



SOUTH BRANCH WIND FARM
WATER ASSESSMENT REPORT

Report 2 of 9

May 31, 2012

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SOUTH BRANCH WIND FARM DESIGN AND OPERATIONS REPORT
SOUTH BRANCH WIND FARM CONSTRUCTION PLAN REPORT

1. PURPOSE

The South Branch Wind Farm Water Assessment Report is prepared for the purpose of compliance with Section 31 of *Ontario Regulation 359/09* (O.Reg 359/09), which amends the *Environmental Protection Act* for the *Renewable Energy Approvals* under Part V.0.1 of the *Act*.

Section 31 requires a summary of the records collected and results of the site investigation.

A preliminary version of this report is made available to Aboriginal stakeholders, public stakeholders and agency stakeholders for review prior to the Renewable Energy Approval (REA) submission. This report is available online for download at www.prowind.ca and available in hard copy at select locations identified on the website and in newspaper advertisements.

A final version of this report is included in the REA submission to the Ontario Ministry of the Environment (MOE).

2. PROJECT OVERVIEW

Prowind Inc. (Prowind) is a Canadian wind energy developer based in Hamilton, Ontario. Prowind is affiliated with its parent company, Prowind GmbH, based in Osnabrück, Germany. Prowind's mandate is to create small-scale, renewable and zero-emission power generation. Prowind believes in distributed generation that has a minimum impact on the surrounding environment and landscape.

The South Branch Wind Farm is a 30 MW project that will employ the use of up to fourteen (14) wind turbines generators. These wind turbines have a hub height of up to 140 m and a rotor diameter of up to 118 m. The project is owned by South Branch Windfarm Inc., a special purpose vehicle created to hold project assets. South Branch Windfarm Inc. is the Proponent of this project and is jointly owned by Prowind Inc. and Eolia Renewable Energy Canada Ltd.

Figure 1 illustrates the project location within Ontario. Figure 2 shows the project area with proposed infrastructure layout. The wind farm will consist of a maximum of 14 wind turbine generators, access roads, a substation, and a combination of underground and overhead cabling.

The project is proposed on privately-owned, agricultural land near the community of Brinston, Ontario. The majority of the project lands are located within the Township of South Dundas, United Counties of Stormont, Dundas and Glengarry, and a small portion of the project lands area located within the Township of Edwardsburg/Cardinal, United Counties of Leeds and Grenville. The land base is in two distinct and separate areas as seen in the map in Figure 2.

It should be noted that the South Branch Wind Farm was previously proposed as three separate 10 MW projects under the Renewable Energy Standard Offer Program (RESOP):

Brinston Wind Farm, South Branch Wind Farm and Boundary Wind Farm. When RESOP was replaced with the Feed-In-Tariff Program (FIT), the project was merged into a single 30 MW project with the adopted name South Branch Wind Farm. A 30 MW contract to sell power generated by South Branch Wind Farm to the Ontario Power Authority under FIT was awarded on April 30, 2010.

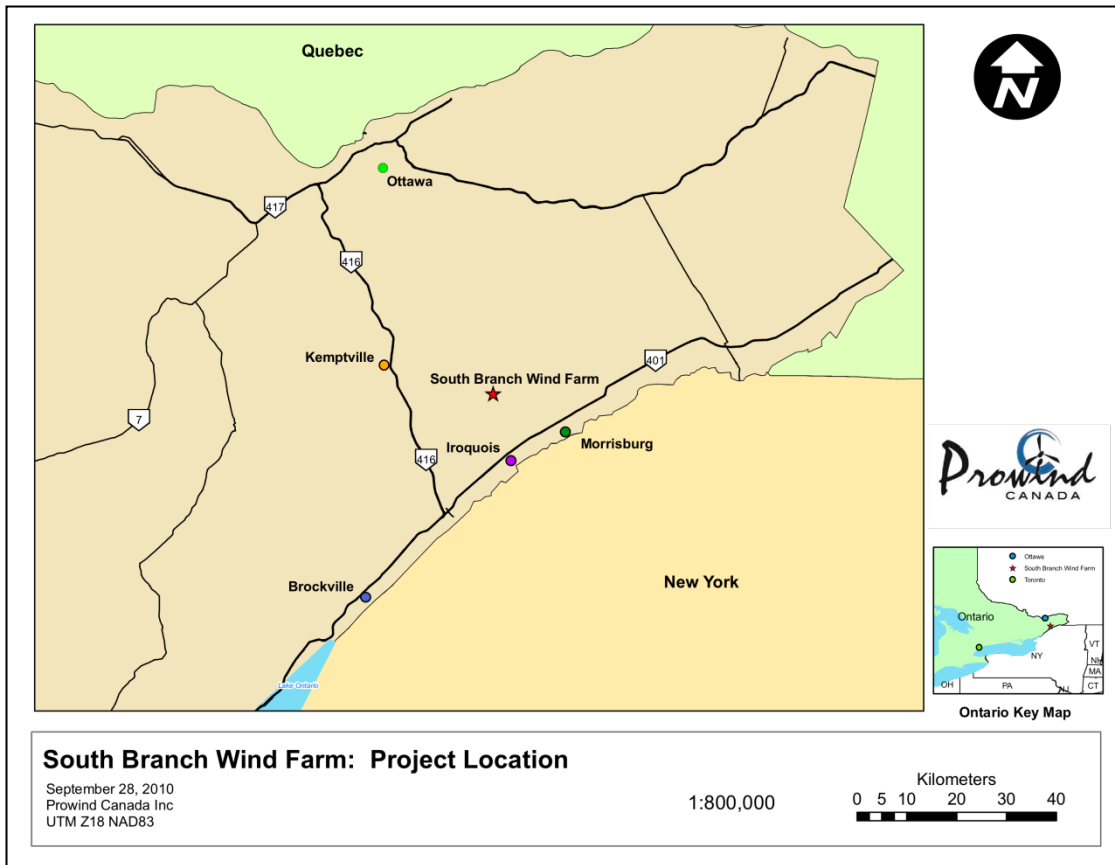


FIGURE 1 SOUTH BRANCH WIND FARM PROJECT LOCATION

3. DEFINITIONS

A 'Water Body' is defined in subsection 1(1) of O. Reg 359/09 as:

"a lake, a permanent stream, an intermittent stream and a seepage area but does not include,

- (a) grassed waterways,*
- (b) temporary channels for surface drainage, such as furrows or shallow channels that can be tilled and driven through,*
- (c) rock chutes and spillways,*
- (d) roadside ditches that do not contain a permanent or intermittent stream,*
- (e) temporarily ponded areas that are normally farmed,*
- (f) dugout ponds, or*
- (g) artificial bodies of water intended for the storage, treatment or recirculation of runoff from farm animal yards, manure storage facilities and sites and outdoor confinement areas"*

Definitions from subsection 1(1) of O. Reg 359/09 needed to describe the above definition are as follows:

" 'intermittent stream' means a natural or artificial channel, other than a dam, that carries water intermittently and does not have established vegetation within the bed of the channel, except vegetation dominated by plant communities that require or prefer the continuous presence of water or continuously saturated soil for their survival;"

" 'permanent stream' means a stream that continually flows in an average year;"

" 'seepage area' means a site of emergence of ground water where the water table is present at the ground surface, including a spring;"

4. RECORDS REVIEW

Section 30 of O. Reg 359/09 outlines the requirements for the records review component of this assessment. The table from this section of the regulation outlines the sources of records to be reviewed (Column 1) and the information to consider (Column 2) and is reproduced below as Table 1.

TABLE 1 TABLE FROM SECTION 30 OF O. REG 359/09

Item	Column 1	Column 2
	Records to be searched and analyzed	Determination to be made
1.	<p>Records that relate to water bodies and that are maintained by,</p> <ul style="list-style-type: none"> • the Ministry of Natural Resources, • the Crown in right of Canada, • a conservation authority, if the project location is in the area of jurisdiction of the conservation authority, • each local and upper-tier municipality in which the project location is situated, • the planning board of an area of jurisdiction of a planning board in which the project location is situated, • the municipal planning authority of an area of jurisdiction of a municipal planning authority in which the project location is situated • the local roads board of a local roads area in which the project location is situated, • the Local Services Board of a board area in which the project location is situated, and • the Niagara Escarpment Commission, if the project location is in the area of the Niagara Escarpment Plan. 	<p>Whether the project location is,</p> <ul style="list-style-type: none"> • in a water body, • within 120 m of the average annual high water mark of a lake, other than a lake trout lake that is at or above development capacity, • within 300 m of the average annual high water mark of a lake trout lake that is at or above development capacity, • within 120 m of the average annual high water mark of a permanent or intermittent stream, or • within 120 m of a seepage area.

Records of water features noted in Table 1 were requested from each of the following agencies:

- Natural Resources Canada (NRCan)
- Ministry of Natural Resources (MNR)
 - Kemptville District Branch
 - Land Inventory Ontario (LIO)
 - Natural Heritage Information Centre (NHIC)
- South Nation Conservation (SNC)
- United Counties of Stormont, Dundas and Glengarry (SD&G)
 - Township of South Dundas (TSD)
- Untied Counties of Leeds and Grenville (L&G)
 - Township of Edwardsburgh/Cardinal (TEC)

The information collected from the above agencies is summarized in Table 2.

It should be noted that the **planning board, municipal planning authority, local roads board, and local services board** for the United Counties of Leeds and Grenville (L&G) and Township of Edwardsburgh/Cardinal (TEC), the United Counties of Stormont, Dundas and Glengarry (SD&G) and Township of South Dundas (TSD) were all contacted through those contacts listed in Table 2. No unique information was available from these departments. These boards are all part of the same municipal office where responsibility, staff and data crossover is common.

Correspondence via in-person meeting with Township of South Dundas (TSD) revealed that this agency has no water records of their own; these records are kept by the upper-tier municipality, United Counties of Stormont, Dundas and Glengarry (SD&G), including Official Plan mapping.

Correspondence via in-person meeting with Township of Edwardsburgh/Cardinal (TEC) revealed that this agency has no water records of their own; these records are kept by the upper-tier municipality, United Counties of Leeds and Grenville (L&G), including Official Plan mapping.

Correspondence via email, telephone and in-person meeting with staff at SD&G revealed that a large portion of their data comes directly from the LIO warehouse. Due to the limitation of file sharing agreements, SD&G could only provide Official Plan constraints mapping.

Correspondence via email and telephone with staff at L&G revealed that they do not create or maintain water records of their own. The majority of their data comes directly from the LIO warehouse. Due to the limitation of file sharing agreements, L&G could not provide any water records.

Correspondence via telephone, email and in-person meetings with South Nation Conservation revealed overlap with the LIO database. Due to the limitation of file sharing agreements, L&G could not provide any water records.

Correspondence with MNR Land Inventory Ontario (LIO) provided the records listed in Table 2.

The MNR maintained Natural Heritage Information Centre (NHIC) database was searched for relevant records in the project area. Those records observed in online mapping were cross-referenced with LIO data and found to be the same.

Correspondence with the MNR Kemptville District Office has been ongoing. An information request for mapping directed us to LIO. Further correspondence with the branch provided a pre-produced Natural Features map for the Townships of Edwardsburg and Matilda which includes water features. The map was in a format not available for direct integration with internal mapping, but was cross-referenced with LIO data and found to be the same.

Records maintained by the “Crown in Right of Canada” were gathered from Natural Resources Canada mapping database, The Atlas of Canada. This mapping system covers all of Canada and contains water records that were cross-referenced with LIO data and found to be the same.

TABLE 2 INFORMATION SOURCES AND RECORDS RECEIVED

Agency	Contact Name and Date	Records Requested	Records Received	Notes
L&G / TEC	<p><u>Name, Position:</u> Debra McKinstry, Clerk/Planning Administrator</p> <p><u>Date:</u> Nov 17, 2010</p>	<p>watercourses water bodies high water marks springs and seepage areas</p>	<p>Official Plan Schedule A - Land Use: - watercourses Official Plan Schedule B - Development Constraints: - Watercourses - Floodplain</p>	<p>Files received as pdfs and could not be incorporated into internal mapping files. Data were compared against other data layers for additional or unique information. No unique data found.</p>
SD&G / TSD	<p><u>Name, Position:</u> Jack Sullivan, GIS Planning Technician</p> <p><u>Date:</u> Aug 18, 2010</p>	<p>watercourses water bodies high water marks springs and seepage areas</p>	<p>No information available</p>	
	<p><u>Name, Position:</u> Karen Fraser, GIS Coordinator</p> <p><u>Date:</u> Aug 18, 2010</p>		<p>Redirected to MNR/LIO</p>	
	<p><u>Name, Position:</u> Michael Otis, County Planner</p> <p><u>Date:</u> June 17, 2010</p>		<p>Official Plan Schedule A2 - Land Use: - waterways Official Plan Schedule B2 - Township of South Dundas - Constraints Plan: - Flood line</p>	<p>Files received as pdfs and could not be incorporated into internal mapping files. Data were compared against other data layers for additional or unique information. No unique data found.</p>

Agency	Contact Name and Date	Records Requested	Records Received	Notes
SNC	<p><u>Name, Position:</u> Mathieu LeBlanc, Planning Assistant</p> <p><u>Date:</u> Jan 25, 2010</p>	Floodplain	Floodplain	
	<p><u>Date:</u> Aug 3, 2010</p>	<p>Watercourses Seepage Areas/Springs Waterbodies Fish habitat Stream classification</p>	Fisheries data Fish species data	Data received in text format and could not be incorporated into internal mapping files. Data was compared against other data layers and used in site investigation analysis.
MNR, Kemptville District Branch	<p><u>Name, Position:</u> Allen Bibby, GIS Officer</p> <p><u>Date:</u> Aug 25, 2010</p>	watercourses water bodies high water marks springs and seepage areas	Natural Heritage mapping for historical township of Matilda and Edwardsburgh (.pdf format): Watercourses Lakes and Ponds	Several data layers received, but only one "Sigwoods" was incorporated into Figure 3. Remainder was used for analysis and EIS planning site investigation, analysis and EIS planning.
MNR LIO	<p><u>Name, Position:</u> Christine Bolton, Information Access Analyst</p> <p><u>Date:</u> June 16, 2010</p>	watercourses water bodies high water marks springs and seepage areas		No data was available beyond the LIO which was available through the LIO warehouse.
	<p><u>Name, Position:</u> LIO Data Warehouse</p> <p><u>Date:</u> Jun 16, 2010</p>	watercourses water bodies high water marks springs and seepage areas		

Agency	Contact Name and Date	Records Requested	Records Received	Notes
	<u>Name, Position:</u> LIO Data Warehouse <u>Date:</u> Mar 22, 2011	OHN – Waterbody OHN – Watercourse	OHN – Waterbody OHN – Watercourse	
MNR NHIC	<u>Name, Position:</u> Atlas of Canada <u>Date:</u> Jan 6, 2010	watercourses water bodies high water mark springs and seepage areas	watercourses	

4.1. RESULTS AND ANALYSIS OF RECORDS REVIEW

The records from the above sources were compiled into a map and used for the site investigation. The map outlines the project location, which is defined in the O. Reg 359/09 as

“a part of land and all or part of any building or structure in, on or over which a person is engaging in or proposes to engage in the project and any air space in which a person is engaging in or proposes to engage in the project”.

This was interpreted as the location of the project components, lands that were directly impacted during the construction and operation of the wind farm.

Project location features were added to the map with the records listed in Table 2. A buffer of 120 m was applied to the project location to determine if any records came within the 120 m area of interest as identified in section 30 of O. Reg 359/09, reprinted as Table 1 of this report. A 59 m radius around each turbine was included as part of the project location to account for the turbine blades that are not depicted in the two-dimensional map. As a result, the buffer around each turbine is 179 m. The resulting map is printed as Figure 3.

The reference letters shown in Figure 3 are used to distinguish the various water features that come within 120 m of the project location and are referenced in the following section to identify and discuss the site investigation findings at each location.

TABLE 3 WATER BODIES IDENTIFIED THROUGH RECORDS REVIEW

Type of water body	No. of features from records review found within 120 m of project location	Water body IDs	Carried forward to Site investigation?
Lake	0	N/A	No
Lake Trout Lake	0	N/A	No
Permanent or Intermittent Stream	33	A to K and O to AJ	Yes
Seepage Area	0	N/A	No

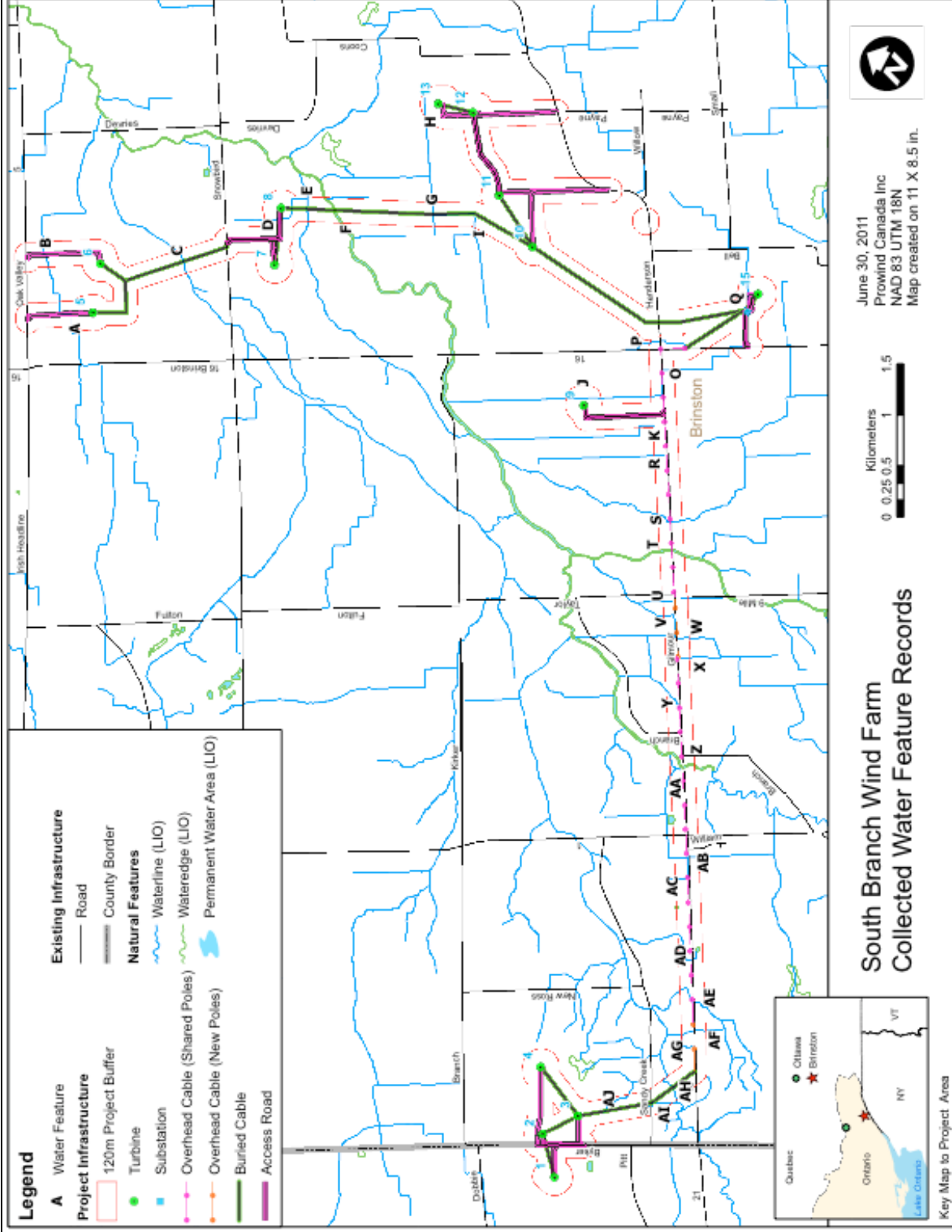


FIGURE 3 COLLECTED WATER FEATURE RECORDS

5. SITE INVESTIGATION

5.1. DETAILS

TABLE 4 SITE INVESTIGATION DATES/TIMES

Date (dd/mm/yyyy)	Time (24h)	Weather Conditions	Area Searched	Surveyor
15/06/2010	1300 - 1600	Sunny, 24 °C	Turbine (T)2, T3, T4, Byker Rd.	Rochelle Rumney
12/08/2010	1430 - 1615	Sunny, scattered clouds, 25 °C	Brinston Rd., Gilmour Rd., County Rd (CR) 18,	Rochelle Rumney
13/9/2010	0830 - 1530	Heavy rain, overcast, sunny, 16 °C to 20 °C	Ecological Land Classification survey, T1, T5, T6, T10, T11, T12, T13, Oak Valley Rd, Henderson Rd	Rochelle Rumney, Nigel Finney
14/10/2010	1330 - 1430	Overcast, recent rain, 14 °C	Gilmour Rd/CR 18	Cathy Weston
25/10/2010	1445 - 1630	Overcast, light wind, moderate to heavy rain, 14 °C	Byker Rd, T1	Rochelle Rumney
26/10/2010	1100 - 1500	Overcast, sunny, 25 °C	Gilmour Rd/CR 18, Sandy Creek Rd., T15, T7, T8, Snowbird Rd., T14, Kirker Rd., Bell Rd.	Rochelle Rumney
15/11/2010	1000 - 1130	Sunny, 6 °C	T9	Cathy Weston
18/11/2010	1430 - 1500	Overcast, 5 °C	substation	Cathy Weston
13-15/06/2011	0800 - 1600	Various, See field notes, App C	Ecological Land Classification of entire project area	Dan Westerhof, Beacon Environmental

The site investigation was completed in twenty-one and a half hours.

Qualifications of all surveyors can be found in Appendix B.

5.2. METHODOLOGY

The methodology used during the site investigation consisted of a visual investigation of the project location to confirm collected records and locate any additional water features. Coordinates and boundaries of water features were recorded using a handheld GPS. Photos and notes were recorded for each feature.

Maps of the project location with a 120 m buffer were taken into the field along with aerial photography for referencing. A handheld GPS unit was used to mark water features and boundaries.

The type of water body was identified using visual cues from surrounding vegetation, stream bed vegetation and general condition.

The project area and land within 120 m of the project location was searched for water features that were not included in the records review.

Field notes taken during the site investigation can be found in Appendix A.

5.3. RESULTS

Table 3 and 4 summarize the water features that were investigated on site based on information gathered in the records review. Each water feature is identified by a letter and described by type of water body, separation distance to the closest project component and its inclusion in the next section, the Environmental Effects and Monitoring.

5.3.1 Corrections/Additions

The site investigation of the water bodies at the South Branch Wind Farm did not identify any additional water bodies that were not noted in the records review.

It was noted during the site investigation that several water bodies identified in the records review were no longer present on the landscape. Several of these water bodies were identified on the map as located within active agricultural fields and it is assumed that these fields are tiled and levelled, effectively removing the overland water body from the landscape. Additionally, some water bodies are dry ditches or grassed waterways.

The water bodies that are identified in Figure 3 that are no longer present on the landscape are listed in Table 5 below. These water bodies are not discussed any further in this report.

5.3.2 Water Bodies Details

Any water body identified within 120 m of the project location is recorded in Table 6 below. The water body is carried into the discussion of environmental effects and mitigation measures if it can be defined a “water body” under the definition outlined in O. Reg 359/09 and comes within 120 m of the project location. Maps of the relevant water bodies and their setback distances to the project location can be in Figures 4, 5 and 6.

TABLE 5 CORRECTIONS TO WATER BODIES RECORDS REVIEW

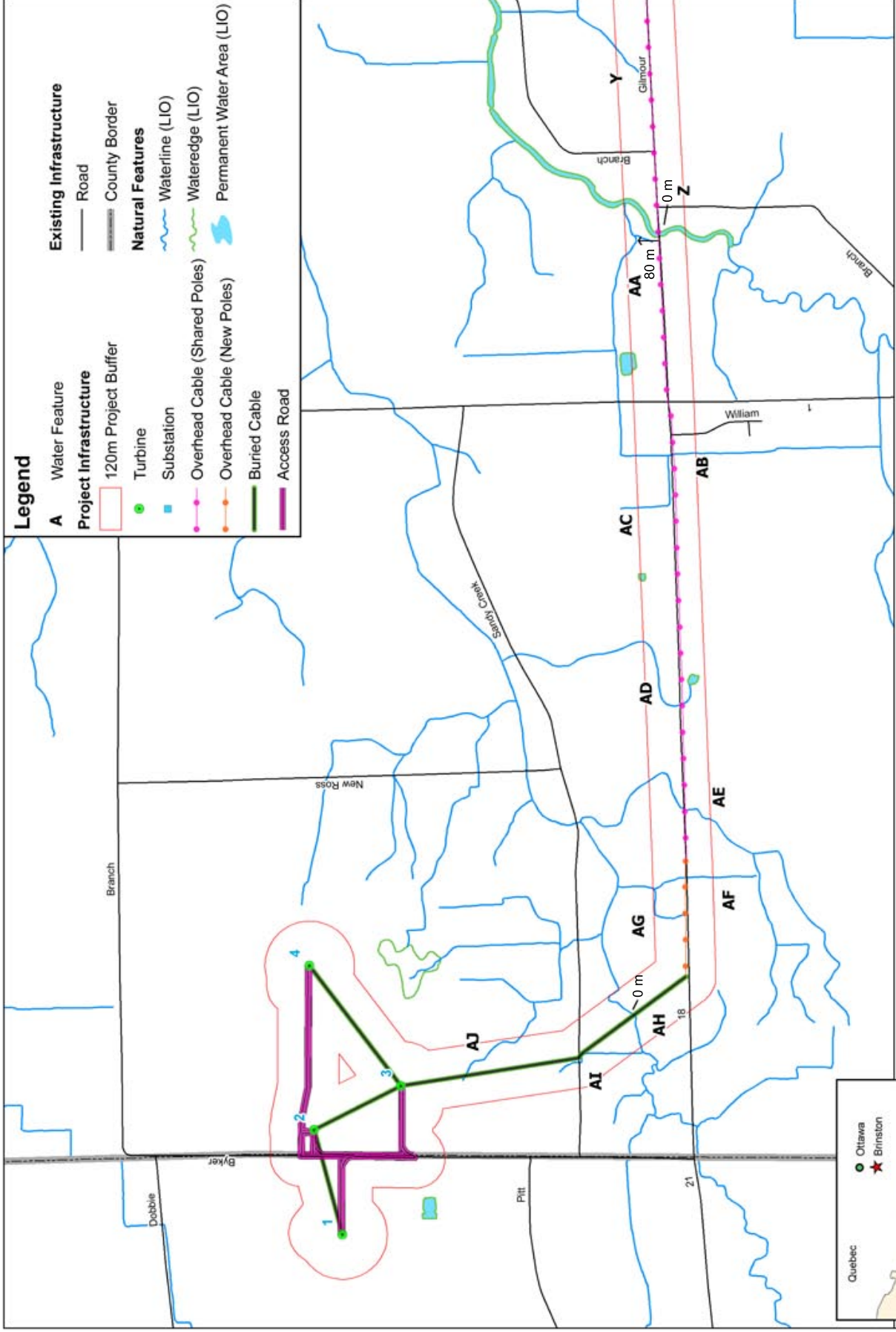
Water Feature ID	Type	Separation Distance	Project Component	Carried forward to EEMM*?
D	Tiled	N/A	Access Road, Buried Electrical Cable, Turbine 8	No
J	Dry Ditch	N/A	Turbine 9, Access Road, Buried Electrical Cable	No
K	Dry Ditch	N/A	Access Road	No
O	Dry Ditch	N/A	Access Road, Buried Electrical Cable	No
P	Dry Ditch	N/A	Buried Electrical Cable, Overhead Electrical Cable	No
Q	Grassed waterway	N/A	Buried Electrical Cable, Turbine 15	No
R	Dry ditch	N/A	Overhead Electrical Cable	No
U	Tiled	N/A	Overhead Electrical Cable	No
V	Grassed waterway	N/A	Overhead Electrical Cable	No
W	Grassed waterway	N/A	Overhead Electrical Cable	No
X	Tiled	N/A	Overhead Electrical Cable	No
Y	Tiled	N/A	Overhead Electrical Cable	No
AB	Grassed waterway	N/A	Overhead Electrical Cable	No
AC	Tiled	N/A	Overhead Electrical Cable	No
AD	Grassed waterway	N/A	Overhead Electrical Cable	No
AE	Tiled	N/A	Overhead Electrical Cable	No
AF	Tiled	N/A	Overhead Electrical Cable	No
AG	Tiled	N/A	Overhead Electrical Cable	No
AI	Tiled/Ditch	N/A	Buried Electrical Cable	No
AJ	Tiled	N/A	Buried Electrical Cable	No

* Environmental Effects and Mitigation Measures, Section 6.0

TABLE 6 SITE INVESTIGATION RESULTS SUMMARY

Water Feature ID	Type	Separation Distance	Project Component	Carried forward to EEMM*?
A	Intermittent Stream	0 m	Access Road	Yes
B	Intermittent Stream	0 m	Access Road	Yes
C	Permanent Stream	0 m	Buried Electrical Cable	Yes
E	Permanent Stream	0 m	Buried Electrical Cable	Yes
F	Permanent Stream	0 m	Buried Electrical Cable	Yes
G	Intermittent Stream	0 m	Buried Electrical Cable	Yes
H	Intermittent Stream	81 m	Turbine 13	Yes
I	Intermittent Stream	0 m	Buried Electrical Cable	Yes
S	Intermittent Stream	0 m	Overhead Electrical Cable	Yes
T	Permanent Stream	0 m	Overhead Electrical Cable	Yes
Z	Permanent Stream	0 m	Overhead Electrical Cable	Yes
AA	Intermittent stream	80 m	Overhead Electrical Cable	Yes
AH	Intermittent Stream	0 m	Buried Electrical Cable	Yes

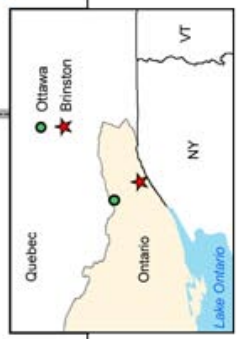
* Environmental Effects and Mitigation Measures, Section 6.0



May 29, 2012
 Prowind Canada Inc
 NAD 83 UTM 18N
 Map created on 11 X 8.5 in.

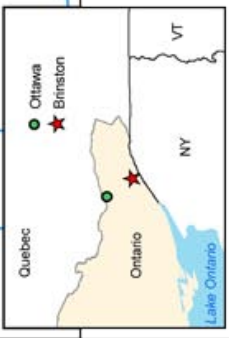
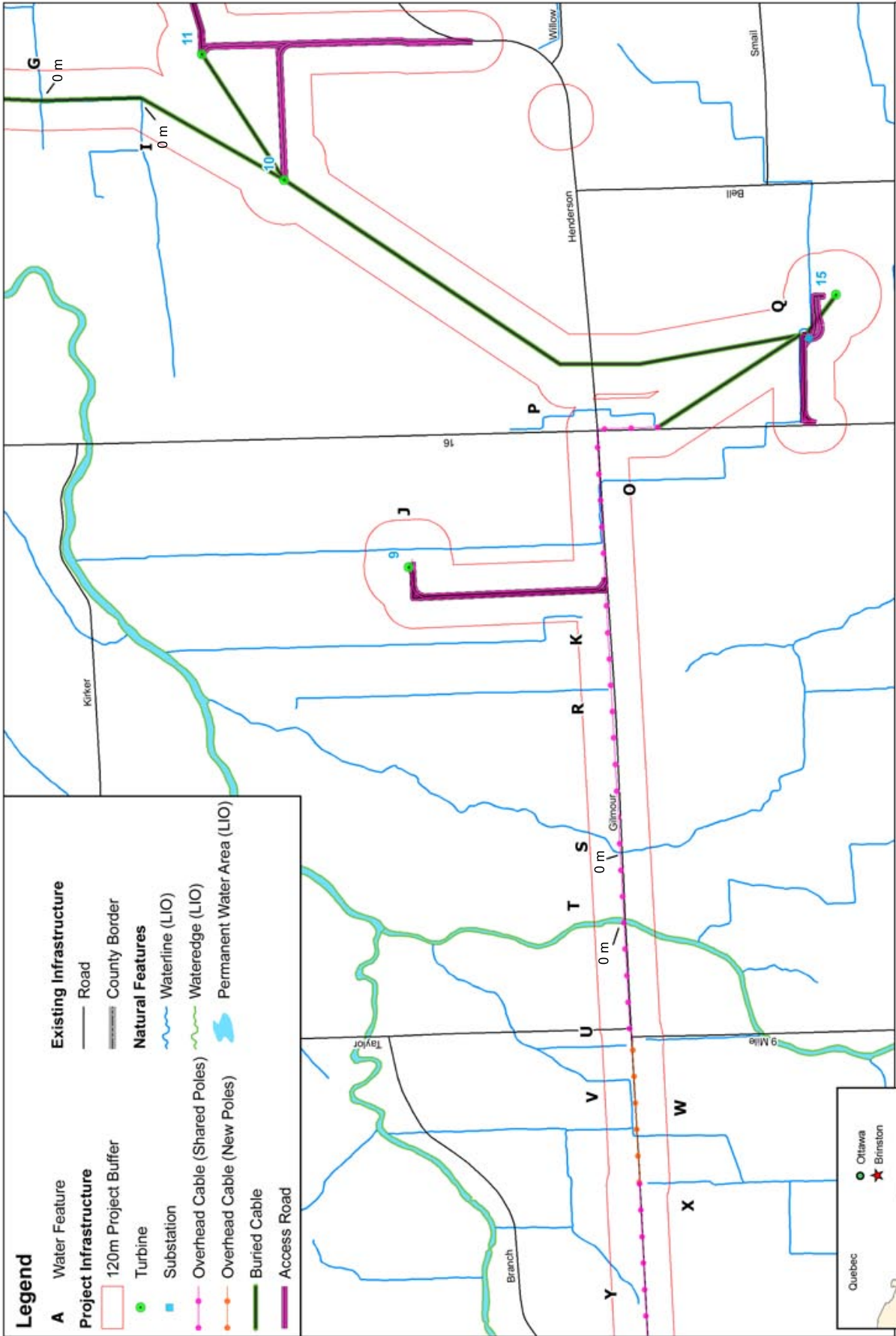


South Branch Wind Farm: Water Feature Setbacks



Key Map to Project Area

Legend	
A Water Feature	Existing Infrastructure
Project Infrastructure	Road
120m Project Buffer	County Border
Turbine	Natural Features
Substation	Waterline (LIO)
Overhead Cable (Shared Poles)	Wateredge (LIO)
Overhead Cable (New Poles)	Permanent Water Area (LIO)
Buried Cable	
Access Road	

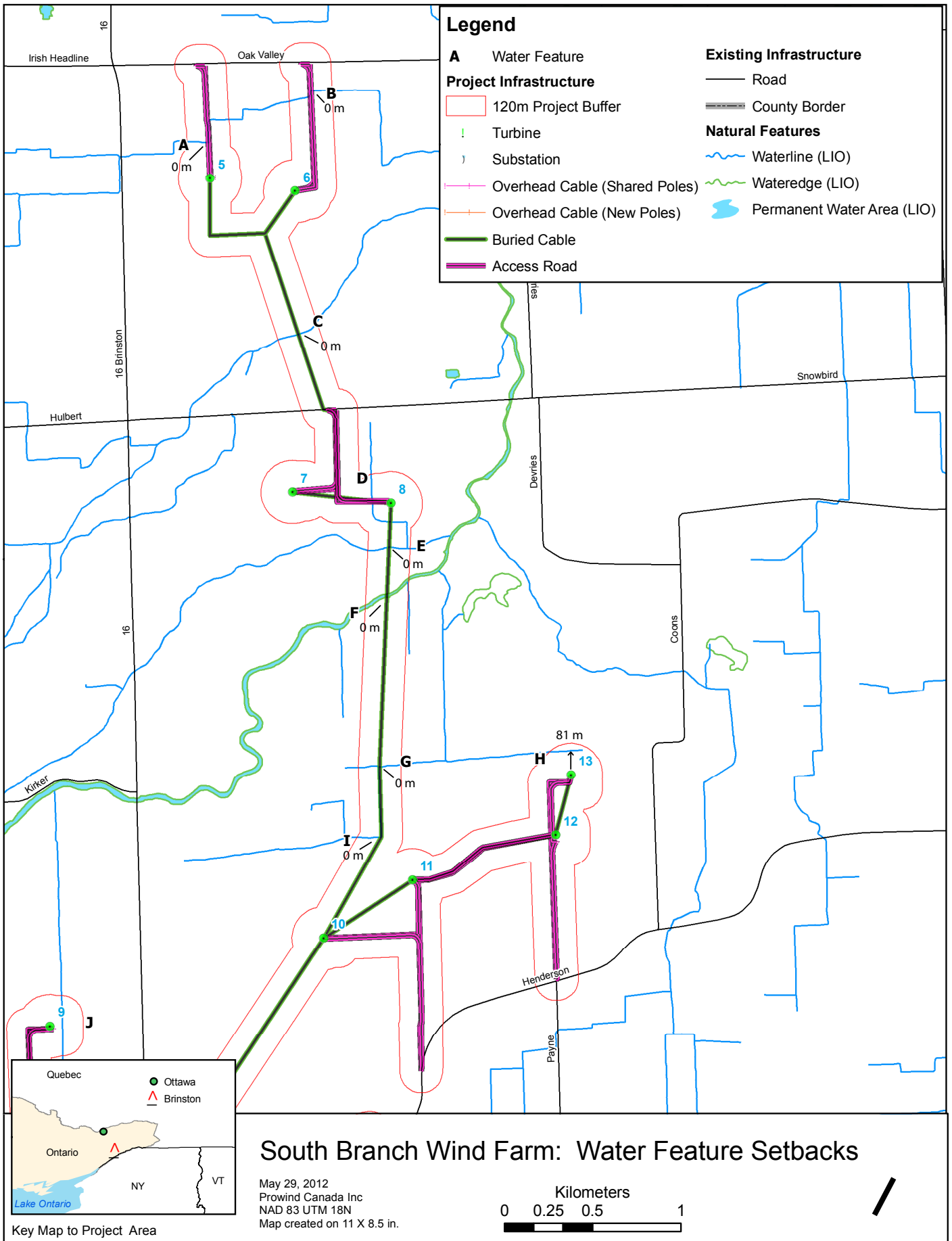


South Branch Wind Farm: Water Feature Setbacks



May 29, 2012
 Prowind Canada Inc
 NAD 83 UTM 18N
 Map created on 11 X 8.5 in.

Key Map to Project Area



5.3.2.1 Water Feature A

As seen in Figure 3, Water Feature A is located in the north-eastern section of the project area, intersecting the access road to Turbine 5.

The site investigation revealed that this watercourse still exists on the landscape. It is located within an agricultural field and is used to collect agricultural drainage and runoff. At the location of the proposed access road, a farm road, watercourse crossing and culvert currently exist.

Water Feature A is dug to conform to agricultural field edges. This feature crosses under the existing farm road and runs alongside this road for a distance of approximately 130 m then turns again to the east. The stream bed is 25 cm wide and the top of bank width is approximately 4 m. At the time of survey, the water depth was 12.4 cm deep.

This feature it is used as agricultural drain is by definition, an intermittent stream and collects runoff during rain events. There is no vegetation along the stream bed due to ditching efforts by the landowner. At the time of site investigation, this stream had several inches of standing water within it.

Ecological Land Classification identified the area surrounding the feature as agricultural. Corn was planted on either side of the drain at the time of survey.

This feature can be identified as a waterbody for the purposes of this report and will be discussed further in the Environmental Effects and Mitigation Measures, Section 6.0.

5.3.2.2 Water Feature B

As seen in Figure 3, Water Feature B is located in the north-eastern section of the project area, intersecting the access road to Turbine 6.

The site investigation revealed that this watercourse still exists on the landscape. It is located within an agricultural field and is used to collect agricultural drainage and runoff. At the location of the proposed access road, a farm road and culvert currently exist for crossing the watercourse.

Water Feature B is dug to conform to agricultural field edges. This feature follows alongside the existing farming road for a distance of approximately 30 m then turns east and crosses under the road. The stream bed is 20 cm wide and the top of bank width is approximately 3.5 m. At the time of survey, the water depth was 11.5 cm deep.

This feature it is used as agricultural drain is by definition, an intermittent stream and collects runoff during rain events. There is no vegetation along the stream bed due to ditching efforts by the landowner. At the time of site investigation, this stream had several inches of standing water within it.

Ecological Land Classification identified this area as agricultural. Corn was planted on either side of the drain at the time of survey.

This feature can be identified as a waterbody for the purposes of this report and will be discussed further in the Environmental Effects and Mitigation Measures, Section 6.0.

5.3.2.3 Water Feature C

As seen in Figure 3, Water Feature C is located in the north-eastern section of the project area, intersecting the buried electrical cable running from Turbines 5 and 6 to Turbines 7 and 8. The cable will be bored under the stream bed.

The site investigation revealed that this watercourse still exists on the landscape. It is located within an agricultural field and is a natural tributary of the South Branch of the South Nation River. The stream bed is narrow, approximately 20 cm wide along the stream bed with a silty bottom. The top of bank width is approximately 7 m. At the time of the survey the stream had approximately 10 cm of water within it.

The ELC survey identified this area as a Dry Moist Old Field Meadow with the following types of vegetation as the most abundant: Tufted Vetch, Kentucky Bluegrass, Smooth Brome. This type of vegetation stretches on for 5 to 7 m on either side of the stream and row crops are planted beyond that. This water body has been identified as possible fish habitat.

This feature can be identified as a waterbody for the purposes of this report and will be discussed further in the Environmental Effects and Mitigation Measures, Section 6.0.

5.3.2.4 Water Feature E

As seen in Figure 3, Water Feature E is located in the north-eastern section of the project area, intersecting the buried electrical cable running from Turbine 8 to Turbine 10. The cable will be bored under the stream bed.

The site investigation revealed that this watercourse still exists on the landscape. It is located within an agricultural field and is used to collect agricultural drainage and runoff. The stream bed is shallow and wider, approximately 60 cm along the stream bed. The top of bank measurement is approximately 8 m.

Ecological Land Classification identified this area as agricultural. Hay was planted on either side of the drain at the time of survey. This water body has been identified as possible fish habitat.

This feature can be identified as a water body for the purposes of this report and will be discussed further in the Environmental Effects and Mitigation Measures, Section 6.0.

5.3.2.5 Water Feature F

As seen in Figure 3, Water Feature F is located in the north-eastern section of the project area, intersecting the buried electrical cable running from Turbine 8 to Turbine 10. The electrical cable will be directionally bored under the watercourse at this location.

The site investigation revealed that this watercourse still exists on the landscape. This watercourse is the South Branch of the South Nation River. The stream bed is

approximately 12 to 15 m wide at regular flow. The top of bank measurement is approximately 40 m wide. Much of the project area is located within the floodplain of this river.

ELC surveys identified the riparian area to the north of the river as Dry Moist Old Field Meadow with the following predominant vegetation: Kentucky Bluegrass, Tufted Vetch and Smooth Brome. The south side of the river is identified as a Native Sapling Regeneration Thicket with the following type of predominant vegetation: green ash and smooth goldenrod. This water body has been identified as probable fish habitat.

This feature can be identified as a water body for the purposes of this report and will be discussed further in the Environmental Effects and Mitigation Measures, Section 6.0.

5.3.2.6 Water Feature G

As seen in Figure 3, Water Feature G is located in the central-east section of the project area, intersecting the buried electrical cable running from Turbine 8 to Turbine 10. The buried electrical cable will be bored below the stream bed at this location.

The site investigation revealed that this watercourse still exists on the landscape. It is located along the edge of an agricultural field and is used to collect agricultural drainage and runoff. At the time of the site investigation the water within this watercourse was stagnant and water quality appeared to be low. The stream bed is approximately 50 cm wide and top of bank measurement is 60 cm. At the time of survey, there was approximately 25 cm of water in the stream bed.

The ELC survey identified this area as a cultural hedgerow with the following predominant vegetation: Green Ash, American Elm, Smooth Brome and Reed Canary Grass.

This feature can be identified as a water body for the purposes of this report and will be discussed further in the Environmental Effects and Mitigation Measures, Section 6.0.

5.3.2.7 Water Feature H

As seen in Figure 3, Water Feature H is located in the central-east section of the project area, north of Turbine 13. The blade sweep area will be within 120 m of the water body. No other wind farm components come within 120 m.

The site investigation revealed that this watercourse still exists on the landscape. It is located along the edge of an agricultural field and a woodland. At the time of the site investigation the water within this watercourse was stagnant and water quality appeared to be low; the depth of the water was approximately 20 cm. The stream bed is approximately 90 cm wide and shallow, the top of bank measurement is approximately 1m.

The ELC survey identified this area as agricultural to the south, planted with corn. To the north is a woodlot, identified as a Silver Maple Mineral Deciduous Swamp with the following predominant vegetation: Silver Maple, Green Ash, American Elm and Dwarf Raspberry.

This feature meets the definition of an intermittent stream and is 81 m from the edge of the project location, in this case the edge of the blade sweep zone.

This feature can be identified as a water body for the purposes of this report and will be discussed further in the Environmental Effects and Mitigation Measures, Section 6.0.

5.3.2.8 Water Feature I

As seen in Figure 3, Water Feature I is located in the central-east section of the project area, running alongside and intersecting the buried electrical cable running from Turbine 8 to Turbine 10. The electrical cable will be bored under the water feature at this location.

The site investigation revealed that this watercourse still exists on the landscape as an agricultural drain. It is located along the edge of an agricultural field and runs along the south and east sides of a woodland. The watercourse is used to collect runoff from the adjacent agricultural fields. At the time of the site investigation the water within this watercourse was stagnant and water quality appeared to be low; the depth of the water was approximately 25 cm. The stream bed is approximately 60 cm wide and the top of bank measures approximately 2 m wide.

The ELC survey identified this area as agricultural to the south, planted with corn. On the north side of the water body the vegetation is identified as cultural hedgerow with the following predominant vegetation: Green Ash, American Elm, Smooth Brome and Reed Canary Grass.

This feature can be identified as a water body for the purposes of this report and will be discussed further in the Environmental Effects and Mitigation Measures, Section 6.0.

5.3.2.9 Water Feature S

As seen in Figure 3, Water Feature S is located in the southern section of the project area, along Gilmour Rd. It is located on both the north and south sides of Gilmour Rd and comes within 120 m of the overhead electrical cable. An overhead electrical cable currently exists at this location; poles will require replacement, but location of poles will remain the same.

The site investigation revealed that this watercourse still exists on the landscape as an intermittent stream. The watercourse runs through agricultural fields on either side of Gilmour Rd. The stream bed is approximately 90 cm wide and covered with vegetation. The top of bank measurement is approximately 6.5 m. At the time of survey the depth of water was approximately 25 cm and appeared to be stagnant with high nutrient levels.

The ELC survey identified this area as agricultural on the north and south sides. North is pasture for horses and south is planted with wheat.

This feature can be identified as a water body for the purposes of this report and will be discussed further in the Environmental Effects and Mitigation Measures, Section 6.0.

5.3.2.10 Water Feature T

As seen in Figure 3, Water Feature T is located in the southern section of the project area, along Gilmour Rd. It is located on both the north and south sides of Gilmour Rd and comes within 120 m of the overhead electrical cable. An overhead electrical cable currently exists at this location; poles will require replacement, but location of poles will remain the same.

The site investigation revealed that this water feature still exists on the landscape and is a permanent stream. This watercourse is part of the South Branch of the South Nation River. It is approximately 15 m wide, shallow, with low flow and high nutrient levels. The top of bank measurement is approximately 40 m wide.

The ELC survey identified this water body itself as Water Lily-Bullhead Lily Floating-leave Shallow Aquatic and the riparian area along the west side and north east side as Cultural Woodland and the riparian area on the south east side as Green Ash Lowland Deciduous Forest. Predominant aquatic vegetation at this location includes the following: Water Lily, Bullhead Lily, Dock spp., Pondweed spp. Predominant terrestrial vegetation at this location includes the following: Green Ash, Bur Oak, Smooth Brome, Reed Canary Grass, Buckthorn. Fauna observations at this location include Snapping Turtle basking on roadside edges and Midland Painted Turtle basking on logs within water body. The water body is identified as probable fish habitat.

This feature can be identified as a water body for the purposes of this report and will be discussed further in the Environmental Effects and Mitigation Measures, Section 6.0.

5.3.2.11 Water Feature Z

As seen in Figure 3, Water Feature Z is located in the southern section of the project area, along Gilmour Rd. It is located on both the north and south sides of Gilmour Rd and comes within 120 m of the overhead electrical cable. An overhead electrical cable currently exists at this location; poles will require replacement, but location of poles will remain the same.

The site investigation revealed that this watercourse still exists on the landscape and is a permanent stream. This watercourse is a branch of the South Branch of the South Nation River. The stream bed is approximately 10 m wide, very shallow with low flow and high nutrient levels. The top of bank measurement is approximately 24 m wide. This river is bridged by Gilmour Rd.

The ELC surveys identify this area as agricultural on the north side of Gilmour Road and identify the riparian area on the south side of the Gilmour as Green Ash lowland deciduous forest. The predominant vegetation in this area includes the following: Green Ash, Reed Canary Grass, Buckthorn. This area is probable fish habitat.

This feature can be identified as a water body for the purposes of this report and will be discussed further in the Environmental Effects and Mitigation Measures, Section 6.0.

5.3.2.12 Water Feature AA

As seen in Figure 3, Water Feature AA is located in the southern section of the project area, along Gilmour Rd. It is located on the north side of Gilmour Rd, just west of Water Feature

Z and setback 85 m from the road. This watercourse comes within 120 m of the overhead electrical cable. An overhead electrical cable currently exists at this location; poles will require replacement, but location of poles will remain the same.

The site investigation revealed that this watercourse still exists on the landscape as an intermittent stream. The stream bed is approximately 45 cm wide and the top of bank width is approximately 50 cm. The area is low lying marshy area.

The ELC survey identified this area as Reed Canary Grass Mineral Meadow Marsh. The predominant vegetation at this location includes the following: Reed Canary Grass, Sensitive Fern, Smooth Brome.

This feature can be identified as a water body and is located 80 m from the edge of the project location, in this case the overhead electrical line. This feature can be identified as a water body for the purposes of this report and will be discussed further in the Environmental Effects and Mitigation Measures, Section 6.0.

5.3.2.13 Water Feature AH

As seen in Figure 3, Water Feature AH is located in the western section of the project area, between County Rd 18 and Sandy Creek Rd within an agricultural field. This watercourse would be intersected by a buried electrical cable. The buried electrical cable will be bored under the watercourse at this location.

The site investigation revealed that this watercourse still exists on the landscape as an intermittent stream. The water body is located within an agricultural field planted with corn and is used for agricultural drainage and natural drainage. The stream bed is shallow and ephemeral and is possible fish habitat during the times of year when the watercourse is full. The stream bed is approximately 2 m wide and shallow. The top of bank measurement is approximately 3.5 m wide.

The ELC survey identified this area as Reed Canary Grass Mineral Meadow Marsh. The predominant vegetation at this location includes the following: Reed Canary Grass, Smooth Brome, Canada Anemone. The water body is possible fish habitat.

This feature can be identified as a water body for the purposes of this report and will be discussed further in the Environmental Effects and Mitigation Measures, Section 6.0.

5.3.2.14 Water Feature AI

As seen in Figure 3, Water Feature AI is located in the western section of the project area, along Sandy Creek Rd. It is located on the north and south sides of Sandy Creek Rd. This watercourse comes within 120 m of the buried electrical cable.

The site investigation revealed that this water feature no longer exists on the landscape and has likely been tiled.

This water feature cannot be considered a water body for the purposes of this report and requires no further discussion.

5.3.2.15 Water Feature AJ

As seen in Figure 3, Water Feature AJ is located in the western section of the project area, within an agricultural field south of Turbine 3. This watercourse comes within 120 m of the buried electrical cable.

The site investigation revealed that this water feature no longer exists on the landscape and has likely been tiled.

This water feature cannot be considered a water body for the purposes of this report and requires no further discussion.

6. ENVIRONMENTAL EFFECTS AND MITIGATION MEASURES

Any water feature found within 120 m of the project location invokes subsection 40(1) of O. Reg 359/09, which prohibits the development of a renewable energy generation facility within 120 m of the high water mark of a permanent or intermittent stream. Subsection 40(1) does not apply if subsection 40(2) is enacted, which allows development within 120m of a water feature if a report is submitted that:

- “(a) identifies and assesses any negative environmental effects of the project on a water body referred to in paragraphs 1 to 4 of subsection (1) and on land within 30 m of the water body;*
- (b) identifies mitigation measures in respect of any negative environmental effects mentioned in clause (a);*
- (c) describes how the environmental effects monitoring plan set out in paragraph of item 4 of Table 1 addresses any negative environmental effects mentioned in clause (a); and*
- (d) describes how the construction plan report prepared in accordance with Table 1 addresses any negative environmental effects mentioned in clause (a).”*

Section 6 of this report is written to fulfill the above requirements.

6.1. PROJECT ACTIVITIES AND POTENTIAL ENVIRONMENTAL EFFECTS

Table 7 outlines all project activities that will take place within 30 m of any water body and the potential environmental effects of each.

TABLE 7 PROJECT ACTIVITIES WITHIN 30 M OF WATER BODY

Phase	Activity	Description of Activity	Potential Environmental Effects
Construction	Surveying and Geotechnical	<ul style="list-style-type: none"> • Surveying and staking locations of roads, cables 	None
	Access Road Construction	<ul style="list-style-type: none"> • Clearing land/vegetation removal • Removing and stockpiling topsoil • Replacing culverts • Grading • Applying and compacting gravel • Applying surface gravel • Reducing road width • Revegetating ditches 	Increased surface water sedimentation and turbidity
	Electrical Network Installation	Directional drilling (boring) of lines <ul style="list-style-type: none"> • Delivery and Setup of Equipment • Drilling conduit • Feeding cable • Removal of waste slurry Overhead lines <ul style="list-style-type: none"> • Replacing/Installing poles • Stringing electrical line 	Potential surface water contamination from frac-out
Operation	Maintain Access	<ul style="list-style-type: none"> • Regular snow removal 	None
Decommissioning	Access Road Modification and Removal	<ul style="list-style-type: none"> • Land clearing edges of road • Removing and stockpiling topsoil • Grading • Applying and compacting base gravel • Applying surface gravel and grading • Removing gravel • Decompacting soil • Reapplying topsoil/grading 	Increased surface water sedimentation and turbidity
	Electrical Network Removal	<ul style="list-style-type: none"> • Removal of lines from drilled conduits • Removal of waste 	None

There are 11 locations in the project area where project infrastructure comes within 30 m of an identified water body where there is potential for negative environmental effects. Table 8 summarizes the specific water body features that come within 30 m of the project location and the specific activities that will take place at this location and the potential negative impacts. This table will also summarize the mitigation measures taken to reduce the impact of these effects. Further discussion on impacts and mitigation measures is detailed in the sections that follow.

TABLE 8 SOUTH BRANCH WIND FARM WATER BODY FEATURES, ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

Water Body ID	Wind Farm Component	Activities within 30 m	Potential Negative Impacts	Performance Objectives
A	Access Road	<ul style="list-style-type: none"> • Vegetation removal • Culvert replacement • Gravel application and compaction • Grading 	<ul style="list-style-type: none"> • Increased sedimentation and turbidity of water body 	<ul style="list-style-type: none"> • Sedimentation control measures placed between construction activities and water body • Water quality monitoring
B	Access Road	<ul style="list-style-type: none"> • Vegetation removal • Culvert replacement • Gravel application and compaction • Grading 	<ul style="list-style-type: none"> • Increased sedimentation and turbidity of water body 	<ul style="list-style-type: none"> • Sedimentation control measures placed between construction activities and water body • Water quality monitoring
C	Buried Electrical Cable	<ul style="list-style-type: none"> • Drilling conduit • Removal of waste slurry 	<ul style="list-style-type: none"> • Potential for contamination and sedimentation of surface water from frac-out • Potential for fish habitat disturbance 	<ul style="list-style-type: none"> • Emergency Frac-out Plan preparation • Spills Kit on site • Boring conducted outside of sensitive fish period
E	Buried Electrical Cable	<ul style="list-style-type: none"> • Drilling conduit • Removal of waste slurry 	<ul style="list-style-type: none"> • Potential for contamination and sedimentation of surface water from frac-out • Potential for fish habitat disturbance 	<ul style="list-style-type: none"> • Emergency Frac-out Plan preparation • Spills Kit on site • Boring conducted outside of sensitive fish period
F	Buried Electrical Cable	<ul style="list-style-type: none"> • Drilling conduit • Removal of waste slurry 	<ul style="list-style-type: none"> • Potential for contamination and sedimentation of surface water from frac-out • Potential for fish habitat disturbance 	<ul style="list-style-type: none"> • Emergency Frac-out Plan preparation • Spills Kit on site • Boring conducted outside of sensitive fish period
G	Buried Electrical Cable	<ul style="list-style-type: none"> • Drilling conduit • Removal of waste slurry 	<ul style="list-style-type: none"> • Potential for contamination and sedimentation of surface water from frac-out 	<ul style="list-style-type: none"> • Emergency Frac-out Plan preparation • Spills Kit on site
H	Turbine 13	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • None
I	Buried Electrical Cable	<ul style="list-style-type: none"> • Drilling conduit • Removal of waste slurry 	<ul style="list-style-type: none"> • Potential for contamination and sedimentation of surface water from frac-out 	<ul style="list-style-type: none"> • Emergency Frac-out Plan preparation • Spills Kit on site
S	Overhead Electrical Cable	<ul style="list-style-type: none"> • Removal of existing pole • Installation of new pole 	<ul style="list-style-type: none"> • Increased sedimentation from loose soil on site 	<ul style="list-style-type: none"> • Sedimentation control measures placed between construction activities and water body • Water quality monitoring
T	Overhead Electrical Cable	<ul style="list-style-type: none"> • Removal of existing pole • Installation of new pole 	<ul style="list-style-type: none"> • Increased sedimentation from loose soil on site 	<ul style="list-style-type: none"> • Sedimentation control measures placed between construction activities and water body • Water quality monitoring

Water Body ID	Wind Farm Component	Activities within 30 m	Potential Negative Impacts	Performance Objectives
Z	Overhead Electrical Cable	<ul style="list-style-type: none"> • Removal of existing pole • Installation of new pole 	<ul style="list-style-type: none"> • Increased sedimentation from loose soil on site 	<ul style="list-style-type: none"> • Sedimentation control measures placed between construction activities and water body • Water quality monitoring
AA	Overhead Electrical Cable	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • None
AH	Buried Electrical Cable	<ul style="list-style-type: none"> • Drilling conduit • Removal of waste slurry 	<ul style="list-style-type: none"> • Potential for contamination and sedimentation of surface water from frac-out • Potential for fish habitat disturbance 	<ul style="list-style-type: none"> • Emergency Frac-out Plan preparation • Spills Kit on site • Boring conducted outside of sensitive fish period

TABLE 9 ENVIRONMENTAL EFFECTS MONITORING PLAN FOR ALL IDENTIFIED POTENTIAL NEGATIVE ENVIRONMENTAL EFFECTS TO WATER BODIES

Performance Objectives	Mitigation Measures	Monitoring Program	Contingency Plan
Avoid increase to surface water turbidity	<ul style="list-style-type: none"> Sedimentation control measures (straw bales, silt fencing) placed between construction activities and water body Careful planning and conduct of directional boring of cables under surface water areas will reduce risk of frac-out. 	Water quality monitoring for turbidity	If surface water turbidity is found to have increased overall compared to the pre construction figures, MNR, SNC and surface water consultants will be engaged and appropriate steps will be taken to attempt to reduce surface water turbidity levels to that of pre construction levels.
Avoid increase to surface water hydrocarbon contaminants	<ul style="list-style-type: none"> Careful planning and conduct of directional boring of cables under surface water areas will reduce risk of frac-out. Spills Kit on Site 	Water quality monitoring F1-F4 hydrocarbons	If surface water hydrocarbon levels are found to have increased overall compared to the pre construction figures, MNR, SNC and surface water consultants will be engaged and appropriate steps will be taken to attempt to reduce surface water hydrocarbon levels to that of pre construction levels.
Avoid fish habitat disturbance	<ul style="list-style-type: none"> Boring conducted outside of sensitive fish period Careful planning and conduct of directional boring of cables under surface water areas will reduce risk of frac-out. Sedimentation control measures (straw bales, silt fencing) placed between construction activities and water body. 	Water quality monitoring for turbidity and F1-F4 hydrocarbons	If surface water turbidity is found to have increased overall compared to the pre construction figures, MNR, SNC and surface water consultants will be engaged and appropriate steps will be taken to attempt to reduce surface water turbidity levels to that of pre construction levels.

6.1.1 Surface Water Sedimentation

6.1.1.1 Potential effects

Surface water sedimentation may occur on-site from loose soil created during construction and decommissioning entering the water bodies. This can occur during culvert replacement, access road upgrades, and overhead poles replacement. Sedimentation could also occur in the case of frac-out during high pressure directional drilling (boring) under watercourses for installation of the electrical network.

The consequence of increased surface water sedimentation is the decreased quality of aquatic plant and animal habitat and general decrease in surface water quality at site of sedimentation and downstream.

6.1.1.2 Mitigation Measures

Where buried electrical cable intersects with water bodies, the cables will be directionally bored under the stream bed as opposed to open-cut trenching. Drilling under the stream bed greatly reduces the impact to the water body and habitat. This method will avoid disrupting the streambed and banks and set construction activities back from the edge of the water feature. Entry and exit points of drilling conduit will be greater than 30 m from the water feature edge. This mitigation measure is applied at the planning phase of the project and reduces the mitigation necessary during construction. There is a possibility of a frac-out during high pressure directional drilling. A frac-out emergency plan will be prepared by and submitted to the MOE, MNR and South Nation Conservation outlining immediate response measures, emergency contacts and rehabilitation plans. This will be prepared by the Engineering Procurement Contractor closer to the construction date.

Where loose soil will be created within 30 m of a water body, such as pole replacement locations and culvert replacement locations, sedimentation management control measures will be placed between the construction activity and the water body. These measures may include straw bales and/or silt fencing.

Soil stockpiles will be located outside of the floodplain, where applicable.

6.1.1.3 Environmental Effects Monitoring Plan

The environmental effects monitoring plan outlines Prowind's intent to monitor the water quality of surface water within the project area.

Baseline data will be collected prior to the construction phase of the wind farm. This will include water quality parameters such as suspended solids and F1-F4 hydrocarbons.

After construction activities have been completed and the site rehabilitated, water samples will be taken again at the same sample locations. This data will be compared to the baseline data and evaluated for change that can be attributed to wind farm activities. A map of the sampling locations can be found in Section 4.2 of the *Design and Operations Report*.

6.1.1.4 Construction Plan

Surface water sedimentation is addressed in Section 5.10 of the *Construction Plan Report*. This section outlines the activities that have the potential to impact surface water quality through loose soil transport into the surface water, which includes land clearing, access road construction, crane pad and lay-down area construction, foundation construction, electrical network installation and site rehabilitation. These are identified for their disruption to soil during construction. It describes the impacts as potential increased turbidity in nearby surface water. Mitigation measures listed in the *Construction Plan Report* include: considerate placement of construction activities away from sensitive features and surface water monitoring.

6.1.2 Surface Water Contamination

6.1.2.1 Potential Effects

There is a possibility for contamination of surface water due to frac-out during high-pressure directional drilling under the water bodies. The mud slurry used for drilling is mixed with lubricants that would enter the stream if a frac-out occurred.

The consequence of increased surface water contamination is the decreased quality of aquatic plant and animal habitat and a general decrease in surface water quality.

6.1.2.2 Mitigation Measures

The primary mitigation measure to reduce the risk of frac-out is careful operation of the construction equipment by trained professionals. Surface water contamination should not occur if care is taken when handling equipment in this area.

A frac-out emergency plan will be prepared through consultation with the drilling contractor, the MOE, the MNR and South Nation Conservation. This will outline emergency response plans, emergency contacts and rehabilitation plans. A spills kit will be on site to deal with any accidental hazardous waste spill. The MOE Spills Action Centre will be notified immediately of any spill event.

6.1.2.3 Environmental Effects Monitoring Plan

The environmental effects monitoring plan outlines the Proponent's intent to monitor the water quality of surface water within the project area.

Baseline data will be collected prior to the construction phase of the wind farm. This will include water quality parameters such as suspended solids and F1-F4 hydrocarbons.

After construction activities have been completed and the site rehabilitated, water samples will be taken again at the same sample locations. This data will be compared to the baseline data and evaluated for change that can be attributed to wind farm activities. A map of the sampling locations can be found in the Section 4.2 of the *Design and Operations Report*.

6.1.2.4 Construction Plan

Surface water contamination is also addressed in Section 5.11 of the *Construction Plan Report*. This section outlines the activities that have the potential to impact surface and ground water quality through contamination by hazardous fluids, which include turbine installation and electrical network installation. These are identified for their use of hazardous fluids during construction. It describes the potential impacts as contamination due to accidental leak or spill. Mitigation measures listed in the *Construction Plan Report* include: extra care when handling hazardous wastes, considerate placement of construction activities away from sensitive features, spill kit on site, and surface water monitoring.

6.1.3 Fish and Fish Habitat Disturbance

6.1.3.1 Potential Effects

Fish and fish habitat may be disturbed during construction activities that require the electrical cabling to be bored under the watercourse.

Disturbance of fish habitat may occur in the case of a frac-out. A frac-out would disturb the stream bed and increase sedimentation and surface water contamination from the lubricants needed for boring.

Riparian and stream bed vegetation may also be disturbed in the case of frac-out.

6.1.3.2 Mitigation Measures

Mitigation measures for potential surface water sedimentation and contamination are discussed in the previous sections.

Mitigation measures for the direct disturbance of fish and fish habitat include avoidance of sensitive fish spawning and rearing periods from March 15th to July 1st. Boring activities will be conducted outside of this sensitive time period in case of a frac-out and the potential for fish and fish habitat disturbance.

6.1.3.3 Environmental Effects Monitoring Plan

The environmental effects monitoring plan outlines the Proponent's intent to monitor the water quality of surface water within the project area.

Baseline data will be collected prior to the construction phase of the wind farm. This will include water quality parameters such as suspended solids and F1 –F4 hydrocarbons.

After construction activities have been completed and the site rehabilitated, water samples will be taken again at the same sample locations. This data will be compared to the baseline data and evaluated for change that can be attributed to wind farm activities. A map of the sampling locations can be found in Section 4.2 of the *Design and Operations Report*.

6.1.3.4 Construction Plan

Fish habitat disturbance is addressed in Section 5.5 of the *Construction Plan Report*. This section outlines the activities that have the potential to disturb fish habitat. It describes the potential impacts as potential surface water sedimentation and contamination and the possible removal of riparian and/or floodplain vegetation. Mitigation measures listed in the *Construction Plan Report* include: considerate placement of construction activities away from sensitive features, drilling entry and exit points greater than 30 m from high water mark, sediment control measures at watercourse, surface water monitoring and replacement of any vegetation that is removed.

APPENDIX A

SITE INVESTIGATION FIELD NOTES

South Branch Wind Farm Field Notes - Water and Natural Features

June 15, 2010 - GPS points from "Boundary" woodlot – correspond with photos
Juan Anderson and Rochelle Rumney
1pm to 4 pm, sunny, 24C

180 view 465119 E, 4973799N POI 074
Pic N wdlt edge 464839 E, 4973645 N POI 073
NW corner woods 464774 E, 4973586 N POI 072
464465 E, 4973956 N - NS windrow
464738 E, 4973699 N POI071 – southern EW windrow
464631 E, 4973850 N POI 070 – northern EW windrow

June 16, 2010 - Poles along 18
Rochelle Rumney and Juan Anderson
11 am to 1 pm, overcast 25 C

Gilmour (18)
poles leave road at Byker Rd.
poles reappear at 465936, 4972940

Poles Start 465935 E, 4972941 N
SW1 466198 E, 4973095 N
SW2 466432 E, 4973226 N
SW3 467522 E, 4973857 N
SW4 467958 E, 4974119 N
SW5 468187 E, 4974255 N
SW6 470063 E, 4975378 N
line starts 469495 E, 4975041 N
line ends 468949 E, 4974718 N

Aug 12, 2010 2:30 pm to 4:15 pm
Cathy Weston and Rochelle Rumney
Sunny with scattered clouds, 25 C

SN River along Brinston, 470598 E, 4978083 N, 76 m asl

Oak Valley Pioneer Park – SNC area – Pioneer Heritage Site
470801 E, 4980660 N
Manicured lawn and picnic table area next to Nation River. no birds or other species
observed.

Watercourse on Snowbird Road at turbine entrance

18 470730 E, 4980660 N - field, no culvert

470243 E, 4980368 N, snowbird maybe watercourse

Watercourse on snowbird almost at 16
469857 E, 4980135 N, point 077

11047 Gilmour Road, photos of hydro lines

Watercourse on Gilmour, ditch

470152 E, 4975435 N, stream on Gilmour east of river

469940 E, 4975289 N River on Gilmour

Gilmour creek at 469369 E, 4974967 N – 078
on north side

469175 E, 4974849 N – 079
Gilmour and SB Road

CA Robert Graham Trail – 1.5 km walking trail
465064 E, 4972418 N
red pine plantation at front

Woodlot on Byker property

woodlot pic of edge at 465043 4973021 - 081

SW corner of woodlot 465077 E 4973064 N – 082
poplar, apple
NW corner 464777 E, 4973584 N – 083

water polygon north of woodlot – 464914, 4973696 – 084

NE corner of woodlot – treeline continues but woodlot stops
465142 4973805 – 085

September 13, 2010

Rochelle Rumney and Nigel Finney

started at 8:30 am, light to heavy rain, overcast, 16 C.

Conducted ELC surveys on woodlots within project area.

Notes on several watercourses are entered into spreadsheet "South Branch Wind Farm Water/Natural Features Field Notes"

rain cleared at approximately 10 am, sunny at approx 11

finished field work at 330 pm

October 14, 2010

October 14, 2010

Cathy Weston

1:30 pm – 230pm

Overcast, 14 C and recent rain

photos, locates and measurements of watercourses

see Field Notes-water_2010-10-14 for more detail

October 25, 2010

Rochelle Rumney

245 pm to 430 pm

overcast, 17 C, very light wind, rain earlier in day and then moderate to heavy rain later on in survey, about 345.

- investigated stream along Byker property line/woodlot – wet area, no watercourse
 - woodlot in Byker field – small, very wet, fallow field. gps marked
 - watercourses along Gilmour Road, S and AC
 - Woodlot I (corner of CR1 and CR18)
 - fields where AH, Q and DEF are located are still corn covered
 - more details in "South Branch Wind Farm Water/Natural Features Field Notes"
-

October 26, 2010

Rochelle Rumney and Cathy Weston

11 am to 3 pm, 25 C, overcast with sun

- see notes in "South Branch Wind Farm Water/Natural Features Field Notes"
- watercourses along 18/Gilmour Rd.
- watercourse at turbine 15
- watercourse at turbine 6
- watercourses at turbine 8
- watercourses on Hofer's land (turbine 14)

South Branch Wind Farm Field Notes - 2010_10_14

Water					Photo
Feature ID	W Coord	N Coord	Comments	Photo id	direction
P	75-21.564	44-56.397	ditch under road - standing water	739	S
P	75-21.564	44-56.397	ditch under road - standing water	740	N
S			didn't see in time to stop - dip in field on fence line		
V	75-23.208	44-55.686	dip in field - tiled	744	N
W	75-23.292	44-55.645	ditch alongside road and heading north from road. Standing water	741	N
W	75-23.292	44-55.645		742	N
W	75-23.292	44-55.645	travels west along gilmour for a while	743	W
Y	75-23.623	44-55.507	dip in yard - no water	745	S
Z	75-23.860	44-55.406	dip in field - some wetness but no surface water	746	NE
Z	75-23.860	44-55.406		747	N
AB	75-24.839	44-54.984	ditch - treed along sides and by road.	no photo -	
AC			Standing water in ditch	mean dog	
AG	75-26.066	44-54.480	didn't see this one	no photo	
			dip in field - wet area, but no surface water	748	N

all measurements and photos taken between 1:30 and 2:30 on Thursday, Oct 14.
Overcast, 14 degrees and recent rain.

South Branch Wind Farm Water Features Field Notes

ID	Date*	Description	Coordinates	E	N	Photo ID	wind farm infrastructure component	intersect infrast.?	other
A	1	channelized, deep cut, standing water	469160, 4981671 > 469226, 4981355 >	469160	4981671	388, 389 390, 391	road	Y	
A1	1	channelized, deep cut, standing water	469226, 4981355	469226	4981355				
B	4	deep cut in field ~ 3 m deep, water ~ 1.5 m	44 59.376, 75 23.287	469405	4981868	511 (E), 512 (w)	road	Y	
C	1	drainage	470176, 4980820	470176	4980820	395-398	cable	Y	
D	4	dip in field, likely tiled/leveled	44 58.695, 75 22.230	470788	4980601	521, 522	road, cable, T6	Y	
E	4	deep cut in field, light movement, dirty water, spraying manure in adjacent field	44 58.381, 75 21.912	471203	4980018	516 (drain), 513, (e), 514 (w), 515 (s)	cable	Y	existing bridge over stream at 44 58.476, 75 21.737
F	4	SN river, moderate flow, wide valley, water level ~ 12-15 m wide,	44 58.256, 75 21.834	471305	4979786	(w), 520 (s)	cable	Y	
G	1	standing water, vegetation in stream, lots of algae	471728, 4978880	471728	4978880	409-411	cable	Y	
H	1	between woodlot and corn field, standing water	472549, 4979405	472549	4979405	413-415	T13	N	
I	1	drainage outlets into creek, lots of leopard frogs, stagnant water, lots of vegetation growth in water no drainage N of SW corner	471924, 4978532 > 471760, 4978437 >	471924	4978532	404 (W), 405 (N) SE corner	cable	maybe	
I1	1	drainage outlets into creek, lots of leopard frogs, stagnant water, lots of vegetation growth in water no drainage N of SW corner	471924, 4978532 > 471760, 4978437 >	471760	4978437				
J	4	drainage ditch, crosses under road	44 57.684, 75 22.649	470229	4978732	523-525	road	n	Hofer Island pt 1 - 44 57.281, 75 23.298 pt 2 - 44 57.311, 75 23.296 foundation filled with rain, vegetation present, no watercourse in or out of pond, stagnant, rectangular in shape - pic 530
K	4	stagnant, some riparian veg	44 57.418, 75 23.197	469506	4978243	527 (N), 526 (s)	road	Y	
L	4	grass covered	44 57.281, 75 23.195	469507	4977989	528 (s) 529 (n)	cable	Y	
M	4	narrow, in agrc field, shallow	44 57.299, 75 22.808	470016	4978020	531 (w), 532 (e)	cable	Y	

N	4	SN river. Wide, good flow.	44 57.218, 75 22.746	470097	4977870	533-535	cable	Y	
O1	5	N side - visible ditch S side - visible ditch next to houses, small, tapers off	N - 44 56.259, 75 21.884	471222	4976089	N - 493-495 S - 496, 497	road, overhead line, cable, T9	Y	1st attempt - 469209, 4974865 - 302 to 304
O2	5	N side - visible ditch S side - visible ditch next to houses, small, tapers off	S - 44 56.324, 75 21.744	471407	4976208	N - 493-495 S - 496, 497			
O3	5	Headed north along field edge. Drainage ditch, uniform along field; approx 8 ft across from shoulder to shoulder. Standing water, grass covered in areas, no wildlife noted	44-56.324; 75- 21.949	471137	4976210	S - 808; N - 809	ROAD, CABLE		
O4	5	SAME AS O3	44-56.407; 75- 22.012	471055	4976364	N-810-811; S - 812	ROAD, CABLE		
O5	5	SAME AS O3	44-56.516; 75- 22.104	470935	4976566	813-815	ROAD, CABLE		
O6	5	SAME AS O3	44-56.667; 75- 22.224	470779	4976846	816-817	ROAD, CABLE		
O7	5	SAME AS O3	44-56.783; 75- 22.317	470657	4977062	818-19	ROAD, CABLE		
P	2	ditch under road - standing water	75-21.564, 44- 56.397	471644	4976343	739 (S), 740 (N)	cable	maybe	
Q	4	Pt 1 - from Brinston Rd., stream and roadside ditch 2 - culvert and land crossing - water 10 ft wide, 0.5 ft deep, still, mossy bottom 3 - grassy stream, light movement, swampy 4 - ditch, grassy 5 - land crossing 6 - turbine location? Stream shallow, clay bottom	1 - 44 56.000, 75 21.288 2 - 44 56.042, 75 21.175 3 - 44 56.079, 75 21.075 4 - 44 56.090, 75 21.037 5 - 44 56.074, 75 21.010 6 - 44 56.113, 75 20.922			1 - 498 (e), 499 (N), 500 (s) 2 - 502 (e), 501 (w), 503 (land crossing) 3 - 504 (w) 505 (e) 4 - 506 (n), 507 (s) 5 - 508, 509 6 - 510		Y	
Q1	4	from Brinston Rd., stream and roadside ditch		472004	4975606				
Q2	4	culvert and land crossing - water 10 ft wide, 0.5 ft deep, still, mossy bottom		472153	4975683				
Q3	4	grassy stream, light movement, swampy		472285	4975751				
Q4	4	ditch, grassy		472335	4975771				
Q5	4	land crossing		472370	4975741				

Q6	4	turbine location? Stream shallow, clay bottom		472486	4975813					
R	4	no longer within project area						T15, road	n	
S		shallow ditch beside lawn, some standing water	44 56.087, 75 22.250	470740	4975773			overhead line	n	
T	1	wide, shallow, slow moving, river. Lots of surface vegetation, algae, lily pads. Painted turtles seen on log in river. Narrow riparian area on either bank	470152E, 4975435N	470152	4975435	yes - 2010_08_12 IMG_0307 & _0308		overhead line	y	
U	1		469940 E, 4975289 N	469940	4975289	yes - 2010_08_12 IMG_0309 to _0311		overhead line	y	
V	2	dip in field - tiled	75-23.206, 44- 55.686	469479	4975036	744 (N)		overhead line	y	
W	2	ditch alongside road and heading north from road. Standing water, travels west along gilmour road for a while	75-23.292, 44.55.645	469365	4974961	741 & 742 (N), 743 (W)		overhead line	y	
X	4	split across road, visible drainage course	44 55.584, 75 23.427 469175 E, 4974849 N	469175	4974849	490 (n), 491 (s), 492 (n)		overhead line	y	
X1	4	split across road, visible drainage course	44 55.584, 75 23.427 469175 E, 4974849 N	469187	4974849					
Y	2 4	no stream, likely tiled dip in yard - no water	44 55.533, 75 23.556 75-23.623, 44- 55.507	469017	4974755	489, 745		overhead line	n	
Y1	2 4	no stream, likely tiled dip in yard - no water	44 55.533, 75 23.556 75-23.623, 44- 55.507	468929	4974707					
Z	2	dip in field - some wetness but no surface water	75-23.860, 44- 55.406	468616	4974522	746 (NE), 747 (N)		overhead line	n	
AA	4	AA1 - west of larger stream, small ditch in field	44 55.219, 75 24.286 468118 E, 4974201 N	468118	4974201	536, 314 to 316		overhead line	y	
AA 1	4	AA1 - west of larger stream, small ditch in field	44 55.219, 75 24.286 468118 E, 4974201 N	468054	4974178					

AB	2	ditch - treed along sides and by road. Standing water in ditch	44 54.984, 75 24.832, 75-23.839, 44- 54.984	468649	4973740	787 (N), 788 (s)	overhead line	Y	
AB	1	ditch - treed along sides and by road. Standing water in ditch	44 54.984, 75 24.832, 75-23.839, 44- 54.984	468640	4973740				
AC	4	nothing visible	44 54.929, 75 24.960	467165	4973646	785-6 (n)	overhead line	Y	
AD	1 4	corn field on south side, wet low area through woodlot, dry bed, swampy area north, house/ditch south	44 54.707, 75 25.501 466734, 4973416	466734	4973416	781-2 (n), 783/4 (s) 372-374	overhead line	Y	overhead line on south side
AD	1 4	corn field on south side, wet low area through woodlot, dry bed, swampy area north, house/ditch south	44 54.707, 75 25.501 466734, 4973416	466451	4973239				
AE	1 4	north side is corn	44 54.599, 75 25.769, 466285, 4973149	466285	4973149	478 (n), 479-480 (s, dugout pond in yard) 375-377	overhead line	Y	
AE	1 4	north side is corn	44 54.599, 75 25.769, 466285, 4973149	466097	4973041				
AF	1 4		44 54.521, 75 25.950 465731, 4972835	465858	4972897	476 (N), 477 (s) 379-380	overhead line	Y	
AF	1		465731, 4972835	465731	4972835				
AG	1	dip in field - wet area, but no surface water	75-26.066, 44- 54.480	465705	4972822	748	overhead line	maybe	
AH	6	shallow stream, running water grassy banks and stream bottom. Approx 15 feet from bank to bank.	44-54.469; 75- 26.422	465237	4972804	820-821	cable	Y	
AI	1		465010, 4972937	465010	4972937	383-386	cable	maybe	
AJ	3	low wet area, some pooled rain water, no watercourse	44 54.676, 75 26.622 44 54.683, 75 26.605	464976	4973189	461 462, 463	cable	Y	

AJ 1	3	low wet area, some pooled rain water, no watercourse		464998	4973202				
AK 1	1	unrecorded watercourse along N edge of woodlot A, appears to be collected runoff in ditch, stagnant	469422, 4981220	469422	4981220			394	

*Date Code Legend

- 1 13-Sep-10/12-Aug-10
- 2 14-Oct-10
- 3 25-Oct-10
- 4 26-Oct-10
- 5 15-Nov-10
- 6 18-Nov-10

APPENDIX B

FIELD STAFF QUALIFICATIONS

FIELD STAFF QUALIFICATIONS – WATER ASSESSMENT

EXTERNAL CONSULTANTS

Nigel Finney

Ecological consultant Nigel Finney is a practicing ecologist with ELC training and over two years of ELC experience and application. Mr. Finney has training in Butternut Health Assessment, NHIC Data Sensitivity, EMAN's Terrestrial Ecosystem Monitoring Protocol, Bird Studies Canada Marsh Monitoring Program. Mr. Finney is also familiar with the ESA 2007 regulations as it pertains to Butternut.

BEACON ENVIRONMENTAL is an independent, Canadian company established in 2005 in response to the growing need for high quality environmental assessment, strategic advice and planning services.

The firm specializes in all aspects of terrestrial and aquatic ecology, and brings together a group of seasoned ecologists with more than 125 years of combined experience out of offices in Bracebridge Markham, Ottawa, and Guelph. Core service areas include: Environmental Planning, Environmental Assessment, Environmental Impact Studies, Ecological Risk Assessment, Ecological Management and Monitoring, Training, Education and Facilitation and Expert Review and Litigation Support.

Beacon Environmental regularly provides technical expertise to a wide range of public and private sector clients. The firm has been providing its services to the energy sector in Ontario since inception, and past and current clients include Ontario Power Generation, Hydro One, Schneider Power Inc. and SkyPower Corporation. Examples of recent projects include:

Dan Westerhof, B.Sc., M.E.S.

Ecologist

- +10 years experience in natural heritage assessment, specializing in plants and habitat assessment
- Certified in ELC and familiar with Marsh Monitoring Program Protocols as well as Ecological Monitoring and Assessment Network (EMAN) protocols
- involved in numerous biophysical inventories in natural areas in southern Ontario, including City of Toronto Potential ESA Study, Natural Heritage Evaluation for the Child and Parent Resource Institute lands in the City of London on the Thames River (for ORC), Biological Monitoring of Potential Pumping site (Nestle Waters)
- experienced in the natural heritage assessments for energy projects, including recent work for OPG on the Little Abitibi Ecological Integrity Assessment (OPG)

PROWIND STAFF

Rochelle Rumney

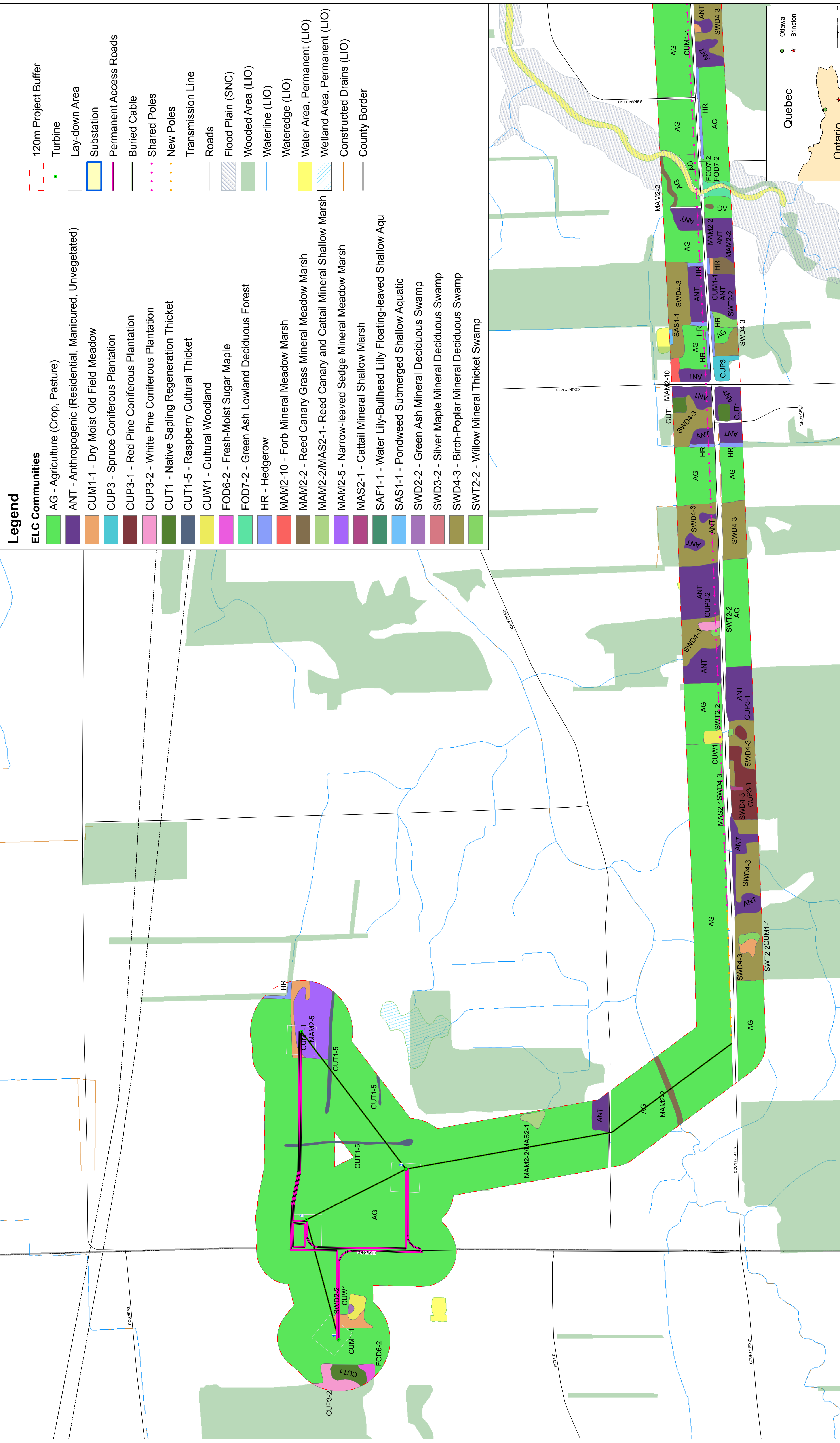
Rochelle Rumney received a Bachelor of Environmental Studies from the University of Waterloo in Environmental Planning and Management, along with a Diploma in Environmental Assessment. She has NHIC data sensitivity training from the Ministry of Natural Resources. She has been coordinating environmental assessments for wind energy projects for four years.

Cathy Weston

Cathy Weston earned a Bachelor of Science from Simon Fraser University in Applied Mathematics and a Master's Degree in Mathematics – Computer Science from the University of Waterloo. Ms. Weston worked for 3 years as an Environmental Technician at Environment Canada prior to working at Prowind.

APPENDIX C

ECOLOGICAL LAND CLASSIFICATION INFORMATION

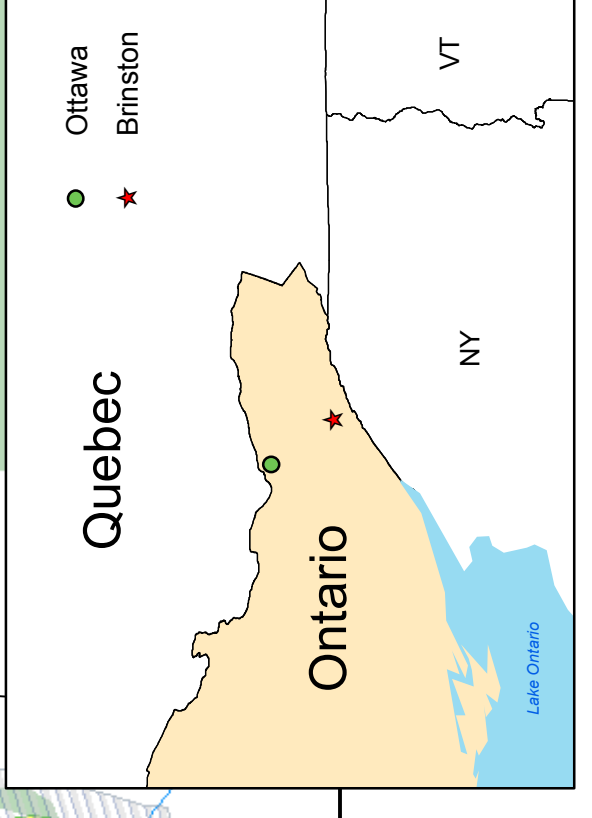
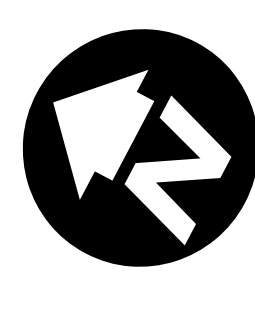
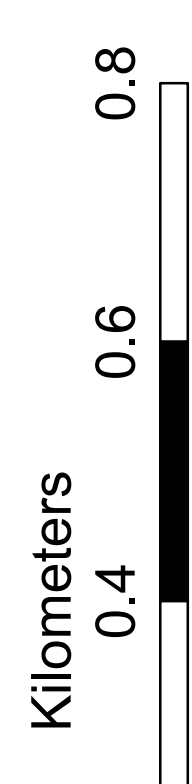


Legend

- ELC Communities**
- AG - Agriculture (Crop, Pasture)
 - ANT - Anthropogenic (Residential, Manicured, Unvegetated)
 - CUM1-1 - Dry Moist Old Field Meadow
 - CUP3 - Spruce Coniferous Plantation
 - CUP3-1 - Red Pine Coniferous Plantation
 - CUP3-2 - White Pine Coniferous Plantation
 - CUT1 - Native Sapling Regeneration Thicket
 - CUT1-5 - Raspberry Cultural Thicket
 - CUW1 - Cultural Woodland
 - FOD6-2 - Fresh-Moist Sugar Maple
 - FOD7-2 - Green Ash Lowland Deciduous Forest
 - HR - Hedgerow
 - MAM2-10 - Forb Mineral Meadow Marsh
 - MAM2-2 - Reed Canary Grass Mineral Meadow Marsh
 - MAM2-2/MAS2-1 - Reed Canary and Cattail Mineral Shallow Marsh
 - MAM2-5 - Narrow-leaved Sedge Mineral Meadow Marsh
 - MAS2-1 - Cattail Mineral Shallow Marsh
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 - SAS1-1 - Pondweed Submerged Shallow Aquatic
 - SWD2-2 - Green Ash Mineral Deciduous Swamp
 - SWD3-2 - Silver Maple Mineral Deciduous Swamp
 - SWD4-3 - Birch-Poplar Mineral Deciduous Swamp
 - SWT2-2 - Willow Mineral Thicket Swamp
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 - Turbine
 - Lay-down Area
 - Substation
 - Permanent Access Roads
 - Buried Cable
 - Shared Poles
 - New Poles
 - Transmission Line
 - Roads
 - Flood Plain (SNC)
 - Wooded Area (LIO)
 - Waterline (LIO)
 - Wateredge (LIO)
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 - Wetland Area, Permanent (LIO)
 - Constructed Drains (LIO)
 - County Border

**South Branch Wind Farm
Project Layout with Natural and Water Features**

June 30, 2011
Prowind Canada Inc
NAD 83 UTM 18N
Map created on 30 X 20 in.



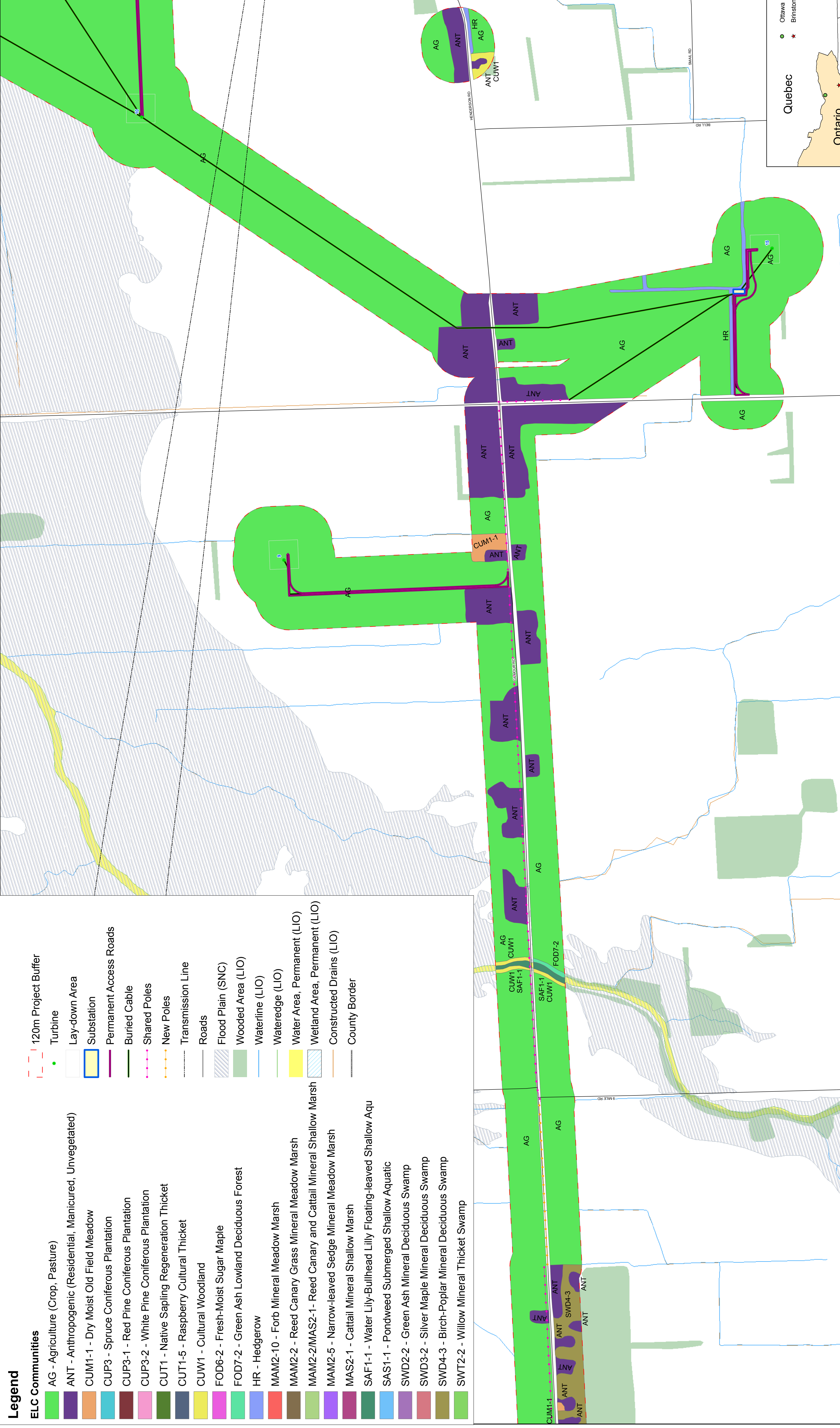
Key Map to Project Area

Legend

ELC Communities

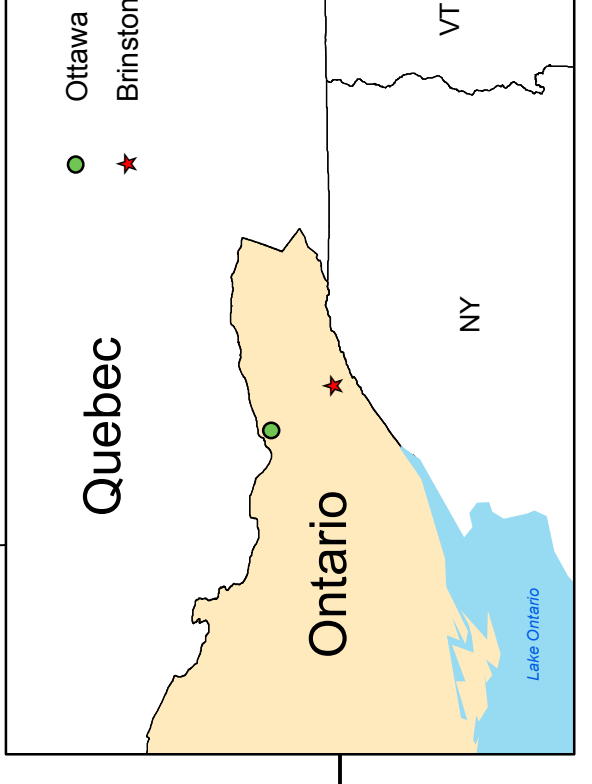
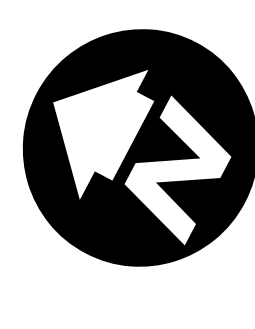
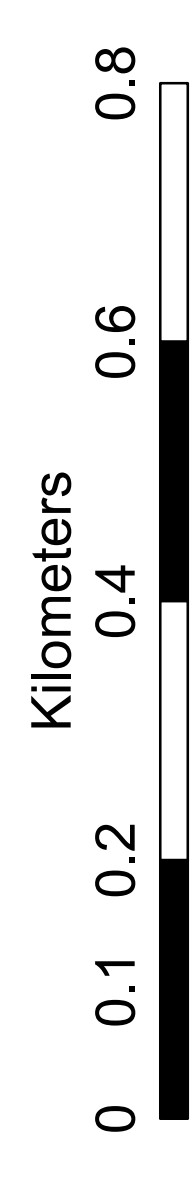
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 NAD 83 UTM 18N
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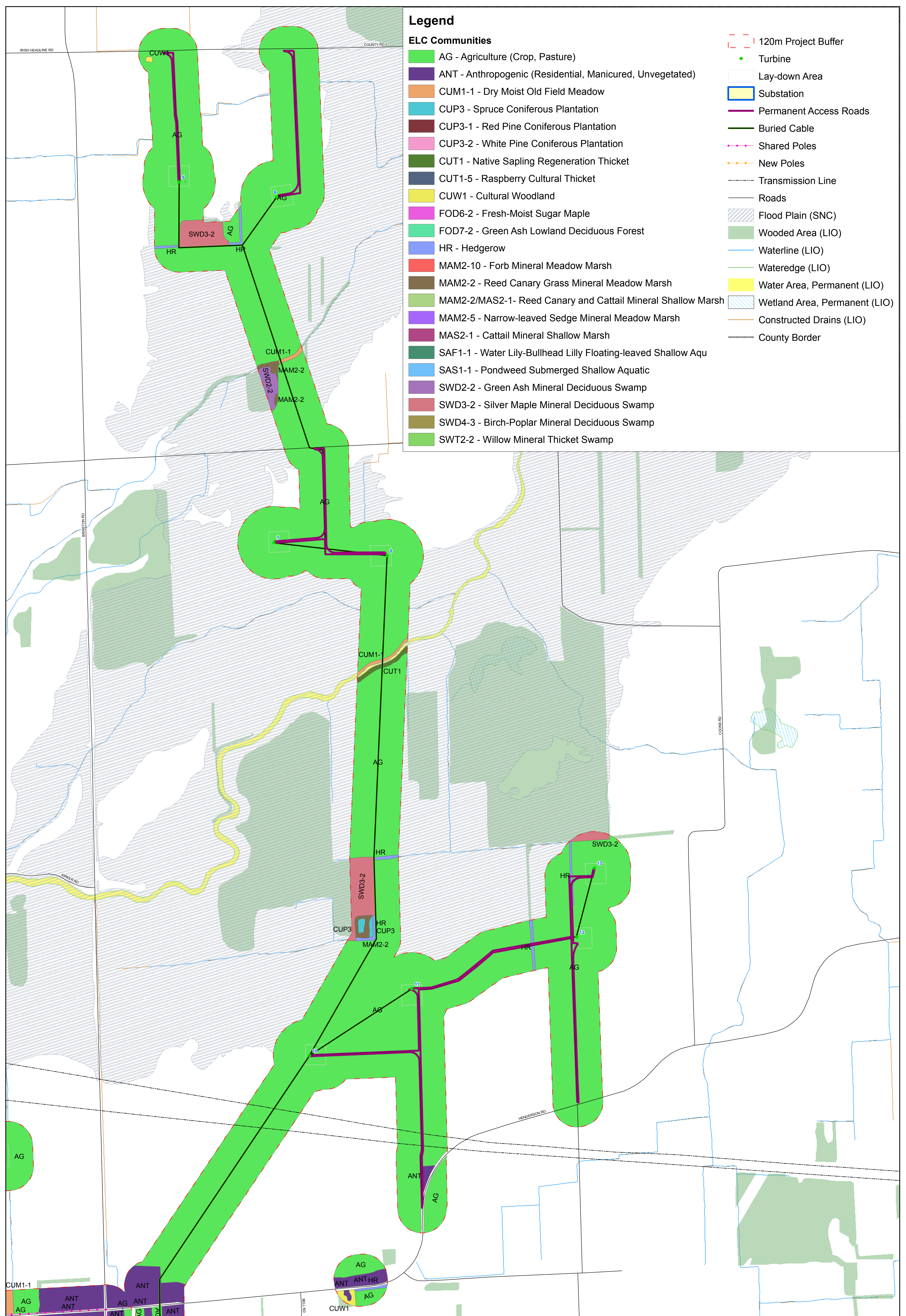
Key Map to Project Area

Legend

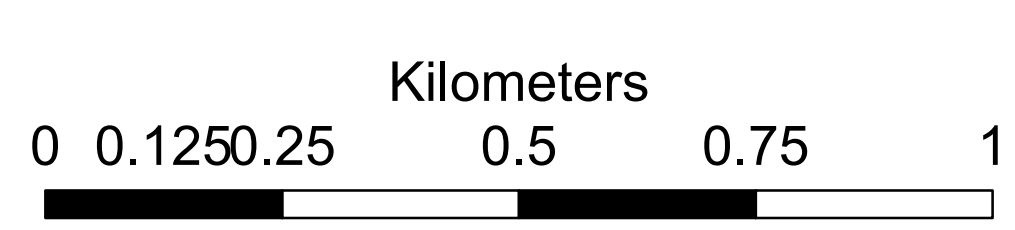
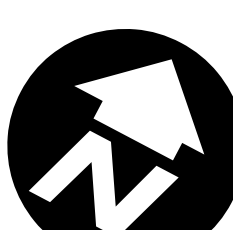
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**South Branch Wind Farm
Project Layout with ELC Codes**



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