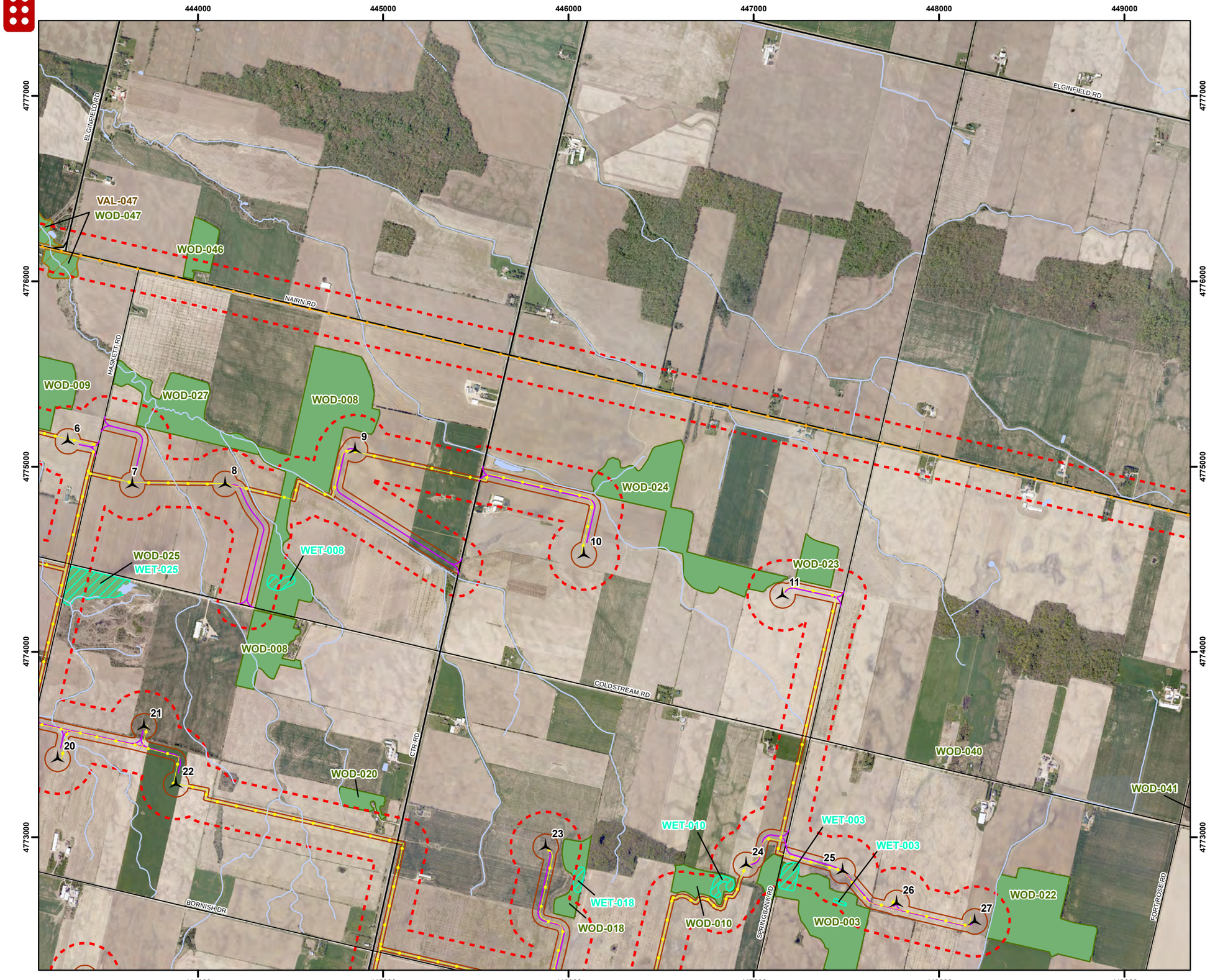

Path: X:\1231_BornishWindFarm\SI_EOS_Mapping\NRSI_1231_Fig9_BornishWF_NaturalFeatures_20K_2012_02_28_KEB.mxd

Figure 9

Bornish Wind Energy Centre

Natural Features - Northeast

Legend

- Project Area (120m)
- Project Location
- Turbine
- Access Road
- Transmission Line
- Collector System
- Staging Area
- Interconnection Facilities
- Substation
- Existing Transmission Line
- Primary Road
- Secondary Road
- Railroad
- Intermittent Watercourse
- Permanent Watercourse
- Waterbody
- Valleyland (VAL)
- Wetland (WET)
- Woodland (WOD)

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Project: 1231 Date: February 24, 2012	NAD83 - UTM Zone 17 Scale: 1:20,000 (11x17")

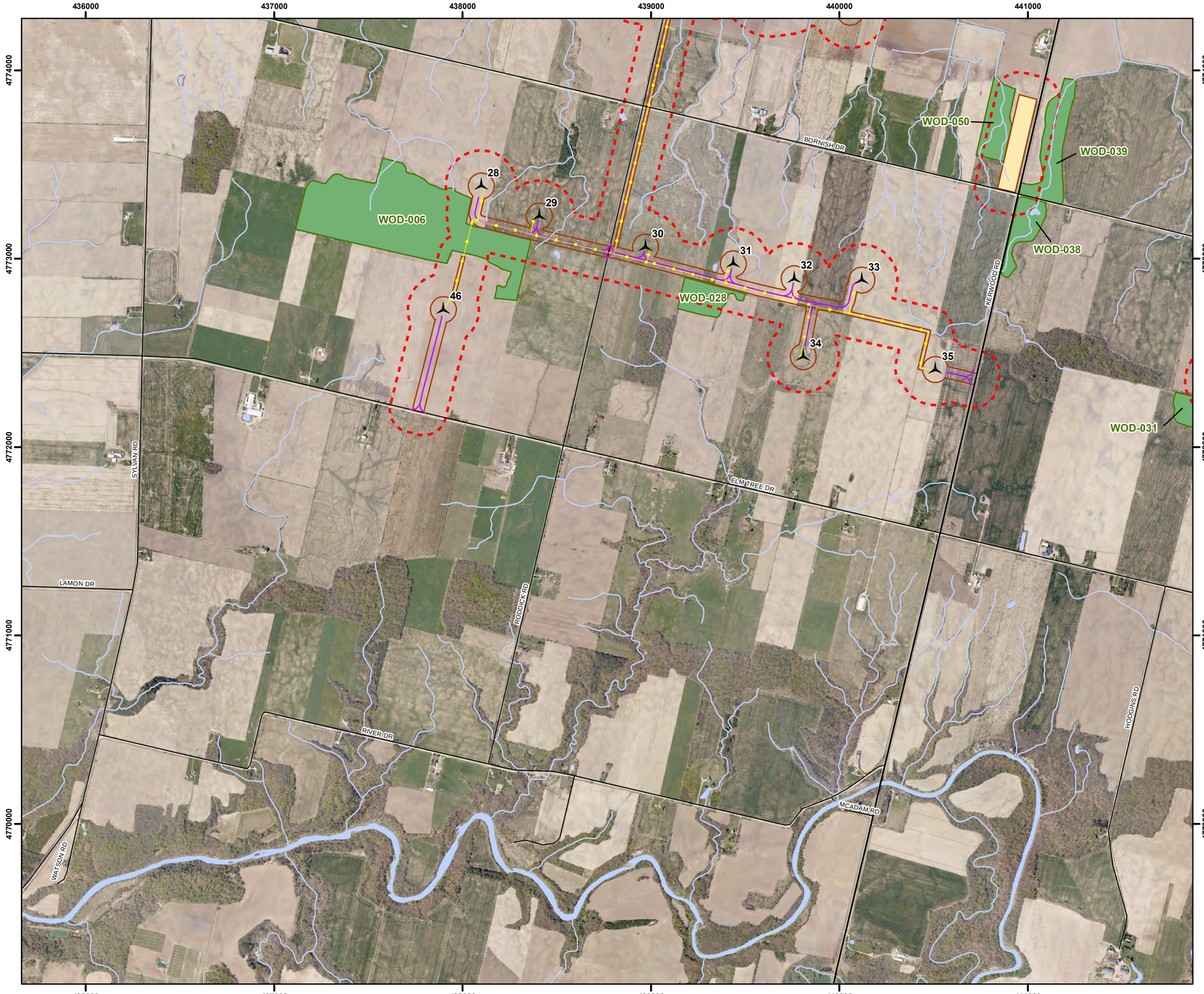
0 200 400 600 800 1,000 Metres

N

Figure 10

Bornish Wind Energy Centre

Natural Features - Southwest



Legend

- Project Area (120m)
- Project Location
- Turbine
- Access Road
- Transmission Line
- Collector System
- Staging Area
- Interconnection Facilities
- Substation
- Existing Transmission Line
- Primary Road
- Secondary Road
- Railroad
- Intermittent Watercourse
- Permanent Watercourse
- Waterbody
- Valleyland (VAL)
- Wetland (WET)
- Woodland (WOD)

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 1231 Date: February 24, 2012	NAD83 - UTM Zone 17 Scale: 1:20,000 (11x17")

0 200 400 600 800 1,000 Metres

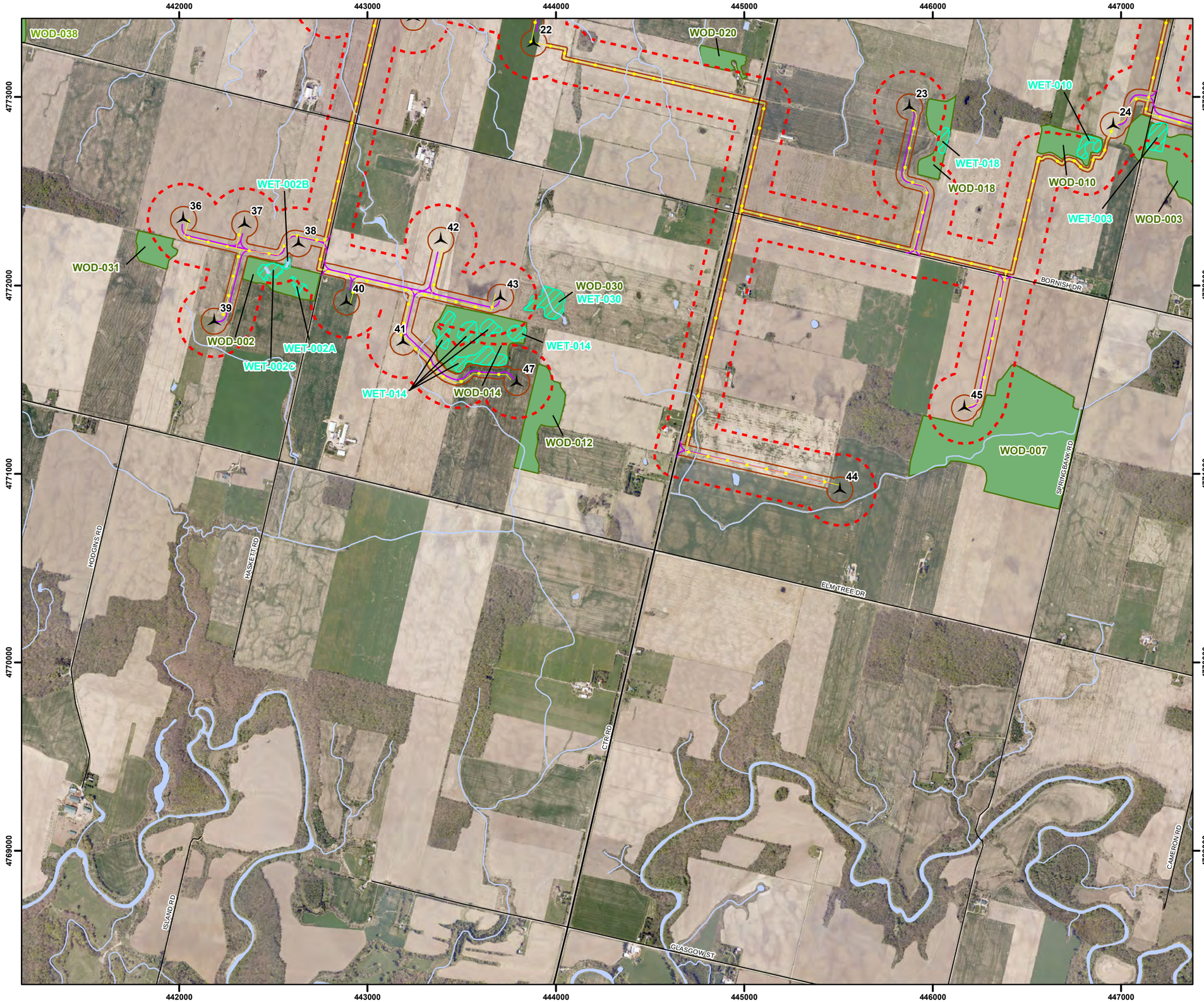
N

Path: X:\1231_BornishWindFarm\SI_EOS_Mapping\NRSI_1231_Fig10_BornishWF_NaturalFeatures_20K_2012_02_28_KEB.mxd

Figure 11

Bornish Wind Energy Centre

Natural Features - Southeast



Legend

- Project Area (120m)
- Project Location
- Turbine
- Access Road
- Transmission Line
- Collector System
- Staging Area
- Interconnection Facilities
- Substation
- Existing Transmission Line
- Primary Road
- Secondary Road
- Railroad
- Intermittent Watercourse
- Permanent Watercourse
- Waterbody
- Valleyland (VAL)
- Wetland (WET)
- Woodland (WOD)

Natural Resource Solutions Inc.
Aquatic, Terrestrial and Wetland Biologists

Project: 1231
Date: March 7, 2012

NAD83 - UTM Zone 17
Scale: 1:20,000 (11x17")

N

0 200 400 600 800 1,000 Metres

Path: X:\1231_BornishWindFarm\SI_EOS_Mapping\NRSI_1231_Fig11_BornishWF_NaturalFeatures_20K_2012_03_07_KEB.mxd

Figure 12

Bornish Wind Energy Centre

Natural Features - T-Line

Legend

- Project Area (120m)
- Project Location
- Turbine
- Access Road
- Transmission Line
- Collector System
- Staging Area
- Interconnection Facilities
- Substation
- Existing Transmission Line
- Primary Road
- Secondary Road
- Railroad
- Intermittent Watercourse
- Permanent Watercourse
- Waterbody
- Valleyland (VAL)
- Wetland (WET)
- Woodland (WOD)

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 1231 Date: March 30, 2012	NAD83 - UTM Zone 17 Scale: 1:20,000 (11x17")

0 200 400 600 800 1,000 Metres

N

Path: X:\1231_BornishWindFarm\SI_EOS_Mapping\NRSI_1231_Fig12_BornishWF_NaturalFeatures_20K_2012_02_30_KEB.mxd

Table 9. Summary of Woodlands within the Bornish Wind Energy Centre Project Area

Feature ID	Size (ha)	Composition	Attributes	Functions	Distance to Project Location (m)	Figure	EOS Required (Y/N)
WOD-001 Woodland	2.1	FODM5-6 Dry-fresh sugar maple basswood deciduous forest	Dominated by sugar maple and basswood with white elm and American beech	• Woodland diversity representation	WT – >120 AR – >120 OL – 30 UL – 5 SI – >120	8	**Yes**
WOD-002 Woodland	4.6	WODM5-2 Moist elm deciduous woodland	Dominated by white elm with shagbark hickory, basswood	• Woodland size	WT – 78 AR – 6 OL – 29 UL – 6 SI – >120	11	**Yes**
WOD-003 Woodland	15.1	WODM4-3 Dry-fresh sugar maple deciduous woodland	Dominated by sugar maple with white ash, American beech, hop hornbeam	• Woodland size • Contains woodland interior habitat • Woodland diversity representation	WT – 42 AR – 6 OL – 7 UL – 6 SI – >120	9,11,12	**Yes**
WOD-004 Woodland	15.6	WODM4-3 Fresh sugar maple deciduous woodland	Dominated by sugar maple, white ash, green ash, red oak, willow sp. European buckthorn	• Woodland size • Contains woodland interior habitat • Water protection	WT – 56 AR – >0.1 OL – 23 UL – 0 SI – >120	8	**Yes**
WOD-006 Woodland	38.9	FODM5-6 Dry-fresh sugar maple – basswood deciduous forest	Dominated by sugar maple and basswood with white ash, American beech	• Woodland size • Contains woodland interior habitat • Water protection • Woodland diversity representation	WT – 93 AR – 4 OL – >120 UL – Overlapping SI – >120	8,10	**Yes**
WOD-007 Woodland	37.2	FODM4-2 Dry-fresh white ash deciduous woodland	Dominated by white ash with sugar maple, basswood, shagbark hickory	• Woodland size • Contains woodland interior habitat • Water protection	WT – 49 AR – 5 OL – >120 UL – 5 SI – >120	11	**Yes**
WOD-008 Woodland	30.6	FODM5-8 Dry-fresh sugar	Dominated by sugar maple with white ash and American beech	• Woodland size • Contains woodland	WT – 44 AR – 7	9	**Yes**

Feature ID	Size (ha)	Composition	Attributes	Functions	Distance to Project Location (m)	Figure	EOS Required (Y/N)
		maple-white ash deciduous forest		interior habitat • Proximity to other significant woodlands or habitats • Water protection • Woodland diversity representation	OL – >120 UL – Overlapping SI – >120		
WOD-009 Woodland	11.0	WODM4-2 Dry-fresh white ash – hardwood deciduous forest	Dominated by white ash with sugar maple, basswood, American beech, shagbark hickory	• Woodland size	WT – 42 AR – 92 OL – >120 UL – 4 SI – >120	8,9	**Yes**
WOD-010 Woodland	4.3	FODM5-8 Dry-fresh sugar maple – white ash deciduous forest	Dominated by sugar maple and white ash with American beech, basswood	• Woodland size • Contains woodland interior habitat • Woodland diversity representation	WT – 55 AR – 105 OL – >120 UL – >0.1 SI – >120	9,11	**Yes**
WOD-012/WOD 021 Woodland	5.8	WODM4-3 Dry-fresh sugar maple deciduous woodland	Dominated by sugar maple with white ash, white elm, hop hornbeam	• Woodland size • Woodland diversity representation	WT – 47 AR – 92 OL – >120 UL – 92 SI – >120	11	**Yes**
WOD-013 Woodland	10.4	WODM4-3 Dry-fresh sugar maple deciduous woodland	Dominated by sugar maple with white ash, hop hornbeam, basswood	• Woodland size • Water protection • Woodland diversity representation	WT – >120 AR – >120 OL – 28 UL – >120 SI – >120	8	**Yes**
WOD-014 Woodland	11.7	FODM7-1 Fresh white elm lowland deciduous forest	Dominated by white elm, silver maple and green ash	• Woodland size • Woodland interior • Water protection • Woodland diversity representation • Woodland value	WT – 57 AR – >0.1 OL – >120 UL – >0.1 SI – >120	11	**Yes**

Feature ID	Size (ha)	Composition	Attributes	Functions	Distance to Project Location (m)	Figure	EOS Required (Y/N)
WOD-015 Woodland	<1	FODM4-2 Dry-fresh white ash-hardwood deciduous forest	Dominated by white ash, red elm with European buckthorn	No known functions	WT – 76 AR – 5 OL – >120 UL – 5 SI – >120	8	**Yes**
WOD-016	1.1	FODM4-2 Dry-fresh white ash-hardwood deciduous forest,	Dominated by white ash with white elm, shagbark hickory, sugar maple and basswood	No known functions	WT – 48 AR – 0.4 OL – >120 UL – 0.4 SI – >120	8	**Yes**
WOD-018 Woodland	4.3	WODM4-3 Dry-fresh sugar maple deciduous woodland	Dominated by sugar maple with American beech, white ash and basswood	• Woodland size • Woodland diversity representation	WT – 40 AR – 7 OL – >120 UL – 7 SI – >120	9,11	**Yes**
WOD-020 Woodland	1.8	FOCM6-1 Dry-fresh white pine naturalized coniferous plantation	Dominated by eastern white pine with black walnut and white ash	No known functions	WT – >120 AR – >120 OL – >120 UL – 110 SI – >120	9,11	**Yes**
WOD-022 Woodland	18.2	FODM5-2 Dry-fresh sugar maple-beech deciduous forest	Dominated by sugar maple and American beech	• Woodland size • Woodland interior • Woodland diversity representation	WT – 48 AR – 82 OL – >120 UL – 82 SI – >120	9,12	**Yes**
WOD-023 Woodland	4.3	FODM5-8 Dry-fresh sugar maple-white ash deciduous forest	Dominated by sugar maple and white ash with basswood and shagbark hickory	• Woodland size • Proximity to other significant woodland • Woodland diversity representation	WT – 63 AR – 14 OL – 90 UL – 14 SI – >120	9,12	**Yes**
WOD-024 Woodland	21.0	FODM4-2 Fresh white ash-hardwood	Dominated by white ash with sugar maple, shagbark hickory and red oak	• Woodland size • Woodland interior • Proximity to other	WT – 21 AR – 11 OL – 9	9	**Yes**

Feature ID	Size (ha)	Composition	Attributes	Functions	Distance to Project Location (m)	Figure	EOS Required (Y/N)
		deciduous forest		significant woodland	UL – 11 SI – >120		
WOD-025 Woodland	1.9	SWDM2-2 Green ash mineral deciduous swamps	Dominated by green ash with trembling aspen and silver maple	• Water protection	WT – >120 AR – >120 OL – 35 UL – >120 SI – >120	8,9	**Yes**
WOD-027 Woodland	12.6	FODM4-2 Dry-fresh white ash hardwood deciduous forest	Dominated by white ash with sugar maple and trembling aspen	• Woodland size • Woodland interior • Water protection	WT – >120 AR – 6 OL – >120 UL – >120 SI – >120	9	**Yes**
WOD-028 Woodland	3.7	FODM4-9 Dry-fresh basswood deciduous forest	Dominated by basswood with sugar maple and shagbark hickory	• Woodland diversity representation • Water protection	WT – 90 AR – 6 OL – >120 UL – 6 SI – >120	10	**Yes**
WOD-029 Woodland	6.1	WODM5-2 Fresh-moist elm deciduous woodland	Dominated by white elm with white ash and white oak	• Woodland size • Water protection	WT – 82 AR – 115 OL – >120 UL – 2 SI – >120	8	**Yes**
WOD-030 Woodland	1.5	SWDM3-2 Silver maple mineral deciduous swamp	Dominated by silver maple and Freeman's maple with green ash	• Water protection • Woodland diversity representation	WT – 89 AR – 73 OL – >120 UL – 73 SI – >120	11	**Yes**
WOD-031 Woodland	3.0	WODM3 Dry-fresh white oak woodland	Dominated by white oak with basswood, shagbark hickory and white ash	• Woodland diversity representation	WT – 70 AR – 64 OL – >120 UL – 64 SI – >120	10,11	**Yes**
WOD-038 Woodland	0.8	FOCM6 Naturalized coniferous	Dominated by Scots pine with white spruce, eastern white pine and basswood	• Proximity to other significant woodland	WT – >120 AR – >120 OL – >120	8,10	**Yes**

Feature ID	Size (ha)	Composition	Attributes	Functions	Distance to Project Location (m)	Figure	EOS Required (Y/N)
		plantation			UL – >120 SI – 72		
WOD-039 Woodland	5.2	FOCM6 Naturalized coniferous plantation	Dominated by white spruce, Scots pine and eastern white pine	• Woodland size • Proximity to other significant woodland	WT – >120 AR – >120 OL – >120 UL – >120 SI – 37	8,10,11	**Yes**
WOD-045 Woodland	10.6	FOCM6 Naturalized coniferous plantation	Dominated by white spruce	• Woodland size • Woodland interior	WT – >120 AR – >120 OL – 15 UL – >120 SI – >120	12	**Yes**
WOD-046 Woodland	4.4	FODM5-6 Dry-fresh sugar maple – basswood deciduous forest	Dominated by sugar maple and basswood with bur oak and silver maple	• Woodland size • Woodland diversity representation	WT – >120 AR – >120 OL – 12 UL – >120 SI – >120	9	**Yes**
WOD-047 Woodland	1.6	WODM5 Fresh-moist deciduous woodland	Dominated by black locust with silver poplar and Scots pine	• Proximity to other significant woodland • Water protection	WT – >120 AR – >120 OL – 20 UL – >120 SI – >120	8,9	**Yes**
WOD-048 Woodland	119.5	WOMM3 Fresh-moist mixed woodland	Dominated by white ash and Scots pine	• Woodland size • Woodland interior • Proximity to other significant woodland • Water protection	WT – >120 AR – >120 OL – 5 UL – >120 SI – >120	8	**Yes**
WOD-050 Woodland	3.0	FOCM6-1 Fresh white pine naturalized coniferous plantation	Contains only eastern white pine	No known functions	WT – >120 AR – >120 OL – >120 UL –>120 SI – 3	8,10	**Yes**
WOD-051 Woodland	11.1	FODM5-5 Dry-fresh	Dominated by sugar maple with shagbark hickory and American	• Woodland size • Water protection	WT – >120 AR – >120	8	**Yes**

Feature ID	Size (ha)	Composition	Attributes	Functions	Distance to Project Location (m)	Figure	EOS Required (Y/N)
		sugar maple – hickory deciduous forest	beech	• Woodland diversity representation	OL – >120 UL – >120 SI – 51		
WOD-052 Woodland	25.0	FODM4-2 Dry-fresh white ash – hardwood deciduous forest	Dominated by white ash with sugar maple, white elm and European buckthorn	• Woodland size • Woodland interior	WT – >120 AR – >120 OL – >120 UL – >120 SI – 10	12	**Yes**
WOD-053 Woodland	1.0	FOCM6 Naturalized coniferous plantation	Dominated by white spruce with eastern white cedar	No known functions	WT – >120 AR – >120 OL – 20 UL – >120 SI – 15	12	**Yes**

Legend
WT: Wind Turbine
AR: Access Road
OL: Overhead Line
UL: Underground Line
SI: Supporting Infrastructure

7.0 Wetlands

During the site investigation, a total of 10 candidate significant wetlands were identified and delineated within 120m of the project location of the Bornish Wind Energy Centre. Detailed mapping of these wetlands can be seen in Figures 8 to 12. Each wetland was assigned a unique identifier. These habitats were identified through ELC mapping and community characterization using the OWES, and are discussed in more detail below and in Table 10.

WET-002 – Duckweed Floating-Leaved Shallow Aquatic Ecosites (SAF 1-3), Red Maple Mineral Deciduous Swamp (SWDM3-1)
WOD-002 contains three wetland inclusions, including wetlands A and B, which are duckweed floating-leaved shallow aquatic ecosites (SAF_1-3)and wetland C, which is a red maple mineral deciduous swamp (SWDM3-1 Wetland A is 0.3 ha shallow aquatic ecosite that mainly consists of open water, while dominate vegetation includes swamp beggar ticks (*Bidens connata)* and lesser duckweed (*Lemna minor)*. This wetland is located 91 m away from a proposed access road and underground cabling. Wetland B is a 0.1 ha shallow aquatic site that is mainly open water, with dominant vegetation including slender willow (*Salix petiolaris)*, rice cut grass (*Leersia oryzoides)*, cocklebur species (*Xanthium sp.)*, lesser duckweed and green ash. Wetland B is located 12 m from a proposed access road and underground cabling. Wetland C is a 0.8 ha mineral deciduous swamp that is dominated by red maple and contains green ash, maple species (*Acer sp.)* and cocklebur species. This wetland is located 24 m from a proposed access road and underground cabling.

WET-003 – Silver Maple Mineral Deciduous Swamp (SWDM3-2)
This wetland is a 1.8 ha swamp inclusion within WOD-003 that is dominated by silver maple and also contains green ash. Other vegetation includes Virginia creeper, sensitive fern and clearweed (*Pilea pumila)*. This wetland is located 6 m away from a proposed access road and underground cabling.

WET-008 – Green Ash Mineral Deciduous Swamp (SWDM2-2)
This 0.3 ha swamp is an inclusion within WOD-008 that is dominated by green ash, silver maple and spicebush and contains hop sedge. This wetland is located 92 m from a proposed access road.

WET-010- Green Ash Mineral Deciduous Swamp (SWDM2-2)
This wetland is a 0.7 ha swamp inclusion found within WOD-010, which is dominated by green ash and also contains Freeman's maple and silver maple. This wetland is >0.1 m from proposed underground cabling. Buffer zone protection will be outlined in the EIS report.

WET-014 – Maple Mineral Deciduous Swamp (SWDM3)

This 3.0 ha wetland is an inclusion within WOD-014 and is dominated by Freeman's maple, green ash and clearweed. This swamp also contains black huckleberry (*Gaylussacia baccata)*, which is listed as very uncommon (occurs in 5-8 locations) in Middlesex County (Oldham 1993). This wetland is located 5 m from a proposed access road and underground cabling.

WET-018 – Silver Maple Mineral Deciduous Swamp (SWDM3-2)
This wetland is a 0.4 ha marsh within WOD-018, which is dominated by silver maple and contains grass species, sedge species, hop sedge and Lady's thumb (*Polygonum persicaria)*. This wetland is located 50 m from a proposed access road and underground cabling.

WET-025 – Green Ash Mineral Deciduous Swamp (SWDM2-2)
This 1.9 ha swamp was surveyed from Coldstream Road, as property access was not granted. The canopy of WOD-025 consists of green ash, trembling aspen (*Populus tremuloides)* and silver maple, while the sub-canopy contains willow species. The understory is dominated by common reed grass (*Phragmites australis)*, while the groundcover consists of goldenrod species, aster species and New England aster. This wetland is located 35 m from proposed overhead cabling.

WET-030 – Silver Maple Mineral Deciduous Swamp (SWDM3-2)
This 1.5 ha swamp was surveyed from the property south of the community as access to this property was not granted. The canopy of WOD-030 is dominated by silver maple, Freeman's maple and green ash, while the sub-canopy contains mainly silver maple and Freeman's maple. The understory is made up of silver maple, goldenrod species and common reed grass, while the groundcover was indistinguishable from the survey location. This wetland is located 73 m from a proposed access road and cabling.

Table 10. Summary of Wetlands within the Bornish Wind Energy Centre Project Area

Feature ID	Size (ha)	Closest Distance to Project Location	Composition	Attributes	Functions	Figure	EOS Required (Y/N)
WET-002 Wetland	0.3	WT – >120 AR – 91 OL – 105 UL – 91 SI – >120	A: SAF_1-3 Duckweed floating-leaved shallow aquatic ecosites	A: Dominant species include: swamp beggar ticks and lesser duckweed; moist silty clay soil	*Flood attenuation*: Isolated wetlands are 100% efficient for attenuating flood crests. *Preservation of biodiversity*: This wetland supports a moderate number of floral and faunal species. *Short term water quality improvement:* wetlands are extremely important in improving water quality when they are positioned in the watershed next to agricultural lands and/or urban areas.	11	**Yes**
	0.1	WT – 45 AR – 12 OL – >120 UL – 12 SI – >120	B: SAF_1-3 Duckweed floating-leaved shallow aquatic ecosites	B: Dominant species include: slender willow, rice cut grass, cocklebur species, lesser duckweed and green ash; moist silty clay soil	*Preservation of biodiversity*: This wetland supports a moderate number of floral and faunal species. *Short term water quality improvement:* wetlands are extremely important in improving water quality when they are positioned in the watershed next to agricultural lands and/or urban areas.	11	**Yes**

Feature ID	Size (ha)	Closest Distance to Project Location	Composition	Attributes	Functions	Figure	EOS Required (Y/N)
	0.8	WT – 109 AR – 24 OL – >120 UL – 24 SI – >120	C: SWDM3-1 Red maple mineral deciduous swamp	C: Dominant species include: red maple and containing green ash, maple species, cocklebur species and reed canary grass; moist silty clay soil	*Flood attenuation*: Isolated wetlands are 100% efficient for attenuating flood crests. *Preservation of biodiversity*: This wetland supports a moderate number of floral and faunal species. *Short term water quality improvement:* wetlands are extremely important in improving water quality when they are positioned in the watershed next to agricultural lands and/or urban areas.	11	**Yes**
WET-003 Wetland	1.8	WT – 100 AR – 6 OL – 35 UL – 6 SI – >120	SWDM3-2 Silver maple mineral deciduous swamp	Dominant species include: silver maple and green ash; moist silty clay soil with 20cm of organics	*Flood attenuation*: Isolated wetlands are 100% efficient for attenuating flood crests. *Preservation of biodiversity*: This wetland supports a moderate number of floral and faunal species. *Short term water quality improvement:* wetlands are extremely important in improving water quality when they are positioned in the watershed next to agricultural lands and/or urban areas.	9,11,12	**Yes**

Feature ID	Size (ha)	Closest Distance to Project Location	Composition	Attributes	Functions	Figure	EOS Required (Y/N)
WET-008 Wetland	0.3	WT – >120 AR – 92 OL – >120 UL – >120 SI – >120	SWDM2-2 Green ash mineral deciduous swamp	Dominant species: green ash, silver maple and spicebush; very fresh silty course sandy soil	*Flood attenuation*: Isolated wetlands are 100% efficient for attenuating flood crests. *Preservation of biodiversity*: This wetland supports a moderate number of floral and faunal species. *Short term water quality improvement:* wetlands are extremely important in improving water quality when they are positioned in the watershed next to agricultural lands and/or urban areas.	9	**Yes**
WET-010 Wetland	0.7	WT – 55 AR – 109 OL – >120 UL – >0.1 SI – >120	SWDM2-2 Green ash mineral deciduous swamp	Dominant species include: green ash and to a lesser extent: Freeman's maple and silver maple; very moist silty clay soil with 7 cm of organics	*Flood attenuation*: Isolated wetlands are 100% efficient for attenuating flood crests. *Preservation of biodiversity*: This wetland supports a moderate number of floral and faunal species. *Short term water quality improvement:* wetlands are extremely important in improving water quality when they are positioned in the watershed next to agricultural lands and/or urban areas.	9,11	**Yes**
WET-014 Wetland	3.0	WT – 70 AR – 5 OL – >120 UL – 5 SI – >120	SWDM3 Maple mineral deciduous swamp	Dominant species include: Freeman's maple, green ash and clearweed; fresh clay soil	*Flood attenuation*: Isolated wetlands are 100% efficient for attenuating flood crests. *Preservation of biodiversity*:	11	**Yes**

Feature ID	Size (ha)	Closest Distance to Project Location	Composition	Attributes	Functions	Figure	EOS Required (Y/N)
					This wetland supports a moderate number of floral and faunal species, including *Gaylussacia baccata*. *Short term water quality improvement:* wetlands are extremely important in improving water quality when they are positioned in the watershed next to agricultural lands and/or urban areas.		
WET-018 Wetland	0.4	WT – 115 AR – 50 OL – >120 UL – 50 SI – >120	SWDM3-2 Silver maple mineral deciduous swamp	Swamp is dominated by silver maple with grass and sedge species; very moist silty clay soil	*Flood attenuation*: Isolated wetlands are 100% efficient for attenuating flood crests. *Preservation of biodiversity*: This wetland supports a moderate number of floral and faunal species. *Short term water quality improvement:* wetlands are extremely important in improving water quality when they are positioned in the watershed next to agricultural lands and/or urban areas.	9,11	**Yes**
WET-025 Wetland	1.9	WT – >120 AR – >120 OL – 35 UL – >120 SI – >120	SWDM2-2 Green ash mineral deciduous swamp	Dominated by green ash and containing trembling aspen and silver maple; no site access to conduct soil sampling	*Preservation of biodiversity*: This wetland supports a moderate number of floral and faunal species. *Short term water quality improvement:* wetlands are extremely important in improving water quality when	8,9	**Yes**

Feature ID	Size (ha)	Closest Distance to Project Location	Composition	Attributes	Functions	Figure	EOS Required (Y/N)
					they are positioned in the watershed next to agricultural lands and/or urban areas.		
WET-030 Wetland	1.5	WT – 89 AR – 73 OL – >120 UL – 73 SI – >120	SWDM3-2 Silver maple mineral deciduous swamp	Dominated by silver maple and Freeman's maple and containing green ash; no site access to conduct soil sampling	*Preservation of biodiversity*: This wetland supports a moderate number of floral and faunal species. *Short term water quality improvement:* wetlands are extremely important in improving water quality when they are positioned in the watershed next to agricultural lands and/or urban areas.	11	**Yes**

Legend

WT: Wind Turbine
AR: Access Road
OL: Overhead Line
UL: Underground Line
SI: Supporting Infrastructure

8.0 Valleylands

A valleyland is defined as a natural area that occurs in a valley or other landform depression that has water flowing through or standing for some period of the year (OMNR 2010). Valleylands serve as natural drainage systems for watersheds and the significance of these features have been assessed within the context of the overall watershed. A summary of valleylands found within the Bornish Wind Energy Centre project area can be found in Table 11, while detailed descriptions of each valleyland are found below.

The identification of valleylands is largely based on geomorphology and aquatic resources. The Ausable Bayfield Conservation Authority was consulted during the records review phase of the project to determine whether valleylands are present within 120 m of the project location. The conservation authority did not identify valleylands within 120 m of the project location. Nonetheless, the presence of valleylands was examined during the site investigation phase in order to confirm their absence from within 120 m of the project location. During site investigations two candidate valleyland areas were identified. These features are described below in more detail and shown on Figures 8 to 12.

VAL-004 – Valleyland

Within WOD-004 there is a stream that runs through the valleyland, which is bordered on both sides by vegetation. This valleyland is a 15.6 ha community with vegetation consisting of a canopy dominated by sugar maple with white ash, green ash, red oak and willow species. The sub-canopy contains European buckthorn, white ash, green ash, hawthorn species, American beech and white elm. The understory is made up of European buckthorn, goldenrod species, aster species and white ash, while the groundcover consists of garlic mustard, aster species, poison ivy and white ash. This natural area contains three complexes, including a buckthorn deciduous shrub thicket (THDM2-6), a dry-fresh sugar maple-white ash deciduous forest (FODM5-8) and a dry-fresh forb meadow (MEFM1) ecosite. This valleyland will be carried forward to the EOS. This valleyland is located >0.1 m from a proposed access road and underground cabling.

VAL-047 Valleyland

Within WOD-047, there is a 1.6 ha valleyland that contains a stream, which is bordered by vegetation on both sides. The stream continues into the adjacent WOD-048, which is a 119.5 ha forest. This valleyland is a natural area with vegetation consisting of a canopy and sub-canopy dominated by black locust and

containing silver poplar and Scots pine. The understory consists of Scots pine, eastern red cedar and European buckthorn, while the groundcover is dominated by cattail species, goldenrod species and grass species. This valleyland will be carried forward to the EOS. This valleyland is located 20 m from proposed overhead cabling.

Table 11. Summary of Valleylands within the Bornish Wind Energy Centre Project Area

Feature ID	Size (ha)	Closest Distance to Project Location	Composition	Attributes	Functions	Figure	EOS Required (Y/N)
VAL- 004 Valleyland	15.6	WT – 56 AR – >0.1 OL – 23 UL – >0.1	WODM4-3 Fresh sugar maple deciduous woodland	Dominated by sugar maple with white ash, green ash, red oak, willow species and European buckthorn.	• Surface water functions • Degree of naturalness • Linkage function • Floodplain attenuation	8	**Yes**
VAL-047 Valleyland	1.6	WT – >120 AR – >120 OL – 20 UL – >120	WODM5 Fresh-moist deciduous woodland	Dominated by black locust and contains silver poplar and Scots pine.	• Proximity to other significant woodland • Water protection	8,9	**Yes**

Legend
WT: Wind Turbine
AR: Access Road
OL: Overhead Line
UL: Underground Line

9.0 Wildlife Habitat

Wildlife habitat as outlined by the SWHTG was examined during the site investigation and is categorized into the following four groups: seasonal concentration areas, rare vegetation communities and specialized wildlife habitat, habitat of species of conservation concern and animal movement corridors. These categories are outlined below and all candidate significant wildlife habitats have been summarized in Table 16 and mapped in Figures 13 to 17. Any habitats that are within 120 m of a project component with no operational impact have been carried forward as generalized wildlife habitat, which are outlined in Table 16 and are mapped in Figures 18 to 22.

9.1 Seasonal Concentration Areas

A summary of candidate seasonal concentration areas that do not occur within the Bornish Wind Energy Centre Project Area can be found in Table 12. These include: waterfowl stopover and staging areas (aquatic), waterfowl stopover and staging areas (terrestrial) bat hibernacula, colonial-nesting bird breeding habitat (swallows), colonial-nesting bird breeding habitat (tree/shrub) and colonial-nesting bird breeding habitat (ground). Seasonal concentration areas that are found within 120 m of the project location can be found in Table 16. Generalized wildlife habitat has been mapped in Figures 18 to 22.

Table 12. Summary of Seasonal Concentration Areas Not Requiring Specific Evaluation of Significant Surveys

Seasonal Concentration Areas	Habitat Present Within 120m of Project Location	Rationale	EOS Required (Y/N/Generalized)
Waterfowl Stopover and Staging Areas (terrestrial)	No	Significant habitat of fields or meadows where flooding occurs are located outside the project location closer to Lake Huron (Greenway Road). No significant habitat located within the project area.	**No**
Waterfowl Stopover and Staging Areas (aquatic)	No	No ponds, marshes, lakes, bays, coastal inlets or watercourses containing abundance food supply found within the project area.	**No**
Bat Hibernacula	No	No caves, abandoned mine shafts, underground foundations or crevices present in the project area.	**No**
Bat Maternity Colonies	Yes	Tree cavities and snags are located within the project area (see Table 16). Several candidate woodlands are located within 120m of a project component that will not have an operational impact and will be carried forward under generalized mitigation measures.	**Yes Generalized**
Turtle-Over-wintering Habitat	No	Ponds and marshes within the project area are not deep or permanent enough for turtle over-wintering.	**No**
Reptile Hibernacula (snakes)	Yes	A concrete pile is present within the project area. It is located within 120m of a project component that will not have an operational impact and will be carried forward under generalized mitigation measures.	**Generalized**
Colonial-Nesting Bird Breeding Habitat (swallows)	No	No banks, steep hills, pits, steep slopes, rock faces or rock piles in meadows, thickets, savannahs, bluffs or cliffs within the project area.	**No**
Colonial-Nesting Bird Breeding Habitat (tree/shrub)	Yes	No nests observed in any habitats during area searches.	**No**

Seasonal Concentration Areas	Habitat Present Within 120m of Project Location	Rationale	EOS Required (Y/N/Generalized)
Colonial-Nesting Bird Breeding Habitat (ground)	No	No rocky island or peninsulas (natural or artificial) in a lake or large present within the project area.	**No**

9.2 Rare Vegetation Communities and Specialized Wildlife Habitat

A summary of rare vegetation communities and specialized wildlife habitat that do not occur within the Bornish Wind Energy Centre project area can be found in Table 13. Rare vegetation communities and specialized wildlife habitats that are found within 120 m of the project location can be found in Table 16. Generalized wildlife habitat has been mapped in Figures 18 to 22.

Table 13. Summary of Rare Vegetation Communities and Specialized Wildlife Habitat Not Requiring Specific Evaluation of Significance Surveys

Wildlife Habitat	Habitat Present Within 120m of Project Location	Rationale	EOS Required (Y/N/Generalized)
Alvars	No	No alvar communities are found within the project area.	**No**
Tall-grass Prairies	No	No tall-grass prairie communities are found within the project area.	**No**
Savannahs	No	No savannah communities are found within the project area.	**No**
Rare Forest Types	No	No rare forest types are found within the project area.	**No**
Talus Slopes	No	No talus slopes are found within the project area.	**No**
Old-growth or Mature Forest Stands	No	All forest communities within the project area are young or mid-age stands.	**No**
Rock Barrens	No	No rock barrens are found within the project area.	**No**
Sand Barrens	No	No sand barrens are found within the project area.	**No**
Waterfowl Nesting Habitat	Yes	No nests observed in any habitats during area searches.	**No**
Bald Eagle, Osprey Nesting, Foraging, and Perching Habitat	No	No forest communities are immediately adjacent to rivers, lakes, ponds or wetlands within the project area.	**No**
Woodland Raptor Nesting Habitat	Yes	No nests observed during area searches.	**No**
Mink Denning Sites	No	No shorelines present within project area.	**No**

Wildlife Habitat	Habitat Present Within 120m of Project Location	Rationale	EOS Required (Y/N/Generalized)
Turtle Over-wintering Habitat	No	Ponds and marshes within the project area are not deep or permanent enough for turtle over-wintering.	**No**
Turtle Nesting Habitat	No	No sand and gravel beaches adjacent to undisturbed shallow weedy areas in marshes, lakes and rivers within project area.	**No**
Seeps and Springs	No	No locations where groundwater comes to surface and no forests in the headwater of a stream within the project area.	**No**
Amphibian Breeding Habitat (woodland)	Yes	Forest or treed swamp with a pond present in project area (see Table 16). Several candidate woodland breeding habitats are located within 120m of a project component that will not have an operational impact and will be carried forward under generalized mitigation measures.	**Generalized**
Amphibian Breeding Habitat (wetland)	No	No swamps, marshes, fens, bogs, open water or shallow aquatics located >120 m from a woodland within the project area.	**No**

9.3 Habitat of Species of Conservation Concern

No habitats of species of conservation concern were found within the project area. The list of these habitats, including explanation for eliminating habitat types can be found below in Table 14.

Table 14. Summary of Habitats of Species of Conservation Concern Not Requiring Specific Evaluation of Significance Studies

Wildlife Habitat	Present Within 120m of Project Location	Rationale	EOS Required (Y/N/Generalized)
Marsh Bird Breeding Habitat	No	Wetland habitat with shallow water present within project area, but no emergent vegetation.	**No**
Woodland Area Sensitive Breeding Birds	No	No large, mature forests with interior habitat ≥200 m from edge and a minimum of 4 ha interior habitat present within 120m of a project component.	**No**
Open Country Breeding Bird Habitat	No	No fields, hayfields or pastureland ≥ 30 ha are located within the project area.	**No**
Shrub/Early Successional Bird Breeding Habitat	No	No shrubland or successional fields within the project area that are significant. One shrubland habitat exists within the project area but has been heavily disturbed by resource extraction within the last 5 years (see Figure 4, habitat north of T20)	**No**
Terrestrial Crayfish	Yes	No terrestrial crayfish or chimneys observed during area searches.	**No**

9.4 Animal Movement Corridors

The records review process did not reveal any known animal movement corridors within 120 m of the project location. The detailed site investigation confirmed the presence of several linear features, including treed fencerows and naturalized drains, within 120 m of the project location, which have the potential to act as animal movement corridors.

These features were examined during the site investigation and compared with the other appropriate wildlife habitats that may suggest the presence of animal movement corridors. Specifically, NRSI biologists examined potential amphibian breeding habitats (woodland and wetland) for potential corridors as per the criteria outlined in Ontario Ministry of Natural Resources' *Significant Wildlife Habitat Technical Guide* (2000) and the *2011 Addendum* (OMNR 2011c). No candidate suitable corridors were found during site investigation due to the interruption of habitat in the landscape by agricultural fields and roads. No candidate animal movement corridors will be carried forward to the evaluation of significance unless significant amphibian breeding habitat is confirmed during the EOS, in which case, amphibian movement corridors will be considered.

9.5 Special Concern, S1-S3 Species and SH Species and Communities

Special concern species, S1-S3 species and SH species and communities that potentially occur within the project area have been evaluated in Table 15. These include 2 bird species, 3 reptile species, 1 mammal species, 21 species of vegetation and 3 species of odonates.

In conjunction with habitat for species of conservation concern, NRSI biologists have also reviewed the specific habitat considerations of several species of conservation concern that are known to occur within the vicinity of the Bornish Wind Energy Centre. Species of conservation concern include all species that have been designated as a species of Special Concern according to the Species At Risk in Ontario (SARO) or have been given a provincial S-Rank of S1-S3, but have not been designated as either Endangered or Threatened within Ontario. Species At Risk (provincially Threatened or Endangered) will be addressed separately in an *Approval and Permitting Requirements Document* to address the *Endangered Species Act* (2007). Many special concern species, S1-S3, and SH species and communities were identified during the records review as potentially being present within 120 m of a project location. Habitat searches for these species were conducted as part of the site investigation for the Bornish Wind Energy Centre. The results of the site investigation relating to these species-specific habitats have been summarized in Table 15.

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Table 15. Summary of Special Concern/Threatened Species, S1-S3 and SH Species and Communities Identified Near the Bornish Wind Energy Centre Project Area

Common Name	S-Rank	SARO Status	COSEWIC Status	Rationale	EOS Required (Y/N)
Birds					
Red-headed Woodpecker	S4B	SC	THR	Habitat exists within project location in the form of woodland edges, fields, pastures and small woodlots; however, during ELC and breeding bird surveys, this species was not observed in any of the candidate habitat within 120 m of the project location. This species and its habitat will be considered when development occurs within woodland edges; otherwise the habitat will not be delineated because of the generalist nature of this bird.	**Generalized**
Golden-winged Warbler	S4B	SC	THR	Habitat exists within the project location in the form of fallow fields bordered by woodland areas and wooded swamps, deciduous damp woods and shrubbery clearings in deciduous woods; however, during ELC and breeding bird surveys, this species was not observed in any of the candidate habitat within 120 m of the project location.	**No**
Herpetofauna					
Common Snapping Turtle	S3			Critical life-cycle habitat for this species, including over-wintering and nesting habitat is not present within 120 m of the project location.	**No**
Eastern Milksnake	S3			No significant habitat is present within the project area.	**No**
(Eastern) Ribbonsnake (Great Lakes population)	S3			No significant habitat is present within the project area.	**No**
Mammal					
Woodland Vole	S3?			Habitat is present within 120m of the project location in the form of mid-age to mature deciduous forest, grasslands and meadows; however, this species was not observed during any candidate habitat surveys conducted within 120 m of the project location. This species and	**Generalized**

Common Name	S-Rank	SARO Status	COSEWIC Status	Rationale	EOS Required (Y/N)
				its habitat will be carried forward as generalized habitat, as no infrastructure will be built within the habitat.	
Vegetation					
Narrow-leaved Wild Leek	S1?			Habitat is present within 120 m of the project location in the form of rich woods; however, this species was not observed in candidate habitat within 120 m of the project location during ELC area searches by using distinguishing features to differentiate between similar species.	**No**
Green Dragon	S3	SC	SC	Habitat for this species occurs within 120 m of the project location in the form of wet bottomlands along creeks; however, this species was not observed in candidate habitat within 120 m of the project location during ELC area searches by using distinguishing features to differentiate between similar species.	**No**
Slim-spiked Three-awned Grass	S2			No dry to moist sandy fields have been identified within 120 m of the project location.	**No**
Cooper's Milk-vetch	S3			Habitat for this species is present within 120 m of the project location in the form of open woods; however, this species was not observed in candidate habitat within 120 m of the project location during ELC area searches by using distinguishing features to differentiate between similar species.	**No**
Carey's Sedge	S2			Habitat for this species exists within 120 m of the project location in the form of mesic to dry-mesic hardwood forests and floodplain woods. This species was not observed in candidate habitat within 120 m of the project location during ELC area searches, likely due to the difficulty in identifying it in the field. This will be carried forward to the EOS.	**Generalized**
Chinese Hemlock Parsley	S2			Habitat is present within 120 m of the project location in the form of wet borders of streams and damp roadsides. However, this species was not observed in candidate habitat within 120 m of the	**No**

Common Name	S-Rank	SARO Status	COSEWIC Status	Rationale	EOS Required (Y/N)
				project location during ELC area searches in August-October within the bloom time (August-September) for this species.	
Tall Tickweed	S2			Habitat for this species exists in the form of thickets and open woods. However, this species was not observed in candidate habitat within 120 m of the project location during ELC area searches in August-October within the bloom time (July-September) for this species.	**No**
Ovate Beak Grass	S1			Habitat is present within 120 m of the project location in the form of riparian woodlands: however, this species was not observed in candidate habitat within 120 m of the project location during ELC area searches in August-October within the bloom time (June-October) for this species.	**No**
Awnless Wild Rye	S2S3			Habitat is present within 120 m of the project location in the form of moist or damp soils of open forests, thickets, grasslands, ditches, and disturbed ground and in bottomlands. This species was not observed in candidate habitat within 120 m of the project location during ELC area searches, likely due to the difficulty in identifying it in the field. This will be carried forward to the EOS. .	**Generalized**
Harbinger-of-spring	S3?			Habitat is present within 120 m of the project location in the form of rich, moist deciduous woods and stream banks; however, this species was not observed in candidate habitat within 120 m of the project location during ELC area searches by using distinguishing features to differentiate between similar species.	**No**
Burning Bush	S3			Habitat is present within 120 m of the project location in the form of dry to moist thickets and woods; however, this species was not observed in candidate habitat within 120 m of the project location during ELC area searches by using distinguishing features to differentiate between	**No**

Common Name	S-Rank	SARO Status	COSEWIC Status	Rationale	EOS Required (Y/N)
				similar species..	
Pumpkin Ash	S2?			Habitat is present within 120 m of the project location in the form of moist woods; however, this species was not observed in candidate habitat within 120 m of the project location during ELC area searches by using distinguishing features to differentiate between similar species.	**No**
Stiff Gentian	S2			Habitat is present within 120 m of the project location in the form of moist roadsides, stream banks and edges of woods; however, this species was not observed in candidate habitat within 120 m of the project location during ELC area searches in August-October within the bloom time (August-October) for this species.	**No**
Yellow Stargrass	S3			Habitat is present within 120 m of the project location in the form of wet to dry meadows. This species was not observed in candidate habitat within 120 m of the project location during ELC area searches, likely due to the difficulty in identifying it in the field. This will be carried forward to the EOS.	**Generalized**
Tall Blazing Star	S2			Habitat is present within 120 m of the project location in the form of dry roadsides; however, this species was not observed in candidate habitat within 120 m of the project location during ELC area searches in August-October within the bloom time (August-October) for this species.	**No**
American Gromwell	S3			Habitat is present within 120 m of the project location in the form of open areas near edges of woods; however, this species was not observed in candidate habitat within 120 m of the project location during ELC area searches by using distinguishing features to differentiate between similar species.	**No**
Winged Loosestrife	S3			Habitat is present within 120 m of the project location in the form of wet meadows and open woods. This species was not observed in candidate habitat within 120m of the project	**Generalized**

Common Name	S-Rank	SARO Status	COSEWIC Status	Rationale	EOS Required (Y/N)
				location during ELC area searches, likely due to the difficulty in identifying it in the field. This will be carried forward to the EOS.	
Slim-flowered Muhly	S2			Habitat is present within 120 m of the project location in the form of rich, deciduous forests. This species was not observed in candidate habitat within 120 m of the project location during ELC area searches, likely due to the difficulty in identifying it in the field. This will be carried forward to the EOS.	**Generalized**
Moss Phlox	S1?			Dry sandy and rocky woods do not occur within the project area.	**No**
Slender Mountain-mint	S3			Habitat is present within 120 m of the project location in the form of dry open areas; however, this species was not observed in candidate habitat within 120 m of the project location during ELC area searches by using distinguishing features to differentiate between similar species.	**No**
Woodland Bulrush	S1			Habitat is present within 120 m of the project location in the form of stream edges. This species was not observed in candidate habitat within 120 m of the project location during ELC area searches, likely due to the difficulty in identifying it in the field. This will be carried forward to the EOS.	**Generalized**
Riddell's Goldenrod	S3	SC	SC	Habitat occurs within 120 m of the project location in the form of old fields; however, this species was not observed in candidate habitat within 120 m of the project location during ELC area searches in August-October within the bloom time (August-October) for this species.	**No**
Perfoliate Tinkersweed	S1			Dry sandy and rocky woods do not exist within the project area.	**No**
Giant Ironweed	S1?			Habitat is present within 120 m of the project location in the form of thickets, moist woods, roadsides and grassy meadows; however, this species was not observed in candidate habitat within 120 m of the project location during ELC	**No**

Common Name	S-Rank	SARO Status	COSEWIC Status	Rationale	EOS Required (Y/N)
				area searches in August-October within the bloom time (August-September) for this species.	
Striped Cream Violet	S3			Rich, floodplain forests and low, wet woods are present within 120 m of the project location; however, this species was not observed in candidate habitat during ELC area searches by using distinguishing features to differentiate between similar species.	**No**
Other Wildlife					
Blue-ringed Dancer	S2			Habitat is present within 120 m of the project location in the form of creeks and streams that are well vegetated and in the form of ditches; however, this species was not observed during any candidate habitat surveys conducted within 120 m of the project location. This species and its habitat will be carried forward as generalized habitat, as no infrastructure will be built within the habitat.	**Generalized**
Tawny Emperor	S2S3			No open woodlands and roadsides where hackberry occurs are present within 120 m of the project location.	**No**
Double-striped Bluet	S3			Habitat is present within 120 m of the project location in the form of slow streams; however, this species was not observed during any candidate habitat surveys conducted within 120 m of the project location. This species and its habitat will be carried forward as generalized habitat, as no infrastructure will be built within the habitat.	**Generalized**
Pronghorn Clubtail	S3			Habitat is present within 120 m of the project location in the form of ponds and slow streams; however, this species was not observed during any candidate habitat surveys conducted within 120 m of the project location. This species and its habitat will be carried forward as generalized habitat, as no infrastructure will be built within the habitat.	**Generalized**

Provincial Rank (S-Rank)
S1: Critically Imperiled

COSEWIC and SARO Status
END: Endangered

S2: Imperiled
S3: Vulnerable
S4: Apparently Secure
SH: Historic

THR: Threatened
SC: Special Concern
NAR: Not at Risk