. 101. There is little evidence of waste rock piles associated with the other mining operations, because all the mines, except for the Dome open pit operation, were underground mines, until the redevelopment of the former Hollinger Mine into an open pit operation. Now the rock piles associated with the redevelopment are clearly visible from the east side of the City.

Topography in the broader Timmins area is dominated by its location at the transition of Precambrian Shield terrain to the south and southwest, and by flat-lying glaciolactrine silt and clay plains to the north and east. An extensive glaciolacustrine sand plain area lies to the south of Timmins, including dune formations, and extends into the lower, southwest portion of the study area (Figure 1.2). A prominent esker / outwash system extends immediately adjacent and parallel to the east side of Highway 655, north from Highway 101. The local topography reaches a maximum of about 365 m above mean sea level (amsl) in the area just southeast of the Hollinger site and north of Gold Mine Road. Further east towards South Porcupine, and within the glaciolacustrine silt and clay plains in the vicinity of the project area, the local topography decreases to as little as 268 m elevation.

The geology of the Timmins area is structurally complex, and includes several major fault zones, and anticline / syncline systems, many of which control surface topographic expressions. The Pearl Lake / Little Pearl Pond, and the Gillies Lake area are controlled by these features, and as a result are the site of deeper sediment accumulations. Bedrock exposures are widespread and frequent throughout the major portion of the study area, but with much reduced expression in the areas dominated by glaciolacustrine silt, clay and sand plains.

Several small lakes and numerous ponds are scattered throughout the area, with larger numbers of ponds having formed along low gradient creek valleys as a result of beaver activity. Most of the area's drainage is captured by the Porcupine and South Porcupine Rivers, which flow east, converging just upstream of Porcupine Lake, northeast of the Dome Mine site. The Porcupine River is a low gradient system that has its headwaters in the area just north and east of the Hollinger site. The Porcupine River drains into Night Hawk Lake and the Frederick House River system. Areas south and west of the Hollinger site drain to either the Skynner Creek or Perch Lake systems, both of which drain to the Mountjoy River, which flows into the Mattagami River. Areas north and west of the Hollinger site drain to Gillies Lake and the Town Creek system, which drains to the Mattagami River; or slightly further north there are a number of smaller drainages that drain directly west to the Mattagami River.

Virtually all drainages in the immediate Timmins area have been affected by existing or past mining activities, which have affected water quality, and to a lesser extent drainage patterns themselves.

The majority of the landscape that has not been developed for urbanization or mining remains in forest cover, with the exception of principal agricultural areas to the north and south of Timmins, near to the Mattagami River, and a number of smaller parcels of land in and around the Porcupine Lake area. Forest communities in the area are virtually all second growth as a result of past logging activities, and fires. Throughout the generally lower-lying, eastern portion of the study area, forest communities are dominated by varying mixtures of black spruce and poplar (trembling aspen and balsam poplar), with white spruce, jack pine, balsam fir, larch and white birch as common associates. Central portions of the study area, where rock outcroppings are common, show similar forest community types, but with a somewhat stronger representation of jack pine. Sandy areas north of Gillies Lake bordering Highway 655, and south and west of the Kayorum (Hollinger) tailings stack, show a dominance of jack pine, or jack pine with poplar. The abundance of poplar in the area is indicative of the level of past disturbance, as poplar species are typically successional and not characteristic of mature forest communities. Virtually all major forest blocks are transected by roads, transmission lines, trails, or other such linear features.

2.2 Land Title Search and Communications with Heritage Groups

Several sources of information were searched as part of this Cultural Hertiage Screening Report. These include the ONLAND property records, the local museums, the town records, and the Ontario Heritage Trust.

2.2.1 Land Title Search

A land title search was carried out using the Ontario Land Property Records Portal, although records pertaining to the initial patenting of the study area are not readily available. The lack of listed records, and the lack of settlement mapping throughout the transmission line ROW, suggests that this potential for both cultural heritage landscapes, as well as built heritage is low, based on this source of information.

2.2.2 Information from Local Sources

2.2.2.1 Timmins Museum and the City of Timmins

Both the Timmins Museum and the town planner for the City of Timmins were contacted to solicit pertinent historical information relating to the study area. Although no replies were received from the Timmins Museum, the planner for the City of Timmins confirmed that there are no designated heritage properties or buildings near the study area. Based on the available information, municipally significant heritage concerns are not likely to be located in the immediate vicinity of the study area.

2.2.2.2. Ontario Heritage Trust

The Ontario Heritage Trust was contacted, and an inquiry was made as to whether the property or any properties in the vicinity had been designated. A reply was received stating that according to their records, there were no designated properties nearby (including the property in question).

2.2.2.3. Ontario's Historical Plaques

A search of Ontario's Historical Plaques database did not result in the identification of any historical plaques within the vicinity of the study area. The nearest Historical Plaques can be found further south in Timmins or further north in Cochrane.

2.2.2.4 Hydro One

Hydro One was contacted for additional information regarding the history of the transmission line. A reply was received stating that they did not have the capacity to provide additional information at this time.

2.2.2.5 Cemeteries

No cemeteries were identified in the study area during a search of the Ontario Genealogical Society's cemetery index and the database of the Canada GenWeb Cemetery Map Project, a database of over 21,000 historical and active Canadian cemeteries. The nearest known cemetery is the Tisdale Cemetery, situated nearly a kilometre east of the transmission line.

3.0 STUDY RESULTS

3.1 Approach to the Screening

The assessment involved the examination of heritage reports of nearby areas, a historical review of the property, and fieldwork to assess the presence of still-standing structures. For evaluation purposes, this report utilized tools available from the Ministry of Citizenship and Multiculturalism (MCM). Among these was the checklist for assessing the Criteria for Evaluating Potential for Built Heritage Resources (Appendix 1), and the UNESCO definitions of Cultural Heritage Landscapes (Appendix 2). The MCM checklist provides a tool for screening for potential built heritage resources and cultural heritage landscapes. Of the criteria, the initial consideration is typically the age of the potential features on a property, namely those 40 years and older. Other considerations evaluated by way of the checklist include prior designation and whether the property is a known interest to Indigenous groups.

The definitions in Appendix 2 draw from two related sources, the more recent operational guidelines of the World Heritage Convention (2023), and the earlier, foundational document, the *2009 World Heritage Cultural Landscapes, a Handbook for Conservation and Management*. Specific to the MCM 0500E checklist, cultural landscapes are described in reference to the cultural heritage landscapes specifically associated with Aboriginal Knowledge.

Cultural Heritage Landscapes are divided into three separate categories with the most common, Category 1, being clearly defined landscapes. These landscapes generally involve the direct modification of the land by humans to create areas of beauty or function, such as gardens and parklands, or monumental structure complexes. These are typically clearly defined. Category 2 landscapes, or organically evolved landscapes, can be described as relict or fossil landscapes, or continuing landscapes which retain an active social role in contemporary society. The former, fossil or relict landscapes are not considered in the same way as cultural heritage landscapes, except insofar as they may be admired by human populations at various times and places. These may be natural features such as water falls, or other prominent geographical features. The Category 3 landscapes are known as associative cultural landscapes. These landscapes are those which gain importance to a community through the association of the area with an event of expression of more ephemeral values such as cermony, historically significant events, or artistic expression.

3.2 Archaeological Heritage Screening

A review of available heritage reports was undertaken as part of the screening process. Two previous archaeological resource assessments have been carried out in the vicinity of the transmission line, including a post-impact assessment carried out for the Kidd Creek Mine in 2008 as well as a Stage 1 archaeological assessment of the proposed Transmission Line in 2023. During the 2008 study, Woodland Heritage Services Ltd. concluded that the development of the Kidd Creek Mine had unlikely impacted any significant pre- or post-contact heritage resources:

> Three areas of pre-mine development archaeological potential were identified at the Kid Creek Mine site based on the Ministry of Culture Archaeological Potential Checklist and the Woodland Heritage Services Potential Checklist. The assessment of potential is primarily based on the presence of small creeks and elevated topography. However, as the area was not on or near a major pre-contact or historic travel route, and there is no destination point ie., a large lake at the headwaters and the creeks are located in a flat swampy terrain with water saturated organic soils overlying clay; the actual chance that any archaeological sites were impacted by the existing mine development is low. As the potential for pre-contact archaeological sites is low, the effect the Kidd Mine may have had on any historical and traditional land use would also have been low.

WHS 2009

The Stage 1 assessment in 2023 concluded that several areas with archaeological potential were present along the proposed transmission line route (WHNE, 2023). The archaeological potential of these areas was found to be associated with modern and historical water sources, as well as historical transportation routes (a portage and a wagon road).

3.2 Built Heritage Screening

Woodland Heritage Northeast examined the available sources in advance of preparing the Checklist of the Criteria for Evaluating Potential for Built Heritage Resources and found no registered built heritage resources within or adjacent to the study area.

The fieldwork component of the Cultural Heritage Screening Report additionally did not observe any structure, standing or in varying states of ruin, along the proposed transmission line right-of-way. The field observations support the results from both the archival work and the historical research.

3.3 Cultural Heritage Landscape Screening

Although a portage was identified in the historical document review, it has been incorporated into the Stage 1 and proposed future Stage 2 archaeological work (MCM PIF # P208-0330-2023, and Map 8). The fieldwork was undertaken with the participation and support of Taykwa Tagamou Nation, and decisions were made at the time of the assessment regarding appropriate measures to address this portage in accordance with the *2011 Standards and Guidelines for Consultant Archaeologists*.

No other cultural heritage landscapes identified as UNESCO defined Category 1-3 Cultural Heritage Landscapes were identified.

3.4 Conclusions

As the proposed transmission line right-of-way is planned to largely cross Crown land and undeveloped patent land, it is somewhat expected that the category of Cultural Heritage which would most aptly apply would be Archaeology. Relict landforms (ancient shorelines associated with Lake Ojibway) were identified through the archaeological work, but to date, it is unknown if these had any relevance to a cultural landscape as research to date has failed to identify past human settlement in association with this phase of Lake Ojibway. That said, the future archaeological component aims to address these questions.

It is important to note that although Highway 655 and the 500 kV transmission line were the closest features on the landscape to the proposed new transmission line, and their respective histories are provided in this screening document, in many places along the proposed TIP-1 transmission line, they are quite distant. As such, the old wagon road and its destination area on Bigwater Lake are not relevant to the conclusions surrounding the cultural heritage potential of the proposed transmission line.

As a result of the background research and a field inspection, no built structures, and no built structures older than 40 years old, were identified on the property. Additionally, while the proposed lands do not appear to be part of a cultural landscape, several areas of archaeological potential were noted, and plans have been established to undertake additional work to survey the areas of archaeological potential identified during the Stage 1 archaeological report under P208-0330-2023 (WHNE, 2023).

With the exception of Archaeological Heritage, the overall proposed TIP-1 Transmission Line is considered to have low potential for both Built Heritage and Cultural Landscape Heritage.

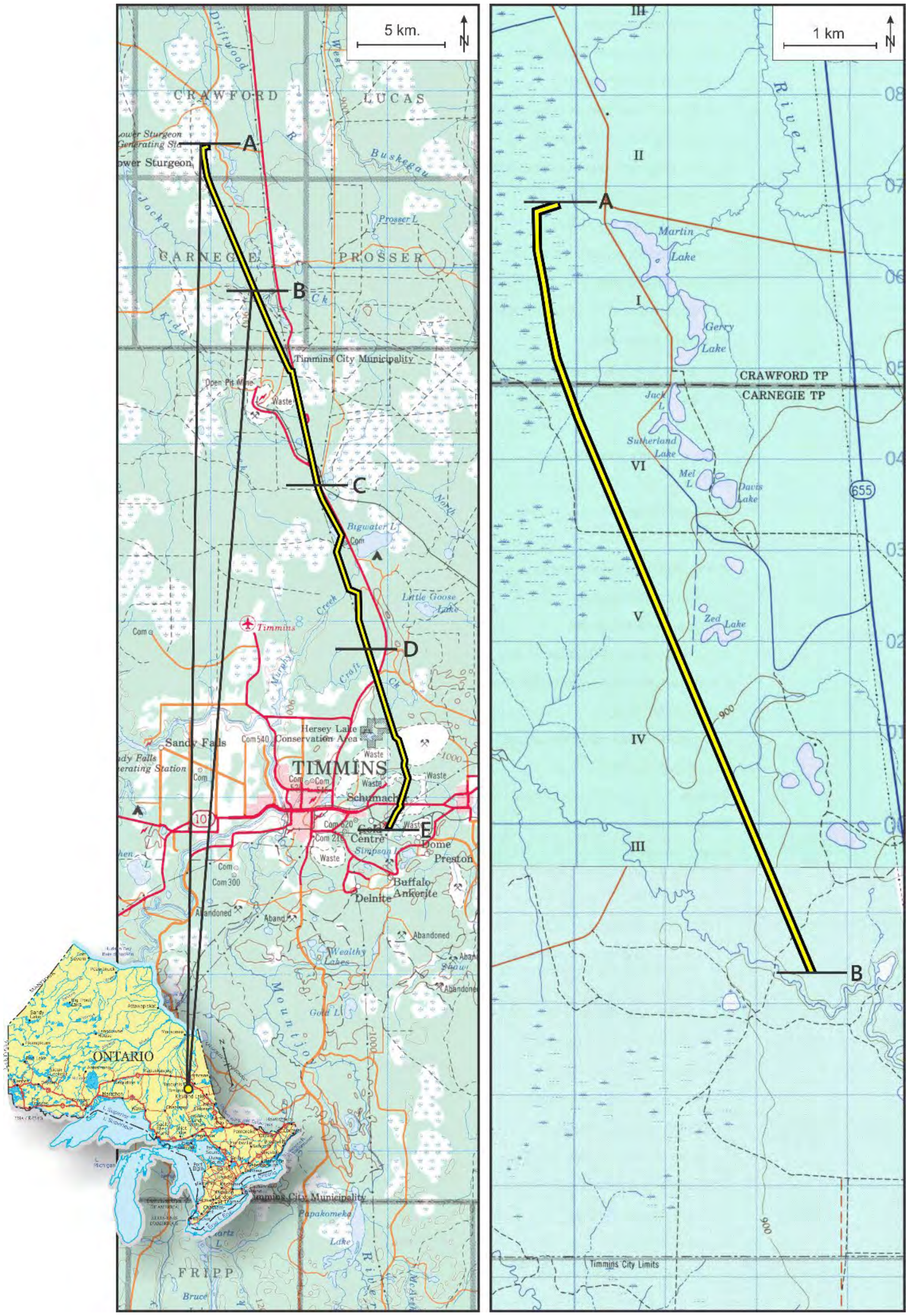
4.0 RECOMMENDATIONS

1. It has been recommended in report P208-0330-2023 (the Stage 1 assessment of the TIP-1 cooridor), that the areas of archaeological potential identified during the assessment be surveyed and mitigated by way of undertaking Stage 2 archaeological assessment (survey) work on those identified areas of archaeological potential.

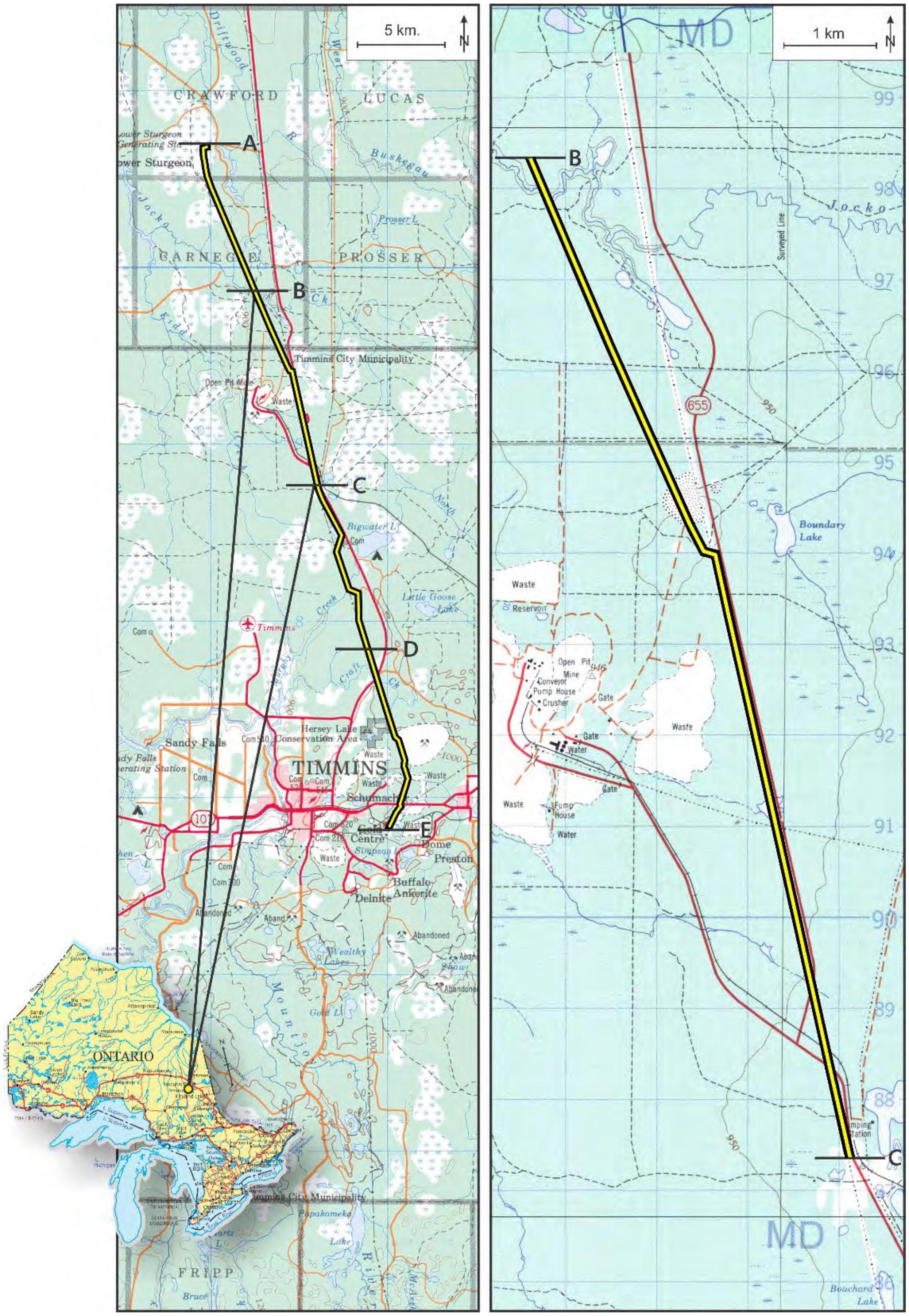
2. As no cultural heritage landscapes have been identified independently of the conclusions reached during the archaoelogicald assessment, no further heritage investiagations into cultural heritage landscapes are recommended.

3. As no standing structures or other structural remains were located within the right-of-way of the TIP-1 transmission line, no further built heritage work is recommended .

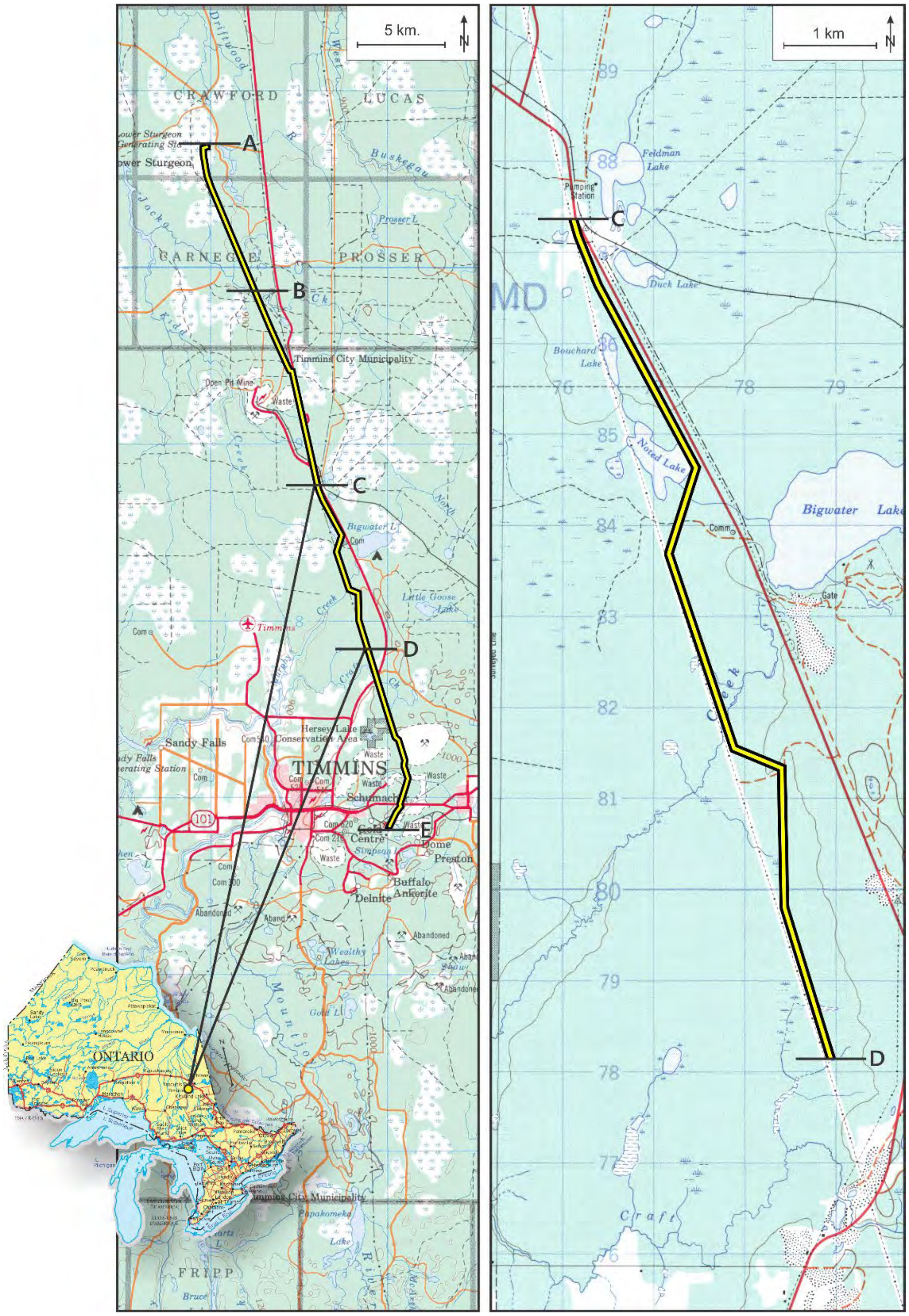
5.0 MAPS



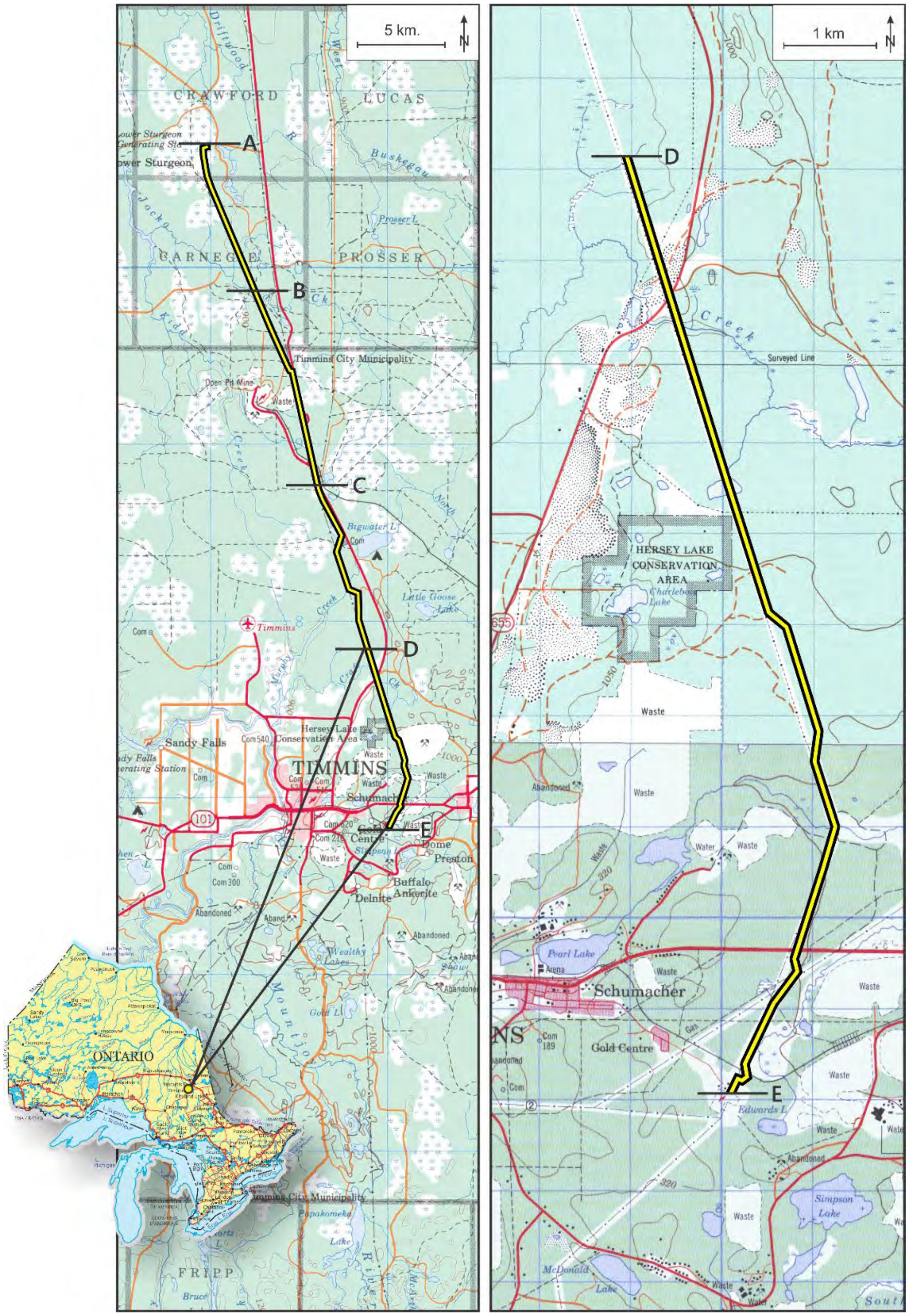
Map 1. Project location map – Section 1.



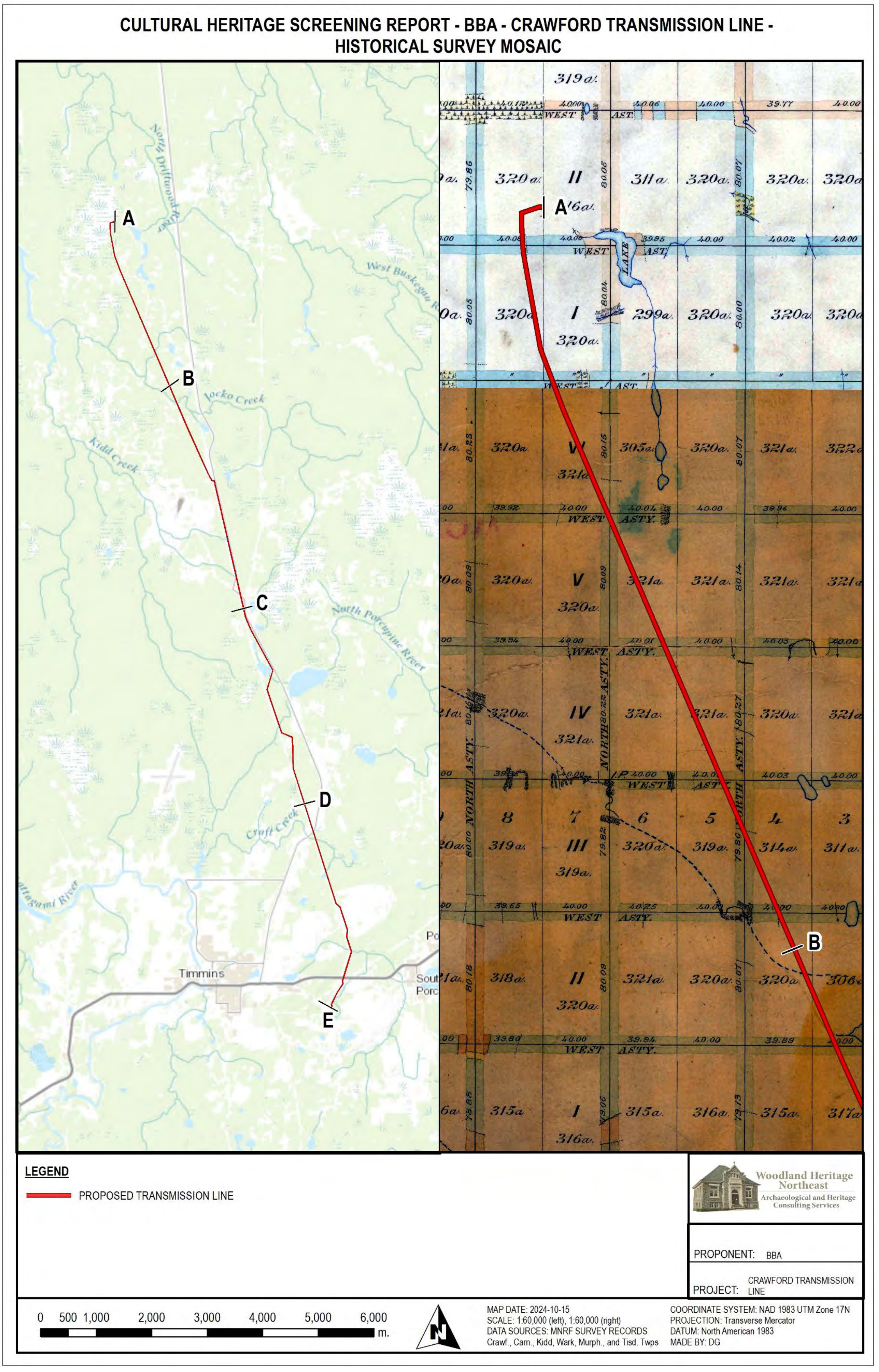
Map 2. Project location map – Section 2.



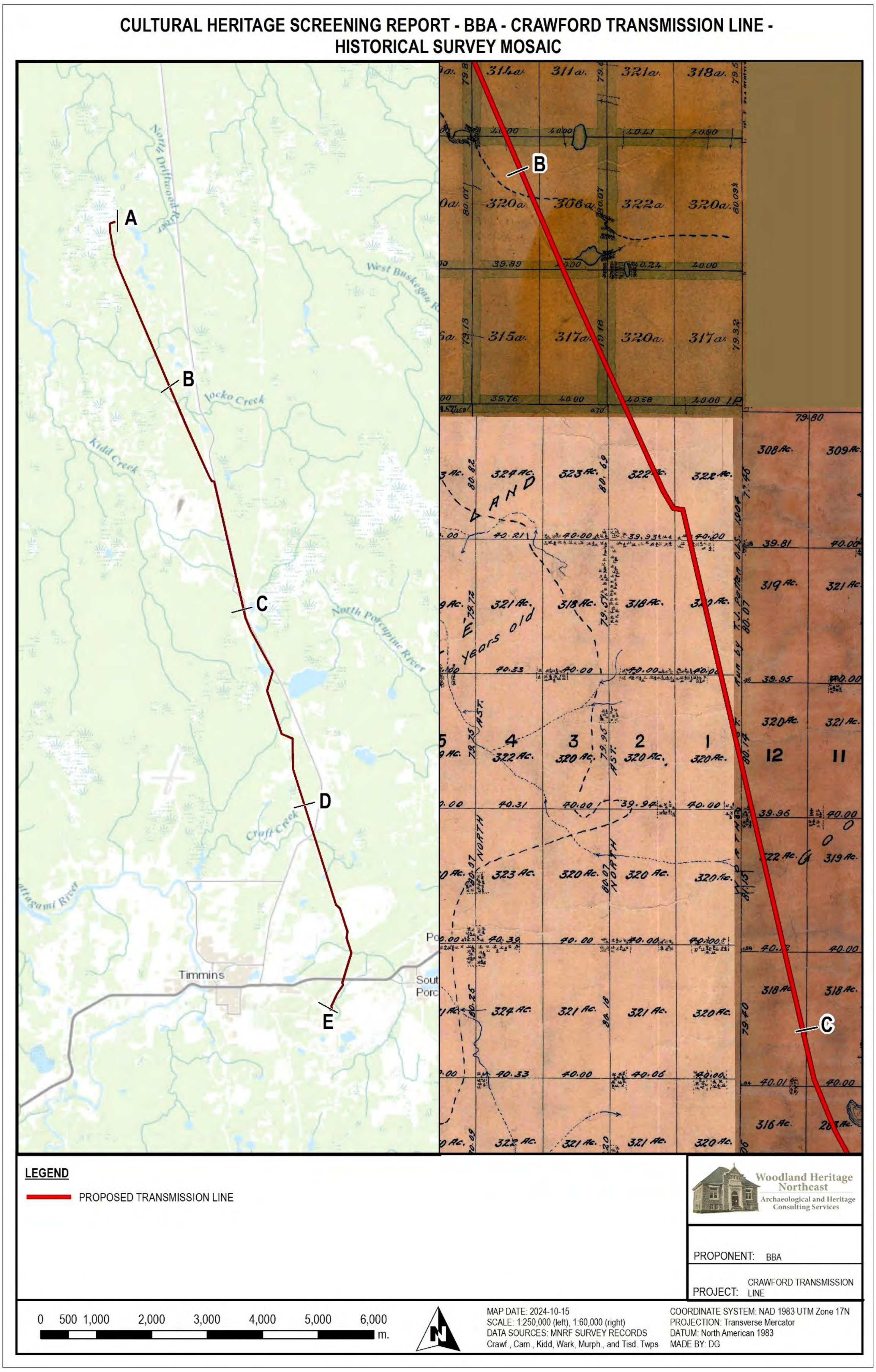
Map 3. Project location map – Section 3.



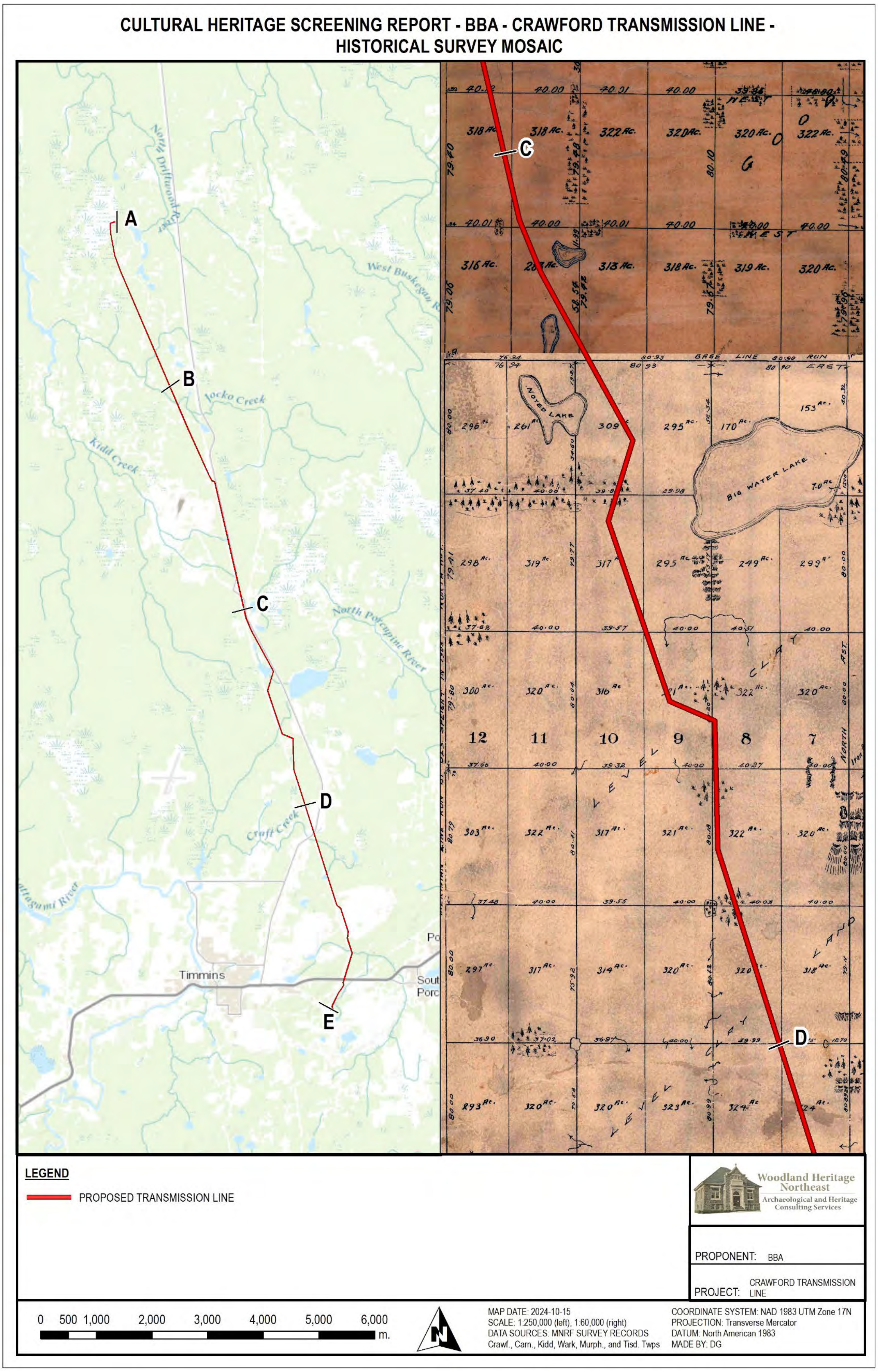
Map 4. Project location map – Section 4.



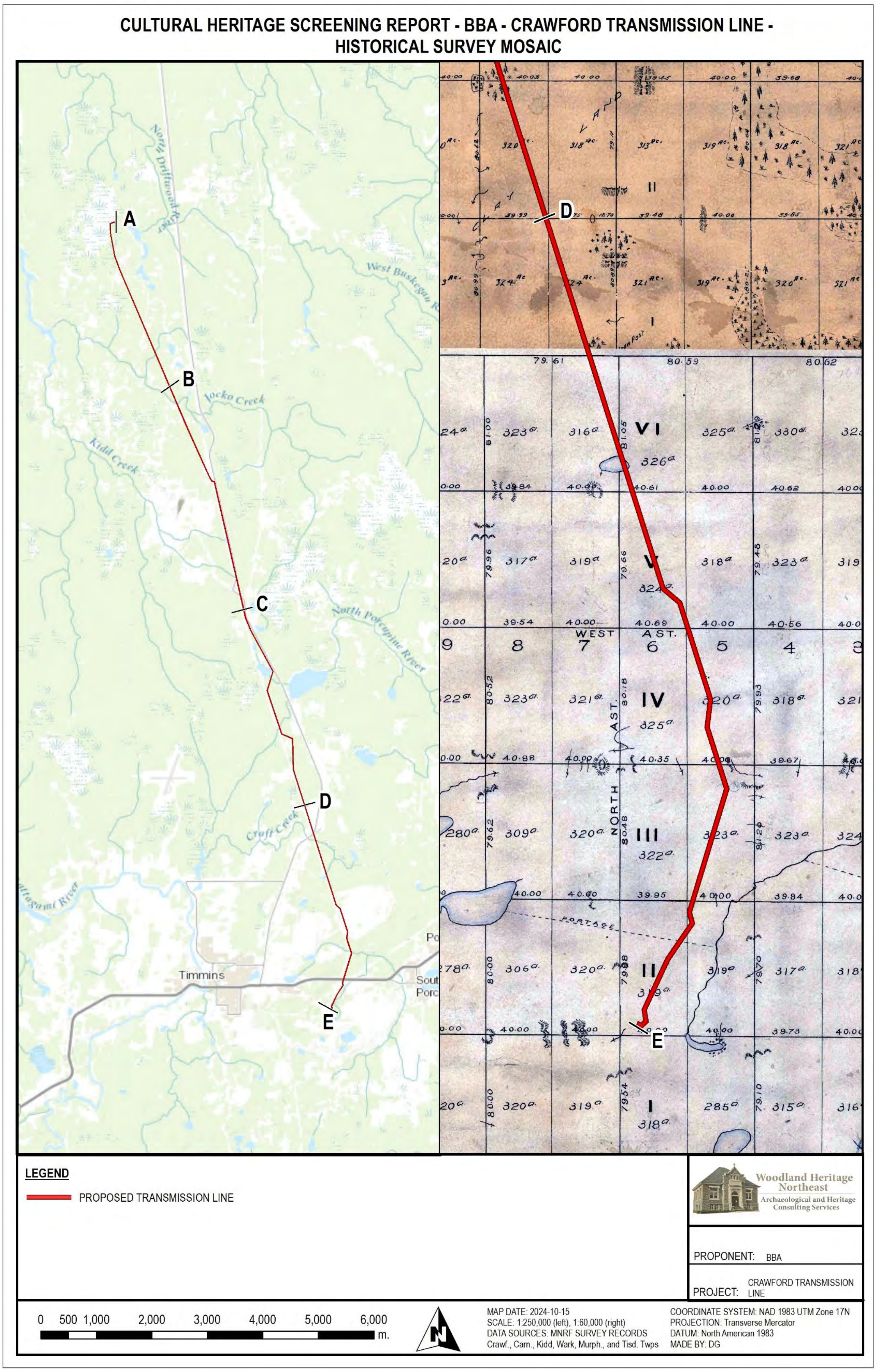
Map 5. Mosaic of historical township surveys from 1903-1905 overlain with the transmission line study area – Section 1.



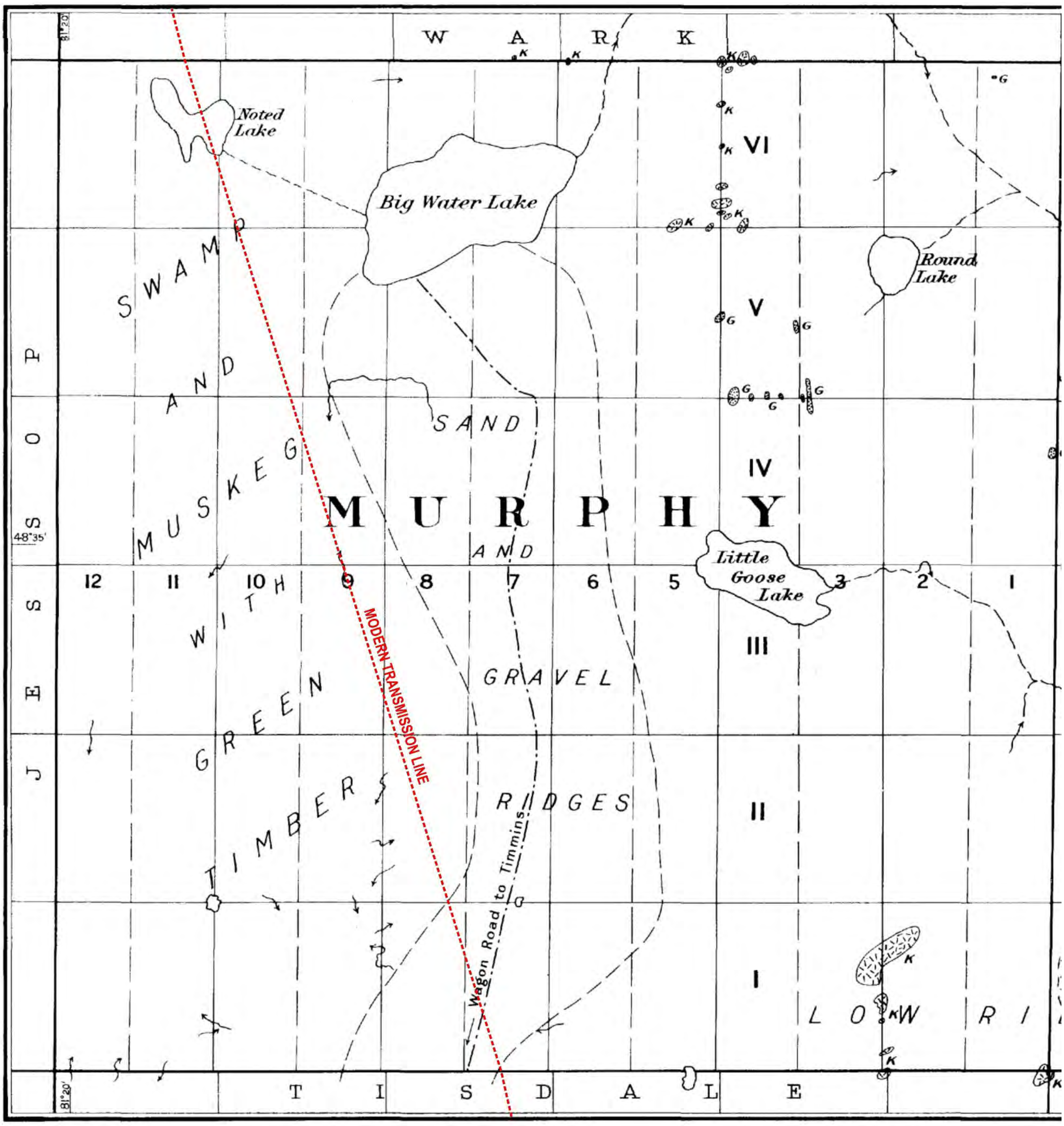
Map 6. Mosaic of historical township surveys from 1903-1905 overlain with the transmission line study area – Section 2.



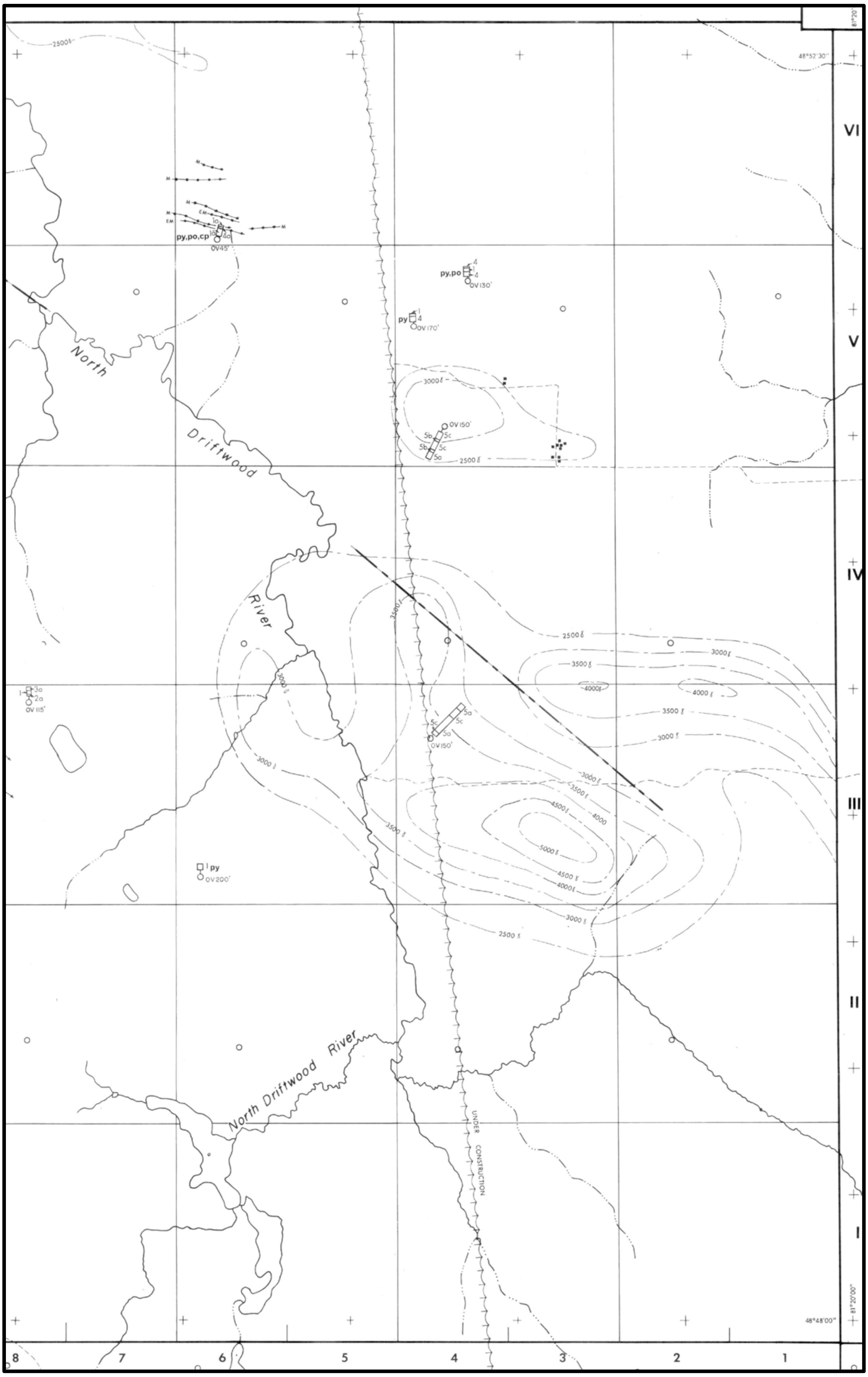
Map 7. Mosaic of historical township surveys from 1903-1905 overlain with the transmission line study area – Section 3.



Map 8. Mosaic of historical township surveys from 1903-1905 overlain with the transmission line study area – Section 4. Note the portage crossing the transmission line on Lot 6, Concession 2 in Tisdale Township.

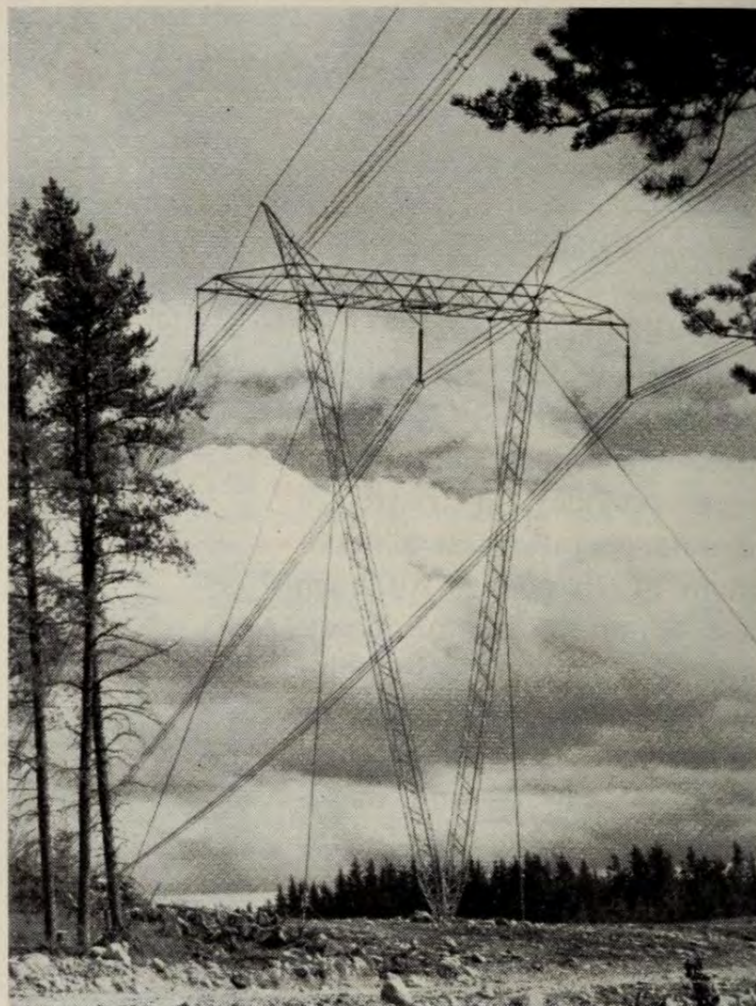


Map 9. Historical map of Murphy Township in 1924 showing the "Wagon Road to Timmins", the precursor of Highway 655. Note: will be revised to show the location of the transmission line and Highway 655. Additionally, it should be noted that "Noted Lake" is mapped incorrectly, the lake should be to the east by a Lot.



Map 10. Excerpt from Department of Mines map P0487 listing the transmission line as "under construction" in 1967, shortly prior to entering service later that year.

6.0 IMAGES



During 1961 the Commission placed orders for approximately 800 V-shaped towers of this type for use on the Ehv line north from Sudbury to power developments in the James Bay watershed. Guyed steel towers are about two-thirds the weight of conventional self-supporting towers, and guyed aluminum towers less than half the weight of guyed steel towers. Economies will result from lower transportation and labour costs in handling guyed towers as compared with self-supporting towers of comparable quality.

Image 1. Photograph and caption excerpted from HEPCO (1961:82) describing the towers to be installed on the transmission line.

Image 2. Photograph taken during the fieldwork showing the typical towers along the transmission line.

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8.0 APPENDICES

Appendix 1. MCM checklist for evaluating potential for built heritage resources and cultural heritage landscapes.

Ontario

Ministry of Tourism, Culture and Sport

Programs & Services Branch
401 Bay Street, Suite 1700
Toronto ON M7A 0A7

Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes

A Checklist for the Non-Specialist

The **purpose of the checklist** is to determine:

- if a property(ies) or project area:
  - is a recognized heritage property
  - may be of cultural heritage value
- it includes all areas that may be impacted by project activities, including – but not limited to:
  - the main project area
  - temporary storage
  - staging and working areas
  - temporary roads and detours

Processes covered under this checklist, such as:

- *Planning Act*
- *Environmental Assessment Act*
- *Aggregates Resources Act*
- *Ontario Heritage Act* – Standards and Guidelines for Conservation of Provincial Heritage Properties

Cultural Heritage Evaluation Report (CHER)

If you are not sure how to answer one or more of the questions on the checklist, you may want to hire a qualified person(s) (see page 5 for definitions) to undertake a cultural heritage evaluation report (CHER).

The CHER will help you:

- identify, evaluate and protect cultural heritage resources on your property or project area
- reduce potential delays and risks to a project

Other checklists

Please use a separate checklist for your project, if:

- you are seeking a Renewable Energy Approval under Ontario Regulation 359/09 – separate checklist
- your Parent Class EA document has an approved screening criteria (as referenced in Question 1)

Please refer to the Instructions pages for more detailed information and when completing this form.

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Project or Property Name
Proposed Crawford Transmission Line

Project or Property Location (upper and lower or single tier municipality)
Parts of Geographic Townships Kidd, Wark, Murphy, and Tisdale Townships, in the City of Timmins

Proponent Name
BBA

Proponent Contact Information
Cathryn.Moffett@bba.ca

Screening Questions

	Yes	No
1. Is there a pre-approved screening checklist, methodology or process in place?		✓

If Yes, please follow the pre-approved screening checklist, methodology or process.

If No, continue to Question 2.

Part A: Screening for known (or recognized) Cultural Heritage Value

	Yes	No
2. Has the property (or project area) been evaluated before and found **not** to be of cultural heritage value?		✓

If Yes, do **not** complete the rest of the checklist.

The proponent, property owner and/or approval authority will:

- summarize the previous evaluation and
- add this checklist to the project file, with the appropriate documents that demonstrate a cultural heritage evaluation was undertaken

The summary and appropriate documentation may be:

- submitted as part of a report requirement
- maintained by the property owner, proponent or approval authority

If No, continue to Question 3.

	Yes	No
3. Is the property (or project area):		
a. identified, designated or otherwise protected under the *Ontario Heritage Act* as being of cultural heritage value?		✓
b. a National Historic Site (or part of)?		✓
c. designated under the *Heritage Railway Stations Protection Act*?		✓
d. designated under the *Heritage Lighthouse Protection Act*?		✓
e. identified as a Federal Heritage Building by the Federal Heritage Buildings Review Office (FHBRO)?		✓
f. located within a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Site?		✓

If Yes to any of the above questions, you need to hire a qualified person(s) to undertake:

- a Cultural Heritage Evaluation Report, if a Statement of Cultural Heritage Value has not previously been prepared or the statement needs to be updated

If a Statement of Cultural Heritage Value has been prepared previously and if alterations or development are proposed, you need to hire a qualified person(s) to undertake:

- a Heritage Impact Assessment (HIA) – the report will assess and avoid, eliminate or mitigate impacts

If No, continue to Question 4.

Part B: Screening for Potential Cultural Heritage Value

	Yes	No
4. Does the property (or project area) contain a parcel of land that:		
a. is the subject of a municipal, provincial or federal commemorative or interpretive plaque?	☐	☑
b. has or is adjacent to a known burial site and/or cemetery?	☐	☑
c. is in a Canadian Heritage River watershed?	☐	☑
d. contains buildings or structures that are 40 or more years old?	☐	☑

Part C: Other Considerations

	Yes	No
5. Is there local or Aboriginal knowledge or accessible documentation suggesting that the property (or project area):		
a. is considered a landmark in the local community or contains any structures or sites that are important in defining the character of the area?	☐	☑
b. has a special association with a community, person or historical event?	☐	☑
c. contains or is part of a cultural heritage landscape?	☐	☑

If Yes to one or more of the above questions (Part B and C), there is potential for cultural heritage resources on the property or within the project area.

You need to hire a qualified person(s) to undertake:

- a Cultural Heritage Evaluation Report (CHER)

If the property is determined to be of cultural heritage value and alterations or development is proposed, you need to hire a qualified person(s) to undertake:

- a Heritage Impact Assessment (HIA) – the report will assess and avoid, eliminate or mitigate impacts

If No to all of the above questions, there is low potential for built heritage or cultural heritage landscape on the property.

The proponent, property owner and/or approval authority will:

- summarize the conclusion
- add this checklist with the appropriate documentation to the project file

The summary and appropriate documentation may be:

- submitted as part of a report requirement e.g. under the *Environmental Assessment Act*, *Planning Act* processes
- maintained by the property owner, proponent or approval authority

Instructions

Please have the following available, when requesting information related to the screening questions below:

- a clear map showing the location and boundary of the property or project area
  - large scale and small scale showing nearby township names for context purposes
- the municipal addresses of all properties within the project area
- the lot(s), concession(s), and parcel number(s) of all properties within a project area

For more information, see the Ministry of Tourism, Culture and Sport's Ontario Heritage Toolkit or Standards and Guidelines for Conservation of Provincial Heritage Properties.

In this context, the following definitions apply:

- **qualified person(s)** means individuals – professional engineers, architects, archaeologists, etc. – having relevant, recent experience in the conservation of cultural heritage resources.
- **proponent** means a person, agency, group or organization that carries out or proposes to carry out an undertaking or is the owner or person having charge, management or control of an undertaking.

1. Is there a pre-approved screening checklist, methodology or process in place?

An existing checklist, methodology or process may already be in place for identifying potential cultural heritage resources, including:

- one endorsed by a municipality
- an environmental assessment process e.g. screening checklist for municipal bridges
- one that is approved by the Ministry of Tourism, Culture and Sport (MTCS) under the Ontario government's Standards & Guidelines for Conservation of Provincial Heritage Properties [s.B.2.]

Part A: Screening for known (or recognized) Cultural Heritage Value

2. Has the property (or project area) been evaluated before and found not to be of cultural heritage value?

Respond 'yes' to this question, if all of the following are true:

A property can be considered not to be of cultural heritage value if:

- a Cultural Heritage Evaluation Report (CHER) - or equivalent - has been prepared for the property with the advice of a qualified person and it has been determined not to be of cultural heritage value and/or
- the municipal heritage committee has evaluated the property for its cultural heritage value or interest and determined that the property is not of cultural heritage value or interest

A property may need to be re-evaluated, if:

- there is evidence that its heritage attributes may have changed
- new information is available
- the existing Statement of Cultural Heritage Value does not provide the information necessary to manage the property
- the evaluation took place after 2005 and did not use the criteria in Regulations 9/06 and 10/06

Note: Ontario government ministries and public bodies [prescribed under Regulation 157/10] may continue to use their existing evaluation processes, until the evaluation process required under section B.2 of the Standards & Guidelines for Conservation of Provincial Heritage Properties has been developed and approved by MTCS.

To determine if your property or project area has been evaluated, contact:

- the approval authority
- the proponent
- the Ministry of Tourism, Culture and Sport

3a. Is the property (or project area) identified, designated or otherwise protected under the *Ontario Heritage Act* as being of cultural heritage value e.g.:

i designated under the *Ontario Heritage Act*

- individual designation (Part IV)
- part of a heritage conservation district (Part V)

Individual Designation – Part IV

A property that is designated:

- by a municipal by-law as being of cultural heritage value or interest [s.29 of the *Ontario Heritage Act*]
- by order of the Minister of Tourism, Culture and Sport as being of cultural heritage value or interest of provincial significance [s.34.5]. **Note**: To date, no properties have been designated by the Minister.

Heritage Conservation District – Part V

A property or project area that is located within an area designated by a municipal by-law as a heritage conservation district [s. 41 of the *Ontario Heritage Act*].

For more information on Parts IV and V, contact:

- municipal clerk
- Ontario Heritage Trust
- local land registry office (for a title search)

ii. subject of an agreement, covenant or easement entered into under Parts II or IV of the *Ontario Heritage Act*

An agreement, covenant or easement is usually between the owner of a property and a conservation body or level of government. It is usually registered on title.

The primary purpose of the agreement is to:

- preserve, conserve, and maintain a cultural heritage resource
- prevent its destruction, demolition or loss

For more information, contact:

- Ontario Heritage Trust - for an agreement, covenant or easement [clause 10 (1) (c) of the *Ontario Heritage Act*]
- municipal clerk – for a property that is the subject of an easement or a covenant [s.37 of the *Ontario Heritage Act*]
- local land registry office (for a title search)

iii. listed on a register of heritage properties maintained by the municipality

Municipal registers are the official lists - or record - of cultural heritage properties identified as being important to the community.

Registers include:

- all properties that are designated under the *Ontario Heritage Act* (Part IV or V)
- properties that have not been formally designated, but have been identified as having cultural heritage value or interest to the community

For more information, contact:

- municipal clerk
- municipal heritage planning staff
- municipal heritage committee

iv. subject to a notice of:

- intention to designate (under Part IV of the *Ontario Heritage Act*)
- a Heritage Conservation District study area bylaw (under Part V of the *Ontario Heritage Act*)

A property that is subject to a **notice of intention to designate** as a property of cultural heritage value or interest and the notice is in accordance with:

- section 29 of the *Ontario Heritage Act*
- section 34.6 of the *Ontario Heritage Act*. **Note**: To date, the only applicable property is Meldrum Bay Inn, Manitoulin Island. [s.34.6]

An area designated by a municipal by-law made under section 40.1 of the *Ontario Heritage Act* as a **heritage conservation district study area**.

For more information, contact:

- municipal clerk – for a property that is the subject of notice of intention [s. 29 and s. 40.1]
- Ontario Heritage Trust

v. included in the Ministry of Tourism, Culture and Sport's list of provincial heritage properties

Provincial heritage properties are properties the Government of Ontario owns or controls that have cultural heritage value or interest.

The Ministry of Tourism, Culture and Sport (MTCS) maintains a list of all provincial heritage properties based on information provided by ministries and prescribed public bodies. As they are identified, MTCS adds properties to the list of provincial heritage properties.

For more information, contact the MTCS Registrar at registrar@ontario.ca.

3b. Is the property (or project area) a National Historic Site (or part of)?

National Historic Sites are properties or districts of national historic significance that are designated by the Federal Minister of the Environment, under the *Canada National Parks Act*, based on the advice of the Historic Sites and Monuments Board of Canada.

For more information, see the National Historic Sites website.

3c. Is the property (or project area) designated under the *Heritage Railway Stations Protection Act*?

The *Heritage Railway Stations Protection Act* protects heritage railway stations that are owned by a railway company under federal jurisdiction. Designated railway stations that pass from federal ownership may continue to have cultural heritage value.

For more information, see the Directory of Designated Heritage Railway Stations.

3d. Is the property (or project area) designated under the *Heritage Lighthouse Protection Act*?

The *Heritage Lighthouse Protection Act* helps preserve historically significant Canadian lighthouses. The Act sets up a public nomination process and includes heritage building conservation standards for lighthouses which are officially designated.

For more information, see the Heritage Lighthouses of Canada website.

3e. Is the property (or project area) identified as a Federal Heritage Building by the Federal Heritage Buildings Review Office?

The role of the Federal Heritage Buildings Review Office (FHBRO) is to help the federal government protect the heritage buildings it owns. The policy applies to all federal government departments that administer real property, but not to federal Crown Corporations.

For more information, contact the Federal Heritage Buildings Review Office.

See a directory of all federal heritage designations.

3f. Is the property (or project area) located within a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Site?

A UNESCO World Heritage Site is a place listed by UNESCO as having outstanding universal value to humanity under the Convention Concerning the Protection of the World Cultural and Natural Heritage. In order to retain the status of a World Heritage Site, each site must maintain its character defining features.

Currently, the Rideau Canal is the only World Heritage Site in Ontario.

For more information, see Parks Canada – World Heritage Site website.

Part B: Screening for potential Cultural Heritage Value

4a. Does the property (or project area) contain a parcel of land that has a municipal, provincial or federal commemorative or interpretive plaque?

Heritage resources are often recognized with formal plaques or markers.

Plaques are prepared by:

- municipalities
- provincial ministries or agencies
- federal ministries or agencies
- local non-government or non-profit organizations

For more information, contact:

- municipal heritage committees or local heritage organizations – for information on the location of plaques in their community
- Ontario Historical Society's Heritage directory – for a list of historical societies and heritage organizations
- Ontario Heritage Trust – for a list of plaques commemorating Ontario's history
- Historic Sites and Monuments Board of Canada – for a list of plaques commemorating Canada's history

4b. Does the property (or project area) contain a parcel of land that has or is adjacent to a known burial site and/or cemetery?

For more information on known cemeteries and/or burial sites, see:

- Cemeteries Regulations, Ontario Ministry of Consumer Services – for a database of registered cemeteries
- Ontario Genealogical Society (OGS) – to locate records of Ontario cemeteries, both currently and no longer in existence; cairns, family plots and burial registers
- Canadian County Atlas Digital Project – to locate early cemeteries

In this context, adjacent means contiguous or as otherwise defined in a municipal official plan.

4c. Does the property (or project area) contain a parcel of land that is in a Canadian Heritage River watershed?

The Canadian Heritage River System is a national river conservation program that promotes, protects and enhances the best examples of Canada's river heritage.

Canadian Heritage Rivers must have, and maintain, outstanding natural, cultural and/or recreational values, and a high level of public support.

For more information, contact the Canadian Heritage River System.

If you have questions regarding the boundaries of a watershed, please contact:

- your conservation authority
- municipal staff

4d. Does the property (or project area) contain a parcel of land that contains buildings or structures that are 40 or more years old?

A 40 year 'rule of thumb' is typically used to indicate the potential of a site to be of cultural heritage value. The approximate age of buildings and/or structures may be estimated based on:

- history of the development of the area
- fire insurance maps
- architectural style
- building methods

Property owners may have information on the age of any buildings or structures on their property. The municipality, local land registry office or library may also have background information on the property.

Note: 40+ year old buildings or structure do not necessarily hold cultural heritage value or interest; their age simply indicates a higher potential.

A building or structure can include:

- residential structure
- farm building or outbuilding
- industrial, commercial, or institutional building
- remnant or ruin
- engineering work such as a bridge, canal, dams, etc.

For more information on researching the age of buildings or properties, see the Ontario Heritage Tool Kit Guide Heritage Property Evaluation.

Part C: Other Considerations

5a. Is there local or Aboriginal knowledge or accessible documentation suggesting that the property (or project area) is considered a landmark in the local community or contains any structures or sites that are important to defining the character of the area?

Local or Aboriginal knowledge may reveal that the project location is situated on a parcel of land that has potential landmarks or defining structures and sites, for instance:

- buildings or landscape features accessible to the public or readily noticeable and widely known
- complexes of buildings
- monuments
- ruins

5b. Is there local or Aboriginal knowledge or accessible documentation suggesting that the property (or project area) has a special association with a community, person or historical event?

Local or Aboriginal knowledge may reveal that the project location is situated on a parcel of land that has a special association with a community, person or event of historic interest, for instance:

- Aboriginal sacred site
- traditional-use area
- battlefield
- birthplace of an individual of importance to the community

5c. Is there local or Aboriginal knowledge or accessible documentation suggesting that the property (or project area) contains or is part of a cultural heritage landscape?

Landscapes (which may include a combination of archaeological resources, built heritage resources and landscape elements) may be of cultural heritage value or interest to a community.

For example, an Aboriginal trail, historic road or rail corridor may have been established as a key transportation or trade route and may have been important to the early settlement of an area. Parks, designed gardens or unique landforms such as waterfalls, rock faces, caverns, or mounds are areas that may have connections to a particular event, group or belief.

For more information on Questions 5.a., 5.b. and 5.c., contact:

- Elders in Aboriginal Communities or community researchers who may have information on potential cultural heritage resources. Please note that Aboriginal traditional knowledge may be considered sensitive.
- municipal heritage committees or local heritage organizations
- Ontario Historical Society's "Heritage Directory" - for a list of historical societies and heritage organizations in the province

An internet search may find helpful resources, including:

- historical maps
- historical walking tours
- municipal heritage management plans
- cultural heritage landscape studies
- municipal cultural plans

Information specific to trails may be obtained through Ontario Trails.

Appendix 2. UNESCO Description of Cultural Heritage Landscapes

UNESCO Cultural Landscapes	Descriptions: [World Heritage Convention pages 22-23]	Cultural Landscapes Definition:
Cultural Landscape Category 'i':	"The most easily identifiable is the **clearly defined landscape** designed and created intentionally by man. This embraces garden and parkland landscapes constructed for aesthetic reasons which are often (but not always) associated with religious or other monumental buildings and ensembles."	This is a landscape that was intentionally designed or created by humans in which its value is a representation of human creativity or 'genius' (UNESCO 2009:20, 121). Examples of this includes human-made landscapes like aesthetically designed parks or gardens, and monumental buildings.
Cultural Landscape Category ii: **Organically Evolved Landscape**	"The second category is the o**rganically evolved landscape**. This results from an initial social, economic, administrative, and/or religious imperative and has developed its present form by association with and in response to its natural environment. Such landscapes reflect that process of evolution in their form and component features. They fall into two sub-categories: - a **relict (or fossil) landscape** is one in which an evolutionary process came to an end at some time in the past, either abruptly or over a period. Its significant distinguishing features are, however, still visible in material form. - a **continuing landscape** is one which retains an active social role in contemporary society closely associated with the traditional way of life, and in which the evolutionary process is still in progress. At the same time it exhibits significant material evidence of its evolution over time."	This category is a reflection of the evolution of the relationship between human-based actions (social, economic, administrative, and/or religious imperatives) has evolved into its current state, or were affected by, the natural environment/environmental processes. Where cultural or traditional peoples/groups and the environment coexist may have resulted in unique developments of architecture, technology, arts or landscape design. This category may also represent architectural or technological designs demonstrating important stages in human history. In sum, this category depicts the interconnection between humans and their environment, and how they adapted to either suit the environment, or modified the environment to suit their needs (UNESCO 2009:20, 121). There are two subcategories: - **Relict (or Fossil) Landscape**: This subcategory reflects the end of an evolutionary process, including the disappearance of a cultural group or civilization, of which the remnants are visible and identifiable in the landscape. - **A Continuing Landscape**: Rather than reflecting the end of an evolutionary process, this subcategory represents a living and possibly still-evolving landscape. This subcategory is a living reflection of a traditional way of life, persisting in the present-day.
Cultural Landscape Category iii: **Associative Cultural Landscape**	"the final category is the **associative cultural landscape**. The inclusion of such landscapes on the World Heritage List is justifiable by virtue of the powerful religious, artistic or cultural associations of the natural element rather than material cultural evidence, which may be insignificant or even absent."	This category of landscape is given its value based on its living/significant association where the natural landscape is closely tied to historical events, traditions, religion, art, or culture. Rather than being a landscape based on visual or material culture (that may or may not be present in the landscape), it is assigned importance based on the value given to it by living peoples.

[i] Archaeological History of Northeastern Ontario

The historical division of the various early periods of the Aboriginal populations of northeastern Ontario is generally divided along the various technological manifestations which can be more or less sequenced into discrete, but general categories which describe pre-European contact and post-European contact periods. The pre-contact historical sequence is further subdivided into temporal/cultural periods based on material culture traits and settlement patterns derived from archaeological data, and historical records. The pre- contact sequence is divided as follows and is provided to establish a context for the considerations of Archaeological Heritage, Built Heritage, and Cultural Landscape Heritage:

- Terminal Pleistocene and Initial Holocene Cultural Periods (before 8,500 B.P.[i])
- Mid-Holocene Cultural Periods (circa 8,500–2,500 B.P.)
- Early and Middle Ceramic Periods (circa 2,500–800 B.P.)
- Late Ceramic Period (circa 800–350 B.P.)

<u>Terminal Pleistocene and Initial Holocene Cultural Periods</u>

As a result of recent archaeological work in the shield regions of Ontario, it is suspected that there is an Initial Holocene Cultural (>8,500 B.P.) component of human occupation in this part of Ontario. This contrasts with earlier interpretations, which seemed to suggest that it was not until the mid-Holocene which recorded the first peopling of the area. At this time, very little is known about the details of the Initial Holocene Cultural Period of the shield area of Ontario, although if similar to those reports outside of the region, the period may be characterised by finely worked projectile point forms (e.g. Agate Basin), and the predation of large game such as Barren Land Caribou (*Rangifer tarandus groenlandicus*). Elsewhere, Initial Holocene people predated the ancient Bison (*Bison antiquus*), though its presence in Ontario has yet to be confirmed.

Initial Holocene peoples may have also supplemented their diets with locally-available boreal subsistence resources such as woodland caribou, moose, beaver, hare, fish, and waterfowl. Faunal data from archaeological sites in the upper Great Lakes region suggests that Early- to Mid-Holocene populations had already developed a generalized foraging strategy, employing a broad variety of faunal resources from a range of ecological settings, including large and small mammals, waterfowl, and fish (Kuehn 1988, Jackson and Hinshelwood 2004, Fidel 2007).

<u>Mid-Holocene Cultural Periods</u>

Formerly believed to be the earliest known inhabitants of Northeastern Ontario some 2,500– 8,500 years ago were the Early/Mid-Holocene Cultures. Up until recently, archaeological material dating to the Early-Holocene was seen to be “largely restricted to the northwest, suggest[ing] that the major penetration into Ontario and eastward took place after the transition from an Agate Basin culture to a Shield Archaic culture [Mid-Holocene],” (Wright 1981:88).

In the shield areas of Ontario, this period represents about 6,000 years of occupation in an area stretching from Manitoba to Quebec. The Mid-Holocene cultural expressions may have evolved directly out of the preceding initial Holocene cultural period, although there are several key differences in material culture. Mid-Holocene quarry/workshop and habitation sites demonstrate a shift from higher quality toolstone toward the exploitation of greater percentages of metasediments such as greywacke. Additionally, it is considered that during the mid-Holocene Cultural Period the first groundstone tools were produced. During this time, the flaking of the tools appears to drop in quality as the period progresses, a change that can be seen from the highly-refined corner notched points through to the smaller side notched points of the later part of the Period. That said, this changing projectile point technology yielded a wider variety of projectile point styles in contrast to the terminal Pleistocene and initial Holocene, including various forms of stemmed and notched points. Of interest in the shield areas of Ontario is the rise in the use of native copper in the production of tools and decorative items, and its distribution throughout North America (Wright 1972a; Pollock 1975, 1976, 1984).

Similar to the earlier cultural expressions, the mid-Holocene groups appear to have been wide ranging big game hunters. As the environment stabilised following the glacial retreat, these people shifted to an economy of smaller game and fishing which required smaller tools and a more local, territorial seasonal round to exploit resources at different times of the year. This trend from big game to more diverse, local resources appears to have continued through the Mid-Holocene period to about 2,000-2500 years ago.

Depending on the location, some Mid-Holocene sites may be more closely associated with post glacial landscape features such as relict shorelines. Several Lake Ojibway shorelines have been identified as intersecting with the proposed transmission line. That said, all but one are somewhat ephemeral, but one which intersects the proposed transmission line at approximately 90 degress was identified clearly by the satellite imagery, in spite of the area being difficult to access. As the environment stabilised, sites became more widely distributed, and associated with suitable occupation locations on modern lakes and rivers.

Early Ceramic Period

Earlier interpretations of archaeology in the northeast suggested that a true early Ceramic period was absent, with the exception of some artifacts located sporadically and seldom featured at archaeological sites in the northeast. Recent excavations in northeastern Ontario and northwestern Quebec challenge this earlier interpretation and suggest that cultures in the Canadian Shield formed part of the Meadowood Interaction Sphere (WHS 2011; WHS 2017; Taché 2008). It is now believed that an early Ceramic Period presence persisted in the shield areas and areas to the north as evidenced by a number of Meadowood artifacts and habitation sites, one of the markers of this period. Vinette 1 ceramics are strongly associated with this period, but not all sites with Meadowood points or cache blades feature ceramics. Generally, ceramics are less commonly found on the Canadian Shield than in more southerly areas.

Middle Ceramic (Laurel) Period

In terms of material culture, the Middle Ceramic Period was similar to the preceding Mid- Holocene, but with the addition of fired clay pottery. As clay is a more plastic and malleable material than stone, distinct surface variations in decoration and structural variations in vessel construction allow archaeologists to develop refined distinctions between different ceramic types. Middle Ceramic vessels are characteristically thin-walled, with straight sided rims and pointed bases and decorations made using plain tool impressions (Wright 1967).

The Middle Ceramic Period economy appears to have been similar to the preceding period, with seasonal exploitation of a variety of subsistence resources the norm. Based on the distribution of sites, it is understood that extended family groups traversed hunting, fishing or gathering territories in pursuit of large and small game, and fish for subsistence during most of the year. In the summer, these groups may have come together into larger bands on larger lakes or rivers. The presence of a series of large ceremonial mounds containing burials, centred on the Rainy River in northwestern Ontario, also suggests that during some years, larger ceremony based gatherings also occurred (Arthurs 1986; Reid and Rajnovich 1991).

Other than the summer group campsites, Laurel sites are generally small, possibly reflecting the establishment of a seasonal round which saw the Laurel people break up into individual families during the fall, winter and spring periods of the year to more effectively exploit available resources. Laurel site distribution and settlement patterns differ from the inland site pattern noted for the mid-Holocene cultural period and set the pattern for settlement in the following late ceramic period. Laurel peoples showed a preference for large lakes and rivers with

preferred campsites on sandy bays, portage ends, points, peninsulas, and locations near waterfalls, below rapids and at river mouths. These locations served for the establishment of small, seasonal hunting and fishing camps.

Late Ceramic Period (Blackduck and Selkirk) Period

The Middle Ceramic (Laurel) material culture appears to have gradually evolved into the late Ceramic. This transition is not as evident in the lithic and copper artifacts, but the pottery makes a notable change to thin walled, globular pots with constricted necks and widened lips decorated using a combination of plain and 'cord-wrapped' object impressions. Two main pottery types are noted by archaeologists who have speculated that a more southerly type (Blackduck) represents early Ojibwe culture, while the more northerly type (Selkirk) represents a Cree culture (Wright 1972b; MacNeish 1958).

Data from the Canadian shield areas of Ontario suggests a trend toward a growth in population during the late Ceramic period reflected in an increased frequency of sites recovered during archaeological surveys. Archaeological evidence suggests that a seasonal cycle of travelling to resource exploitation areas may have been well established during this era. Site locations follow an established pattern with preference given to level places on islands, peninsulas, narrow parts of lakes, sandy beaches and portage ends, as well as rapids and waterfalls on rivers. These people were the ancestors of present day regional cultural/social groups.

Post-Contact Historical Environment

Archaeologists' understanding of the post-European contact period is based in both archaeological and documentary research. The post-contact historical sequence can be described in terms of significant themes relating to the consecutive waves of influence from, primarily, eastern Canada. The post-contact historic sequence is generally subdivided according to the main Euro-Canadian economic or political trends. The major post-contact periods in northeastern Ontario are divided as follows:

- Early post-contact (circa 350–85 B.P.)
- Survey and Development (circa 85–10 B.P.)

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