



ACTIVA BADEN NORTH LANDS
BADEN, ONTARIO

SCOPED ENVIRONMENTAL IMPACT STUDY



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1.0 INTRODUCTION & SITE OVERVIEW

1.1 Project Overview

WSP Canada Inc. (WSP), was retained by Activa Holdings Inc. (Activa) in 2019 to undertake natural environment studies for a scoped Environmental Impact Study (EIS) in support of a Draft Plan of Subdivision application for lands located in Baden, Ontario (the 'Subject Property'; Figure 1). Note that the Subject Property as discussed herein includes both the current Draft Plan lands located within the Township Urban Area (i.e., TUA Lands), as well as additional lands owned by Activa outside of the TUA (i.e., Non-TUA Lands). Lands outside of the TUA (i.e., Non-TUA Lands) are not proposed for development other than for related infrastructure (e.g., SWM facility) that supports the development within the TUA.

The intent of this scoped EIS is to evaluate the sensitivity and significance of the natural features that could be influenced by the proposed development, determine appropriate setbacks, mitigation measures, and enhancement opportunities to ensure the protection of these features.

2025 Update

The current report is an update to the Scoped EIS submitted in July 2022, including updated impact assessment, in consideration of the following:

- Post-circulation comments from GRCA (letter dated November 4, 2022)
- Preliminary Post-Circulation Comments from Region of Waterloo (letter dated January 11, 2023)
- Post-circulation comments from the Township of Wilmot (email dated February 9, 2023)
- Post-circulation comments from the Township of Wilmot (email dated June 6, 2023)
- Updated Post-Circulation Comments from Region of Waterloo (letter dated June 9, 2023)
- Updated Hydrogeological Investigation (Stantec 2025)
- Updated Functional Servicing and Stormwater Management Report (Stantec 2025)
- Revised Draft Plan (MHBC; June 3, 2024)
- Updated commentary on biological monitoring



This EIS, and other supporting technical reports, have been prepared in support of a revised Draft Plan that includes the following revisions:

- A 3m width trail block has been added (Block 22) to provide pedestrian access to the existing trails and natural area to the north
- The SWM block has been adjusted to provide a 6m width maintenance access to Street Five
- The limit of the subject lands has been squared off along the northeast side and is reflective of the MDS setback requirements.
- The multiple residential block on Street One has been consolidated with the previous block to the north
- The Jacob Cressman Drive right of way extension has been replaced with a 6m width pedestrian walkway to promote walkability and encourage vehicular traffic to access the subject lands from the west rather than from the existing residential subdivision to the south.

The current report includes revisions to report sections 1 – 7, including updates to the draft plan and other policies of technical reports. There are some minor edits to existing conditions as discussed herein, but no substantive changes to vegetation and wildlife habitat as presented in the 2022 EIS. There are no changes to confirmed, surveyed feature limits as shown on the 2022 EIS figures.

Notwithstanding the edits to this report, there are no changes to conclusions or recommendations.

1.2 Site Overview

The Subject Property is a 31.5 ha parcel of land located northwest of Michael Myers Road and Kropf Drive in Baden, Ontario. The property consists primarily of active agricultural crop lands, with natural heritage features (woodland and wetland) in the northwest corner. The Subject Property is bounded by a residential subdivision to the southeast, agricultural crop lands to the east and west, as well as natural areas to the north (upland forest and *Philipsburg Southeast Wetland Complex*) and east (*St. Agatha Beech Maple Forest*). There is a narrow hydro-corridor immediately north of the property limit (20 m wide or less), though on-site and off-site woodland areas are contiguous.

The northwest portion of the Subject Property is 'regulated' by the Grand River Conservation Authority (GRCA) under Ontario Regulation 41/24, based on presence of wetlands and a watercourse. None of the natural features within the Subject Property is currently designated based on Map 4 (Greenlands Network) of the Region of Waterloo's Regional Official Plan, ROP (2015) or Map 7 of the Township of Wilmot Official Plan, TOP (2019).

As of October 20, 2024, the new Provincial Planning Statement (PPS) has come into effect and the Growth Plan has been revoked. The Growth Plan policies continue to apply where mentioned within



the Greenbelt Plan (MMAH 2017). The Natural Heritage features located in the northwest portion of the Subject Property are designated as *Natural Heritage System Area* under the ROP and TOP described above and are subject to the new PPS (2024).

Several natural heritage designations are found on adjacent lands. Natural heritage designations currently apply to the woodland area to the north of the Subject Property: *Core Environmental Feature* (CEF) in the ROP (2015) and TOP (2019). On the adjacent property to the north, there is an evaluated, non-provincially significant wetland feature, which is part of the *Phillipsburg Southeast Wetland Complex*. This off-site wetland complex is considered a *Locally Significant Wetland (Supporting Environmental Feature)*, per Section 8.1.5.2 (a) of the TOP (2019).

No defined surface watercourses are present on the property.

1.3 Study Team

The study team through the application process includes:

- MHBC: Planning
- Stantec: Functional Servicing, Stormwater Management and Hydrogeology
- WSP: Ecological Services

1.4 Proposed Development

The proposed development envelope is restricted to a portion of the Subject Property currently under agricultural land use. The natural heritage features located within the northwest corner of the site and on adjacent lands to the north will be retained in full and protected with setbacks recommended herein. Vegetation communities on the Subject Property (cultural meadow, cultural thicket, deciduous forest, marsh, deciduous swamp, and swamp thicket) have been assessed and evaluated to determine their significance and sensitivity, leading to management recommendations. The intent of this scoped EIS is to evaluate the sensitivity and significance of the natural features that could be influenced by the proposed development.

As shown on the Draft Plan of Subdivision (MHBC; June 3, 2024; included on Figure 6) the proposed development is residential, with required roads, Stormwater Management (SWM) measures and municipal services (sanitary, water). Natural heritage work and project team review has been undertaken to identify protection areas, appropriate setbacks, and environmental enhancement opportunities. The plan has been guided by this iterative process.



2.0 STUDY APPROACH

2.1 Planning Framework

This scoped EIS is being undertaken in accordance with relevant policies and guidelines of the Township of Wilmot, Region of Waterloo, and GRCA.

Additional relevant planning legislation and policy pertinent to this study are listed below and discussed in further detail in Section 5 Policy Assessment.

Federal:

- Fisheries Act (1985)
- Migratory Birds Convention Act (1994) and Regulations (2022)
- Species at Risk Act, SARA (2002)

Provincial:

- Endangered Species Act, ESA (2007)
- Provincial Planning Statement (2024)

Regional / Municipal:

- Region of Waterloo Official Plan (2015)
- Township of Wilmot Official Plan (April 2019)

GRCA

- Ontario Regulation 41/24 (2024)
- Policies for the Administration of the Prohibited Activities, Exemptions and Permits Regulation. Ontario Regulation 41/24 (GRCA May 2024):

2.2 Agency Liaison

As part of the natural environment review and assessment, agency consultation has been on-going and has included the following:

- **Terms of Reference.** A Terms of Reference (TOR) was prepared by WSP, based on input received from City, GRCA and Region staff during site walks and other correspondence (Appendix A). A draft was submitted to the Township, Region, and GRCA on September 2, 2020. Comments were received from GRCA and Region on October 8, 2020 and incorporated into the work plan discussed herein. Acknowledgement from the Township (no comments) was received on October 21, 2020.
- **Site walks, Meetings and correspondence,** held on the following dates:
 - o **January 14, 2020.** Pre-submission consultation meeting. Attended by Region of Waterloo (Cheryl Marcy, John Holowackyi, David Welwood), Township of Wilmot (Harold O'Krafka, Bryan Bishop), Stantec Ltd. (Kevin Brousseau, Hitesh Lad), Waterloo Region District School Board (Nathan Hercanuck), Waterloo Catholic District School Board (Lindsay Ford, Virina Elgawly), MHBC Planning (Pierre Chauvin, Paul Britton, Michelle Baya), Grand River Conservation Authority (Trevor Heywood).
 - o **August 20, 2020.** Site walk attended by Region of Waterloo staff (Jane Gurney), MHBC (Paul Britton), and WSP (Jennifer McPhee). The purpose of this site walk was to review the dripline (CEF) limits (previously flagged by WSP). The limits were confirmed with some minor revisions to the dripline boundary by the Region. Flag locations were subsequently total station surveyed.
- **Post-circulation comments on the Scoped EIS (2022)**
 - o See Section 1.1

2.3 Natural Environment Review

The natural environment review has included:

- Collection and review of relevant mapping, soils reports, Official Plans, Natural Heritage Information Centre (NHIC) LIO database, GRCA online mapping, the Ontario Breeding Bird Atlas (Birds Canada, no date), and Ontario Reptile and Amphibian Atlas (Ontario Nature 2019).
- Review of historical aerial photographs of the Subject Property and surrounding lands (Section 3.1) , taken in 1946, 1954, 1955, 1966, and 2006 (accessed through the Waterloo University Map Library;2008). See Figure 2.
- Completion of field surveys within and surrounding the Subject Property as detailed in the Project Chronology (Appendix B).

Additional methodology details are provided in appropriate report sections. Representative site photographs were taken during field visits (Appendix C). Background and other data sources are listed in the References section of the report.

3.0 BIOPHYSICAL FEATURES

3.1 Past and Present Land Use

A sequence of historical air photos covering 1946, 1954, 1955, 1966, and 2006 were reviewed (Figure 2), with the following observations:

- Land use in the broader area to the west and east of the Subject Property (i.e., agriculture) remains unchanged since 1946.
- The lands to the south has undergone a transition from predominantly agricultural to a residential neighborhood rather recently (i.e., lands remain predominantly agricultural in the vicinity of the site up to 2006 air photos), while the golf course was established between 1966 and 2006.
- The majority of the Subject Property has been continually used for agriculture from 1946 to the present.
- With respect to the natural environmental features on the Subject Property and adjacent land, some notable changes have occurred since 1946, specifically:
 - o Vegetation Units 3, 6, 8, 11, and scattered mature trees in Unit 12 have been present on the landscape since 1946, while Units 5, 7, 9, 10, and 13 were not yet present in 1946 or 1955.
 - o By 1966, Vegetation Unit 13 was evident, but Units 5, 7, 9, and 10 were still under active agriculture.
 - o By 2006, cultural meadow / thicket had developed within Vegetation Unit 9 and 10, as well as portions of Unit 5. By this same year, the large tree willows of Unit 7 appear to be mid-aged.

3.2 Physiography, Drainage, and Soils

This section incorporates information from The Soils of Waterloo County (Present and Wicklund 1971), The Physiography of Southern Ontario (Chapman and Putnum 1984) and observations made



during field surveys throughout the duration of the study.

The Subject Property is situated within a large portion of Till Plains landform that extends from Plattsville to the south to nearly Listowel to the north. The area is located within the Waterloo Hills Physiographic Region.

Mapping in the Soils of Waterloo County (Presant and Wicklund 1971) indicate surficial soils in the area consist of predominantly silty clay loam with imperfect to poor drainage in the southern portion of the Subject Property. To the north, the soils are predominantly lacustrine deposits of fine sandy loam with good drainage to the west and loam over clay with imperfect drainage to the east.

The Subject Property is located within the Nith River subwatershed. Locally, the property is characterized by an undulating agricultural field that drains northward via diffuse overland flow toward the *Phillipsburg Southeast Wetland Complex*. North of the property, there is a regulated (unnamed) watercourse, with associated areas of regulated wetland and steep valley slope. This feature conveys surface flows from the large wetland illustrated as Vegetation Unit 7 / 8 (Figure 3) to north into the *Phillipsburg Southeast Wetland Complex* via a culvert at the HEPC, ultimately outletting to the Nith River. There is a short surface drainage feature in Vegetation Unit 9 that conveys flows from a tile drain outlet towards the Vegetation Unit 8 wetland on lands adjacent to the Draft Plan.

3.3 Hydrogeology

The following hydrogeological reports have been prepared:

- Hydrogeological Investigation, Activa Baden North Subdivision, Township of Wilmot, Ontario - Draft Plan Submission. (Stantec, 2022b)
- Hydrogeological Investigation, Activa Baden North Subdivision, Township of Wilmot, Ontario - Revised Draft Plan Submission (Stantec, 2024)

Information in this section has been summarized from these previously mentioned reports.

The hydrogeological investigation included the following tasks:

1. Characterization of the existing geological and hydrogeological conditions within the Site, including a discussion of hydrostratigraphic units, seasonal fluctuations in groundwater levels and hydraulic gradients, existing hydraulic interactions between the local wetlands and groundwater system, and groundwater quality conditions.
2. Assessment of whether future buildings / underground parking structure, servicing (i.e., storm/sanitary sewers and watermains) and associated construction activities will intercept

the groundwater table and evaluate if any measures are required to mitigate potential disturbances on pre-development groundwater elevations and flow patterns.

3. Preliminary assessment as to whether construction and/or permanent dewatering may be required for the proposed development.
4. Perform a pre- and post-development water balance for the Site and assess how potential land use changes could affect the groundwater recharge function of the Site and the hydroperiod of the nearby wetlands (i.e., seasonal pattern of surface water and groundwater interactions with the wetlands).
5. Review the proposed land use activities for conformity with Source Water Protection requirements as stipulated in the Clean Water Act, 2006, S.O. 2006, c. 22.
6. Identify any other potential hydrogeological constraints to the development of the Site and evaluate potential mitigation measures to alleviate these constraints.

Key results of relevance to natural heritage are as follows:

- Groundwater elevations across the Site ranged from 6.4 m BGS (at BH/MW01-20) to 0.4 m above ground surface (at DP1-20) over the monitoring period (July 2020 to July 2024).
- Groundwater contours generally mimic the existing topography of the Site, with an interpreted localized groundwater divide running from southwest-northeast through the south-central portion of the property. From this divide, groundwater flows in a northern direction to the topographically low-lying area located in the central portions of the Site and follows this depressed area to the northern Site limits and onward to the *Phillipsburg Southeast Wetland Complex*, with some flow also likely being directed towards Wetland 8. To the south of the divide, groundwater is interpreted to flow in a southern direction towards the existing built-out phase of the Activa Baden Subdivision.
- Regional mapping indicates that the Site is characterized as a groundwater recharge area (see Figure C-1 of the Hydrogeological Investigation), although the recharge potential for most of the property will be limited by the low permeability deposits of silt and clay associated with Aquitard 1 (ATB1). For the silty sand to sandy silt deposits of Aquifer 1 (AFB1), vertical hydraulic conductivities are estimated to be in the range of 10^{-6} m/s, equating to infiltration rates ranging from 53 mm/hour to 84 mm/hour.
- Wetland (Veg. Unit 13) is a groundwater recharge feature. Based on the surface water catchments, this wetland does not receive groundwater or surface water contributions from the Subject Property under existing (pre-development) conditions.

- Wetland (Veg. Unit 8) is predominantly a groundwater recharge feature that mostly receives surface water inputs from the Site under existing conditions. If there are any groundwater contributions to this feature from the Subject Property, they are minimal given that most of the property is covered by low permeability deposits of silt, clay, and/or clay to clayey silt till associated with Aquitard 1 (ATB1), where the horizontal movement of groundwater through this unit is calculated to be in the range of 0.09 m/year (i.e., one meter every 10.8 years) (see Sections 4.2.2 and 4.2.3 of the Hydrogeological Investigation report).
- Wetland (Veg. Unit 3/11) is a groundwater discharge feature, with the source of groundwater inputs to this wetland originating from recharge areas located off-site to the west of the Subject Property. The Subject Property area currently proposed for development does not contribute groundwater or surface water inputs to this wetland.
- According to GRCA mapping (refer to Figures C-1 and C-2 in the Hydrogeological Investigation report; Stantec, 2024) and the Nith Watershed Report (GRCA 2020), off-site wetlands to the north (e.g., *Phillipsburg Southeast Wetland Complex*) are interpreted to be groundwater recharge features with high groundwater recharge potential.

Additional hydrogeological commentary is provided in Section 4.3.

3.4 Environmental Designations

There are multiple overlapping designations and/or natural heritage features on and adjacent to the Subject Property. These are mapped on Figure 1 and outlined below.

- *Locally Significant Wetland* (non-PSW)
 - o On adjacent lands to the north, there is an evaluated, non-provincially significant wetland feature, which is part of the *Phillipsburg Southeast Wetland Complex*, a 61 ha complex that extends to the north of the Subject Property. While this wetland has been evaluated as non-provincially significant, it is considered locally significant due to unique features within the local landscape, per Section 8.1.5.2 (a) of the TOP (2019), such as protecting rare species, moderation of storm flows, or maintaining critical ecosystem function. The Nith Watershed Report (GRCA 2020) indicates that this wetland complex: provides habitat for rare species such as Green Dragon (*Arisaema dracontium*); provides flood and erosion control; and has a high groundwater recharge potential.
- Core Environmental Features (Regional Official Plan, Map 4-Greenlands Network and Township of Wilmot Official Plan Map 7)

- o Adjacent lands north of the Subject Property are designated as CEF (likely as *Significant Woodland*).
- o An evaluation of the natural heritage features within the Subject Property re; CEF designation is provided in Section 5.
- *Supporting Environmental Features (Township of Wilmot Official Plan)*
 - o *Phillipsburg Southeast Wetland Complex* is considered a *Locally Significant Wetland*, per Section 8.1.5.2 (a) of the TOP (2019). Commentary on *Supporting Environmental Features* (SEF) is provided in Section 5.
- Regulation Limit (GRCA)
 - o The northwest portion of the Subject Property and adjacent lands are ‘regulated’ by the GRCA under Ontario Regulation 41/24, based on presence of wetlands.
- No defined surface watercourses are present on the property. A regulated watercourse is present on lands to the north. Overflow from the Unit 8 marsh drains north into that watercourse.

3.5 Vegetation

3.5.1 Approach

A three-season botanical inventory and vegetation assessment of the property and adjacent lands was conducted in 2019 and 2020. Refer to the field chronology for specific dates (Appendix B).

In addition, vegetation plot monitoring surveys were undertaken on June 22 and September 26, 2023.

The scope of fieldwork and analyses for the EIS included the following:

- Classifying, mapping and evaluating vegetation communities within the Subject Property. Vegetation communities were classified using the Ecological Land Classification for Southern Ontario (ELC) (Lee et al. 1998).
- Vegetation community significance was evaluated using Natural Heritage Resources of Ontario: Vegetation Communities of Southern Ontario (Bakowsky 1996; NHIC website).
- Botanical inventory and preparation of a vascular plant species list (Table D.1, Appendix D).
 - o Plant species status was evaluated using the Region of Waterloo Significant Species List: Vascular Plants Component, PC-99-028.1 (1999) for regional significance; the

NHIC website for provincial rarity ranks (i.e. S-Ranks); the Species at Risk in Ontario list (MNR updated regularly) for provincial status designations; and the Canadian Species At Risk list (Committee on the Status of Endangered Wildlife in Canada [COSEWIC]) for national status designations.

- o Nomenclature generally follows VASCAN (2020).
- o The quality of a particular vegetation community can be reflected in its richness of conservative species as indicated by the *Floristic Quality Index* (FQI) number (Oldham et al. 1995). FQI is a measurement of a vegetation community's ecological quality based on its plant species composition. FQI is calculated by weighting the mean *Coefficient of Conservatism*¹ divided by species richness. Generally, 1 – 10 is low quality, 11 – 20 is moderate, 21 – 35 is high quality, and > 35 is exceptional.

3.5.2 Vegetation and Flora Overview

The Subject Property consists primarily of active agricultural fields, with wetlands and a deciduous forest in the northwest corner and scattered hedgerows. Additional deciduous forests are located north and east of the property.

In total, 158 vascular plant species (including 40 non-native species [25%]) were recorded within the Subject Property and natural areas to the south and east. Of the species recorded:

- One vascular plant **Species at Risk** (SAR), Butternut (*Juglans cinerea*; Endangered), was recorded within Vegetation Unit 10.
- No **globally** rare species (i.e., G-rank G1 - G3) were recorded.
- With the exception of Butternut, which is **provincially** imperiled (S2?), all of the vascular plants recorded during WSP field surveys are common and secure or apparently secure in Ontario (i.e., ranked S5, S4, SE5 or SE4).
- Eight species considered **significant in the Regional Municipality of Waterloo** (1999) (exceptions noted below) were recorded on the Subject Property:
 - o Broad-leaved Sedge (*Carex platyphylla*) – Unit 6
 - o Tuckerman's Sedge (*Carex tuckermanii*) – Unit 11
 - o Common Hackberry (*Celtis occidentalis*)² – Unit 6 and 12

¹ CC. Rank of 0 to 10 based on degree of fidelity to a range of synecological parameters: (0-3) Taxa found in various communities; (4-6) Taxa typically associated with specific plant community, but tolerate moderate disturbance; (7-8) Taxa associated with communities in advanced successional stages with minor disturbance; (9-10) Taxa with high fidelity to a narrow range of synecological parameters.

² Considered significant in the Region of Waterloo, with the expectation that additional research may prove otherwise)

- o Eastern Mannagrass (*Glyceria septentrionalis*)² - Unit 13
- o Virginia Stickseed (*Hackelia virginiana*)² – Unit 8
- o Black Walnut (*Juglans nigra*)^{2,3} – Unit 5, 6, and 7
- o Virginia Creeper (*Parthenocissus quinquefolia*)³ – Unit 7
- o Northern Watermeal (*Wolffia borealis*)³ – Unit 13

2023 Update

Results from 2023 monitoring are generally consistent with the 2019-2020 survey results, botanical inventory, with the following exception:

- One additional regionally rare species was recorded in Veg. Unit 13 in 2023: Boreal Mannagrass (*Glyceria borealis*)

3.5.3 Vegetation Communities

Ten natural / semi-natural vegetation communities were delineated on the Subject Property, based on field surveys. None of the vegetation communities on the Subject Property is provincially significant (per Bakowsky 1996; NHIC website). Vegetation communities are mapped on Figure 3. Brief descriptions of these communities are included in Table 1.

³ Considered significant in the Region of Waterloo ONLY if demonstrably indigenous (naturally occurring)

Table 1. Vegetation Community Descriptions

UNIT	HABITAT / ELC VEGETATION TYPE	LAYER	DOMINANT SPECIES	DESCRIPTION AND COMMENTS
3	Thicket Swamp SWTO2-4 Shining Willow Organic Deciduous Thicket Swamp	Canopy/ Sub-canopy	Shining Willow (<i>Salix lucida</i>), Cottony Willow (<i>Salix eriocephala</i>), Peach-leaved Willow (<i>Salix amygdaloides</i>)	• 23 spp. recorded (83% native; FQI 17.7) • Age: mid-aged thicket • Disturbance: low with a high abundance of native species • Overall botanical quality: Moderate
		Shrub Layer	Red-osier Dogwood (<i>Cornus sericea</i>)	
		Ground Layer	Small Duckweed (<i>Lemna minor</i>), Great Duckweed (<i>Spirodela polyrhiza</i>)	
5	Cultural Meadow CUM1-1 Dry – Moist Old Field Meadow CUT1-1 Sumac Mineral Cultural Thicket	Canopy/ Sub-canopy	Staghorn Sumac (<i>Rhus typhina</i>), Dotted Hawthorn (<i>Crataegus punctata</i>), Black Walnut, White Ash (<i>Fraxinus americana</i>)	• 44 spp. recorded (43% native; FQI 10.3) • Age: pioneer to young • Disturbance: moderate to high disturbance with infrequent mowing under hydrocut; and abundant non-native species • Regionally Significant species: Black Walnut • Overall botanical quality: Low
		Shrub Layer	Common Milkweed (<i>Asclepias syriaca</i>), Hemp Dogbane (<i>Apocynum cannabinum</i> var. <i>cannabinum</i>)	
		Ground Layer	Wild Carrot (<i>Daucus carota</i>), Garden Bird's-foot Trefoil (<i>Lotus corniculatus</i>), Prickly Sow-thistle (<i>Sonchus asper</i>), Green Foxtail (<i>Setaria viridis</i>), Common Lamb's-quarters (<i>Chenopodium album</i>), Canada Horseweed (<i>Erigeron canadensis</i>)	

UNIT	HABITAT / ELC VEGETATION TYPE	LAYER	DOMINANT SPECIES	DESCRIPTION AND COMMENTS
6	Deciduous Forest FOD5-1* Dry-Fresh Sugar Maple Deciduous Forest *Partial inventory / habitat assessment from community edge (No permission to enter)	Canopy/ Sub-canopy	Sugar Maple (<i>Acer saccharum</i>), American Beech (<i>Fagus grandifolia</i>)	• 52 spp. Recorded (89% native; FQI 33.0) • Age: mature • Disturbance: low to moderate – some edge effects, canopy gaps, recreational trails, exotic species; rubbish • Occasional standing stags and deadfall • Regionally Significant species: Black Walnut, Broad-leaved Sedge, and Common Hackberry • Overall botanical quality: High
		Shrub Layer	Chokecherry (<i>Prunus virginiana</i>), Sugar Maple, Bitternut Hickory (<i>Carya cordiformis</i>), Black Cherry (<i>Prunus serotina</i>)	
		Ground Layer	Sugar Maple, Large False Solomon's-seal (<i>Maianthemum racemosum</i>), Virginia Waterleaf (<i>Hydrophyllum virginianum</i>), Yellow Trout Lily (<i>Erythronium americanum</i>)	
7	Deciduous Swamp SWD4-1 Willow Mineral Deciduous Swamp	Canopy/ Sub-canopy	Crack Willow (<i>Salix euxina</i>), Cottony Willow, Yellow Birch (<i>Betula alleghaniensis</i>), White Elm (<i>Ulmus americana</i>)	• 23 spp. recorded (78% native; FQI 16.3) • Age: mid-aged • Disturbance: moderate – edge effects; exotic species present • Regionally Significant species: Black Walnut, Virginia Creeper • Overall botanical quality: Moderate
		Shrub Layer	Red-osier Dogwood	
		Ground Layer	Spotted Jewelweed (<i>Impatiens capensis</i>), Reed Canary Grass (<i>Phalaris arundinacea</i>)	

UNIT	HABITAT / ELC VEGETATION TYPE	LAYER	DOMINANT SPECIES	DESCRIPTION AND COMMENTS
8	Shallow Marsh MAS2-1 Cattail Mineral Shallow Marsh	Canopy/ Sub-canopy	Crack Willow	• 23 spp. recorded (83% native; FQI 17.9) • Age: young • Disturbance: low – a few exotic species; limited recent anthropogenic disturbance • Regionally Significant species: Virginia Stickseed • Overall botanical quality: Moderate
		Shrub Layer	Cottony Willow	
		Ground Layer	Narrow-leaved Cattail (<i>Typha angustifolia</i>), Reed Canary Grass	
9	Cultural Complex CUM1-1 Dry – Moist Old Field Meadow CUT1 Mineral Cultural Thicket <i>Inclusion(s):</i> MAM2-10⁴* Mixed Forb Mineral Meadow Marsh	Canopy/ Sub-canopy/ Shrub	none	• 15 spp. recorded (40% native; FQI 8.5) • Age: pioneer • Disturbance: high – exotic species occasional • Species of conservation concern: none • Overall botanical quality: Low
		Ground Layer	Common Milkweed, Smooth Brome (<i>Bromus inermis</i>), Slender Stinging Nettle (<i>Urtica dioica</i> ssp. <i>gracilis</i>), Blue Vervain (<i>Verbena hastata</i>), Tall Beggarticks (<i>Bidens vulgata</i>), Awnless Brome, Wild Carrot, Prickly Sow-thistle, Common Lamb's-quarters, Reed Canary Grass	

⁴ Small, narrow strip of marsh species along either side of a drainage ditch from the field to the wetland; not large enough to map as wetland; not included within the delineated wetland / CEF area and is not considered a regulated watercourse

UNIT	HABITAT / ELC VEGETATION TYPE	LAYER	DOMINANT SPECIES	DESCRIPTION AND COMMENTS
10	Deciduous Forest FOD6-1 Dry-Fresh Sugar Maple – Lowland Ash Deciduous Forest <i>Inclusion(s):</i> CUW1 Mineral Cultural Woodland	Canopy/ Sub-canopy	Sugar Maple	15 spp. recorded (93% native; FQI 15.0) - Age: mid-aged - Disturbance: low to moderate – some edge effects, canopy gaps, recreational trails, invasive / exotic species - Overall botanical quality: Moderate
		Shrub Layer	Sugar Maple	
		Ground Layer	Garlic Mustard (<i>Alliaria petiolata</i>), Green Ash (<i>Fraxinus pennsylvanica</i>), Broad-leaved Enchanter's Nightshade (<i>Circaea canadensis</i>), Sugar Maple, Yellow Trout Lily	
11	Thicket Swamp SWTO2-4 Shining Willow Organic Deciduous Thicket Swamp *Partial inventory / habitat assessment from community edge (No permission to enter)	Canopy/ Sub-canopy	Peach-leaved Willow	17 spp. recorded (88% native; FQI 17.8) - Age: mid-aged thicket - Disturbance: low overall – some edge effects; Regionally Significant species: Tuckerman's Sedge - Overall botanical quality: Moderate
		Shrub Layer	Shining Willow (<i>Salix lucida</i>), Cottony Willow, Red-osier Dogwood	
		Ground Layer	Reed Canary Grass, White Meadowsweet (<i>Spiraea alba</i>), Small Duckweed (<i>Lemna minor</i>), Great Duckweed (<i>Spirodela polyrhiza</i>), Dwarf Clearweed (<i>Pilea pumila</i>), Bulbous Water-hemlock (<i>Cicuta bulbifera</i>), Tall Beggarticks	
12	Deciduous Forest FOD5-1 Dry-Fresh Sugar Maple Deciduous Forest	Canopy/ Sub-canopy	Sugar Maple, Green Ash, Black Cherry	16 spp. recorded (88% native; FQI 16.6) - Age: mature - Disturbance: low to moderate – canopy gaps, trails, invasive / exotic species - Occasional standing stags and deadfall Regionally Significant species: Common Hackberry - Overall botanical quality: Moderate
		Shrub Layer	Sugar Maple, Common Hackberry (<i>Celtis occidentalis</i>)	
		Ground Layer	Garlic Mustard, Green Ash, Broad-leaved Enchanter's Nightshade, Spotted Jewelweed, Yellow Trout Lily	

UNIT	HABITAT / ELC VEGETATION TYPE	LAYER	DOMINANT SPECIES	DESCRIPTION AND COMMENTS
13	Meadow Marsh MAM2-2 Reed-canary Grass Graminoid Mineral Meadow Marsh <i>Inclusion(s):</i> SAF Floating-leaved Shallow Aquatic	Canopy/ Sub-canopy	Cottony Willow	• 21 spp. recorded (86% native; FQI 17.2) • Age: young • Disturbance: low to moderate, edges ploughed regularly with old field meadow species adjacent, very few non-natives • Regionally Significant species: Eastern Mannagrass, and Northern Watermeal • Crayfish chimneys along northern perimeter • Overall botanical quality: Moderate
		Shrub Layer	Reed Canary Grass, Cottony Willow	
		Ground Layer	Reed Canary Grass, Eastern Mannagrass, Soft Rush (<i>Juncus effusus</i>), Northern Water-horehound (<i>Lycopus uniflorus</i>)	

2023 Update

Results from 2023 monitoring are generally consistent with the 2019-2020 vegetation community classification results. No major changes to the composition or limits of each vegetation community were recorded during vegetation monitoring. The following observations were made:

- **Unit 3 (SWTO2-4):** While woody and herbaceous species were similar to those previously observed, no floating leaved species (i.e., Small Duckweed, Greater Duckweed) were observed within the standing water component of the thicket swamp in 2023.
- **Unit 12 (FOD5-1):** No living Green Ash remained in the canopy due to Emerald Ash Borer infestation; however, Green Ash was still present in similar abundance in the subcanopy, understory, and ground layer.

3.5.4 Delineation of Natural Feature Limits

Wetland limits and the *Core Environmental Feature* (CEF) / dripline limits were delineated by WSP. CEF limits were confirmed by agency staff (Region of Waterloo) during a site visit on August 20, 2020. Due to COVID-19 restrictions, GRCA staff were not able to review the wetland limits on site, which had been pre-flagged by WSP; however, GRCA staff confirmed the wetland limits via email on October 15, 2020 based on detailed species and community data for each wetland provided by WSP. Limits of both the CEF and wetlands were subsequently total station surveyed. Surveyed CEF dripline and wetland limits, as shown on Figures 5 and 6, were used in the preparation of the preliminary site plan and included on all base plans for the current submission. Note that in some areas the wetland and CEF limits are coincident (e.g., where it is both 'dripline' and 'swamp wetland').

There are no changes to confirmed / surveyed feature limits.

3.6 Avifauna

3.6.1 Avifauna Survey Approach

Breeding bird surveys were conducted by qualified, experienced staff under appropriate timing and conditions (i.e., early morning visits during breeding bird season [May 24th to July 10th]; low wind, and no precipitation). All habitats on the Subject Property were thoroughly surveyed through a combination of wandering transects with 5-minute point count stations (except for adjacent lands owned by others where visual / auditory observations were recorded from the edge). Species presence, abundance and level of breeding evidence were recorded per Ontario Breeding Bird Atlas [OBBA] protocols (Bird Studies Canada 2003). Avifaunal observations were recorded for all



directions and distances from the transects / point count stations; therefore, some individuals may have been counted more than once.

Avifaunal survey results were grouped in wildlife survey units (WSU's; see Figure 4), based on general vegetation / habitat types and locations):

- WSU1 (agriculture, hedgerows and hydro corridor)
- WSU2a (deciduous forest north of Subject Property; Vegetation Unit 6 m + swamp)
- WSU2b (deciduous forest in northwest corner; Veg. Units 10, 12)
- WSU3 (marsh / wetland; Veg. Units 7, 8, 9)
- WSU4 (isolated wetland pond; Veg. Unit 13)
- WSU5a (thicket swamp west of property; Veg. Unit 11)
- WSU5b (thicket swamp; Veg. Unit 3)

Breeding bird surveys for the EIS were completed on May 28 and June 18, 2020. In addition, breeding bird surveys were completed on June 4, 2023 and July 8, 2023 as part of the pre-construction biological monitoring. Breeding bird results (species, location, number of individuals, and level of breeding evidence) are discussed below.

Avifaunal species status was evaluated using: the Region of Waterloo Significant Species List: Breeding Birds Component (1996) for regional significance; the NHIC website for provincial rarity ranks (i.e. S- Ranks); the Species at Risk in Ontario list (MECP – updated periodically) for provincial status designations; and the national Species at Risk list (COSEWIC - updated periodically) for national status designations.

3.6.2 Avifauna Results

In 2020, 36 bird species were recorded with breeding evidence within or immediately adjacent to the Subject Property (i.e., possible, probable, or confirmed breeding evidence according to OBBA standards). Eleven additional species were “observed” within the Subject Property with no breeding evidence, including three species recorded during the breeding bird surveys as flyovers or foraging visitants on the Subject Property: Barn Swallow (*Hirundo rustica*), Bobolink (*Dolichonyx oryzivorus*) and Canada Goose (*Branta canadensis*), and eight species observed incidentally during the Turtle Basking and Amphibian Calling Surveys (outside of breeding season, likely migrants). Refer to the Recorded Avifauna List in Appendix E.

Eight avifauna SCC (including SAR) were recorded during the breeding bird surveys:

- **Species at Risk.** Three SAR were recorded, one with breeding evidence:

- o Barn Swallow (*Special Concern* in Ontario and Canada) – one individual was ‘observed’ foraging over the agricultural fields during on May 28 and June 18, 2020, with no breeding evidence. No nesting habitat is present.
- o Bobolink (*Threatened* in Ontario and Canada) – one individual observed perched on hedgerow tree in the agricultural field (WSU1) on June 18, 2020. This individual was likely foraging / dispersing from adjacent habitat areas because there no suitable grassland breeding habitat is present within the Subject Property; therefore, no breeding evidence was recorded.
- o Wood Thrush (*Hylocichla mustelina*; *Special Concern* in Ontario and *Threatened* in Canada) – one individual with ‘possible’ breeding evidence was recorded in suitable deciduous forest habitat on adjacent lands north of the Subject Property (WSU2a).
- **Significant in Waterloo Region:**
 - o American Redstart (*Setophaga ruticilla*) – one individual with ‘possible’ breeding evidence recorded in WSU2b.
 - o Least Flycatcher (*Empidonax minimus*) – one individual with ‘possible’ breeding evidence recorded in WSU2a.
 - o Red-bellied Woodpecker (*Melanerpes carolinus*) – one individual with ‘possible’ breeding evidence recorded in WSU2b.
 - o Wilson’s Snipe (*Gallinago delicata*) – one individual with ‘possible’ breeding evidence recorded in WSU3.
- **Area Sensitive (MNRF 2015):** One of the recorded species is considered “Area Sensitive” according the Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (MNRF 2015), though no *Significant Wildlife Habitat* is present for this criterion:
 - o Savannah Sparrow (*Passerculus sandwichensis*) - six individuals with ‘probable’ breeding evidence recorded in the agricultural field (WSU1). The habitat within the Subject Property does not meet the criteria for candidate *Significant Wildlife Habitat* because this is an active agricultural field (sites with row cropping within the last 5 years are excluded as SWH) and the areas of cultural meadow vegetation along field edges / hedgerows do meet the size criteria (much less than the 30 ha threshold).

Table 2. Avifauna Species of Conservation Concern

Common Name	G-Rank	S-Rank	COSEWIC	COSSARO	SARA Status	Regionally Significant	Area Sensitive
American Redstart	G5	S5B				W	
Least Flycatcher	G5	S4B				W	
Red-bellied Woodpecker	G5	S4				W	
Savannah Sparrow	G5	S5					X
Wilson's Snipe	G5	S5B				W	
Wood Thrush	G5	S4B	THR	SC	THR		
Totals: 6			1	1	1	4	1

** As noted, two additional species (Barn Swallow and Bobolink) were 'observed' with no breeding evidence and no suitable nesting habitat is present on the Subject Property).*

Avifauna recorded during field surveys are primarily tolerant species commonly found in cultural meadow, woodland edge, shrub and hedgerows in rural/agricultural areas (e.g., American Goldfinch, American Robin, Baltimore Oriole, Brown-headed Cowbird, Cedar Waxwing, Chipping Sparrow, Common Grackle, European Starling, Gray Catbird, House Wren, Mourning Dove, Northern Cardinal and Song Sparrow).

Species associated with the wetland habitats (thicket swamp, shallow marsh and meadow marsh) were also recorded (e.g., Mallard, Red-winged Blackbird, Swamp Sparrow and Wilson's Snipe). A greater diversity of wildlife habitats and specialized wildlife habitat elements are present in the forested areas north of the property, including habitat for forest-associated birds such as American Redstart, Red-bellied Woodpecker, White-breasted Nuthatch and Wood Thrush. The avifauna species observed and exhibiting breeding evidence in the study area are expected given the broader landscape context and site-specific habitat conditions.

2023 Update

No changes to avian habitat have occurred since 2020. Results from 2023 monitoring are generally consistent with the 2020 survey results, though with slightly lower richness overall (31 breeding species). Slight differences in avian composition between 2023 and 2020 are due to exclusion of agricultural field habitat (where Canada Goose, Chipping Sparrow, Horned Lark, Mourning Dove and Savannah Sparrow were recorded in 2020), and not recording less common and/or forest associated species (Yellow-billed Cuckoo, Wilson's Snipe, Red-bellied Woodpecker and Northern Flicker).

Note that four species were recorded in 2023 that were not recorded in 2020: Eastern Wood-pewee (WSU 2a/2b); Mourning Warbler (HEPC); Rose-breasted Grosbeak (HEPC); and Scarlet Tanager (WSU 2a).

3.7 Herpetofauna

3.7.1 Spring Amphibian Breeding Survey Approach

Amphibian breeding activity was assessed using a passive three-minute auditory survey as specified by the Marsh Monitoring Program (MMP) amphibian monitoring protocol (Bird Studies Canada, 2008). Observations of species present, call levels and a count of individuals present, where applicable, were recorded on standardized field data sheets. The MMP protocol uses the following assessment approach:

- Level 1 - individual calls can be counted, with no overlap;
- Level 2 - some calls can be counted, some overlap; and
- Level 3 - calls continuous and overlapping, individuals not distinguishable.

Per MMP protocols, surveys begin a half-hour after sunset on nights with suitable weather conditions and conclude near midnight. Appropriate timing for the amphibian calling surveys was confirmed by referencing other local sites with known amphibian populations, liaison with other researchers and tracking weather information for the site. In accordance with MMP guidelines, nighttime air temperatures were greater than 5°C for the first survey, 10°C for the second survey, and 17°C for the third survey.

Amphibian calling surveys were completed at seven stations targeting potential habitat features on the Subject Property (Figure 4) on the following dates: April 6, May 26, and June 18, 2020. For additional details regarding the survey conditions, refer to the field chronology in Appendix B.

In addition, MMP surveys were completed on April 11, May 8 and June 25, 2023 as part of pre-construction biological monitoring (excluding Stations AC6 and AC7).

Amphibian station locations and habitats:

- AC1: WSU3 (marsh / wetland; Veg. Units 7, 8, 9)
- AC2: WSU4 (isolated wetland / pond; Veg. Unit 13)
- AC3: WSU5a (thicket swamp west of property; Veg. Unit 11)
- AC4: WSU5b (thicket swamp; Veg. Unit 3)
- AC5: WSU2a (deciduous forest north of Subject Property; Vegetation Unit 6);

- AC6: seasonally wet depression within active croplands
- AC7: offsite woodland to the east (St. Agatha Beech Maple forest)

3.7.2 Breeding Amphibian Results

Amphibian MMP breeding survey results are presented in Table 3. Key results:

- Six common anuran species were recorded⁵:
 - o American Toad (*Anaxyrus americanus*)
 - o Gray Treefrog (*Hyla versicolor*)
 - o Green Frog (*Rana clamitans*)
 - o Northern Leopard Frog (*Lithobates pipiens*)
 - o Spring Peeper (*Pseudacris crucifer*)
 - o Wood Frog (*Lithobates sylvaticus*)
- Three species were heard in full chorus (L3 calling) during the surveys: Gray Treefrog, Spring Peeper, and Wood Frog.
- No amphibian SCC were recorded during the field surveys or other field surveys.

Table 3. Spring Anuran Breeding Survey (MMP) Results

Station #	Results			
	Survey #	Species	Call Code	Count
1	1	Spring Peeper	L3	
		Wood Frog	L3	
	2	Gray Treefrog	L3	
		Green Frog	L2	10
		Spring Peeper	L3	
	3	Gray Treefrog	L3	
		Green Frog	L1	5
2	1	Gray Treefrog	L1	2
		Spring Peeper	L3	
	2	Gray Treefrog	L2	10
		Green Frog	L1	1
		Spring Peeper	L3	
	3	Gray Treefrog	L1	6

⁵ Including MMP survey results and other field survey results

Station #	Results			
	Survey #	Species	Call Code	Count
3	1	Green Frog	L1	6
		Spring Peeper	L3	
	2	Wood Frog	L2	12
		Gray Treefrog	L2	8
		Spring Peeper	L2	10
	3	Gray Treefrog	L2	12
		Green Frog	L1	1
4	1	Spring Peeper	L3	
		Wood Frog	L1	1
	2	Gray Treefrog	L1	1
		Spring Peeper	L2	15
	3	American Toad	L1	1
		Green Frog	L1	1
5	1	Spring Peeper	L3	
	2	No Observations		
	3	Gray Treefrog	L1	3
6	1	Wood Frog	L1	1
	2	No Observations		
	3	No Observations		
7	1	No Observations		
	2	No Observations		
	3	No Observations		

Additional and incidental amphibian observations are noted below:

- There is no suitable amphibian breeding habitat at AC6 or in the surrounding agricultural fields. One Wood Frog was recorded on one date (first round of MMP surveys) and visual observations of 100+ American Toad tadpoles were also recorded near AC6; however, these were in ephemeral pools in ploughed fields (i.e., nonviable habitat). Those areas did not provide a suitable hydroperiod for successful breeding as they were shallow or dry during the June 18, 2020 survey.
- An additional station was completed (AC7) targeting the woodland adjacent to the east of the property. No anuran calling was recorded at this station. However, it is ~200 m away from the station making auditory detections challenging. It may support suitable amphibian breeding habitat though it appears to be a relatively dry upland forest (based on air photo interpretation and topography).



- Northern Leopard Frog was recorded incidentally in WSU3 (2 individuals calling on May 3, 2020) and WSU4 (3 observed on Sept. 5, 2019).

2023 Update

No changes to herpetofauna breeding habitat have occurred since 2020.

In 2023, six species were recorded during MMP surveys: American Toad; Gray Treefrog; Green Frog; Northern Leopard Frog; Spring Peeper; and Wood Frog.

Results are consistent with 2020 survey results (WSP 2022), with respect to species richness and composition. In 2020, six species were recorded in total (same as 2023), none of which is an SCC. There were some differences in species / abundance recorded at each station (e.g., increased abundance for some stations / species in some cases, decreases in others), though no consistent trends are evident and changes to amphibian breeding habitat have occurred.

3.7.3 Turtle Basking Survey Approach

The wetlands and open-water areas on the Subject Property offer potential turtle overwintering and basking habitat. To evaluate, a turtle basking survey with multiple vantage points was undertaken on May 3, 2020 to visually assess all suitable wetland features on the Subject Property (WSU3, 4, 5a and 5b⁶). Turtle habitat suitability was also assessed during these surveys, including presence basking logs or other features, water depth and level of sun exposure.

The basking survey was conducted under appropriate conditions (mid-morning to mid-afternoon; sunny with low winds and air temperatures between 17° C and 20° C).

Supplemental basking observations were made during other field surveys in spring - summer 2019 and 2020.

In addition, turtle basking surveys were completed at four locations (WSU3, 4, 5a and 5b) on April 27 and May 18, 2023.

3.7.4 Turtle Basking Results

During the turtle basking survey, two species were recorded:

- Midland Painted Turtle (*Special Concern*, in Canada [COSEWIC]):

⁶ Note that the pools within the swamp on adjacent lands to the north (WSU2a) were partially viewed from the north edge of the Subject Property

- o Four individuals in the WSU3 marsh
- o Seven individuals in the WSU4 isolated pond (two adults, five young).
- Snapping Turtle (*Special Concern* in Ontario and Canada):
 - o Two individuals recorded in the WSU4 isolated pond (one adult, one young).
 - o In addition, during the wildlife survey on June 18, 2020, two adult Snapping Turtles were observed digging nest holes in the agricultural field adjacent to the WSU4 pond (location shown in Figure 4.

Although nesting was not confirmed (no further observation of eggs / hatched young), an interim buffer surrounding the potential nesting area was staked on June 30, 2020 to prevent potential inadvertent harm during agricultural activities.

2023 Results

In 2023, one species was recorded during the turtle basking surveys: Snapping Turtle. Evidence of Midland Painted Turtle and Snapping Turtles (tracks near WSU 3, 4 and 5) was also recorded.

Results from 2023 vary somewhat with respect to distribution and abundance relative to 2019-2020 results as documented in the Scoped EIS (WSP 2022); during those surveys, 4-7 Midland Painted Turtles and 2 Snapping Turtles were recorded in the WSU3 marsh and WSU4 isolated pond. This may be due to low precipitation in the Region in recent years. Also, Snapping Turtle abundance in these wetlands is likely under-estimated given this species cryptic behaviour. However, as noted above, no change to wetland/aquatic habitat has occurred.

3.8 General Wildlife Observations

Supplemental wildlife observations were recorded during all field visits. All observations made during the field surveys were recorded, including sightings of species, as well as evidence of use (e.g. browse, tracks / trails, scat, burrows, and vocalizations). Wildlife habitat potential was also evaluated during field surveys.

Wildlife observation consisted of several common bird, insects, herptile, and mammal species:

- **Avifauna:** 8 species as noted in Section 3.6.2
- **Herpetofauna:** 4 anuran species, as noted in Section 3.6.2; and 2 turtle species, as noted in Section 3.6.4.
- **Mammals** (6 species): Coyote (*Canis latrans*), Eastern Chipmunk (*Tamias striatus*), Eastern Cottontail (*Sylvilagus floridanus*), Raccoon (*Procyon lotor*), Red Squirrel (*Tamiasciurus hudsonicus*) and White-tailed Deer (*Odocoileus virginianus*).

- **Lepidoptera & Odonata** (3 species, including 1 SAR):
 - o Common Green Darner (*Anax junius*) and Mourning Cloak (*Nymphalis antiopa*) in WSU2b and WSU3
 - o Monarch (*Danaus plexippus*; *Special Concern* in Ontario and Canada) – 6 individuals observed foraging / flying through crop fields on Sept. 5, 2019.

One additional wildlife species was observed:

- **Terrestrial Crayfish** - evidence of use (burrows) was recorded during the 2020 surveys: ~3 burrows along the southern edge of WSU3; and 2 burrows along the northern edge of WSU4 (see Figure 4 for locations). There are two species of crayfish which create these burrows: Meadow Crayfish (*Cambarus diogenes*), which is provincially rare (S3); and Chimney Crayfish (*Fallicambarus fodiens*). No crayfish were observed and identification to species was not confirmed. Crayfish chimneys were recorded adjacent to WSU4 during 2023 monitoring.

3.9 Wildlife Movement and Corridors

Wildlife movement on the Subject Property, which is at the boundary of urban and agricultural / rural lands, is expected to be typically opportunistic, with wildlife crossing open fields, forest edges, and hedgerows, and often following areas where movement is unimpeded or unthreatened by anthropogenic disturbances and activities. Although White-tailed Deer tracks were observed along the forest / wetland edges in WSU2a and WSU3, no defined or high-traffic wildlife movement paths were evident during field surveys. There is also potential for herpetofauna species to move between the contiguous wetland and woodland habitats as they transition from spring breeding to summer foraging and overwintering habitats.

At a local landscape level, wildlife movement will generally be restricted to the northern portion of the Subject Property where the natural features occur. Birds and other wildlife are likely to move along the hydro corridor or cross at narrower gaps between woodlands, which connect the St. Agatha Beech Maple Forest ANSI in the east and Phillipsburg Forest ANSI in the west.

3.10 Significant Wildlife Habitat

3.10.1 Evaluation

WSP has undertaken an assessment of *Significant Wildlife Habitat* (SWH) using the Significant Wildlife Habitat Ecoregion Criteria Schedules, Ecoregion 6E (MNR 2015). The full assessment is included in Appendix F. Based on field survey results, SWH was confirmed for three criteria:

- **Special Concern and Rare Wildlife Species.** Confirmed SWH is present in and WSU2a (Wood Thrush) and WSU4 (Snapping Turtle).
 - o Note: Monarch (SC) were observed; however, recorded individuals were likely migrants, foraging over agricultural fields, and along field and wetland edges. No confirmed SWH is present; none of the observations was associated with defined habitat features (e.g., concentrations of Milkweed) or ELC community types.
 - o Note: one Barn Swallow (SC) was 'observed' foraging over the agricultural fields during on May 28 and June 18, 2020, with no breeding evidence. No nesting habitat is present.
- **Amphibian Breeding Habitat (Woodland)** was confirmed at one location:
 - o The WSU3 cattail marsh (Station AC1). Level 3 calling for Gray Treefrog, Spring Peeper and Wood Frog). Tadpoles were also observed. This confirmed SWH includes the marsh (Unit 8), plus adjacent contiguous woodland.
- **Terrestrial Crayfish** Confirmed SWH is present in WSU3 and WSU4; the wetland Ecosites (SWD – Unit 7, MAS – Unit 8 and MAM – Unit 13), plus the edge areas immediately adjacent to Unit 13 (i.e., within ~ 1m), where burrows were recorded

In addition, candidate (unconfirmed) SWH was identified for three criteria:

- **Bat Maternity Colonies (#6):** candidate SWH is present in northwest forested area (WSU2b) where mature Sugar Maple trees are present. Note that the edge of the forest on adjacent lands to the northeast appears less mature and as such, has a relatively low suitability for bat roosting. No suitable hedgerow or isolated cavity trees are present on the subject property.
- **Turtle Wintering Areas (#7):** Candidate habitat is present in WSU 2a, WSU4, WSU5a and WSU5b. Midland Painted Turtle and Snapping Turtle were observed basking in the wetlands in early May as follows:
 - o Seven Midland Painted Turtles and two Snapping Turtles in WSU4 (isolated meadow marsh / pond)
 - o One Snapping Turtle in WSU5b (Thicket Swamp at west edge of Subject Property)

Water levels were only suitable for turtle overwintering in WSU4 (estimated >0.5 m with muddy bottom in September 2019), and potentially in WSU5a (thicket swamp, off property to the west) and WSU 2a (deciduous swamp forest, off property to the north), which could only be assessed from the edge. Based on results of the targeted early May 2020 survey and incidental turtle basking observations in September 2019, overwintering in WSU4 cannot be confirmed; the recorded individuals may have moved from the adjacent WSU2a wetlands in late March - April.

- **Turtle Nesting Areas:** Candidate habitat is present adjacent to the marsh wetlands (WSU3, WSU4, WSU5a / 5b). Two Snapping Turtles were observed digging nests in the agricultural field adjacent to the small meadow marsh (WSU4); however, successful nesting was not confirmed. SWH criteria are not definitive regarding exclusion of agricultural fields, but other man-made habitats are excluded (road embankments / shoulders). Active agricultural fields are less likely to provide successful nesting opportunities given frequent disturbance (e.g., ploughing, seeding, harvesting, soil compaction), but the observed nesting area was staked to avoid future agricultural disturbance.

There are no changes to the SWH analysis based on results of the 2023 monitoring.

3.11 Wildlife Species of Conservation Concern

The following information is based on secondary source background review and field work completed by WSP (2019 – 2020) on the Subject Property. For the purpose of this report, SCC include:

- Species listed by COSEWIC, including species subject to the provisions of the federal Species at Risk Act (SARA; 2002)
- Species listed by COSSARO, including species subject to the provisions of the Endangered Species Act (ESA; 2007)
- Provincially significant species (NHIC S-rank of S1 to S3),
- Regionally significant bird species (per Region of Waterloo 1996)
- Regionally significant plant species (per Region of Waterloo 1999)
- *Area Sensitive* bird species listed in the Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (MNRF 2015).

3.11.1 Natural Heritage Information Centre

Based on review of the NHIC database, there are no records of provincially rare species (Species at Risk [SAR] or S1 to S3) on the Subject Property. There are 'recent' (< 20 yrs) records in the general area for the following *Threatened* species; however, no suitable breeding habitat is present on the Subject Property for these species:

- Eastern Meadowlark (*Sturnella magna*; *Threatened* in Ontario and Canada): recorded to the northeast (17NJ2607) on June 20, 2002; and
- Bobolink (*Threatened* in Ontario and Canada): recorded to the east (17NJ2706) on June 20, 2002.

3.11.2 Ontario Reptile & Amphibian Atlas

Based on review of the Ontario Reptile & Amphibian Atlas (ORAA) database, there are recent records (< 20 yrs) of the following SCC in the general area (within 17NJ20, a 10 x 10 km square that includes the Subject Property):

- Snapping Turtle (*Special Concern* in Ontario and Canada), recorded 13 occurrences 1978 to 2019 in the vicinity of the Subject Property; and
- Western Chorus Frog (*Pseudacris triseriata*; *Threatened* in Canada), recorded in the vicinity of the Subject Property on April 23, 2006.

3.11.3 Ontario Breeding Bird Atlas

Based on review of the Ontario Breeding Bird Atlas (OBBA) database, there are records of six avian SCC in the vicinity of the Subject Property (between 2001 – 2005 in 17NJ20, a 10 x 10 km square that includes the Subject Property):

- Red-headed Woodpecker (*Melanerpes erythrocephalus*; *Special Concern* in Ontario and *Threatened* in Canada);
- Eastern Wood-Pewee (*Contopus virens*; *Special Concern* in Ontario and Canada);
- Barn Swallow (*Threatened* in Ontario and Canada);
- Wood Thrush (*Special Concern* in Ontario and *Threatened* in Canada);
- Bobolink; and
- Eastern Meadowlark.

3.11.4 Field Survey Results (WSP 2019 - 2020)

Field work completed to date include botanical inventories and vegetation assessments, general wildlife, breeding bird and marsh bird surveys, spring amphibian breeding surveys, and turtle basking / spring emergence surveys.

Additional details and results for non-SAR SCC are included Section 3.5 – 3.7).

Based on field surveys, five SAR have been recorded on the Subject Property:

- Barn Swallow
 - o One individual was ‘observed’ foraging over the agricultural fields during on May 28 and June 18, 2020, with no breeding evidence.
 - o No suitable nesting habitat is present on the Subject Property.

- Bobolink
 - o One individual was ‘observed’ along a mid-field hedgerow on June 18, 2020.
 - o Since no suitable nesting habitat is present on the Subject Property, it is concluded that this was a foraging visitant.
- Wood Thrush
 - o One individual was recorded with ‘possible’ breeding evidence in the woodland on adjacent lands to the north (WSU2a).
- Snapping Turtle
 - o Two individuals were recorded in / adjacent to WSU4 (including nests) and one individual was recorded in WSU5b.
- Monarch
 - o Several individuals were recorded along the edges of WSU4 and immediately south of WSU3 on July 20, 2020, as on September 2019 site visit.
 - o Milkweed is occasionally present along the edges of all units, but no large concentrations are present.

A SAR habitat assessment has been completed (Appendix G), with commentary on policy compliance and impacts in Section 5 and Section 6.

2023 Update

One of the five SAR listed above was recorded in 2023: Snapping Turtle (*Special Concern* in Ontario; WSU3).

One additional SAR was recorded in 2023: Eastern Wood-pewee (*Special Concern* in Ontario and Canada; WSU2a and WSU2b).

4.0 PROPOSED DEVELOPMENT

As input to the development of the Draft Plan of Subdivision (MHBC; June 3, 2024), natural feature limits were delineated (Section 3.4.4). Setback requirements were then determined based on the features and functions of these adjacent features. The Draft Plan was then modified to implement these recommendations, in an iterative fashion. A brief description of the proposed stormwater management strategy (Stantec, 2025) is included in Section 4.3; the reader is referred to the various technical reports for additional details.

Note that the Draft Plan (MHBC: June 3, 2024) illustrates the proposed initial phase of development within the TUA Lands; the current EIS addresses these lands only. A conceptual layout is included for the Non-TUA Lands on the remainder of the property; a future application will be submitted for those lands.

4.1 Proposed Development

Activa Holdings Inc. is proposing the establishment of a new residential subdivision on the north-east side of Baden. The Draft Plan (June 3, 2024), shown on Figure 6, was developed to address the above environmental management recommendations. The general characteristics of the Draft Plan are as follows:

- Development parcel is 17.2 ha in size
- Seventeen low density residential blocks (154-187 units)
- Two multiple residential blocks (117-157 units)
- Stormwater management facility, outletting to retained wetland
- Trail, trail/drainage corridor, and drainage corridor blocks
- 0.3 m reserve blocks
- Five new streets
- The lots will be serviced by municipal water and sanitary services
- No trails are proposed within the natural heritage features or their associated setbacks

4.2 Stormwater Management

The stormwater management (SWM) strategy is summarized below. For additional details, refer to the Activa Baden North Subdivision. Township of Wilmot. Functional Servicing and Stormwater Management Report (Stantec, 2025). Drawings and technical information are included in Appendix H. The SWM design involved the following study components:

- Complete a hydrologic study to determine the existing site conditions with respect to topography, soils information and existing land uses.
- Prepare an existing and proposed development condition hydrologic model using SWMHYMO to determine runoff volumes and peak flow rates to downstream areas.
- Complete the preliminary design of the SWM Facility to provide sufficient water quality and water quantity control to achieve target rates to downstream receivers.



- Summarize the study through preliminary design and recommendations.

The SWM strategy was developed in consideration of design criteria for: water quality; water quantity; infiltration; erosion control; and erosion and sediment control (ESC).

The proposed SWM strategy incorporates minor and major runoff components and SWM facility design attributes that have considered ecological and hydrogeological objectives:

- Minor system conveyance via storm sewer networks to the proposed SWM Facility (Infiltration Basin) that will provide 'enhanced' water quality and quantity control. Though the SWM is required to provide 'normal' water quality treatment prior to discharging to the downstream wetland, it has been designed with sufficient permanent pool volume within the forebay and infiltration volumes within the main cell to provide 'enhanced' water quality treatment.
 - o The proposed SWM Facility provides sufficient storage to attenuate post-development discharge to the downstream wetland to maintain existing runoff volumes and target peak flow rates.
- Major storm runoff is conveyed via overland flow through the rights-of-way (with the exception of conveyance via a dedicated pipe for an isolated area).
- The SWM Facility is designed as an infiltration basin complete with a wet forebay.
 - o The wet forebay provides initial water quality treatment and isolation of sediment deposition for ease of removal.
 - o The infiltration cell will provide sufficient infiltration to enhance site infiltration levels and maintain runoff volumes to the wetland, with surface flows proposed to be drained by a multi-stage outlet consisting of dual CSP risers (set above the infiltration cell bottom), downstream orifice control, a ditch inlet catchbasin (DICB) and overflow weir.
- Due to the underlying soils through most of the site consisting of clay to clay-till with low infiltration potential, no lot-level infiltration is proposed for the subdivision.

4.3 Water Balance

Information related to the water balance analysis is summarized below. For additional details, refer to the Hydrogeological Investigation, Activa Baden North Subdivision, Township of Wilmot, Ontario. Revised Draft Plan Submission (Stantec, 2024). Relevant drawings and technical information are included in Appendix H.



The updated Hydrogeological Investigation (Stantec, 2024) was revised in consideration of the following:

- The revised Draft Plan layout.
- Results of groundwater monitoring data up to July 2024 (i.e., monitoring results from July 2020 to July 2024)
- Minor changes to pre- and post-development water balance calculations to reflect the minor changes to the Draft Plan layout.

WSP notes that none of the conclusions presented in the hydrogeological report issued in July 2022 changed due to these previously mentioned updates.

4.3.1 Existing Conditions

Under current conditions, the wetlands on and adjacent to the Subject Property receive groundwater and surface water inputs as follows:

Veg. Unit 3/11:

- Surface water
 - o This wetland does not receive surface water contributions from the Subject Property (refer to Figure 1 in Stantec, 2024).
- Groundwater
 - o This wetland is interpreted to be a groundwater discharge feature; however, the source of groundwater inputs to this wetland appear to originate from infiltration that occurs off-site on the lands to the west of the Subject Property (refer to Figure 13 in Stantec, 2024).

Veg. Unit 8:

- Surface water
 - o This wetland, together with the contiguous off-site *Phillipsburg Southeast Wetland Complex*, receives approximately 48,473 m³ of surface water runoff annually from the Subject Property (i.e., Catchments 100, 101 and 102; refer to Figure 1 and Table G-1 in Stantec, 2024).
- Groundwater
 - o Vertical hydraulic gradients beneath Veg. Unit 8 are predominantly downward, indicating that this wetland is a groundwater recharge feature, with this interpreted function being supported by regional mapping provided by the GRCA (see Figures

C-1 and C-2 in Stantec, 2024). Even if this wetland were to receive groundwater inputs from the Subject Property, the volume of these contributions is expected to be minimal, given that most of the property is covered by deposits of low permeability deposits of silt, clay, and/or clay to clayey silt till associated with Aquitard 1 (ATB1) where the horizontal movement of groundwater through this unit is calculated to be in the range of 0.09 m/year (i.e., one meter every 10.8 years). Any groundwater recharge occurring on the Subject Property that could be of some consequence to this wetland would be from the surficial sand deposits of Aquifer 1 (AFB1), which immediately surround this wetland (mostly off-site) and will remain largely untouched under the post-development condition (refer to Figure 4 in Stantec, 2024).

Veg. Unit 13:

- Surface water
 - o This wetland does not receive surface water contributions from the Subject Property (see Figure 1 in Stantec, 2024).
- Groundwater
 - o This wetland is interpreted to be a groundwater recharge feature, with the groundwater table shown to consistently remain below the substrate of this wetland (i.e., there is no connection between this wetland and the Subject Property groundwater flow system) (refer to Section 4.2.3 in Stantec, 2024).

Off-site Wetland (SWD) to the north:

- Surface water
 - o This wetland (i.e., *Phillipsburg Southeast Wetland Complex*), together with the contiguous Veg. Unit 8, receive approximately 48,473 m³ of surface water runoff annually from the Subject Property (i.e., Catchments 100, 101 and 102; refer to Figure 1 and Table G-1 in Stantec, 2022b).
- Groundwater
 - o As shown in Figure 13 in Stantec (2022b), groundwater flowing from beneath the Subject Property is largely directed towards the off-site wetland to the north. However, the bulk of annual infiltration that occurs across on the Subject Property is through the low permeability deposits of silt, clay, and/or clay to clayey silt till associated with Aquitard 1 (ATB1), where once reaching the groundwater table is calculated to move horizontally at a rate of 0.09 m/year (i.e., one meter every 10.8 years). As such, the volume of groundwater being contributed to the off-site wetland from the Subject Property will be low. Stantec is of the opinion that most groundwater inputs to the off-site wetland complex occurs through the sand deposits of Aquifer 1 (AFB1), which predominantly surround this wetland beyond the boundaries of the



Subject Property (refer to Figure 4 in Stantec, 2024).

4.3.2 Proposed Conditions / Water Balance

4.3.1.1 Surface Water

Under the pre-development condition, Veg. Unit 8 and the abutting offsite *Phillipsburg Southeast Wetland Complex* receive approximately 48,473 m³ of surface water runoff annually from the Subject Property (i.e., Catchments 100, 101 and 102; refer to Figure 1 and Table G-1 in Stantec, 2022b).

Under the post-development condition, surface water runoff generated from Catchments 200, 201, and 202 (TUA Lands) and Catchments 203, 205, and 206 (non-TUA Lands) will be directed to the proposed SWM facility, which will outlet to Veg. Unit 8 and ultimately drain to the abutting *Phillipsburg Southeast Wetland Complex* (refer to Figure 15 and Table 6 in Stantec, 2022b). The estimated post-development annual runoff volume from the Subject Property to the wetlands, with the implementation of post-development infiltration augmentation measures, is calculated to be 47,981 m³, resulting in an annual deficit of 492 m³ (1%) being directed to these wetland systems.

Veg. Unit 3 and Veg. Unit 13 do not receive surface water contributions from the Subject Property. Consequently, the proposed development will not affect the current hydrological function of these wetlands.

4.3.1.2 Groundwater

Implementation of proposed post-development infiltration augmentation measures at the Subject Property will result in an annual infiltration surplus of 78,963 m³. This increase in infiltration volume is unlikely to negatively affect the form and/or function of Veg. Unit 8 and the contiguous *Phillipsburg Southeast Wetland Complex* for the following reason:

- Vertical hydraulic gradients recorded beneath Veg. Unit 8 are predominantly downward, suggesting that this wetland is a groundwater recharge feature. In addition, regional GRCA mapping shows Veg. Unit 8 and the *Phillipsburg Southeast Wetland Complex* to be in an area characterized by downward vertical hydraulic gradients (Figure C-1 in Stantec, 2022b) and groundwater recharge conditions (Figure C-2 in Stantec, 2022b), suggesting that these wetlands do not receive groundwater inputs from the Subject Property. The excess infiltration occurring post-development will move downward through the sand-based deposits that underlie the SWMF infiltration cell and recharge Aquifer 1 (AFB1).

Although Veg. Unit 3 is identified as a groundwater discharge feature, the source of groundwater



inputs to this wetland appear to originate from infiltration that occurs off-site on the lands to the west of the Subject Property. As such, proposed development of the Subject Property will have no impact on the groundwater discharge function of Veg. Unit 3.

- Veg. Unit 13 is interpreted to be a groundwater recharge feature, with the groundwater table shown to consistently remain below the substrate of this wetland. In addition, groundwater is interpreted to flow southeast away from this wetland onto the portion of the Subject Property proposed for development (i.e., lands upgradient of this wetland within the Subject Lands will not be developed). This interpretation indicates that there is no connection between this wetland and the groundwater flow system associated with the Subject Property. As such, proposed development of the Subject Property will have no impact on the existing groundwater function of Veg. Unit 13.

Conclusion: Through the use of end-of-pipe infiltration, the proposed development will:

- 1) maintain a monthly runoff balance (refer to Figure 16 and Appendix G in Stantec 2024) to the on-site wetlands (i.e., Veg. Unit 8)
- 2) maintain a monthly runoff balance to the off-site *Phillipsburg Southeast Wetland Complex*
- 3) enhance infiltration across the Subject Property.

5.0 POLICY ASSESSMENT

Relevant planning legislation and policy pertinent to this study are summarized briefly in the following sections. An overview of key policies and implications is provided along with an assessment of the policy as it relates to natural heritage features within the Subject Property.

5.1 MIGRATORY BIRDS CONVENTION ACT (1994)

5.1.1 Overview of Key Policies

The Migratory Birds Convention Act, MBCA (1994) and Migratory Birds Regulations, MBR (2014) protect most species of migratory birds and their nests and eggs anywhere they are found in Canada, including surrounding ocean waters, regardless of ownership. General prohibitions under the MBCA and MBR protect migratory birds, their nests and eggs and prohibit the deposit of harmful substances in waters / areas frequented by them.

The MBR includes an additional prohibition against incidental take, defined by Environment and Climate Change Canada (ECCC) as:

“The inadvertent harming, killing, disturbance or destruction of migratory birds, nests and eggs.”

ECCC implements policies and guidelines to protect migratory birds, their eggs and their nests. There is guidance on the ECCC website to minimize the risk of incidental take effects on migratory birds, achieve compliance with the law and maintain sustainable populations of migratory birds.

Compliance with the MBCA and MBR is best achieved through a due diligence approach, which identifies potential risk, based on a site-specific analysis in consideration of the Avoidance Guidelines and Best Management Practices information on the ECCC website⁷.

5.1.2 Study Assessment

Implications of the MBCA have potential to occur during the construction phase of the project when the land is cleared, potentially removing nests of migratory birds.

Most avian species recorded during field surveys are subject to the provisions of the MBCA. Vegetation removals are limited to crops, small portions of cultural meadow, and a few trees (< 5), which provide habitat for generalist and/or urban-adapted species. No habitat unique in the local landscape will be impacted by proposed works.

Compliance with the MBCA will be achieved using the following due diligence approach:

- Proponent awareness of the MBCA, potential for nesting in the area and potential for impacts to migratory birds, nests and eggs. Adjacent lands to the south provide suitable habitat for nesting of water associated and generalist species.
- Implementation of the following avoidance and mitigation measures, where possible:
 - o Avoiding works (i.e., vegetation / potential nesting habitat removal) within the “regional nesting period” for this area⁸
 - o Avoiding works in key sensitive locations.
 - o Implementing post-construction habitat creation / restoration
 - o Recommended Best Management Practices (BMPs) during construction to minimize potential indirect impacts to vegetation / potential nesting habitat outside of the direct footprint.

⁷ <https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/guidelines.html>

⁸ <https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/general-nesting-periods/nesting-periods.html>

5.2 Species at Risk Act (2002)

5.2.1 Overview of Key Policies

The federal Species at Risk Act (SARA) includes a number of prohibitions to protect individuals of listed Species at Risk, including:

- *“No person shall kill, harm, harass, capture or take an individual of a threatened, endangered or extirpated species.*
- *No person shall possess, collect, buy, sell or trade an individual of a threatened, endangered or extirpated species, or any part or derivative of such an individual.*
- *No person shall damage or destroy the residence of one or more individuals of a threatened or endangered species, or of an extirpated species if a recovery strategy has recommended the reintroduction of the species into the wild in Canada.”*

These prohibitions apply on private lands throughout Canada only to aquatic species and species of migratory birds protected by the Migratory Birds Convention Act listed as Endangered, Threatened, or Extirpated under Schedule 1 of SARA. For other listed wildlife species, these prohibitions apply only in federal lands. However, the Governor in Council may, by order, apply these prohibitions to non-federal lands if the Minister of the Environment is of the opinion that the laws of a province do not effectively protect a listed species or the residences of a listed species.

On the recommendation of the Minister of the Environment, the Minister of Fisheries and Oceans or the Minister of Canadian Heritage, the Governor in Council may also apply these prohibitions on federal lands to species that are not listed by COSEWIC but are designated *endangered* or *threatened* by a provincial or territorial minister.

SARA also includes provisions to protect *critical habitat*; these are complex and vary according to the species in question and the location of the critical habitat. SARA's provisions also permit the Minister of the Environment, the Minister of Fisheries and Oceans and the Minister of Canadian Heritage broad discretionary powers to implement (or not) prohibitions to protect critical habitat. Generally, critical habitat protection applies to Threatened, Endangered and Extirpated species.

5.2.2 Study Assessment

Applicability:

The project is on non-federal (private / municipal) lands and there is no order by Governor in Council; hence SARA applies to aquatic and migratory bird species and habitat.

Individuals and Residences:

Three SARA-listed migratory bird species were recorded on the subject property: Barn Swallow, Bobolink and Wood Thrush (all *Threatened*, Schedule 1 under SARA). However, breeding evidence and suitable nesting habitat was only recorded for one of these species:

- **Wood Thrush** in the woodlands on adjacent lands north of the Subject Property, which will not be impacted by the proposed works.

We are aware of no downstream critical habitat for aquatic SAR species which would be impacted by the proposed activities with the proper implementation of recommended mitigation and protection measures.

Critical Habitat:

No critical habitat for SARA-listed aquatic or migratory bird species is present within the proposed work areas and none is known on adjacent lands where there is potential for indirect impact.

Recommendations:

Implement all recommended during-construction measures / best-management practices to mitigate potential impacts to SAR individuals and recommended SWM measures to mitigate potential impact to downstream aquatic habitat.

Implement all requirements for MBCA compliance (see Section 5.1.1) and ESA compliance (as described in Section 5.2.1).

5.3 Endangered Species Act (2007)

5.3.1 Overview of Key Policies

Species designated as *Threatened or Endangered* by the Committee on the Status of Species at Risk in Ontario (COSSARO), otherwise known as Species at Risk in Ontario (SARO), and their habitats (e.g. areas essential for breeding, rearing, feeding, hibernation and migration) are automatically afforded legal protection under the Endangered Species Act (ESA) (Government of Ontario 2007). ESA Subsection 9(1) states that:

“No person shall,

- kill, harm, harass, capture or take a living member of a species that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species;*
- possess, transport, collect, buy, sell, lease, trade or offer to buy, sell, lease or trade,*

- c) *a living or dead member of a species that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species,*
- d) *any part of a living or dead member of a species referred to in subclause (i),*
- e) *anything derived from a living or dead member of a species referred to in subclause (i); or*
- f) *sell, lease, trade or offer to sell, lease or trade anything that the person represents to be a thing described in subclause (b) (i), (ii) or (iii)".*

Clause 10(1)(a) of the ESA states that:

"No person shall damage or destroy the habitat of a species that is listed on the Species at Risk in Ontario list as an endangered or threatened species"

The ESA also calls for the development of species-specific Recovery Strategies and Habitat Regulations. Unlike the *general habitat* of a species, *regulated habitat* may include areas that are currently unoccupied by the species. These areas are commonly referred to as "recovery habitat." In order to balance social and economic considerations with protection and recovery goals, the ESA also enables the MNRF to issue permits or enter into agreements with proponents in order to authorize activities that would otherwise be prohibited by subsections 9(1) or 10(1) of the Act provided the legal requirements of the Act are met.

5.3.2 Study Assessment

Applicability

Potentially suitable habitat for species afforded protection under the ESA (2007) is present within the Subject Property. Two *Threatened or Endangered* species subject to the provisions of the ESA have been recorded on the Subject Property: Barn Swallow and Bobolink. As noted, however, there was no breeding evidence and suitable nesting habitat is not present.

Habitat Assessment / Screening

We have undertaken a screening exercise to identify which SAR have reasonable potential to be present within a given Subject Property based on known occurrences of the species and the habitats present. First, we developed a list of SAR known to occur within the vicinity of Subject Property or region from review of various sources including: NHIC data; MNRF regional SAR lists; DFO SAR mapping; Ontario Breeding Bird Atlas; Ontario Reptile and Amphibian Atlas; and personal/corporate experience. Each species known preferred habitat was then cross-referenced against habitats identified within the Subject Property or adjacent lands, with consideration of species distribution and range, to determine the reasonable likelihood of the species being present - based on the 'key habitats used by species'. Considering findings of surveys and habitat suitability, we then assessed



'likelihood and magnitude of impacts to species or habitats'.

The full SAR habitat evaluation was included in Appendix G.

Results and Conclusions

We concluded that for most of the listed species, no suitable habitat is present or only a small amount / marginally suitable habitat is present and the likelihood of occurrence is low.

Two species subject to the provisions of the ESA (i.e., *Threatened or Endangered*) have been recorded on the Subject Property:

- Butternut (*Juglans cinerea*; END). One tree is present in Vegetation Unit 10. This individual is located over 45 m from the edge of the retained woodland and no suitable regeneration habitat is present within 50 m of tree.
- Bobolink (THR). One individual of each species was recorded on the Subject Property in 2020; however, Bobolink was not recorded with breeding evidence and no suitable nesting habitat is present on the Subject Property. Additionally, Bobolink was not recorded in 2023.

Conclusion: no impact to endangered or threatened species or their habitat, as all Butternut habitat will be retained and no Bobolink nesting habitats are present within the Subject Property.

For all other SAR species with some potentially suitable habitat in the vicinity of the proposed works, but not recorded during field surveys, the likelihood and magnitude of impacts is 'none', based on: the size and/or quality of habitat; low likelihood of occurrence; presence of abundant (and generally much larger / higher quality) habitat in the local landscape; and retention of potentially suitable habitat in the northwest corner of the property (wetland, open water, treed areas). Impacts to other potentially suitable SAR habitat will be mitigated by implementation of recommended protection, mitigation and enhancement measures.

5.4 Provincial Planning Statement (2024)

5.4.1 Overview of Key Policies

The Provincial Planning Statement (PPS; MMAH October 2024) identifies natural heritage objectives and provisions related to development and site alteration in and/or adjacent to certain natural heritage features.

Per Section 4.1.4, development and site alteration shall not be permitted in:

- a. Significant wetlands in Ecoregions 5E, 6E and 7E.
- b. Significant coastal wetlands.



Per Section 4.1.5, unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions, development and site alteration shall not be permitted in:

- a. Significant wetlands in the Canadian Shield north of Ecoregions 5E, 6E and 7E.
- b. Significant woodlands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Mary's River).
- c. Significant valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Mary's River).
- d. Significant wildlife habitat.
- e. Significant areas of natural and scientific interest.
- f. Coastal wetlands in Ecoregions 5E, 6E and 7E that are not subject to policy 2.1.4(b).

Per Section 4.1.6, *“Development and site alteration shall not be permitted in fish habitat except in accordance with provincial and federal requirements.”*

Per Section 4.1.7, *“Development and site alteration shall not be permitted in habitat of endangered species and threatened species, except in accordance with provincial and federal requirements.”*

Per Section 4.1.8, *“Development and site alteration shall not be permitted on adjacent lands to the natural heritage features and areas identified in policies 4.1.4, 4.1.5 and 4.1.6 unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions.”*

5.4.2 Study Assessment

An assessment of PPS natural heritage policies was undertaken, as described below.

- **Endangered or Threatened Species⁹**
 - o Three *Endangered* or *Threatened* SAR were recorded: Butternut and Bobolink.
 - o **Conclusion:** no impact to endangered or threatened species or their habitat, with protection and mitigation measures as recommended herein.

⁹ Note that the “significant habitat of Endangered and Threatened species is also considered a Core Environmental Feature in the Regional Official Plan – policy 7.C.1 (a).”

- **PSW**

- o None is present within or adjacent to the Subject Property.
- o The wetlands within the Subject Property would not meet criteria for provincial significance on their own.
- o **Conclusion:** no impacts to PSW

- **Significant Woodlands**

- o *Significant Woodland* is present on adjacent lands to the north of the Subject Property (based on interpretation of CEF mapping and general vegetation character, as evident from property limits); these will be retained in full. The woodland on the Subject Property (outside of the current Draft Plan area) meets criteria for designation as *Significant Woodland* under the ROP. See Section 5.6.2.
- o All *Significant Woodland* within the Subject Property is to be retained in full, with a minimum 10 m development setback, though the effective setback is actually greater based on the wetland +30 m setback.
- o **Conclusion:** no impacts to significant woodland.

- **Significant Valleylands**

- o None is present within or adjacent to the Subject Property.
- o **Conclusion:** no impacts to significant valleyland.

- **Significant Wildlife Habitat**

- o An evaluation of *Significant Wildlife Habitat* was undertaken using the Significant Wildlife Habitat Ecoregion Criteria Schedules, Ecoregion 6E (MNRF 2015). The analysis is provided in Section 3.7.2 with conclusions and recommendations summarized below.
- o Based on field survey results, SWH was confirmed for three criteria: Amphibian Breeding Habitat (Woodland); Special Concern and Rare Wildlife Species; and Terrestrial Crayfish. All of these SWH categories are associated with forest and wetland vegetation units in the northwest corner of the Subject Property, which will be retained in full.
- o Within the Subject Property, candidate (unconfirmed) SWH was identified for four categories, all associated with forest and wetland vegetation units in the northwest corner of the Subject Property, which will be retained in full: Bat Maternity Colonies; Reptile Hibernaculum; Turtle Nesting Areas; and Turtle Overwintering Habitat.
- o **Conclusion:** With recommended retention, protection and mitigation measures, there is no impact on confirmed or candidate SWH.

- **ANSI**

- o No ANSIs are present within the Subject Property.
- o **Conclusion:** no impact to ANSIs.

- **Fish Habitat**

- o None is present within or adjacent to the Subject Property.
- o **Conclusion:** No impacts to Fish Habitat within or downstream of the Subject Property.

5.5 Waterloo Regional Official Plan, ROP (2015)

5.6.1 Overview of Key Policies

The Regional Official Plan (ROP; 2015) identifies a ‘Greenlands Network’ of *environmental features* and *linkages* among them. Policies of the ROP have the goal of maintaining, enhancing, or where feasible restoring the Greenlands Network. The Greenlands Network (ROP Map 4) is comprised of *Landscape Level Systems (including Environmental Significant Landscapes)*, *Core Environmental Features* (CEF), Fish Habitat, *Supporting Environmental Features*, and the *linkages* between them.

As per policies of the ROP, development and site alteration proposed adjacent to the above noted features requires the completion of an *Environmental Impact Statement* to evaluate potential impacts.

5.6.2 Study Assessment

None of the natural features within the Subject Property is currently designated based on Map 4 (Greenlands Network) of the ROP. The natural area on adjacent lands north of the Subject Property consists of woodland, wetland and aquatic features, portions of which are designated as *Core Environmental Feature* (CEF) in the ROP. There are no *Landscape Level System* designations (Significant Valley, Environmentally Significant Landscapes, or Regional Recharge Areas) on the Subject Property or adjacent lands.

Considering results of the current study (background review and field survey findings), we have evaluated relevant ROP natural heritage policies (i.e., Greenlands Network, Section 7), as follows.

Landscape Level Systems:

- No *Environmentally Sensitive Landscapes* (ESLs), Significant Valleys or Provincial Greenbelt Natural Heritage System components are present.



- *Regional Recharge Areas* are identified on lands to the north and of the Subject Property. None is present on the Subject Property. Maintaining the pre-development groundwater recharge function of the Subject Property under the post-development condition will be explored further during the detail design stage of the project.

Core Environmental Features (CEF), as defined in Section 7.C of the ROP – which states that the CEF designation applies to lands that meet the following criteria:

- Significant Habitat of Endangered or Threatened Species
 - o One *Endangered* species, Butternut (*Juglans cinerea*) was recorded within Vegetation Unit 10. The Butternut and its habitat will be retained (located over 45 m from the woodland edge) with the proposed Draft Plan development envelope. Two *Threatened* species (Barn Swallow and Bobolink) were recorded on the Subject Property; however, both species were recorded with no breeding evidence and no suitable nesting habitat is present on the Subject Property.
- Provincially Significant Wetlands
 - o None is present on the Subject Property, and the wetlands within the Subject Property would not meet criteria for provincial significance on their own.
- Environmentally Sensitive Policy Areas
 - o None is present on the Subject Property.
- Significant Woodlands
 - o None is present in the Draft Plan portion of the Subject Property. *Significant woodland* is mapped on adjacent lands north of the Subject Property (Vegetation Unit 6 / SWD; based on interpretation of CEF mapping and general vegetation character, as evident from property limits). While not currently mapped as *Significant Woodland* in the ROP, that woodland on the Subject Property is a native species-dominated forest / swamp community (Vegetation Units 7, 10 and 12) that meets the 4-ha size criterion; as such, it would be considered Significant Woodland. In addition, since the canopy gap separating the *Significant Woodland* to the north from the woodland features in the northwest corner of the Subject Property is less than 20 m in some areas, the woodland features within the Subject Property could also be considered to be part of the broader *Significant Woodland*.
 - o All *Significant Woodland* within the Subject Property is to be retained in full, with minimum development setbacks of surveyed dripline + 10m (the actual development limit ranges from 30 m to 40+ based on the larger wetland setback).
- Environmentally Significant Valley Features

- o None is present on the Subject Property. No defined watercourses / floodplains are present.
- Significant Areas of Natural and Scientific Interest
 - o None is present.

Fish Habitat

- Fish habitat is not present on the Subject Property.

Supporting Environmental Features (SEF), including

- Features identified by municipalities. See Section 5.7.2.
- Environmentally Significant Discharge Areas¹⁰ and Environmentally Significant Recharge Areas¹¹
 - o None has been identified.
- Areas that are regulated by the GRCA under Ontario Regulation 41/24). See Section 5.8.1.
 - o All regulated features (i.e., wetlands) will be retained in full, with development setbacks of 30 m (and a SWM block setback of 15 m).

Linkages

- None is mapped. Natural areas on the property provide linkage to natural heritage features to the north. This function will be maintained and enhanced via establishment of a naturalized buffer in current croplands.
- There are no existing linkages across the remainder of the Subject Property and no natural features to the south / east to consider for potential linkages (i.e., those are urban developed lands or active crop lands).

5.6.3 Policy Compliance

No development or site alteration is proposed within *Landscape Level Systems, Core Environmental Features, Fish Habitat* or *Supporting Environmental Features*.

Development on lands adjacent to natural heritage features (i.e., the portion of the Subject Property specified in the current Site Plan) has been considered in the current study, with the conclusion that there will be no adverse environmental impacts, with implementation of recommended retention, protection and mitigation measures discussed in this EIS.

¹⁰ **Environmentally Significant Discharge Areas.** Lands where groundwater discharges to the surface of the soil or to surface water bodies to sustain wetlands, fisheries, or other specialized natural habitats

¹¹ **Environmentally Significant Recharge Areas** lands where water infiltrates into the ground to replenish an aquifer that sustains, in full or in part, environmental features.

5.6 Township of Wilmot Official Plan (April 2019)

5.7.1 Overview of Key Policies

The Township of Wilmot Official Plan (April 2019) includes environmental features that form part of a broader *Greenlands Network* described in the ROP.

Per Section 8.1.3.4 of the TOP, development or site alteration is generally not be permitted within Core Environmental Features.

Per Section 8.1.3.5 of the TOP, development or site alteration will only be permitted on lands contiguous to *Core Environmental Features* where an EIS demonstrates no adverse impacts to The CEFs or their ecological functions.

The TOP provides further details on what should be included. Section 8.1.5.2 of the TOP includes criteria for identification of *Supporting Environmental Features* (SEF).

5.7.2 Study Assessment

The proposed development area within the Draft Plan is zoned as Urban Residential within the TOP Map 4.1 (Baden Urban Area). The 'Additional Lands Owned by Applicant', including the natural features in the northwest portion, are zoned as *Prime Agriculture* on the TOP Map 10 (The Countryside). The Subject Property is outside of the Countryside boundary and not designed as *Protected Countryside*. Per Map 3, no *Environmentally Constrained Lands* (Erosion or Flooding Hazards) are present within the Subject Property.

Township CEF and *Landscape Level System* designations are consistent with the ROP: none is identified on the Subject Property; and adjacent lands north of the Subject Property include woodland and wetland features, portions of which are designated as CEF and SEF.

Per Policy 8.1.5, *Supporting Environmental Features* (SEFs) do not meet criteria for designation as Landscape Level Systems or CEFs.

- On the Subject Property, all environmental features are considered significant at the Regional level (i.e., CEF woodland or SAR habitat, SWH) or Provincial level (i.e., SAR habitat, wetlands, significant woodlands and SWH) per analysis in Sections 5.5.2 and 5.6.2; hence no SEF evaluation has been undertaken.
- All will be retained in full, with setbacks and mitigation measures.



5.7.3 Policy Compliance

No development or site alteration is proposed within the CEFs present within the Subject Property and all retained lands will be protected by an appropriate vegetation protection setback.

5.7 Grand River Conservation Authority Policies

Per Section 28 of the Conservation Authorities Act R.S.O. 1990, GRCA has the responsibility to regulate activities in hazard lands (e.g., areas in and near watercourses (and their associated valleys, if applicable), wetlands, shorelines or floodplains). Ontario Regulation 41/24: Prohibited Activities, Exemptions and Permits is a regulation issued under the Conservation Authorities Act that provides a mechanism for the GRCA to issue permits for development within areas regulated under Section 28 of the Conservation Authorities Act.

Per Section 28.1 (1) of the Conservation Authorities Act:

- An authority may issue a permit to a person to engage in an activity specified in the permit that would otherwise be prohibited by Section 28, if, in the opinion of the authority,
 - o The activity is not likely to affect the control of flooding, erosion, dynamic beaches or pollution or the conservation of land;
 - o The activity is not likely to create conditions or circumstances, that, in the event of a natural hazard, might jeopardize the health or safety of persons or result in the damage or destruction of property; and
 - o Any other requirements that may be prescribed by the regulations are met.

5.8.1 Study Assessment

As mapped by the GRCA and verified by WSP in the field, there are three unevaluated wetland features on the Subject Property (Vegetation Units 3, 8, and 13, as shown on Figure 3), one wetland directly adjacent to the Subject Property to the west (Vegetation Unit 11), and one wetland immediately north of the Subject Property. All are regulated by GRCA under O. Reg. 41/24. Natural features and adjacent areas in the northwest corner of the property are within the GRCA regulated area limit. The drainage feature located within Vegetation Unit 9, which flows from a tile drain into Vegetation Unit 8, is not considered to be a regulated watercourse.

Based on GRCA and Natural Heritage Information Centre (NHIC) mapping (Figure 1; also included in Attachment C of the TOR in Appendix A), the wetland to the north of the Subject Property is an evaluated, non-provincially significant wetland feature, which is part of the *Phillipsburg Southeast*



Wetland Complex. That off-site wetland complex would be considered a *Locally Significant Wetland (Supporting Environmental Feature)*, per Section 8.1.5.2 (a) of the Township of Wilmot Official Plan. No evaluated wetlands are located within the Subject Property. The nearest Provincially Significant Wetland (PSW), the *Spongy Lake Wetland PSW Complex*, is located more than 2.5 km away.

With the Draft Plan (MHBC; June 3, 2024), all wetlands within the Subject Property will be retained, with a development setback of wetland limit +30 m (or wetland +15 m for the SWM block) and a future naturalized buffer.

5.8.2 Ontario Wetland Evaluation System Complexing Evaluation

It should be noted that the wetland complexing presented in the previous EIS was based on guidance provided in the Ontario Wetland Evaluation System – Southern Manual Version 3.2 (OWES; 2013). As per changes in Ontario Wetland Evaluation System Southern Manual (4th Edition, 2022), the ‘wetland complex’ rule (i.e., assessing a group of wetlands that are functionally linked and <750 m away from one another as a single wetland system) is no longer included, and with the exception of closely grouped wetlands, this rule no longer exists within the Ontario Wetland Evaluation System.

6.0 IMPACTS & MITIGATION

6.1 Environmental Management

Feature limits, setbacks, and environmental management recommendations were reviewed and refined through field visits, project team liaison, and in consideration of the updated site plan and associated grading and servicing requirements. The primary focal area is the development interface bordering the wetlands and CEF, and natural features on adjacent lands. The collective review, including agency liaison (GRCA, Township of Wilmot, Region of Waterloo), has considered the following objectives:

- Maintaining water inputs and surface water quality to natural areas.
- Recommending ecologically appropriate development setbacks, based on a combination of: the nature and sensitivity of features to be protected; relevant policy; endeavoring to be consistent with buffers applied to natural features in the Region; and consideration of buffer guidelines from published literature.
- Identifying protection, mitigation and enhancement measures.

These management measures are discussed in Table 5. This review guided the development of the recommended setbacks shown on Figure 6 and described herein.

6.2 Mitigation and Protection Measures

All natural areas north / west of the development constraint limit, as shown on Figure 6, will be retained in full. Direct impacts to CEF vegetation and wetlands will be avoided with the Draft Plan, and very limited tree removals are proposed within the development envelope: one American Elm (*Ulmus americana*: poor to fair health); one Common Apple (*Malus pumila*); one Willow (*Salix* sp.); and one Trembling Aspen (*Populus tremuloides*). Potential impacts from the proposed development will be mitigated as follows, with additional detail provided in Table 5:

Pre-construction

The following measures are to be prepared, confirmed / finalized and installed prior to any disturbance to the Site.

1. Finalize **SWM strategy / detailed design**, which includes the following elements to mitigate potential impacts to wetland **hydrology and ecology**:
 - o Maintenance of surface water inputs (rates and volume) to retained wetlands located immediately to west and north of the development envelope.
 - o On-site infiltration / groundwater recharge measures.
 - o Enhanced water quality treatment.
2. Implement the following Development setbacks:
 - o CEF woodland limit + 10 m.
 - o Wetland limit +30 m (adjacent to residential areas).
 - o Wetland limit +15 m (adjacent to SWM facility block).
3. Building design considerations to mitigate impacts to wildlife
 - o **Lighting**: strategies to minimize light pollution and 'spillage' of light into the natural areas (i.e., through use of bird and bat-friendly lighting technologies and minimizing lighting adjacent to buffers / natural areas).
 - o **Bird friendly building design**: Consider integrating specific building design elements to mitigate the risk of bird collisions (e.g., window glass type / treatments, visual markers, awnings, internal and external lighting operation) for buildings adjacent to the retained natural area. The Fatal Light Awareness Program Canada

(FLAP) and *Birdsafe* provide guidelines for design¹².

4. Confirm / finalize the recommended **Biological Monitoring Program** and locations as discussed in Section 7 and shown on Figure 7
 - o Undertake 1 year of pre-construction monitoring; prepare annual report.
 - i. Update: pre-construction monitoring was completed in 2023 and documented in a report submitted to Township, Region and GRCA
 - o Address recommendations, as required.
5. Prepare a **Buffer Enhancement Plan** to enhance and manage the buffer to provide additional protection to the natural feature from direct and indirect impacts associated with construction and occupancy / changed land use. Key elements to incorporate or consider:
 - o Native species;
 - o Wildlife habitat elements;
 - o Turtle nesting habitat; and
 - o Permanent fencing and 'natural areas' signage.
6. Prepare a **SWM Planting Plan**, utilizing native species, consistent with and intended to complement and support the Buffer Planting Plan.
7. **Install recommended buffer and SWM plantings** / seeding per approved plans, as required (could also be installed during construction).
8. Prepare a **Stewardship Brochure**: intended to inform residents and/or property managers about adjacent natural areas and how they can be responsible stewards of these natural resources. It is recommended that the brochure be provided to all landowners / property managers and made available at the sales trailer. The brochure should be part of the property sale documentation, to ensure that next generation purchasers are informed about environmental stewardship. Topics to address include:
 - o Proper handling of yard waste and composting;
 - o Potential impacts and control / disposal of fertilizers and herbicides / pesticides;
 - o De-icing salts, driveway and automotive cleaning residues;
 - o Protection of soil and vegetation in the natural areas; explanation of the importance of saplings and native ground flora; and
 - o Pet implications and control; and invasive plant spread from yards.

¹² <https://flap.org/wp-content/uploads/2019/11/FLAP-Canada-BirdSafe-Building-Standard.pdf>

9. Prepare an *Erosion and Sediment Control (ESC) Plan*.
 - o Install required measures such as ESC fencing prior to construction. Regularly inspect ESC fencing and other ESC measures.
10. Prepare a *Spills Management Plan*.
11. Follow recommended measures in the Clean Equipment Protocol for Industry (Holloran 2013).
12. Install vegetation protection fencing, coincident with the ESC fencing prior to construction.
13. Follow **ecologically appropriate timing windows** for any vegetation removals
 - o MBCA. Potential impacts to migratory birds will be mitigated by completing any habitat removals outside of the Regional Nesting Period, where possible, and/or following other measures to demonstrate compliance with the MBCA.
 - o ESA. Potential impacts to potential / unconfirmed SAR bat and bird habitat will be mitigated by completing habitat removals outside of the nesting period or active bat period, in consideration of compliance requirements with the ESA.

During-construction

The following measures are to be installed and/or implemented throughout the construction period:

1. Implement / install outstanding **SWM measures**.
2. Continue with **during-construction Biological Monitoring**.
 - o Prepare annual reports.
 - o Address recommendations, as required.
3. Implement / install outstanding **Buffer Planting Plan** and **SWM Planting Plan** elements.
4. Install **permanent fencing** (e.g. chain-link) at the development limit to minimize human access and disturbance in the CEF.
 - o Implement repairs to maintain fencing in good condition (if required).
5. Turtle nesting habitat creation and enhancement as follows:
 - o Retain exposed agricultural soils (not seeded / planted) in two areas, each ~10 m x 20 m, adjacent to wetlands in WSU3 and 4 (as shown in Figure 6).
 - o Turtle nesting habitat enhancement areas will consist of a combination of 20% Granular A gravel mixed with 80% coarse sand (to a depth of 40cm). The design also includes installation of 2 layers of geotextile below the nesting substrate to help reduce the speed of vegetation growth on the mounds.

- o Implement maintenance measures as required (e.g., vegetation clearing, adding sand etc.).
- 6. **Install recommended plantings** / seeding per approved plans, if required (could also be installed during construction).
- 7. **Best management practices** during construction.
 - o ESC. Regularly inspect ESC measures throughout construction. Install required measures such as Implement repairs to maintain fencing in good condition.
 - o *Spills Management Plan*.
 - o Implement recommended measures in the Clean Equipment Protocol for Industry (Holloran 2013).
 - o Install vegetation protection fencing, coincident with the ESC fencing prior to and throughout construction.

Post-Construction

The following measures are to be installed / implemented throughout the post-construction period.

1. Remove **ESC fencing**.
2. Continue with **post-construction Biological Monitoring** per approved program duration; prepare annual reports.
 - o Address recommendations, as required.
3. Implement / install outstanding **Buffer Planting Plan** and **SWM Planting Plan** elements (e.g., replacement plantings).
4. Remove temporary **Vegetation Protection Fencing**.
5. Remove **Temporary Wildlife Exclusion Fencing**.

6.3 Impact Assessment

All areas north / west of the development envelope, as shown on Figure 6, will be retained in full. Specific mitigation and environmental management measures are discussed in Table 5. With implementation of recommended measures, potential impacts to natural heritage features and functions on and adjacent to the Subject Property will be mitigated.

This section reviews potential impacts or condition changes to natural environmental features on or bordering the Subject Property, on the basis of direct activities (e.g., construction activities such as clearing and grading) or indirect activities (e.g., occupancy activities such as dumping of waste material and creation of indiscriminate trails).



Currently, the Subject Property is comprised of an agricultural land with CEF woodland, unevaluated wetlands to the north / west and approved / existing residential development to the south. Development is restricted to current agricultural lands. Direct impacts to the CEF woodland, wetlands and feature setbacks have been avoided.

There is potential for indirect impacts to the retained natural environmental features on the Subject Property and on adjacent lands including: construction-related impacts; changes in surface and groundwater inputs to receiving areas; and post-development occupancy-related effects.

In Table 5, each potential impact factor is reviewed in terms of anticipated and residual effects, as well as proposed mitigation. The identified mitigation measures will be incorporated with appropriate wording on construction drawings and detailed grading plans that will be prepared prior to any site grading (following site plan approval). The Draft Plan and environmental management notes are provided in Figure 6.

Table 4. Environmental Management Approach by Feature Type

FEATURE	ENVIRONMENTAL MANAGEMENT RECOMMENDATIONS AND RATIONALE
Unevaluated Wetlands (Vegetation Units 3, 8, 11, and 13)	Unevaluated Wetlands. The outer limit of the unevaluated wetlands on the Subject Property have been delineated by WSP, confirmed by the GRCA, and surveyed, as shown on Figures 5 and 6. The wetlands show anthropogenic disturbance to varying degrees, but generally not extensive (e.g., adjacent agricultural use and the presence of some invasive species) and a mix of primarily common wetland species with some regionally significant species (i.e., Tuckerman’s Sedge, Eastern Mannagrass, and Northern Watermeal). Setbacks. The unevaluated wetlands are to be retained in full and protected with a setback of 30 m from the surveyed wetland limit (development blocks) and wetland +15m setback (SWM block). The majority of the future buffer area is currently under active agricultural use. Buffer Management and Stewardship. In addition to the proposed setback, a number of buffer management measures to mitigate potential impacts to the unevaluated wetlands and enhance wildlife habitat: • Permanent fencing. Recommended at the development limit abutting retained natural areas to restrict access and reduce lot expansion / impacts to the wetland due to occupancy related activities. • Vegetation Management: establishing vegetation in the current agricultural field via nodal enhancement plantings of deciduous native species interspersed with native seeding. The buffer planting plan will be designed to protect the wetland edge and eventually restore these areas to a functional part of the existing natural areas. These measures will provide a net benefit to the wetland by: adding floristic diversity; improving existing habitat quality by reducing non-native species invasion potential; increasing the overall size of the natural area; and increasing the effectiveness of the buffer. • Wildlife Habitat Enhancement: Two measures are recommended: 1) For creation / enhancement of turtle nesting habitat, retain exposed agricultural soils (not seeded / planted) in two areas, each ~10 m x 20 m, adjacent to wetlands in WSU3 and 4 (as shown in Figure 6); and 2) Install 4-5 log and/or brush piles within the wetland buffer area - retain cut logs or brush from hedgerow or other vegetation removals (no invasive species) for use as wildlife cover elements (habitat for a variety of wildlife including snakes and small mammals). • Environmental Stewardship. Two measures are recommended: 1) ‘<u>Sensitive Area</u>’ signage, installed at regular intervals along the development limit; and 2) provision of an environmental stewardship <u>information brochure</u> to homeowners and/or building managers. The purpose of these brochures is to inform residents and property managers about the environmental features within or bordering the subdivision and how they can be responsible stewards of these natural resources. Topics to address include: proper handling of yard waste and composting; potential impacts and control of fertilizers and herbicides / pesticides, de-icing salts, driveway and automotive cleaning residues and disposal of toxic substances in the storm sewer system; protection of soil and vegetation in the natural areas; explanation of the importance of saplings and native ground flora; pet implications and control; and invasive plant spread from yards. It is recommended that the brochure be provided to all landowners / property managers and made available at the sales trailer or at the City. The brochure should be part of the property sale documentation, to ensure that next generation purchasers are informed about environmental stewardship. Water Balance. As discussed in the <u>FSR/SWM Report</u> (Stantec, 2022a; rev 2025) and <u>Hydrogeological Investigation</u> (Stantec, 2022b; rev. 2024), surface water inputs to Veg. Unit 8 and the offsite <i>Phillipsburg Southeast Wetland Complex</i> will be sufficiently maintained (i.e., within 1% of the pre-development conditions) via treated SWM facility discharge to these wetlands (as per Section 4.3.2, Veg. Units 3 and 13 do not receive surface water contributions from the proposed development area of the Subject Property). Infiltration occurring at the SWM facility via the implementation of LID measures will enhance groundwater recharge at the Subject Property, noting that Veg. Unit 8 and the off-site <i>Phillipsburg Southeast Wetland Complex</i> are groundwater recharge features and as per Section 4.3.2. Veg. Units 3 and 13 do not receive groundwater contributions from the proposed development area of the Subject Property. SWM Strategy. The proposed SWM strategy will: (1) provide quantity and enhanced quality control as well as infiltration using a SWM facility (infiltration basin) that discharges treated runoff into Veg. Unit 8, which drains to the <i>Phillipsburg Southeast Wetland Complex</i>, and (2) implement both distributed end-of-pipe infiltration via LIDs (per Water Balance paragraph above), as required / feasible. Trails. No trail connections are recommended within the retained Natural Heritage features or their associated buffers Erosion & Sediment Control. An agency approved Erosion & Sediment Control (ESC) Plan will be developed at final design. Prior to any site grading, ESC fencing will be installed at the construction limit. The fence will be inspected regularly and remain in place until construction is complete. Biological Monitoring. An annual biological monitoring program is recommended, as presented in Section 7. Pre-construction monitoring was completed in 2023.



FEATURE	ENVIRONMENTAL MANAGEMENT RECOMMENDATIONS AND RATIONALE
Core Environmental Feature	CEF / Dripline Limit. The limit of the CEF / Significant Woodland within the Subject Property was flagged at the dripline, confirmed by Township and Region staff, surveyed, and plotted on Figure 5. Setbacks. This feature is to be retained in full and protected with a setback of 10 m from the CEF woodland (dripline) limit. This setback has been derived in consideration of the agricultural land use history and pre-stressing of tree roots from yearly ploughing extending close to / under the dripline at the south and east limits of this feature, as well as the tolerance of the cultural habitat type (cultural meadow / cultural thicket) nearest the development limit. This approach is consistent with the setback / buffer approach that has been supported by agencies on recent developments in the area and meets the Region's CEF minimum setback of 10 m. Note that the effective development setback (i.e., from residential multi-block) is 35m-40+m, based on the wetland +30 m setback from development blocks. Buffer Management and Stewardship. In addition to the proposed physical setback, a number of buffer management measures are proposed: • Permanent fencing: As above. • Vegetation Management: As above. • Environmental Stewardship. As above. Water Balance and SWM Strategy. As above Trails. As above. Erosion & Sediment Control. As above. Biological Monitoring. As above.



Table 5. Natural heritage impact assessment

Feature Significance and Sensitivity	Natural Environment Impacts	Recommended Mitigation Measures	Residual Effects
Vegetation			
Development Envelope on Subject Property Vegetation. The development envelope area of the subject properties is under interim agricultural use (row crops) with no Natural heritage features present. Designated Areas. None Species at Risk: none Species of Conservation Concern: none Flora significance and sensitivity: none. Lands Adjacent to Development Envelope Designated Areas. CEF / Significant Woodland SAR and SCC: SCC: Broad-leaved Sedge (Unit 6); Tuckerman's Sedge (Unit 11), Common Hackberry (Unit 6 & 12), Eastern Mannagrass (Unit 13), Virginia Stickseed (Unit 8), Black Walnut (Unit 5, 6, & 7), Virginia Creeper (Unit 7); Northern Watermeal (Unit 13); and Boreal Mannagrass (Unit 13) SAR: Butternut (Unit 10) Flora significance and sensitivity: varies from low to high overall. Less diverse in areas dominated by Cattail or European Reed and CUM / CUT. Mix of habitat types, upland and wetland plants.	Direct Impacts. Vegetation Removals. A small section of cultural meadow within Unit 9 Indirect Impacts. There is potential for indirect impacts to vegetation as the result of construction, adjacent land use and hydrological changes, and occupancy related activities. Hydrology (Quality) impacts to wetlands (long-term). Potential for increased sedimentation / erosion, contamination, and salt loading from surface water inputs. Hydrology (Quantity). Potential changes to the hydrological / surface water regime in the wetlands resulting from increases in impervious surfaces and reduction of run-off inputs to the wetlands. Hydrogeology (Quantity and Quality). Minimal as wetlands do not appear to be sustained by groundwater inputs originating from areas of Subject Property that will be developed (see Section 4.3.2). Construction-related Impacts (short-term). These include: damage to vegetation outside the work zone; sedimentation; spills of contaminants / fuels Occupancy-related Impacts. May include woodland / wetland edge effects; trail creation; dumping; effects of salt spray from road maintenance or water quality effects related to residential uses (i.e. salt, pesticides).	Indirect Impacts to be mitigated by: Hydrological (Surface Water) and Hydrogeological (Groundwater) Quantity (long-term). Inputs to wetlands will be maintained post-development, as per Stantec FSR (2022a; 2025) and Hydrogeological (2022b; 2024) reports and Section 4.3.2. Surface Water Quality (long-term). Mitigated by: development setbacks and fencing / restricted access (to reduce potential for direct impact / contamination); stewardship; and SWM strategy – with enhanced quality control. Develop and implement ESC plan, including fencing prior to any site grading. Permanent Fencing. As discussed in Table 5. Buffer Management and Stewardship. As discussed in Table 5. ESC Plan. As discussed in Table 5. Biological Monitoring. Section 7; includes vegetation plot monitoring	Residual impacts to vegetation are not anticipated, with proper implementation of recommended mitigation. - Wetland and woodlands will be retained in full and protected with development setbacks. - Setbacks will provide good dripline and root zone protection (well beyond the current state). These setbacks, coupled with buffer management measures, will help to maintain or improve edge integrity by establishing a thicker, more diverse edge zone. - Permanent fencing / living fence and stewardship measures will help to reduce secondary effects on forest / wetland integrity following development and occupancy. - Residual long-term effects to surface water quality in the wetlands is not anticipated, considering: - There will be no direct disturbance to the wetlands. - Enhanced / larger buffer for nutrient filtering. - Long-term impacts to groundwater quality are not anticipated as wetlands are sustained by groundwater inputs originating from areas of Subject Property that will be developed (see Section 4.3.2). - Residual impacts from construction are not anticipated, with implementation of recommended vegetation protection and ESC fencing, and spill management plan.



Feature Significance and Sensitivity	Natural Environment Impacts	Recommended Mitigation Measures	Residual Effects
Wildlife			
<u>Development Envelope on Subject Property</u> • Habitat. Lands under interim agricultural use (row crops) with a small amount of cultural meadow (Unit 9)), which provides limited foraging and nesting opportunities for common bird species. Seasonally wet areas at the south end of the agricultural field provide non-viable amphibian breeding habitat (due to short hydroperiod and lack of wetland vegetation). • Species at Risk and Species of Conservation Concern: Three SAR: Barn Swallow, Bobolink and Monarch, observed foraging / passing through the agricultural fields with no breeding evidence or suitable nesting / reproduction habitat. • Significance and sensitivity: low. Common, tolerant anthropogenic or culturally influenced habitats. No specialized or significant wildlife habitat. <u>Lands Adjacent to Development Envelope</u> • Habitat. Deciduous woodland; marsh, swamp and thicket wetlands; and a narrow cultural meadow (hydro corridor). • SAR and SCC: Habitat for: - o SAR: Wood Thrush (WSU2a) and Snapping Turtle (WSU4 and 5b); potential SAR bat roosting habitat - o SCC: Four Regionally Significant bird species (American Redstart, Least Flycatcher, Red-bellied Woodpecker, & Wilson's Snipe); potential nesting and overwintering habitat for Midland Painted Turtle and Snapping Turtle, confirmed SWH for Amphibian Breeding, Special Concern species and Terrestrial Crayfish. • Significance and sensitivity: high. Good habitat diversity, some more sensitive and specialized habitat types (e.g., turtle and amphibian breeding habitat in wetlands, SAR / SCC birds in woodland).	Potential impacts on wildlife habitat are similar to those discussed for vegetation (i.e., indirect impacts to habitat, occupancy related effects etc.). Some additional occupancy-related effects are specific to wildlife (e.g. noise / artificial light disturbance, pet predation, influence of increased pedestrian activity / house proximity to wildlife habitats). Direct impacts. • Loss of wildlife habitat is restricted to crop fields and a small area of cultural meadow, which are widespread / abundant in the local landscape and provide habitat for disturbance-tolerant, common bird species. • Movement opportunities. While there may be potential for wildlife movement across the fields, there are no defined wildlife movement areas, and lack of natural vegetation cover act as barriers for more sensitive species. At a local landscape level, wildlife movement is generally restricted to the northwest portion of the Property in the retained natural features. Indirect Impacts. There is potential for indirect impacts to wildlife habitats on adjacent lands as a result of construction, changes to hydrology and occupancy-related activities. • Construction-related impacts. These are generally limited to temporary disturbances during construction. Potential for sedimentation and contamination are addressed by ESC controls and SWM measures. • Surface Water quality impacts (long-term). As above. • Hydrology. As above. • Occupancy-related impacts. These may include: pet predation; woodland edge effects; increased noise / light and pedestrian presence.	Retention and protection of vegetation resources in adjacent natural areas will also protect wildlife habitat. Wildlife specific mitigation measures are as follows: • Movement opportunities. Local wildlife movement opportunities will be maintained through setbacks and creation of a naturalized buffers (net enhancement relative to the current agricultural use). • Habitat for wildlife SCC / SWH. Habitat for woodland and wetland species to be retained in full, with buffer enhancements. Additional measures are proposed to protect wildlife habitat and mitigate impacts to individuals, including: ESC measures; maintenance of hydrological inputs; temporary wildlife exclusion fencing; restricted human access (via permanent fencing / barriers); and stewardship. • Lighting. Strategies to minimize light pollution and 'spillage' of light into the natural areas will be considered (i.e., through selection of bird and bat-friendly lighting technologies and minimizing lighting adjacent to buffers / natural areas). • Surface Water Quality (long-term). As above • Permanent Fencing. As above. • Buffer Management and Stewardship. As above. • ESC Plan. As above. • Occupancy-related impacts. wildlife and wildlife habitat impacts will be mitigated by a combination of measures: <u>permanent fencing</u> along the development limits to restrict access to sensitive areas and prevent lot 'spreading' and <u>stewardship</u> measures (signage, homeowner brochure). The intent is to restrict access to sensitive areas and inform local residents / occupants about the sensitivity of adjacent natural areas. • Monitoring. Section 7; includes breeding bird and spring amphibian breeding components.	Residual impacts to wildlife and wildlife habitat resulting from development on the Subject Property are not anticipated, considering that cultivated fields provide habitat primarily for common, disturbance-tolerant wildlife species. Potential for indirect impacts on adjacent natural areas will be mitigated by: • Standard ESC, SWM treatment of contaminants, maintenance of hydrological inputs to dependent features, buffering of sensitive areas. • Stewardship measures to raise awareness of the sensitivity of adjacent natural areas and further reduce potential for indirect (occupancy-related) impacts. • Improved natural area buffering and wildlife habitat enhancements. In any populated area there is potential for unauthorized intrusion and damage to natural areas, and less tangible but inferred effects of occupancy on breeding bird activity. Population changes in breeding birds are inevitably related to the approved transformation of the broader landscape in the Region. Changes can also be caused by factors outside the Region (such as alteration/loss of wintering habitat, severe climatic conditions during migration activity, and changes in migratory stopover habitat). Hence, it must be recognized that shifts in wildlife species composition may be inevitable in this area over time, and in fact have probably already occurred with changes in the regional landscape.

7.0 BIOLOGICAL MONITORING

7.1 Program Components

Typical during-construction monitoring is recommended (e.g., ESC fencing and SWM facility inspection). In addition, an annual Biological Monitoring program is proposed to monitor potential impacts to retained natural areas on the property and on adjacent lands to the south and east. The recommended program is outlined below; it is intended that the program would be finalized as a condition of plan approval (i.e., duration, components).

The main program components are field monitoring, integration of other monitoring information and preparation of an annual report. Proposed Biological Monitoring survey locations are shown on Figure 7.

Vegetation Plot Monitoring

- Permanent plot monitoring will be established in the retained wetland and upland vegetation communities northwest of the development envelope to assess any changes in vegetation community resulting from development. The approach includes fixed point photo-monitoring, a quantitative / qualitative species assessment within plots along transects and general comments on vegetation within the vicinity of the plot. WSP has implemented this type of monitoring at many sites across the Region over the past 20 years.
- One monitoring plot is recommended in each of Units 3, 8, 10, and 13.
- Two survey dates per year (June and September).

Breeding Bird Survey

- An annual breeding bird survey of the adjacent woodland and valleyland habitats will be undertaken following OBBA protocols, as follows.
- Wandering transects within and/or along the edges of 3 survey units within the retained natural areas: BB1 (WSU2a), BB2 (WSU3), and BB3 (a combination of WSU2b / 4 / 5a / 5b).
- Two survey dates (late May to early July).

Spring Breeding Amphibian Survey

- An annual spring amphibian breeding survey of wetland / pond habitats on lands to the south will be undertaken following the Marsh Monitoring Program (MMP) Amphibian Calling Survey Protocol (Bird Studies Canada 2008).

- Five point-count stations at locations targeting retained wetlands: AC1, AC2, AC3, AC4, AC5.
- Three survey dates in spring.

Turtle Basking and Nesting Habitat Monitoring

- One initial inspection to confirm suitability and appropriate retention of exposed soil areas adjacent to wetlands for turtle nesting habitat.
- Turtle basking surveys in WSU3, 4, 5a/5b wetland habitats:
 - o Two surveys per year in April - May during conditions suitable for turtle basking.
- Turtle nesting activity in the created / enhanced nesting areas (daytime surveys for tracks, evidence of use):
 - o Two surveys per year, combined with Breeding Bird Surveys in late May - early July.
- The objective of these monitoring surveys is to assess habitat suitability and use (not to census the population).

7.2 Program Details

7.2.1 Pre-construction (1 year)

Monitoring should consist of the following activities that are the responsibility of the developer:

- Periodic inspection of vegetation protection fencing and ESC fencing.
- Conduct all biological monitoring surveys.
- Prepare annual biological monitoring report that includes results, integration of other monitoring, recommendations and implementation of remedial measures, where required.

7.2.2 During Construction

Monitoring should consist of the following activities that are the responsibility of the developer:

- Inspection of vegetation protection fencing and sediment control fencing to ensure that it is in good repair.
- Removal of construction debris that may accumulate along, and damage, the above fencing.
- Implementation of remedial measures, where required, as quickly as possible (e.g., erosion stabilization; repair/replacement of damaged/fallen fencing; pruning, fertilization or irrigation of retained trees).

- Conduct all biological monitoring surveys (including turtle nesting surveys, if habitat was previously installed).
- Prepare annual biological monitoring report that includes results, integration of other monitoring, recommendations and implementation of remedial measures, where required.

7.2.3 Post Construction (2 years)

Monitoring to be conducted for 2 years following completion / substantial buildout (~90%) should consist of the following activities that are the responsibility of the developer:

- Inspection of vegetation protection fencing and sediment control fencing to ensure that it is in good repair.
- Removal of construction debris that may accumulate along, and damage, the above fencing.
- Implementation of remedial measures, where required (e.g., erosion stabilization; repair/replacement of damaged/fallen fencing; pruning, fertilization or irrigation of retained trees).
- Conduct all biological monitoring surveys.
- Prepare annual biological monitoring report that includes results, integration of other monitoring, recommendations and implementation of remedial measures, where required.

7.3 Status

Pre-construction monitoring was completed in 2023, as documented in a report submitted to the Township, Region and GRCA on August 29, 2024.

Based on findings of the 2023 monitoring surveys, there are no substantial changes to existing conditions as documented herein; minor revisions are included in Section 3.



8.0 CONCLUSIONS & RECOMMENDATIONS

WSP supports the Draft Plan application subject to the recommended protection, mitigation and enhancement measures as discussed herein. The proposed development can be undertaken while protecting environmental features and their functions. This conclusion reflects the following considerations:

- The environmental review and planning for the Subject Property has occurred under the guidance of several larger scale planning frameworks that identify key natural environmental features and sensitivities within the broader landscape.
- This plan recognizes and anticipate that changes in the landscape matrix will occur. Most notably, this area is undergoing a shift in land use from interim agricultural to urban residential.
- The recommended development setbacks ensure there will be no intrusion into the CEF or wetlands. These areas will be retained in full and their ecological functions will be protected with setbacks, buffer enhancement, permanent fencing / barrier, temporary wildlife exclusion fencing, 'sensitive area' signage, provision of a stewardship brochure to homeowners and building managers.
- **SWM / Water Balance.** The proposed SWM strategy will maintain hydrological inputs to retained wetlands and provide enhanced surface water quality relative to the current uncontrolled condition – pending verification / refinement of recommendations at detailed design.
- **Species at Risk.** With implementation of recommended mitigation measures, the proposed development complies with ESA for Threatened / Endangered SAR recorded on the Subject Property (Butternut and Bobolink) or with potential to occur (SAR Bats).
- **Significant Wildlife Habitat.** Potential impacts to confirmed / candidate *Significant Wildlife Habitat* will be mitigated with the proposed protection, mitigation and enhancement measures discussed herein.

To ensure that environmental protection and mitigation is properly managed during site development the following recommendations/actions are identified, to be finalized as conditions of approval:

- Permanent fencing at the development constraint limit - shown on Figure 6.
- Temporary wildlife exclusion fencing at the development constraint limit (during-construction).



- Establishment of a naturalized buffer, with native species plantings/ seeding and targeted wildlife habitat creation, including turtle nesting areas, which will: add habitat diversity; increase the functional size of the retained natural area; increase the effectiveness of the buffer; and provide an overall net benefit.
- **Environmental Stewardship.** Two measures are recommended: 1) 'Sensitive Area' signage, installed at intervals along the development limit / woodland interface; and 2) provision of an environmental stewardship information brochure to homeowners and building managers.
- **No trail links** are proposed from the Subject Property to the adjacent natural heritage features or their buffers.

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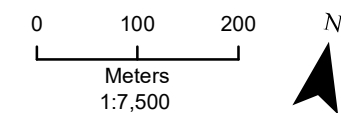
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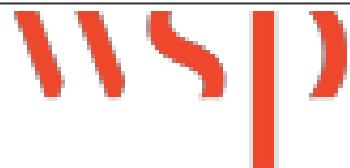
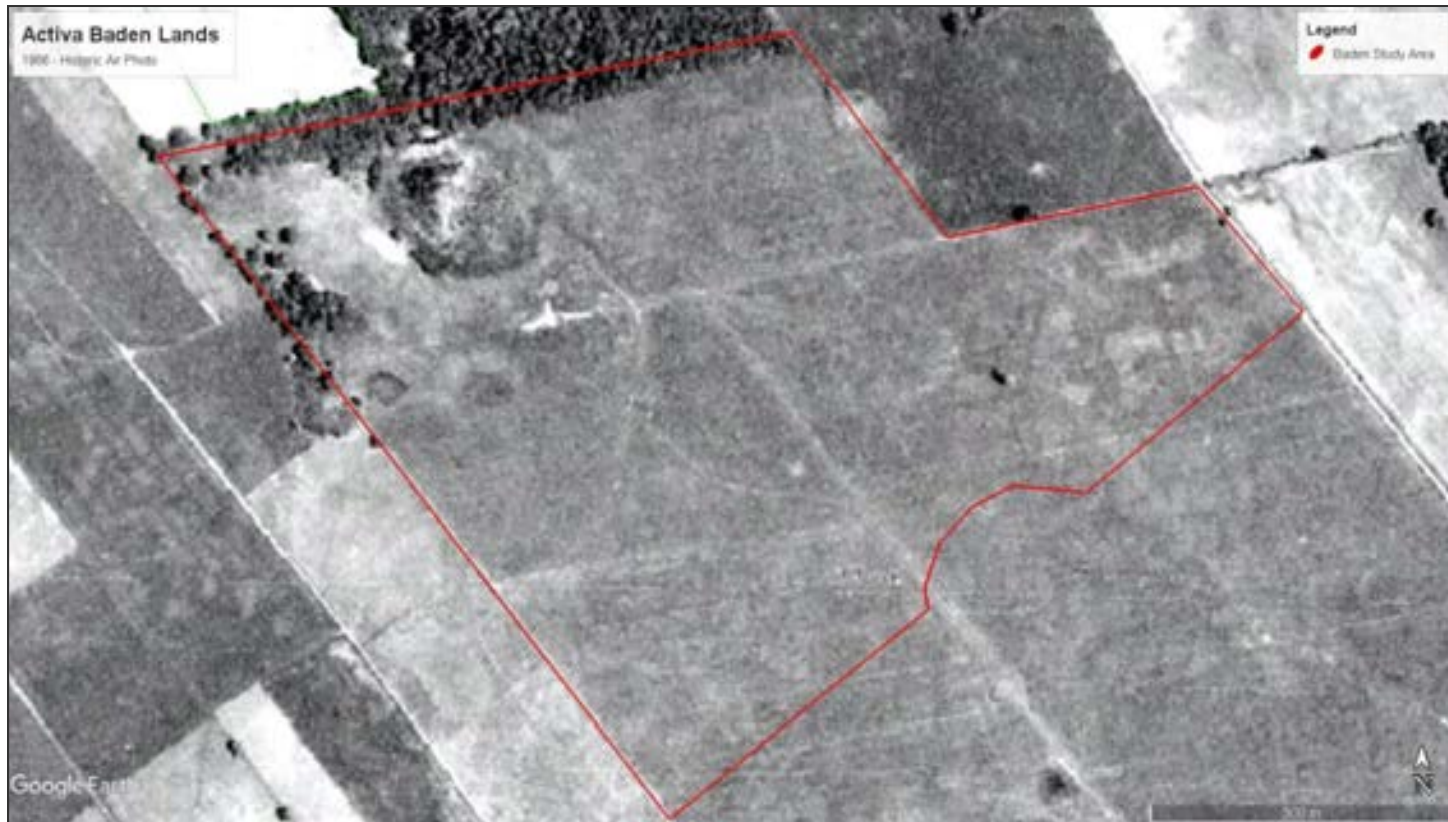
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ACTIVA - BADEN LANDS - SCOPED EIS Site Context & Designated Areas



Date: April 2025
Project No: 19M-01246-00
Figure No: 1

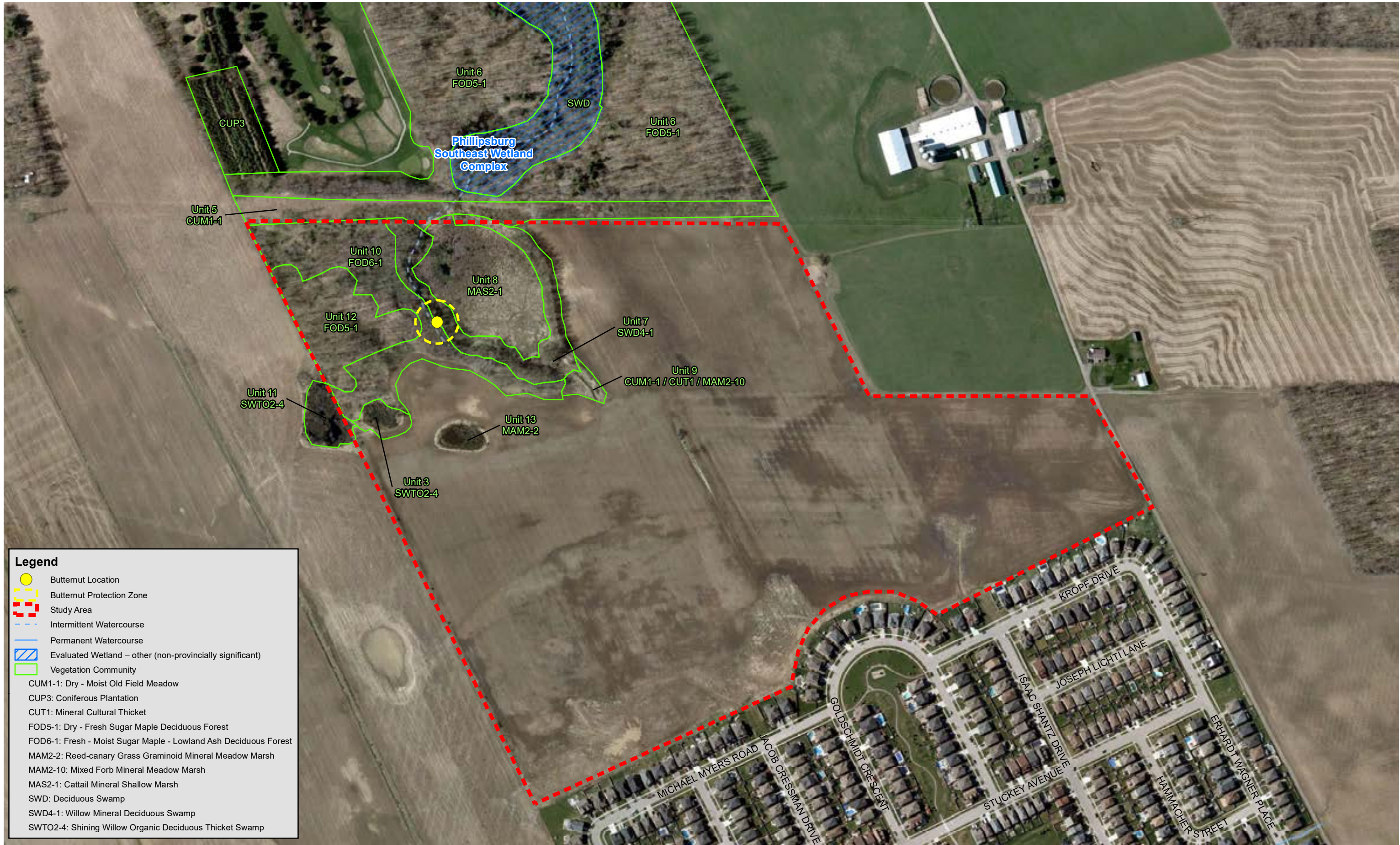


ACTIVA - BADEN LANDS - SCOPED EIS
Historical Air Photos

Date: July 2022

Project No: 19M-01246-00

Figure No: 2



ACTIVA - BADEN LANDS - SCOPED EIS
Vegetation & Flora

0 50 100
Meters
1:4,000



Date: July 2022
Project No: 19M-01246-00
Figure No: 3



ACTIVA - BADEN LANDS - SCOPED EIS
Wildlife Survey Locations & Key Results

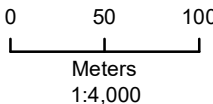
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Meters
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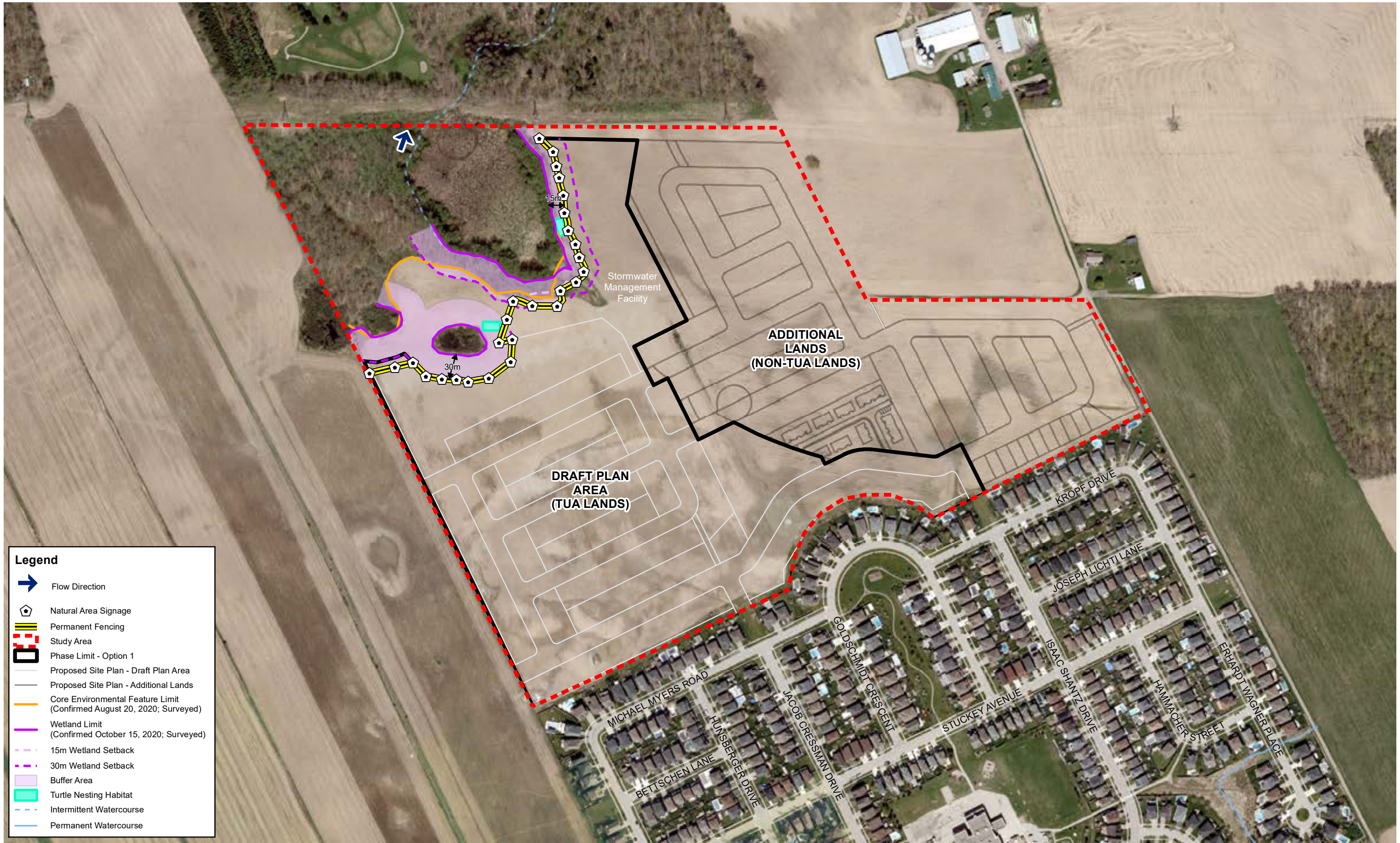
Date: July 2022
Project No: 19M-01246-00
Figure No: 4



ACTIVA - BADEN LANDS - SCOPED EIS
Feature Limits & Development Setbacks



Date: July 2022
Project No: 19M-01246-00
Figure No: 5

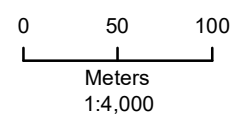


Legend

- Flow Direction
- Natural Area Signage
- Permanent Fencing
- Study Area
- Phase Limit - Option 1
- Proposed Site Plan - Draft Plan Area
- Proposed Site Plan - Additional Lands
- Core Environmental Feature Limit (Confirmed August 20, 2020; Surveyed)
- Wetland Limit (Confirmed October 15, 2020; Surveyed)
- 15m Wetland Setback
- 30m Wetland Setback
- Buffer Area
- Turtle Nesting Habitat
- Intermittent Watercourse
- Permanent Watercourse



ACTIVA - BADEN LANDS - SCOPED EIS
Draft Plan & Environmental Management Notes



Date: February 2025
Project No: 19M-01246-00
Figure No: 6



Legend

- Flow Direction
- Amphibian Calling Station (AC1-AC5)
- Vegetation Plots (V1-V4)
- Turtle Basking Survey Location (TVES1-TVES4)
- Breeding Bird Survey Area
- Wildlife Survey Unit (WSU)
- Study Area
- Phase Limit - Option 1
- Proposed Site Plan - Draft Plan
- Proposed Site Plan - Additional Lands
- Hydro Line
- Intermittent Watercourse
- Permanent Watercourse
- Evaluated Wetland - other (non-provincially significant)



ACTIVA BADEN LANDS - 2023 BIOLOGICAL MONITORING
Biological Monitoring Locations

0 50 100
Meters
1:4,000



Date: February 2025
Project No: CA0001332.3375
Figure No: 1

APPENDIX A

Terms of Reference

ACTIVA BADEN LANDS

**SCOPED ENVIRONMENTAL
IMPACT STUDY**

DRAFT TERMS OF REFERENCE

September 2020





SIGNATURES

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Date

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Date

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1.0 INTRODUCTION

WSP Canada Group Limited (WSP) is pleased to submit these draft *Terms of Reference* (TOR) for a Scoped Environmental Impact Study (EIS) in support of a future development application for the lands located in Baden, Ontario (the 'subject property'; Figure 1; Attachment A). The subject property is a 31.5 ha parcel of land located northwest of Michael Myers Road and Kropf Drive in Baden, Ontario.

WSP was retained in 2019 by Activa Management Corporation to undertake natural environment studies in support of planning and development applications for the subject property. We have prepared these TOR, for agency review and comment, to provide background information on the subject property and to confirm the scope of work required to complete the EIS.

2.0 EXISTING CONDITIONS

2.1 Site Overview and Landscape Context

The property consists primarily of active agricultural crop lands, with natural heritage features (woodland and wetland) in the northwest corner. The subject property is bounded by a residential subdivision to the southeast, agricultural crop lands to the east and west, as well as natural areas to the north (upland forest and Philipsburg Southeast Wetland Complex) and east (St. Agatha Beech Maple Forest). There is a narrow hydro-corridor immediately north of the property limit (20 m wide or less), though on-site and off-site woodland areas are contiguous.

Natural heritage field surveys have been undertaken by WSP staff in late summer 2019 and spring/summer 2020. No additional field surveys are proposed.

2.2 Land Use and Designations

There are a number of overlapping designations and/or natural heritage features on and adjacent to the subject property. These are mapped on Figure 1 (Attachment A), presented in the background mapping (Attachment C), and outlined below.

2.2.1 *Region of Waterloo Official Plan (2015)*

Based on Map 3c (Baden and New Hamburg Urban Area, Wilmot) of the 2015 Region of Waterloo Official Plan (ROP), the subject property is located outside of the Township Urban Area Boundary. The subject property is located outside of the *Countryside* Line and outside of the *Protected Countryside* boundary. The property is classified as *Prime Agriculture Area* based on the 2015 ROP mapping (Map 7; The Countryside).

None of the natural features within the subject property is currently designated based on Map 4 (Greenlands Network) of the ROP. The natural area adjacent to the subject property to the north consists of woodland and wetland features, portions of which are designated as *Core Environmental Feature* (CEF) in the ROP. In addition, there are no *Landscape Level System* designations (*Significant Valley*, *Environmentally Significant Landscapes*, or *Regional Recharge Areas*) on the adjacent lands.

2.2.2 *Township of Wilmot Official Plan (April 2019)*

Phase 1 of the proposed development, as shown on the Concept Plan in Attachment B (MHBC; Mary 16, 2019), is zoned as *Urban Residential* within the Township of Wilmot Official Plan (TOP) Map 4.1 (Baden Urban Area). The remaining area, Phase 2 and the natural features in the northwest portion, are currently zoned as *Prime Agriculture* on the TOP Map 10 (The Countryside). The subject property falls outside of the *Countryside* boundary and is not designed as *Protected Countryside*. No *Environmentally Constrained Lands* (Erosion or Flooding Hazards) are present within the subject property based on Map 3 (Environmentally Constrained Lands) of the TOP.

Consistent with the ROP, none of the natural features within the subject property is currently designated as a *Core Environmental Feature* (CEF) or Landscape Level Features in the ROP – Map 7 (The Greenlands Network). The natural area adjacent to / north of the subject property consists of woodland and wetland features, portions of which are designated as CEF and *Supporting Environmental Features* (SEF) in the TOP. In addition, there are no *Landscape Level System* designations (*Significant Valley*, *Environmentally Significant Landscapes* (ESL), or *Regional Recharge Areas*) on the adjacent lands.

The TOP indicates that, following the issuance of the mapping of the Natural Heritage System by the Province, the TOP will undergo a municipal comprehensive review, which will incorporate the Natural Heritage System into their mapping and establish appropriate policies with regards to the long-term ecological and hydrological functions, as set out in Sections 4.2 of the Growth Plan. Until this update is completed, the TOP will follow the existing Greenlands Network policies.

2.2.3 *Growth Plan for the Greater Golden Horseshoe (May 2019)*

Based on provincial mapping (NHIC; Attachment C), the natural heritage features in the northwest corner of the subject property are designated as part of the provincial *Natural Heritage System*, as identified in the Growth Plan, and may be subject to applicable Greenbelt Plan policies. Based on Map 10 of the TOP, Phase 1 of the development falls within the urban boundary while Phase 2 is outside of the urban boundary. Based on the Growth Plan policies within Sections 4.2.2, 4.2.3, and 4.2.4, hydrological and environmental features in Phase 2 will be subject to a 30-m setback, including unevaluated wetlands, once the TOP undergoes the next municipal review. The Concept Plan (MHBC; May 16, 2019) included in Attachment B includes a 30m setback from mapped and field-verified hydrological and environmental features.

Provincial mapping of the *Natural Heritage System* for the Growth Plan does not apply until it has been implemented in the applicable upper-tier or single-tier official plan. Until that time, the policies in the Growth Plan will apply to the natural heritage systems outside settlement areas, as identified in official plans that were approved and in effect as of July 1, 2017.

2.2.4 *Wetlands & Surface Drainage*

Wetlands

As mapped by the Grand River Conservation Authority (GRCA) and verified by WSP in the field, there are three unevaluated wetland features on the subject property (Wetlands 1, 2 and 3a/3b as shown on Figure 1), and one wetland immediately north of the subject property. All are regulated by GRCA under Ontario Regulation 150/06. Natural features and adjacent areas in the northwest corner of the property are within the GRCA regulated area limit.

Based on GRCA and Natural Heritage Information Centre (NHIC) mapping (Attachment C), there is an evaluated, non-provincially significant wetland feature on the adjacent property to the north; this is part of the *Phillipsburg Southeast Wetland Complex*. That off-site wetland complex would be considered a *Locally Significant Wetland (Supporting Environmental Feature)*, per Section 8.1.5.2 (a) of the Township of Wilmot Official Plan. No evaluated wetlands are located within the subject property. The nearest *Provincially Significant Wetland* (PSW), the *Spongy Lake Wetland PSW Complex*, is located more than 2.5 km away.

Surface Drainage

No regulated watercourses are present on the subject property. North of the property, there is a regulated (un-named) watercourse, with associated areas of regulated wetland and steep valley



slope. This feature conveys surface flows from Wetland 1 to north into the *Phillipsburg Southeast Wetland Complex*, ultimately outletting to the Nith River.

2.3 Species of Conservation Concern (SCC)

The following information is based on secondary source background review and field work completed by WSP (2019 - 2020), and is intended as an initial list of *Species of Conservation Concern* (SCC) potentially using the subject property. For the purpose of this TOR, SCC include federal (Species at Risk Act; SARA), provincial (Endangered Species Act; ESA), and regionally significant species.

2.3.1 Natural Heritage Information Centre

Based on review of the NHIC database, there are no records of provincially rare species (Species at Risk [SAR] or S1 to S3) on the subject property. There are 'recent' (< 20 yrs) records in the general area for the following *Threatened* species:

- Eastern Meadowlark (*Sturnella magna*; *Threatened*, ESA and SARA): recorded to the northeast (17NJ2607) on June 20, 2002 (Attachment C)
 - o No suitable habitat is present on the subject property.
 - o No Eastern Meadowlarks were recorded during field surveys
 - Bobolink (*Dolichonyx oryzivorus*; *Threatened*, ESA and SARA): recorded to the east (17NJ2706) on June 20, 2002 (Attachment C).
 - o No suitable nesting habitat is present on the subject property.
 - o One Bobolink was 'observed', with no breeding evidence, on June 18, 2020
-

2.3.2 Ontario Reptile & Amphibian Atlas

Based on review of the Ontario Reptile & Amphibian Atlas (ORAA) database, there are recent records (< 20 yrs) of the following SCC in the general area (within 17NJ20, a 10 x 10 km square that includes the subject property):

- Snapping Turtle (*Chelydra serpentina*; *Special Concern*, ESA and SARA), recorded in the vicinity of the subject property on May 5, 2019
- Western Chorus Frog (*Pseudacris triseriata*; *Threatened*, SARA), recorded in the vicinity of the subject property on April 23, 2006.

2.3.3 Ontario Breeding Bird Atlas

Based on review of the Ontario Breeding Bird Atlas (OBBA) database, there are records of six avian SCC in the vicinity of the subject property (between 2001 – 2005 in 17NJ20, a 10 x 10 km square that includes the subject property):

- Red-headed Woodpecker (*Melanerpes erythrocephalus*; *Special Concern*, ESA and *Threatened*, SARA); Eastern Wood-Pewee (*Contopus virens*; *Special Concern*, ESA and SARA); Barn Swallow (*Hirundo rustica*; *Threatened*, ESA and SARA); Wood Thrush (*Hylocichla mustelina*; *Special Concern*, ESA and *Threatened*, SARA); Bobolink; and Eastern Meadowlark.

2.3.4 Field Survey Results (WSP 2019 - 2020)

Field surveys completed to date include botanical, general wildlife, amphibian calling and turtle basking / spring emergence surveys (as detailed in Section 3.0). Based on these surveys, five SAR / SCC have been recorded on the subject property:

- Barn Swallow - one individual was 'observed' foraging over the agricultural fields during on May 28 and June 18, 2020, with no breeding evidence. No suitable nesting habitat is present.
- Bobolink - one individual was 'observed' along a mid-field hedgerow on June 18, 2020. Since no suitable nesting habitat is present on the subject property (i.e., the property is a mix of woodland/wetland and agricultural fields ploughed or planted with corn), it was concluded that this was a foraging visitant.
- Wood Thrush - one individual was recorded with 'possible' breeding evidence in the woodland along northern edge of subject property.
- Snapping Turtle - two individuals were recorded in *Wetland 2* and one individual in *Wetland 3a* on May 3, 2020 (refer to mapping in Attachment A). Two Snapping Turtles and nests were recorded in the crop field immediately east of *Wetland 2* on June 18, 2020. Nest areas were staked / flagged to prevent inadvertent harm during farming activities.
- Monarch - several individuals were recorded along the edges of *Wetland 2* and immediately south of *Wetland 1* on July 20, 2020. Milkweed is occasionally present along the edges of all units.

Evidence of one additional species, which may be provincially rare, was recorded:

- Several Terrestrial Crayfish burrows (~3) were recorded along the southern edge of *Wetland 1* and two along the northern edge of *Wetland 2* during the 2020 surveys.



There are two species of crayfish which create these burrows: Meadow Crayfish (*Cambarus diogenes*), which is provincially rare (S3); and Chimney Crayfish (*Fallicambarus fodiens*). No crayfish were observed and identification to species was not confirmed.

3.0 SCOPE OF WORK

The Scoped EIS will include the following tasks which address objectives and requirements / guidance of the Region of Waterloo Greenlands Network Implementation Guidelines (May 2016), and consider existing natural features on and adjacent to the subject property.

1. **Background Review.** Existing natural heritage conditions will be characterized to the extent possible through a desktop review of existing mapping and databases (including iNaturalist and eBird, as relevant), information from the Ministry of Natural Resources and Forestry (MNRF) and/or Ministry of Environment, Conservation and Parks (MECP), GRCA, Region of Waterloo, Township of Wilmot, and any existing studies. Background information is discussed herein.
2. **Field Surveys.** Field surveys have been conducted in 2019 – 2020 on the subject property, as follows:
 - **General wildlife and habitat assessment:** including identification of tracks, scat, burrows, nests or other evidence of wildlife habitat use. Assessment of sensitive or *Significant Wildlife Habitat* types. General wildlife surveys were conducted during all field visits.
 - **SAR surveys & Evaluation.** A targeted American Badger habitat search was completed on May 3, 2020. No additional / targeted SAR field surveys are proposed. An evaluation of SAR / habitat potential will be undertaken using background information and results of recommended field surveys.
 - **Botanical Inventory:** Multi-season inventory (Spring [late-May to early June], early summer [late June to July], and late summer [early September]). Locations of significant species to be recorded, including plants likely to cause nuisance and health problems (e.g., Giant Hogweed, Poison Ivy, etc.).
 - Plant species status will be evaluated using the Region of Waterloo Listing of Significant Vascular Plants (1999) for regional significance; the NHIC website for provincial rarity ranks (i.e. S-Ranks); the Species At Risk in Ontario list (COSSARO – current list at time of report preparation) for provincial status designations; and the Canadian Species At Risk list (COSEWIC – current list at time of report preparation) for national status designations.

- **Vegetation community classification:** following the Ecological Land Classification for Southern Ontario, ELC (Lee et al. 1998).
 - **Amphibian Calling surveys:** three rounds of evening surveys at stations targeting suitable wetland habitat - per the Bird Studies Canada's Marsh Monitoring Program protocol.
 - **Breeding bird surveys:** two rounds of early morning surveys between May 24 and July 10 covering the subject property and immediately adjacent lands, based on accepted OBBA protocols.
 - **Marsh Bird surveys:** two rounds of survey, combined with the May and June Amphibian Calling surveys, following the Bird Studies Canada's Marsh Monitoring Program protocol for marsh birds (including call-playback stations targeting suitable wetland habitats on the subject property).
 - **Turtle Basking / Spring Emergence:** one survey targeting all wetland features was completed on May 3, 2020 during suitable conditions for turtle basking (sunny / warm weather). Supplementary searches were undertaken during other fieldwork.
 - **Preliminary Wetland delineation:** pre-flagging, based on accepted protocols and procedures, was completed on July 20, 2020
 - **Preliminary Woodland dripline delineation:** pre-flagging survey of limits was completed on July 20, 2020
3. **Confirmation of woodland / wetland delineations:** confirmation of pre-flagged limits through agency site walk and/or verification; subsequent survey of approved limits
- a. A site walk with Region of Waterloo staff was completed on August 20, 2020. Woodland limits were confirmed and are in the process of being surveyed for circulation to review staff.
 - b. Wetland limits are in process of being surveyed. Surveyed limits and supporting material will be provided to GRCA for confirmation.
4. **Species at Risk and Significant Wildlife Habitat Analysis:** This will include an assessment of SAR habitat potential / impacts, based on known regional records, habitat suitability and SAR observations from background information and field work.
5. **Review, input to and Integration of other technical studies:** WSP ecology will work as part of an integrated study team to review results collected by other study team members as input to the planning process for the subject property. This information will



be reviewed by ecology staff, and considered and integrated in the EIS, where relevant (e.g., hydrogeology, soils, grading etc.).

- 6. Identification and Evaluation of Opportunities and Constraints:** Natural environmental features will be evaluated to determine their protection and/or management requirements. Development limits, recommended setbacks and buffer management measures will be identified, in accordance with applicable policy and precedence.
- 7. Input to Development Proposal:** Based on environmental constraints, consolidated data review, and consideration of other relevant technical information, WSP ecology staff will provide input to the development limits and proposed development plan.
- 8. Identification of Impacts, Mitigation, and Enhancement:** The details of the proposed development, including the stormwater management strategy and other relevant considerations, will be reviewed to identify potential impacts on ecological features and functions. WSP ecologists will identify potential impacts based on direct and indirect effects of the proposed development. Mitigation, protection, and enhancement recommendations will be identified.
- 9. Preparation of a scoped EIS Report:** Prepared in accordance with the approved TOR. The report will include:
 - a. development proposal description
 - b. natural environment existing conditions and analysis
 - c. identification of ecological constraints
 - d. an assessment of impacts, mitigation and enhancement opportunities
 - e. policy compliance discussion
 - f. a discussion of any additional ecological studies, biological monitoring program, environmental permits, and approvals required for development
 - g. figures to support the text, including mapping of natural features on an air photo base.
 - h. technical appendices, such as field survey chronology, species lists, photographs, and agency correspondence.
- 10. Region, City, and Agency Liaison.** Consultation and correspondence is anticipated throughout the study. A draft Scoped EIS report will be submitted to Wilmot Township, Region of Waterloo and GRCA for review and comment. The report will subsequently be finalized based on agency comments.



ATTACHMENT A

Subject Property & Natural Heritage
Features

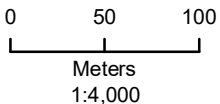


Legend

- Subject Property
- Hydro Line
- Intermittent Watercourse
- Permanent Watercourse
- Area of Natural and Scientific Interest
- Natural Heritage System Area
- Evaluated Wetland
- GRCA Wetland



ACTIVA - BADEN LANDS - SCOPED EIS TOR
Subject Property and Natural Heritage Features



Date: May 2020
Project No: 19M-01246-00
Figure No:



ATTACHMENT B

Concept Plan

Concept Plan

Activa Holdings Inc.
Baden Lands
Township of Wilmot
Region of Waterloo

LEGEND

Subject Lands

Countryside Line

GRCA Wetland Limit

GRCA Regulated Area

Settlement Boundary

Area Added to Settlement Boundary

Post-Development Drainage Boundary (Catchment No.201)

Potential 30m Wetland Setback

Directional Flow

	Area*	Saleable Frontage**	Road Length
Phase 1	14.8 ha	2,300.4m / 7,547.2ft	1,904.3m / 6,247.7ft
Phase 2	16.7 ha	2,718.4m / 8,918.6ft	1,830.1m / 6,004.3ft
Total	31.5 ha	5,018.8m /16,465.8ft	3,734.4m /12,252.0ft

*Area excludes northwest corner of property (GRCA wetlands and associated setbacks). Total Area of Subject Lands is 39.4 ha (Phase 1: 15.2 ha and Phase 2: 24.2 ha)
**Saleable frontage measured at 7.6m front yard setback or 7.5m rear yard setback, whichever is applicable. Assumed flankage yard of 6.0m and interior side yard of 1.5m.
No saleable frontage assumed for multiple block.

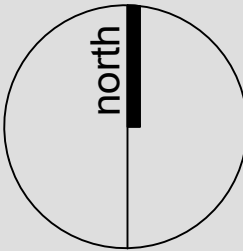
Base Plan Sources:
Imagery: Google Earth
Wetlands and Regulation Limit: GRCA
Settlement Boundary: Amendment No. 9 to the Township of Wilmot Official Plan, Map 4.1 Baden Urban Area
Post-Development Drainage Boundary: Stantec - Activa Baden Subdivision "Revised" Preliminary Stormwater Management Report (June 2000)

DATE: May 16, 2019

FILE: 8784BB

SCALE: 1:1,500

DRAWN: DGS



K:\8784BB-ACTIVA BADEN\CONCEPTS\CONCEPT PLAN MAY16 2019.DWG



ATTACHMENT C

Background Mapping



Activa Baden



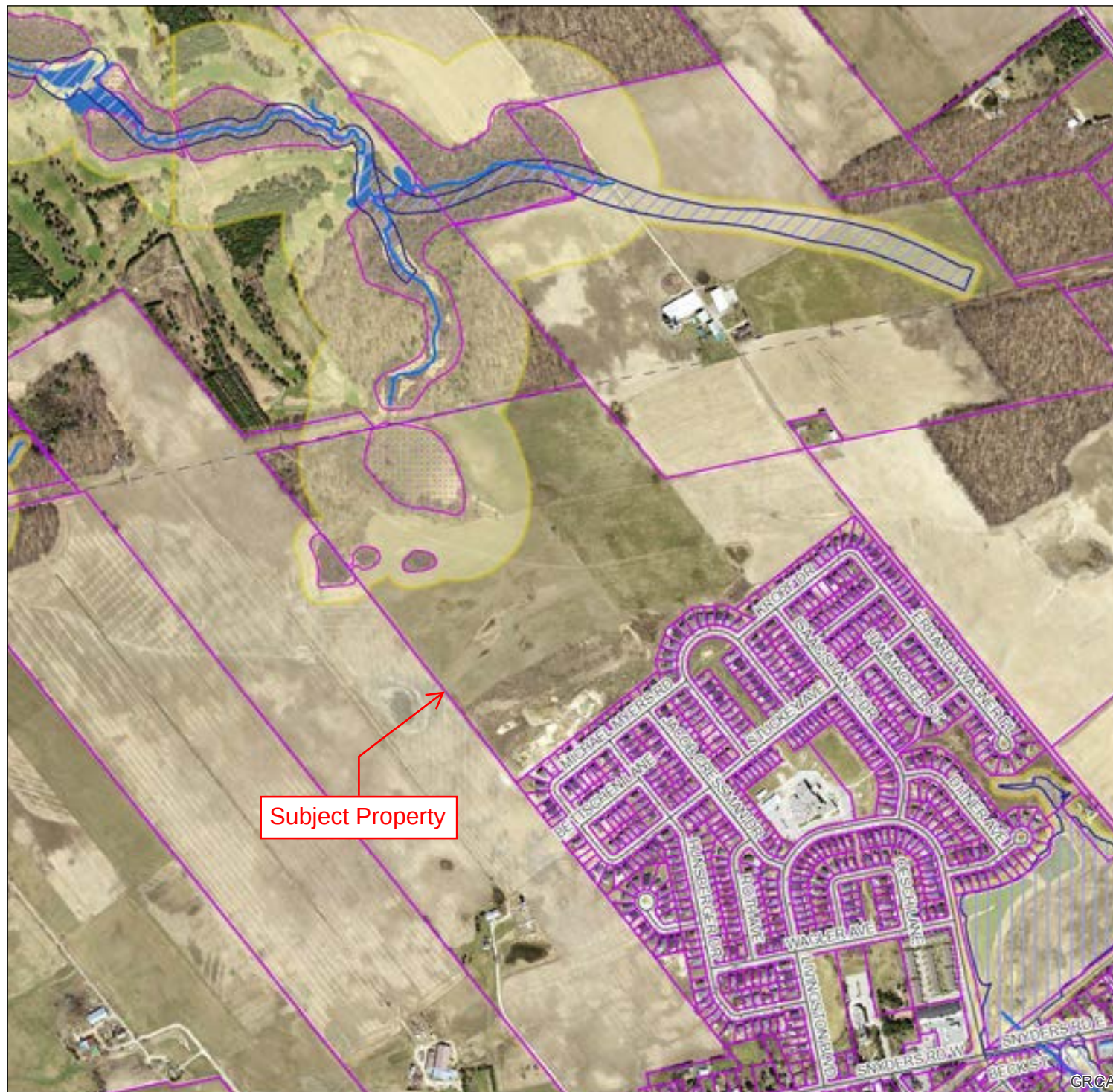
Legend

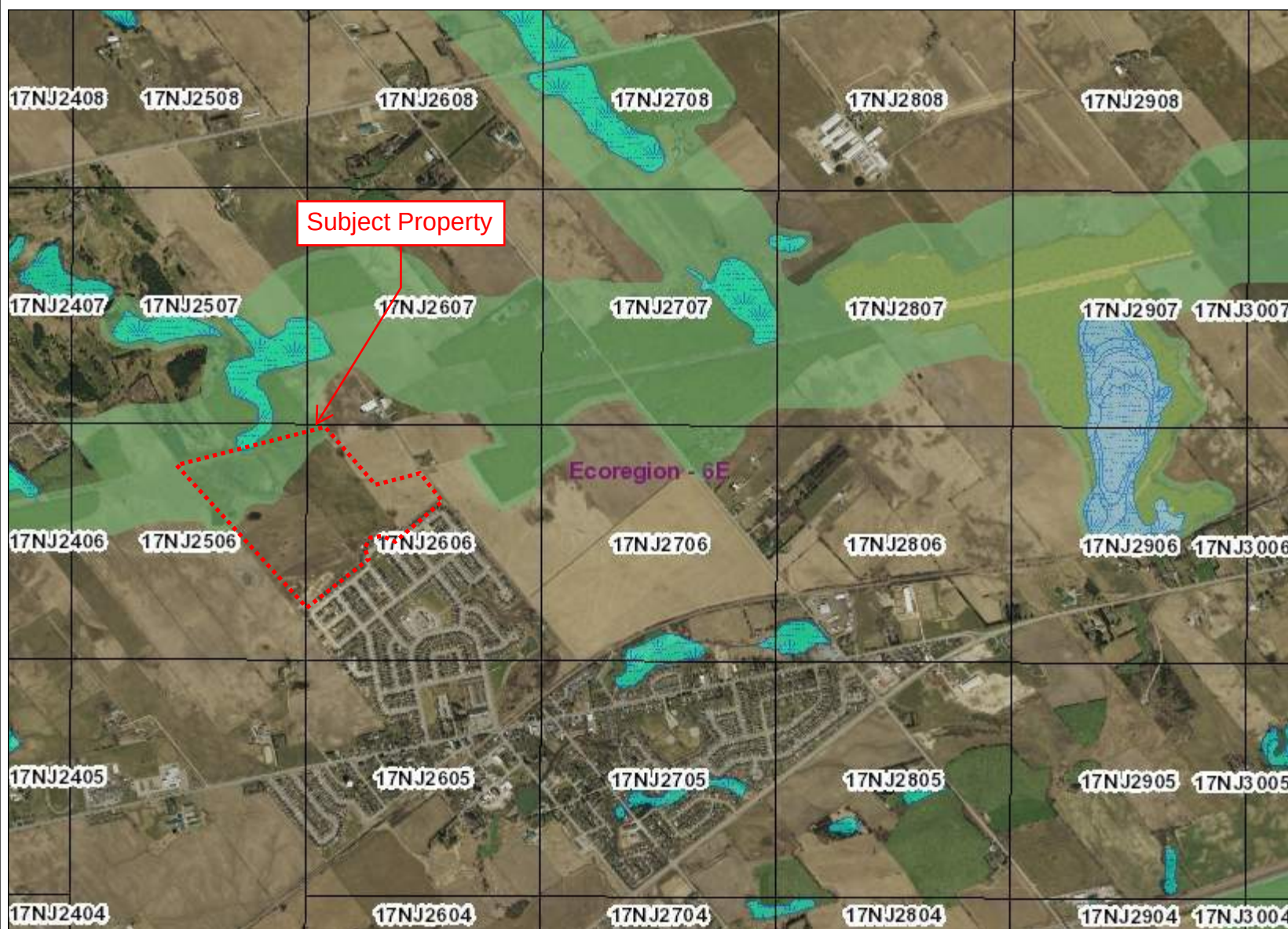
- Regulation Limit (GRCA)
- Regulated Watercourse (GRCA)
- Regulated Waterbody (GRCA)
- Wetland (GRCA)
- Floodplain (GRCA)
 - Engineered
 - Estimated
 - Approximate
 - Special Policy Area
- Slope Valley (GRCA)
 - Steep
 - Oversteep
 - Steep
- Slope Erosion (GRCA)
 - Oversteep
 - Toe
- Lake Erie Flood (GRCA)
- Lake Erie Shoreline Reach (GRCA)
- Lake Erie Dynamic Beach (GRCA)
- Lake Erie Erosion (GRCA)
- Parcel - Assessment (MPAC/MNRF)

This legend is static and may not fully reflect the layers shown on the map. The text of Ontario Regulation 150/06 supercedes the mapping as represented by these layers.

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Disclaimer: This map is for illustrative purposes only. Information contained herein is not a substitute for professional review or a site survey and is subject to change without notice. The Grand River Conservation Authority takes no responsibility for, nor guarantees, the accuracy of the information contained on this map. Any interpretations or conclusions drawn from this map are the sole responsibility of the user.
The source for each data layer is shown in parentheses in the map legend. For a complete listing of sources and citations go to: <https://maps.grandriver.ca/Sources-and-Citations.pdf>

0 62.5 125 250 375 Metres
NAD 1983 UTM Zone 17N Scale: 10,310





Legend

- Assessment Parcel
- Woodland
- Conservation Reserve
- Provincial Park
- Natural Heritage System
- Ecotone
- Wetland
 - Previously Significant Wetland Evaluated
 - Non-Previously Significant Wetland Evaluated
 - Unassessed Wetland
- Area of Natural Heritage & Scientific Interest (ANHS)
 - Previously Significant Life Science ANHS
 - Previously Significant Earth Science ANHS
- Greenbelt Plan
 - Boundary
 - Greenbelt External Connections
- Land Use Designations
 - Protected Countryside
 - Greenbelt Town and Village
 - Greenbelt median
 - Urban River Valley
 - Greenbelt Specialty Crop Area
- Niagara Escarpment Plan (NEP)
 - Boundary
 - Park and Open Space System
- Land Use Designations
 - Escarpment Natural Area
 - Escarpment Protection Area
 - Escarpment Road Area
 - Mineral Resource Extraction Area
 - Escarpment Recreation Area
 - Urban Area
 - Minor Urban Centre
- Oak Ridges Moraine Conservation Plan (ORM)
 - Boundary
 - Land Use Designations
 - Natural Core Area
 - Natural Linkage Area
 - Countryside Area
 - Rural Settlement
 - Pleasure Enclave Residential Community
 - Settlement Area

1.3 0 0.64 1.3 Kilometers



This map should not be relied on as a precise indicator of routes or locations, nor as a guide to navigation. The Ontario Ministry of Natural Resources and Forestry (OMNRF) shall not be liable in any way for the use of, or reliance upon, this map or any information on this map.

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Region of Waterloo

Regional Official Plan SHAPING OUR FUTURE

MAP 3c

TOWNSHIP OF WILMOT TOWNSHIP URBAN AREA BADEN & NEW HAMBURG

LEGEND

- Provincial Highway
- Regional Road
- River
- Region of Waterloo International Airport
- Municipal Boundary
- Railway

0 0.5 1 2 Km



Sources: Region of Waterloo, Ministry of Energy and Infrastructure

2015

* Built Up Area includes all lands within the built boundary, as established by the Province.

Note: This map forms part of the Official Plan of the Regional Municipality of Waterloo and must be read in conjunction with the policies of this Plan.

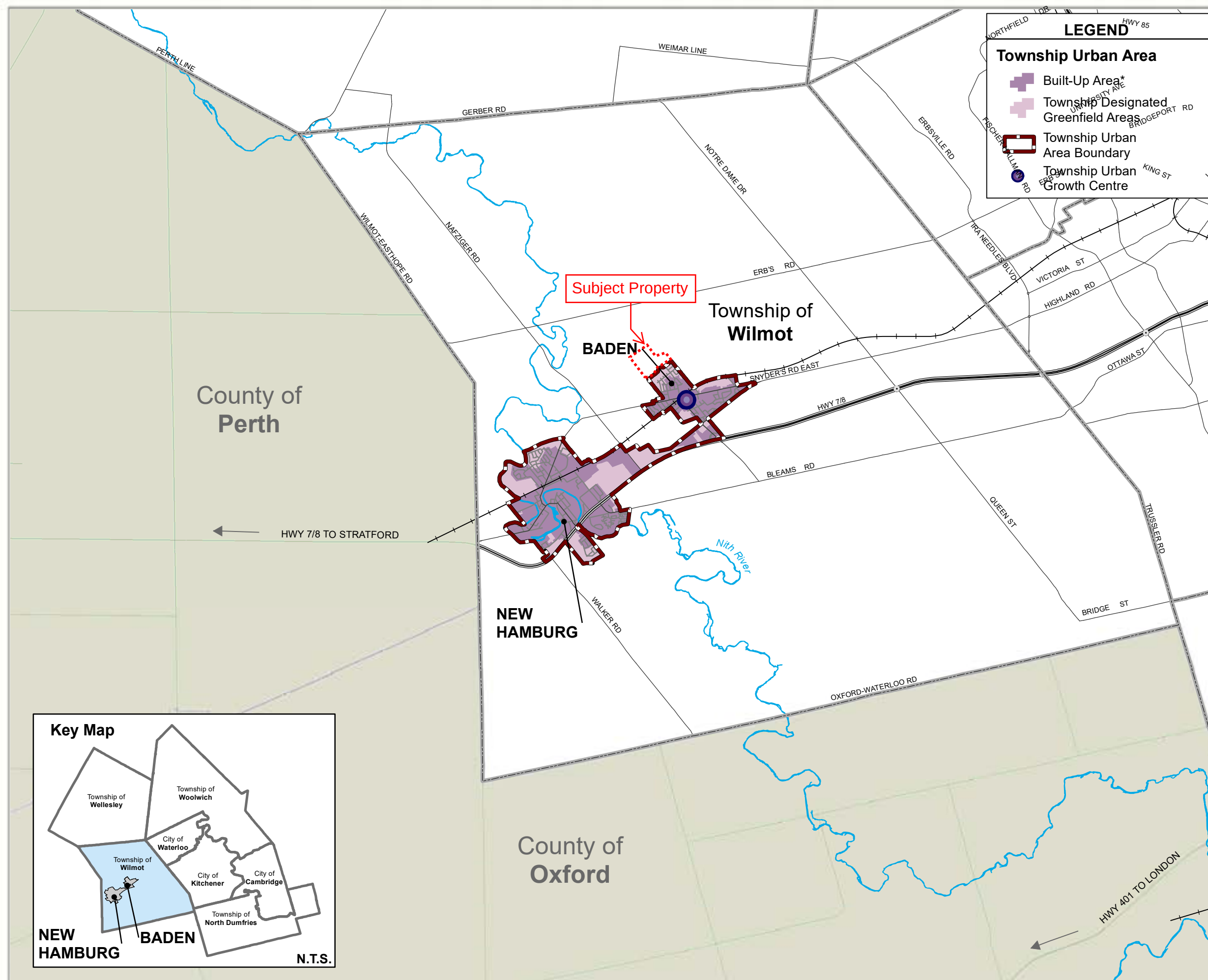
LEGEND

Township Urban Area

- Built-Up Area*
- Township Designated Greenfield Areas
- Township Urban Area Boundary
- Township Urban Growth Centre

Key Map

NEW HAMBURG **BADEN** **N.T.S.**





Region of Waterloo

Regional Official Plan SHAPING OUR FUTURE

MAP 4

GREENLANDS NETWORK

LEGEND

- Provincial Highway
- Regional Road
- River
- Region of Waterloo International Airport
- Municipal Boundary
- Railway

0 1 2 4 Km



Sources: Region of Waterloo, Ministry of Natural Resources

2015

Note: Permanent and intermittent watercourses are identified in the Technical Appendix for Landscape Level Systems and Core Environmental Features

Note: This map forms part of the Official Plan of the Regional Municipality of Waterloo and must be read in conjunction with the policies of this Plan.

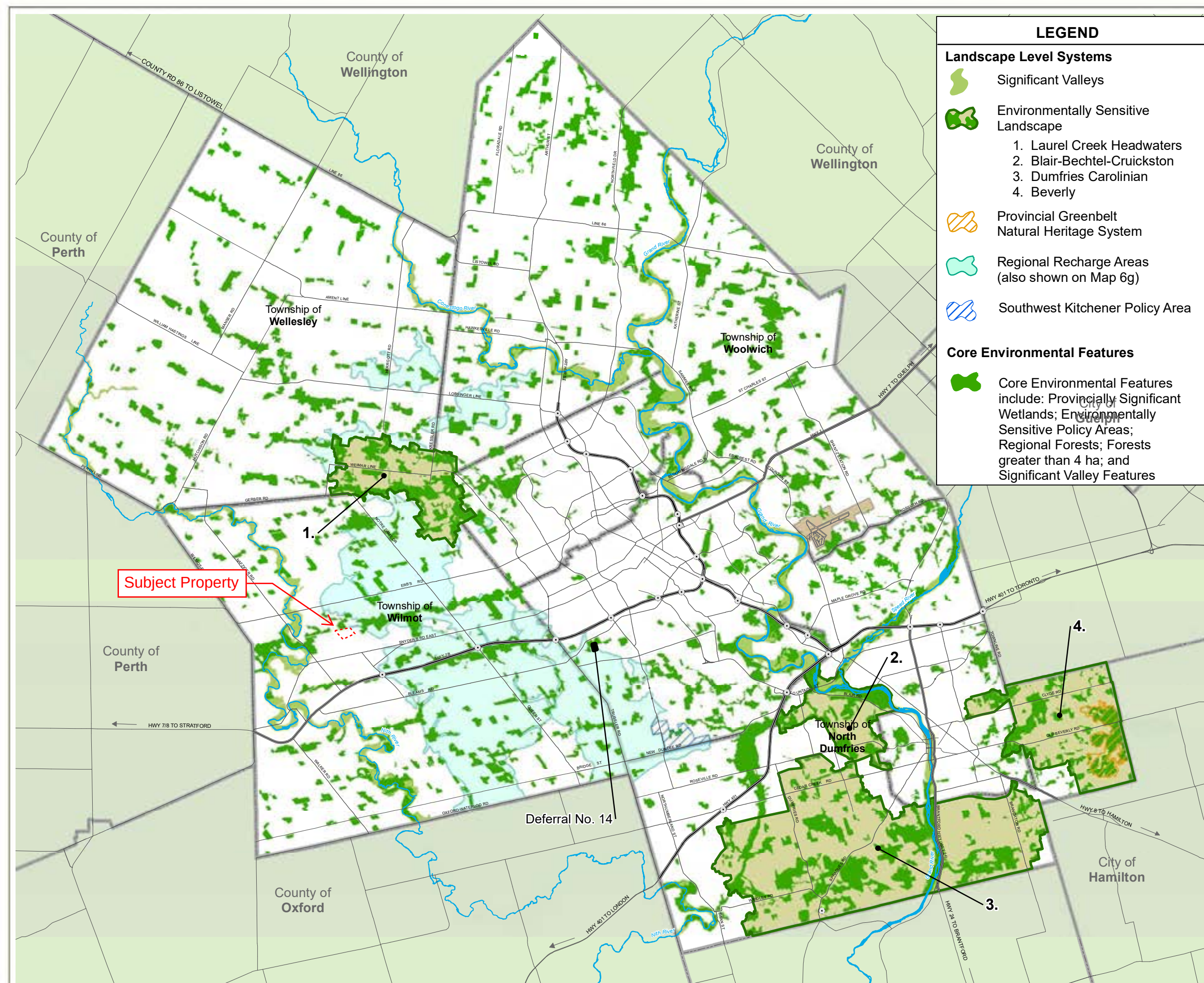
LEGEND

Landscape Level Systems

- Significant Valleys
- Environmentally Sensitive Landscape
 1. Laurel Creek Headwaters
 2. Blair-Bechtel-Cruickston
 3. Dumfries Carolinian
 4. Beverly
- Provincial Greenbelt Natural Heritage System
- Regional Recharge Areas (also shown on Map 6g)
- Southwest Kitchener Policy Area

Core Environmental Features

- Core Environmental Features include: Provincially Significant Wetlands; Environmentally Sensitive Policy Areas; Regional Forests; Forests greater than 4 ha; and Significant Valley Features





Region of Waterloo

Regional Official Plan SHAPING OUR FUTURE

MAP 7 THE COUNTRYSIDE

LEGEND

- Provincial Highway
- Regional Road
- River
- Region of Waterloo International Airport
- Municipal Boundary
- Railway

0 1 2 4 Km



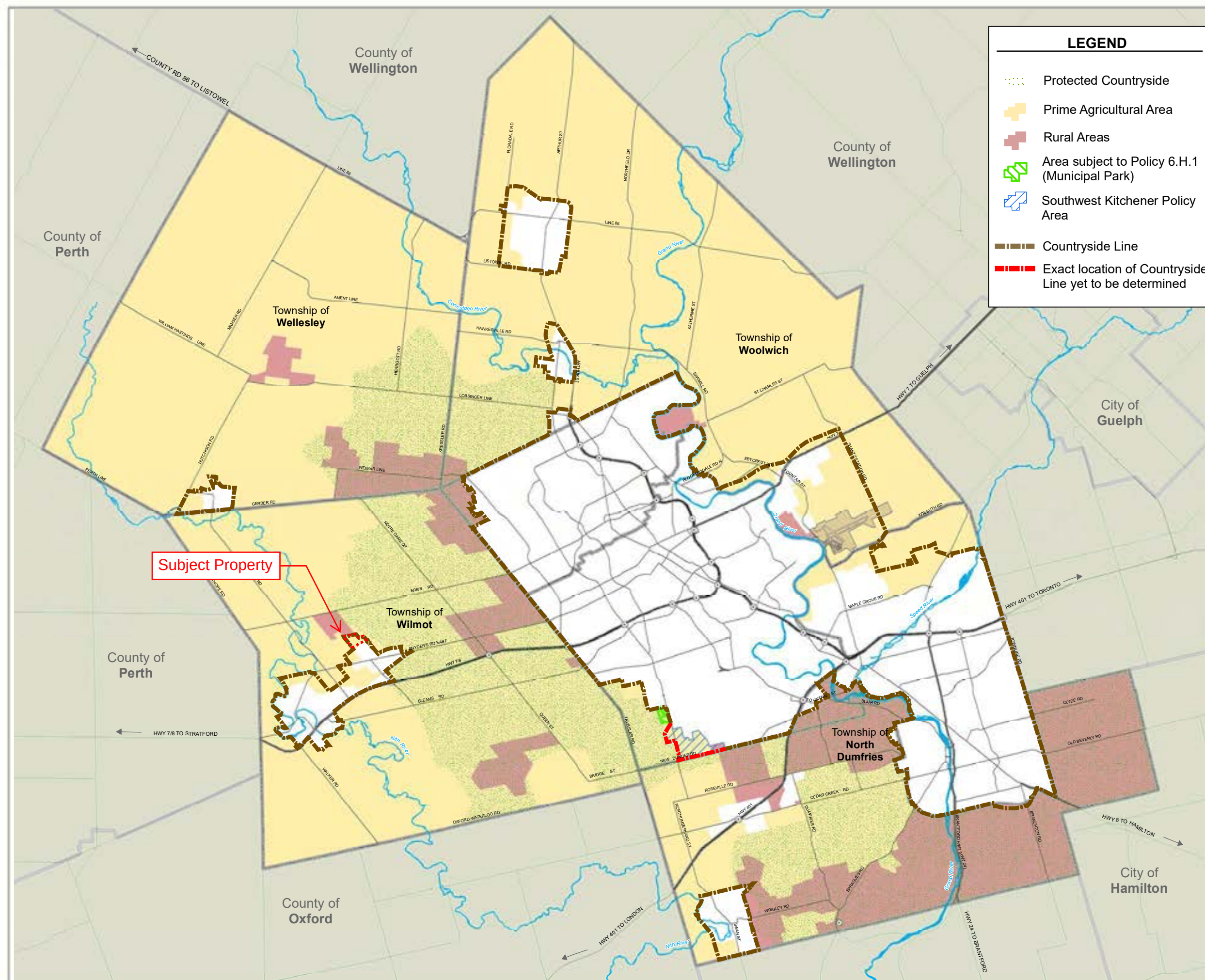
Sources: Region of Waterloo

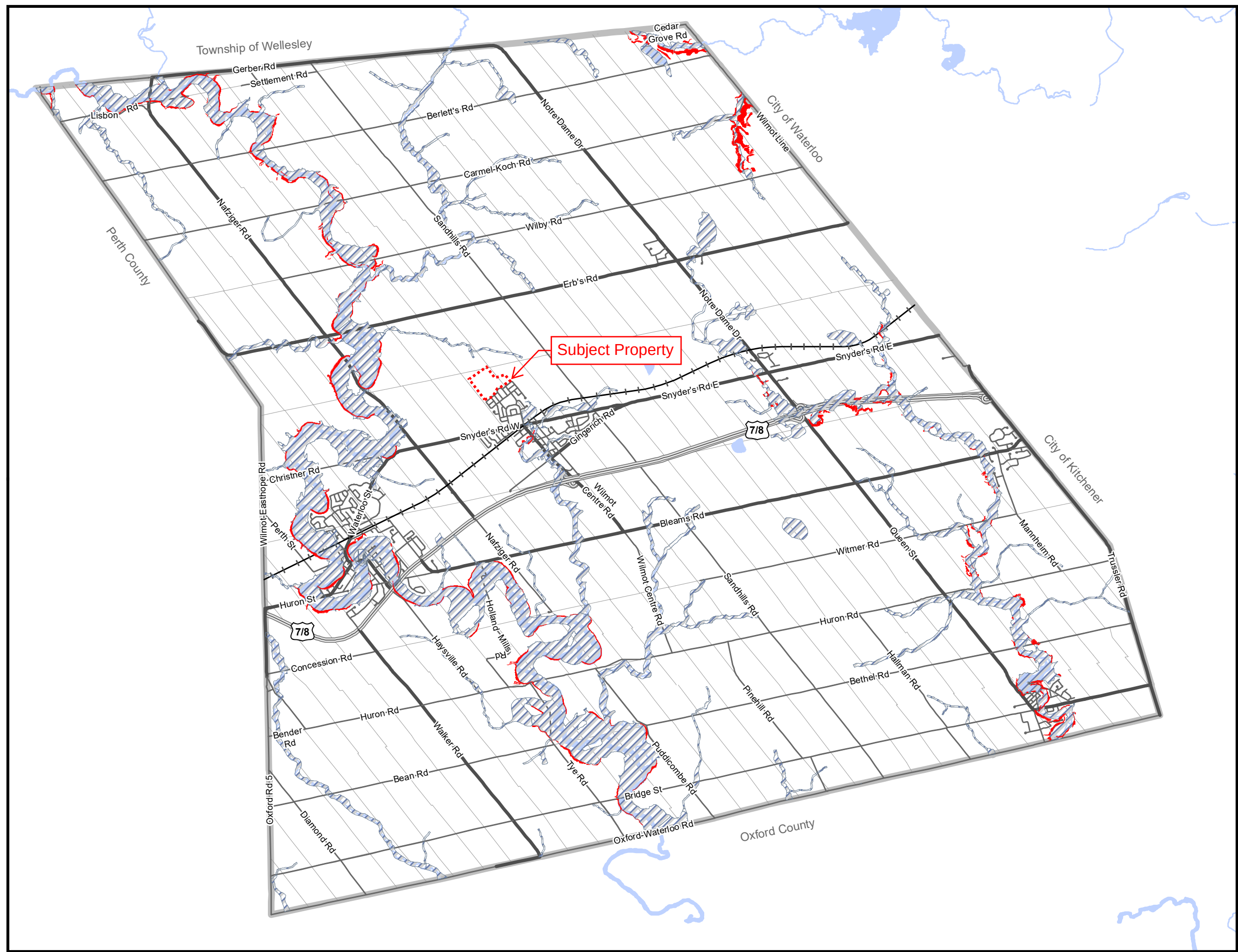
2015

Note: This map forms part of the Official Plan of the Regional Municipality of Waterloo and must be read in conjunction with the policies of this Plan.

LEGEND

- Protected Countryside
- Prime Agricultural Area
- Rural Areas
- Area subject to Policy 6.H.1 (Municipal Park)
- Southwest Kitchener Policy Area
- Countryside Line
- Exact location of Countryside Line yet to be determined





TOWNSHIP
OF WILMOT

Official Plan

Map 3 Environmentally Constrained Lands

Legend

-  Erosion Hazards
-  Flooding Hazards

2019

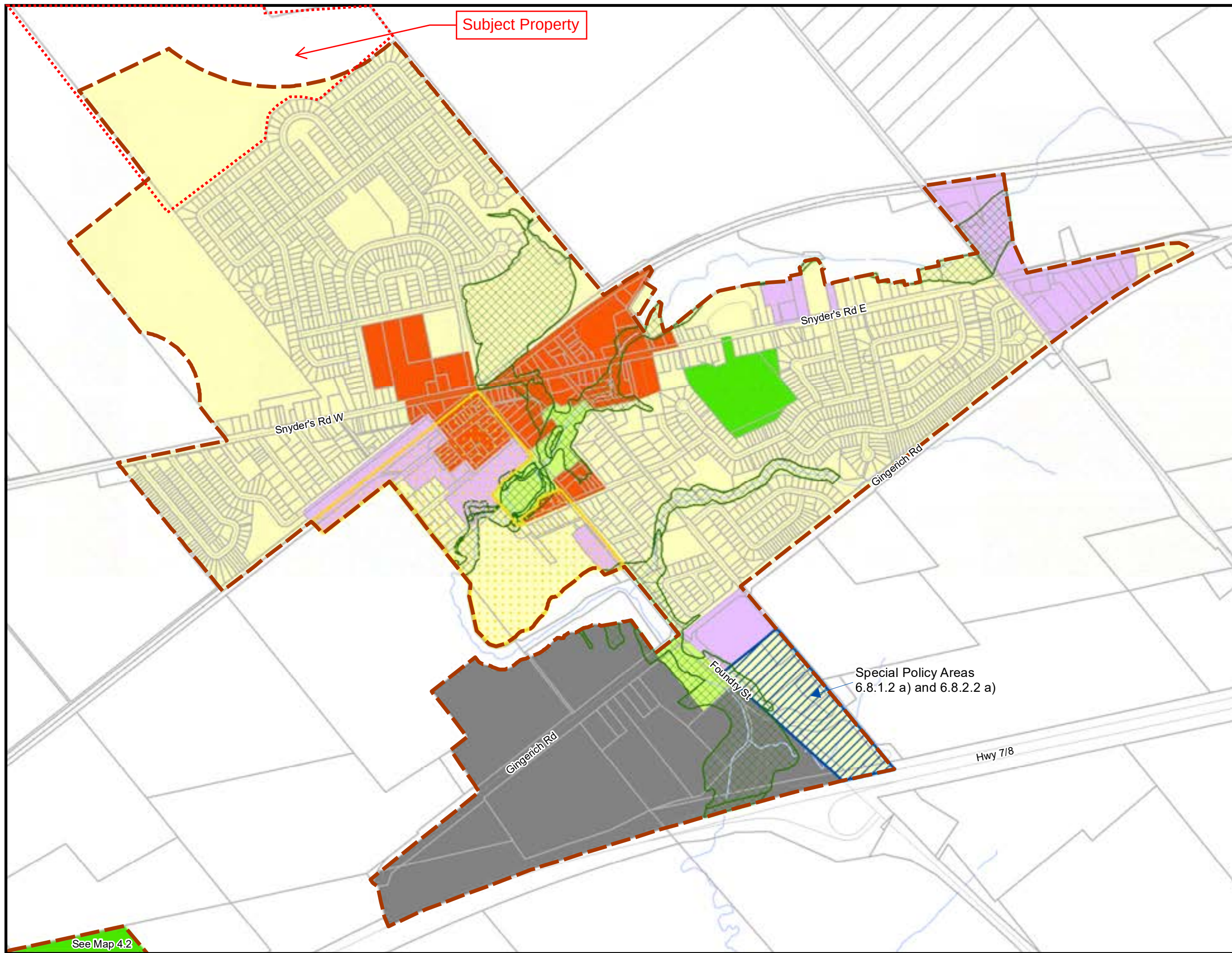


0 1 2
Kilometers

This map forms part of the Township of Wilmot
Official Plan and must be read with the other
maps and policies of this Plan.

April 2019
Consolidation

Produced by:
Township of Wilmot
Development Services



TOWNSHIP
OF WILMOT

Official Plan

Map 4.1 Baden Urban Area

Legend

- Urban Area Boundary
- Urban Growth Centre Overlay
- Environmentally Constrained Lands
- Special Policy Areas
- Urban Residential
- Urban Core Area
- General Industrial
- Light Industrial
- Open Space
- Major Recreation

2019



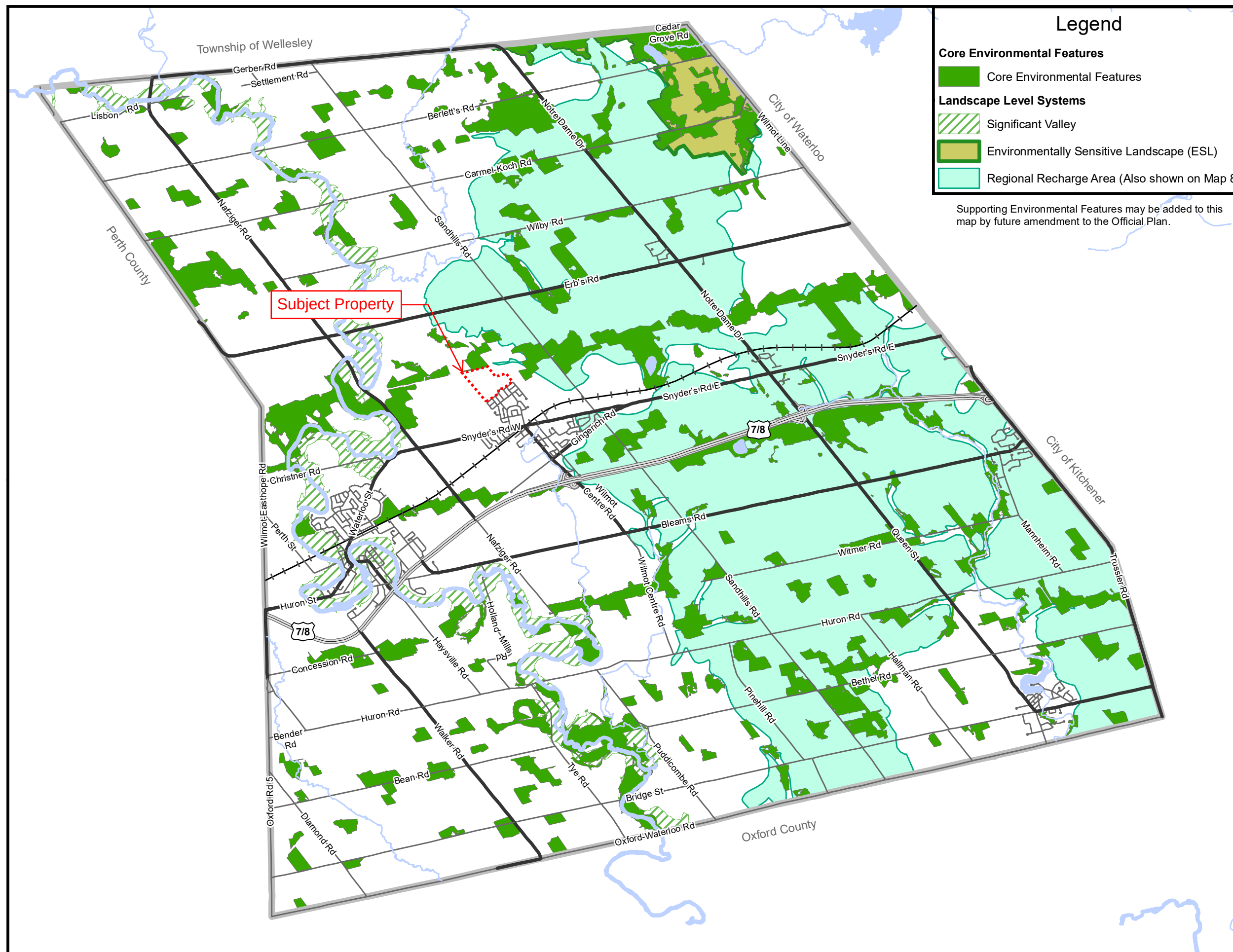
0 150 300
Meters

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Legend

Core Environmental Features

Core Environmental Features

Landscape Level Systems

Significant Valley

Environmentally Sensitive Landscape (ESL)

Regional Recharge Area (Also shown on Map 8)

Supporting Environmental Features may be added to this map by future amendment to the Official Plan.



**TOWNSHIP
OF WILMOT**

Official Plan

Map 7 The Greenlands Network

2019

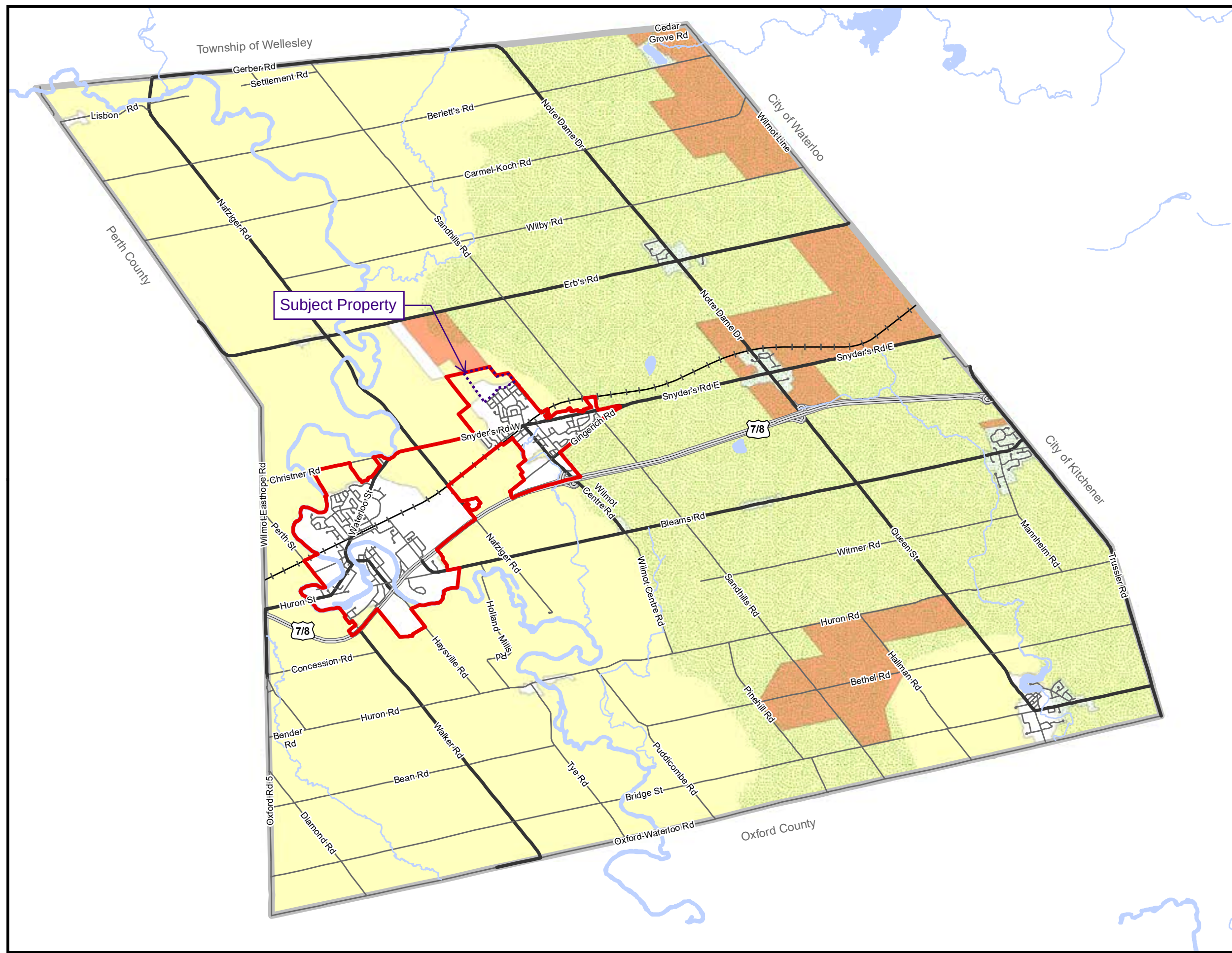


0 1 2
Kilometers

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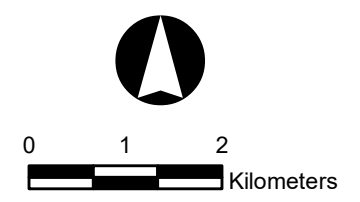
Official Plan

Map 10 The Countryside

Legend

-  Countryside Line
-  Protected Countryside
-  Rural Areas*
-  Prime Agricultural
-  Urban Areas / Rural Settlement Areas

2019



This map forms part of the Township of Wilmot Official Plan and must be read with the other maps and policies of this Plan.

April 2019
Consolidation

*Deferral No. 6

Produced by:
Township of Wilmot
Development Services

APPENDIX B

Field Survey Chronology

Appendix B - Field Survey Chronology

Date	Staff	Task	Total Hours (person hours)	Coverage / Units	Weather Conditions
2019					
Sept. 5, 2019	MD, CVD	General Wildlife, SAR / Significant Wildlife Habitat Survey	7	Whole Property / Study Area	Air Temp - Start: 16C, End: 21C; Sky Code: 0-0; Wind Scale: 1-1
Sept. 5, 2019	JM	Botanical inventory, wetland delineation, ELC	6	Whole Property / Study Area	Air Temp - Start: 16C, End: 21C; Sky Code: 0-0; Wind Scale: 1-1
2020					
April 6, 2020	JM, SG	Amphibian Calling surveys (Round 1)	3.5	Whole Property / Study Area (AC1-7)	Air Temp - Start: 11C, End: 9C; Sky Code: 2-2; Wind Scale: 1-0
May 4, 2020	MD	Turtle Basking, Spring Wildlife / Reptile Emergence, American Badger Survey	4.5	Whole Property / Study Area	Air Temp - Start: 17C, End: 20C; Sky Code: 0-1; Wind Scale: 4-3
May 26, 2020	MD, SG	Marsh Bird Survey (Round 1) and Amphibian Calling Survey (Round 2)	2	Whole Property / Study Area (AC1-7)	Air Temp - Start: 25C, End: 22C; Sky Code: 0-0; Wind Scale: 0-0
May 28, 2020	CVD	Breeding Bird Survey, general wildlife	4	Whole Property / Study Area	Air Temp - Start: 20C, End: 21C; Sky Code: 1-1; Wind Scale: 1-2
June 17, 2020	JM	Botanical inventory, ELC	6	Whole Property / Study Area	N/A
June 18, 2020	CVD	Breeding Bird Survey (round 2), general wildlife	4	Whole Property / Study Area	Air Temp - Start: 14C, End: 20C; Sky Code: 1-0; Wind Scale: 1-1
June 18, 2020	MD, SG	Marsh Bird Survey (Round 2) and Amphibian Calling Survey (Round 3)	2	Whole Property / Study Area (AC1-7)	Air Temp - Start: 23C, End: 19C; Sky Code: 0-0; Wind Scale: 2-1
June 30, 2020	CVD	Turtle nest staking	2	Pond	Air Temp - 27C; Sky Code: 1; Wind Scale: 1

Appendix B - Field Survey Chronology

Date	Staff	Task	Total Hours (person hours)	Coverage / Units	Weather Conditions
July 21, 2020	JM	Botanical inventory, and feature delination, ELC	4	Whole Property / Study Area	N/A
August 20, 2020	JM	Agency Site walk for woodland delineation	3	Dripline	N/A
Total # field dates	12				
Total # hours	48				

APPENDIX C

Representative Site Photographs



Unit 3— Shining Willow Organic Deciduous Thicket Swamp (SWTO2-4) East edge - May 3, 2020



Unit 3— Shining Willow Organic Deciduous Thicket Swamp (SWTO2-4) West edge - May 3, 2020



Unit 3— Shining Willow Organic Deciduous Thicket Swamp (SWTO2-4) showing standing water - May 3, 2020



Unit 3 — Edge of Unit 3 showing Crayfish chimneys—Sept 5, 2019



Unit 3 — Edge of Unit 3 showing Monarch on Spotted Joe-pyeweed —July 21, 2020



Unit 7—Willow Mineral Deciduous Swamp (SWD4-1) —Sept 5, 2019



Unit 5 —Dry - moist old field cultural meadow (CUM1-1) facing east —Sept 5, 2019



Unit 6 — Dry - Fresh Sugar Maple Deciduous Forest (FOD5-1). Sept 5, 2019



Activa Baden Lands
REPRESENTATIVE SITE PHOTOGRAPHS

Date: July 2022

Project No: 19M-01246-00

Appendix C



Unit 7—Willow Mineral Deciduous Swamp (SWD4-1) —Sept 5, 2019



Unit 7—Willow Mineral Deciduous Swamp (SWD4-1) —Sept 5, 2019



Unit 7—Willow Mineral Deciduous Swamp (SWD4-1) —Sept 5, 2019



Unit 8 – Cattail Mineral Shallow Marsh (MAS2-1) —Sept 5, 2019



Unit 8 – Cattail Mineral Shallow Marsh (MAS2-1)—Sept 5, 2019



Unit 8 – Cattail Mineral Shallow Marsh (MAS2-1)—Sept 5, 2019



Unit 9 – Cultural Mosaic —Sept 5, 2019



Unit 9 – Cultural Mosaic/Mixed Forb Mineral Meadow Marsh (MAM2-10) in small MAM2-10 pocket—Sept 5, 2019



Activa Baden Lands
REPRESENTATIVE SITE PHOTOGRAPHS

Date: July 2022
Project No: 19M-01246-00
Appendix C



Unit 9 – Cultural Mosaic/Mixed Forb Mineral Meadow Marsh with upland species in foreground —Sept 5, 2019



Unit 10 – Fresh – Moist Sugar Maple – Lowland Ash Deciduous Forest (FOD6-1)—Sept 5, 2019



Unit 10 – Fresh – Moist Sugar Maple – Lowland Ash Deciduous Forest (FOD6-1)—Sept 5, 2019



Unit 11—Shining Willow Organic Deciduous Thicket Swamp (SWTO2-4) located just outside of the property boundary—May 3, 2020



Unit 11—Shining Willow Organic Deciduous Thicket Swamp (SWTO2-4) showing standing water from property line —May 3, 2020



Unit 13– Reed-canary Grass Graminoid Mineral Meadow Marsh (MAM2-2) / Floating-leaved Shallow Aquatic (SAF) - May 3, 2020



Unit 13– Reed-canary Grass Graminoid Mineral Meadow Marsh (MAM2-2) / Floating-leaved Shallow Aquatic (SAF)- June 18, 2020



Unit 13– Reed-canary Grass Graminoid Mineral Meadow Marsh (MAM2-2) / Floating-leaved Shallow Aquatic (SAF) - June 18, 2020



Activa Baden Lands
REPRESENTATIVE SITE PHOTOGRAPHS

Date: July 2022
Project No: 19M-01246-00
Appendix C



Snapping Turtle digging nest adjacent to Unit 13 / WSU4 — June 18, 2020



Snapping Turtle and Midland Painted Turtle basking in Unit 13 / WSU4—May 3, 2020



Water draining out of agricultural field drain into Unit 8— May 3, 2020



Swamp deciduous forest (SWD) in Unit 6, view facing north from northern property edge — May 3, 2020



APPENDIX D

Vegetation and Flora

Appendix D.1. Vascular plant species list for the Activa Baden Study Area.

SCIENTIFIC NAME	COMMON NAME	CC ¹	CW ¹	OWES WETLAND LIST ²	G_RANK ³	N_RANK	S_RANK ⁴	COSEWIC ⁵	SARA ⁶	SARO ⁷	WATERLOO REGION (1999) ⁸	PHYSIOLOGY /HABIT ¹	NATIVE STATUS ⁹	UNIT 3	UNIT 5	UNIT 6	UNIT 7	UNIT 8	UNIT 9	UNIT 10	UNIT 11	UNIT 12	UNIT 13
<i>Abutilon theophrasti</i>	Velvetleaf		3		GNR	NNA	SNA					Forb	I		X								
<i>Acer saccharum</i>	Sugar Maple	4	3		G5	N5	S5					Tree	N			X				X		X	
<i>Actaea pachypoda</i>	White Baneberry	6	5		G5	NNR	S5					Forb	N			X							
<i>Agrimonia gryposepala</i>	Hooked Agrimony	2	3		G5	N5	S5					Forb	N					X					
<i>Alisma triviale</i>	Northern Water-plantain	1	-5	X	G5	N5	S5					Forb	N	X									X
<i>Alliaria petiolata</i>	Garlic Mustard		0		GNR	NNA	SNA					Forb	I			X				X		X	
<i>Allium tricoccum</i>	Wild Leek	7	3		G5	N5	S4					Forb	N			X							
<i>Ambrosia artemisiifolia</i>	Common Ragweed	0	3		G5	N5	S5					Forb	N		X								
<i>Apocynum cannabinum</i> var. <i>cannabinum</i>	Hemp Dogbane	3	0		G5T5	N5	S5					Forb	N		X								
<i>Arctium minus</i>	Common Burdock		3		GNR	NNA	SNA					Forb	I		X				X				
<i>Arisaema triphyllum</i>	Jack-in-the-pulpit	5	-3	X	G5	N5	S5					Forb	N			X				X		X	
<i>Asarum canadense</i>	Canada Wild Ginger	6	5		G5	N5	S5					Forb	N			X							
<i>Asclepias incarnata</i>	Swamp Milkweed	6	-5	X	G5	N5	S5					Forb	N				X	X					X
<i>Asclepias syriaca</i>	Common Milkweed	0	5		G5	N5	S5					Forb	N		X				X				
<i>Axyris amaranthoides</i>	Russian Pigweed		0		GNR	NNA	SNA					Forb	I										
<i>Barbarea vulgaris</i>	Bitter Wintercress		0		GNR	NNA	SNA					Forb	I		X								
<i>Betula alleghaniensis</i>	Yellow Birch	6	0	X	G5	N5	S5					Tree	N				X						
<i>Bidens cernua</i>	Nodding Beggarticks	2	-5	X	G5	N5	S5					Forb	N					X	X				X
<i>Bidens vulgata</i>	Tall Beggarticks	5	0	X	G5	N5	S5					Forb	N	X	X		X		X		X		
<i>Boehmeria cylindrica</i>	False Nettle	4	-5	X	G5	N5	S5					Forb	N			X							
<i>Bromus inermis</i>	Smooth Brome		5		G5	NNA	SNA					Grass	I		X				X				
<i>Carex crinita</i>	Fringed Sedge	6	-5	X	G5	N5	S5					Sedge	N	X							X		
<i>Carex cristatella</i>	Crested Sedge	3	-3	X	G5	N5	S5					Sedge	N										X
<i>Carex lupulina</i>	Hop Sedge	6	-5	X	G5	N5	S5					Sedge	N			X							
<i>Carex plantaginea</i>	Plantain-leaved Sedge	7	5		G5	N5	S5					Sedge	N			X							
<i>Carex platyphylla</i>	Broad-leaved Sedge	7	5		G5	N5	S4S5				W	Sedge	N			X							
<i>Carex radiata</i>	Eastern Star Sedge	4	0	X	G5	N5	S5					Sedge	N			X							
<i>Carex rosea</i>	Rosy Sedge	2	5		G5	N5	S5					Sedge	N									X	
<i>Carex</i> sp.	Sedge sp.											Sedge											
<i>Carex stipata</i>	Awl-fruited Sedge	3	-5	X	G5	N5	S5					Sedge	N										X
<i>Carex stricta</i>	Tussock Sedge	4	-5	X	G5	N5	S5					Sedge	N	X							X		

SCIENTIFIC NAME	COMMON NAME	CC ¹	CW ¹	OWES WETLAND LIST ²	G_RANK ³	N_RANK	S_RANK ⁴	COSEWIC ⁵	SARA ⁶	SARO ⁷	WATERLOO REGION (1999) ⁸	PHYSIOLOGY /HABIT ¹	NATIVE STATUS ⁹	UNIT 3	UNIT 5	UNIT 6	UNIT 7	UNIT 8	UNIT 9	UNIT 10	UNIT 11	UNIT 12	UNIT 13
<i>Carex tuckermanii</i>	Tuckerman's Sedge	7	-5	X	G5	NNR	S5				W	Sedge	N								X		
<i>Carya cordiformis</i>	Bitternut Hickory	6	0		G5	N5	S5					Tree	N			X							
<i>Caulophyllum giganteum</i>	Giant Blue Cohosh	5	5		G4G5	N4	S5					Forb	N			X		X				X	
<i>Caulophyllum thalictroides</i>	Blue Cohosh	5	5		G5	N5	S5					Forb	N			X							
<i>Celtis occidentalis</i>	Common Hackberry	8	0		G5	N4	S4				W*	Tree	N			X						X	
<i>Chelidonium majus</i>	Greater Celadine		5		GNR	NNA	SNA					Forb	I			X						X	
<i>Chenopodium album</i>	Common Lamb's-quarters		3		G5	NNA	SNA					Forb	I		X				X				
<i>Cichorium intybus</i>	Wild Chicory		5		GNR	NNA	SNA					Forb	I		X								
<i>Cicuta bulbifera</i>	Bulbous Water-hemlock	5	-5	X	G5	N5	S5					Forb	N	X				X			X		
<i>Circaea canadensis</i>	Broad-leaved Enchanter's Nightshade	2	3		G5	N5	S5					Forb	N			X	X			X		X	
<i>Cirsium vulgare</i>	Bull Thistle		3		GNR	NNA	SNA					Forb	I		X				X				
<i>Cornus alternifolia</i>	Alternate-leaved Dogwood	6	3		G5	N5	S5					Shrub	N			X							
<i>Cornus sericea</i>	Red-osier Dogwood	2	-3	X	G5	N5	S5					Shrub	N	X			X				X		
<i>Crataegus punctata</i>	Dotted Hawthorn	4	5		G5	N5	S5					Tree	N		X								
<i>Daucus carota</i>	Wild Carrot		5		GNR	NNA	SNA					Forb	I		X				X				
<i>Digitaria sanguinalis</i>	Hairy Crabgrass		3		G5	NNA	SNA					Grass	I		X								
<i>Dipsacus fullonum</i>	Common Teasel		3		GNR	NNA	SNA					Forb	I		X								
<i>Dryopteris carthusiana</i>	Spinulose Wood Fern	5	-3	X	G5	N5	S5					Fern	N			X							
<i>Echinochloa crus-galli</i>	Large Barnyard Grass		-3	X	GNR	NNA	SNA					Grass	I		X								
<i>Echinocystis lobata</i>	Wild Cucumber	3	-3	X	G5	N5	S5					Vine	N				X						
<i>Eleocharis obtusa</i>	Blunt Spikerush	5	-5	X	G5	N5	S5					Sedge	N										X
<i>Elymus repens</i>	Quackgrass		3		GNR	NNA	SNA					Grass	I		X								
<i>Epilobium ciliatum</i>	Northern Willowherb	3	-3	X	G5	N5	S5					Forb	N					X					
<i>Equisetum arvense</i>	Field Horsetail	0	0	X	G5	N5	S5					Fern	N							X			
<i>Erigeron canadensis</i>	Canada Horseweed	0	3		G5	N5	S5					Forb	N		X								
<i>Erigeron strigosus</i>	Rough Fleabane	4	3		G5	N5	S5					Forb	N		X								
<i>Erythronium americanum</i>	Yellow Trout Lily	5	5		G5	N5	S5					Forb	N		X	X				X		X	
<i>Eupatorium perfoliatum</i>	Common Boneset	2	-3	X	G5	N5	S5					Forb	N	X									
<i>Euthamia graminifolia</i>	Grass-leaved Goldenrod	2	0		G5	N5	S5					Forb	N										
<i>Fagus grandifolia</i>	American Beech	6	3		G5	N5	S4					Tree	N			X							
<i>Fraxinus americana</i>	White Ash	4	3		G5	N5	S4					Tree	N		X					X		X	
<i>Fraxinus pennsylvanica</i>	Green Ash	3	-3	X	G5	N5	S4					Tree	N	X		X	X			X		X	
<i>Galium mollugo</i>	Smooth Bedstraw		5		GNR	NNA	SNA					Forb	I			X							

SCIENTIFIC NAME	COMMON NAME	CC ¹	CW ¹	OWES WETLAND LIST ²	G_RANK ³	N_RANK	S_RANK ⁴	COSEWIC ⁵	SARA ⁶	SARO ⁷	WATERLOO REGION (1999) ⁸	PHYSIOLOGY /HABIT ¹	NATIVE STATUS ⁹	UNIT 3	UNIT 5	UNIT 6	UNIT 7	UNIT 8	UNIT 9	UNIT 10	UNIT 11	UNIT 12	UNIT 13
<i>Geranium robertianum</i>	Herb-Robert	2	3		G5	N4	S5					Forb	I			X							
<i>Geum aleppicum</i>	Yellow Avens	2	0	X	G5	N5	S5					Forb	N			X	X						
<i>Geum canadense</i>	Canada Avens	3	0	X	G5	N5	S5					Forb	N			X							
<i>Glyceria septentrionalis</i>	Eastern Mannagrass	7	-5	X	G5	NNR	S4				W*	Grass	N										X
<i>Glyceria striata</i>	Fowl Mannagrass	3	-5	X	G5	N5	S5					Grass	N			X							
<i>Hackelia virginiana</i>	Virginia Stickseed	5	3		G5	N5	S5				W*	Forb	N					X					
<i>Hepatica acutiloba</i>	Sharp-lobed Hepatica	8	5		G5	N5	S5					Forb	N			X							
<i>Hesperis matronalis</i>	Dame's Rocket		3		G4G5	NNA	SNA					Forb	I			X							
<i>Hydrophyllum virginianum</i>	Virginia Waterleaf	6	0		G5	N5	S5					Forb	N			X							
<i>Impatiens capensis</i>	Spotted Jewelweed	4	-3	X	G5	N5	S5					Forb	N				X	X		X		X	
<i>Iris versicolor</i>	Harlequin Blue Flag	5	-5	X	G5	N5	S5					Forb	N	X									
<i>Juglans cinerea</i>	Butternut	6	3		G4	N3N4	S2?	END	END	END		Tree	N							X			
<i>Juglans nigra</i>	Black Walnut	5	3		G5	N4	S4?				W*+	Tree	N		X	X	X						
<i>Juncus effusus</i>	Soft Rush	4	-5	X	G5	N5	S5					Rush	N										X
<i>Leersia oryzoides</i>	Rice Cutgrass	3	-5	X	G5	N5	S5					Grass	N					X	X				
<i>Leersia virginica</i>	White Cutgrass	6	-3	X	G5	N4N5	S4					Grass	N			X							
<i>Lemna minor</i>	Small Duckweed	5	-5	X	G5	N5	S5?					Forb	N	X				X			X		X
<i>Lemna trisulca</i>	Star Duckweed	6	-5	X	G5	N5	S5					Forb	N										X
<i>Leonurus cardiaca</i>	Common Motherwort		5		GNR	NNA	SNA					Forb	I			X							
<i>Lotus corniculatus</i>	Garden Bird's-foot Trefoil		3		GNR	NNA	SNA					Forb	I		X								
<i>Lycopus americanus</i>	American Water-horehound	4	-5	X	G5	N5	S5					Forb	N	X			X				X		
<i>Lycopus uniflorus</i>	Northern Water-horehound	5	-5	X	G5	N5	S5					Forb	N										X
<i>Lysimachia nummularia</i>	Creeping Yellow Loosestrife		-3		GNR	NNA	SNA					Forb	I	X							X		
<i>Maianthemum racemosum</i>	Large False Solomon's-seal											Forb	N			X							
<i>Onoclea sensibilis</i>	Sensitive Fern	4	-3	X	G5	N5	S5					Fern	N	X							X		
<i>Oxalis corniculata</i>	Creeping Wood-sorrel		3		GNR	NNA	SNA					Forb	I		X								
<i>Panicum capillare</i>	Common Panicgrass	0	0		G5	N5	S5					Grass	N		X								
<i>Parthenocissus quinquefolia</i>	Virginia Creeper	6	3		G5	N4N5	S4?				W+	Vine	N				X						
<i>Parthenocissus vitacea</i>	Thicket Creeper	4	3		G5	N5	S5					Vine	N			X	X			X		X	
<i>Persicaria hydropiperoides</i>	False Waterpepper	4	-5	X	G5	N5	S5					Forb	N					X					
<i>Persicaria maculosa</i>	Spotted Lady's-thumb		-3	X	G3G5	NNA	SNA					Forb	I				X		X				
<i>Phalaris arundinacea</i>	Reed Canary Grass	0	-3		G5	N5	S5					Grass	I	X			X	X	X		X		X
<i>Phleum pratense</i>	Common Timothy		3		GNR	NNA	SNA					Grass	I		X								

SCIENTIFIC NAME	COMMON NAME	CC ¹	CW ¹	OWES WETLAND LIST ²	G_RANK ³	N_RANK	S_RANK ⁴	COSEWIC ⁵	SARA ⁶	SARO ⁷	WATERLOO REGION (1999) ⁸	PHYSIOLOGY /HABIT ¹	NATIVE STATUS ⁹	UNIT 3	UNIT 5	UNIT 6	UNIT 7	UNIT 8	UNIT 9	UNIT 10	UNIT 11	UNIT 12	UNIT 13
<i>Phryma leptostachya</i>	Lopseed	6	3		G5	N5	S4S5					Forb	N			X							
<i>Pilea pumila</i>	Dwarf Clearweed	5	-3	X	G5	N5	S5					Forb	N	X		X					X		
<i>Plantago major</i>	Common Plantain		3		G5	NNA	SNA					Forb	I		X								
<i>Plantago rugelii</i>	Rugel's Plantain	1	0		G5	N5	S5					Forb	N		X								
<i>Poa palustris</i>	Fowl Bluegrass	5	-3	X	G5	N5	S5					Grass	N					X					
<i>Poa pratensis</i>	Kentucky Bluegrass		3		G5	N5	S5					Grass			X				X				
<i>Polygonatum biflorum</i>	Giant Solomon's Seal	8	3		G5	N4	S4					Forb	N			X				X		X	
<i>Polystichum acrostichoides</i>	Christmas Fern	5	3		G5	N5	S5					Fern	N			X							
<i>Populus tremuloides</i>	Trembling Aspen	2	0		G5	N5	S5					Tree	N										
<i>Potamogeton natans</i>	Floating-leaved Pondweed	5	-5	X	G5	N5	S5					Forb	N										X
<i>Potentilla recta</i>	Sulphur Cinquefoil		5		GNR	NNA	SNA					Forb	I		X			X					
<i>Prunus avium</i>	Sweet Cherry		5		GNR	NNA	SNA					Tree	I		X								
<i>Prunus serotina</i>	Black Cherry	3	3		G5	N5	S5					Tree	N			X				X		X	
<i>Prunus virginiana</i>	Chokecherry	2	3		G5	NNR	S5					Shrub	N			X							
<i>Pyrola elliptica</i>	Shinleaf	5	5		G5	N5	S5					Forb	N					X		X			
<i>Quercus rubra</i>	Northern Red Oak	6	3		G5	N5	S5					Tree	N			X							
<i>Ranunculus sceleratus</i> var. <i>sceleratus</i>	Cursed Buttercup		-5	X	G5T5	N5	SNA					Forb	N										
<i>Rhus typhina</i>	Staghorn Sumac	1	3		G5	N5	S5					Shrub	N		X								
<i>Rubus allegheniensis</i>	Alleghany Blackberry	2	3		G5	N5	S5					Shrub	N		X	X							
<i>Rubus idaeus</i> ssp. <i>strigosus</i>	North American Red Raspberry	2	3		G5T5	N5	S5					Shrub	N		X								
<i>Salix alba</i>	White Willow		-3	X	G5	NNA	SNA					Tree	I										
<i>Salix amygdaloides</i>	Peach-leaved Willow	6	-3	X	G5	N5	S5					Tree	N	X							X		
<i>Salix discolor</i>	Pussy Willow	3	-3	X	G5	N5	S5					Shrub	N										
<i>Salix eriocephala</i>	Cottony Willow	4	-3	X	G5	N5	S5					Shrub	N	X			X	X			X		X
<i>Salix euxina</i>	Crack Willow		0		GNR	NNA	SNA					Tree	I	X			X	X					X
<i>Salix lucida</i>	Shining Willow	5	-3	X	G5	NNR	S5					Shrub	N	X							X		
<i>Sambucus canadensis</i>	Common Elderberry	5	-3	X	G5	NNR	S5					Shrub	N		X								
<i>Sambucus racemosa</i>	Red Elderberry	5	3		G5	N5	S5					Shrub	N			X				X		X	
<i>Sanguinaria canadensis</i>	Bloodroot	5	3		G5	N5	S5					Forb	N			X							
<i>Schoenoplectus tabernaemontani</i>	Soft-stemmed Bulrush	5	-5	X	G5	N5	S5					Sedge	N										
<i>Scirpus cyperinus</i>	Common Woolly Bulrush	4	-5	X	G5	N5	S5					Sedge	N										X
<i>Scutellaria galericulata</i>	Marsh Skullcap	6	-5	X	G5	N5	S5					Forb	N					X					
<i>Setaria viridis</i>	Green Foxtail		5		GNR	NNA	SNA					Grass	I		X								

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<i>Sium suave</i>	Common Water-parsnip	4	-5	X	G5	N5	S5					Forb	N	X									
<i>Solanum dulcamara</i>	Climbing Nightshade		0	X	GNR	NNA	SNA					Forb	I	X			X						X
<i>Solanum nigrum</i>	European Black Nightshade		0		GNR	NNA	SNA					Forb	I				X						
<i>Solidago altissima</i> var. <i>altissima</i>	Eastern Tall Goldenrod	1	3		G--T5	N5	S5					Forb	N		X								
<i>Solidago flexicaulis</i>	Zigzag Goldenrod	6	3		G5	N5	S5					Forb	N			X							
<i>Sonchus asper</i>	Prickly Sow-thistle		3		GNR	NNA	SNA					Forb	I		X				X				
<i>Spiraea alba</i>	White Meadowsweet	3	-3	X	G5	N5	S5					Shrub	N	X				X			X		
<i>Spirodela polyrhiza</i>	Great Duckweed	4	-5	X	G5	N5	S5					Forb	N	X				X			X		X
<i>Stuckenia pectinata</i>	Sago Pondweed	4	-5	X	G5	N5	S5					Forb	N										X
<i>Symphyotrichum lanceolatum</i>	Panicked Aster	3	-3	X	G5	N5	S5					Forb	N		X		X						
<i>Symphyotrichum lateriflorum</i>	Calico Aster	3	0		G5	N5	S5					Forb	N				X						
<i>Symphyotrichum novae-angliae</i>	New England Aster	2	-3		G5	N5	S5					Forb	N		X								
<i>Symplocarpus foetidus</i>	Eastern Skunk Cabbage	7	-5	X	G5	N5	S5					Forb	N					X					
<i>Taraxacum officinale</i>	Common Dandelion		3		G5	N5	SNA					Forb	I		X								
<i>Tilia americana</i>	Basswood	4	3		G5	N5	S5					Tree	N			X							
<i>Toxicodendron radicans</i> var. <i>rydbergii</i>	Western Poison Ivy	2	0		G--T5	N5	S5					Vine	N			X							
<i>Trifolium hybridum</i>	Alsike Clover		3		GNR	NNA	SNA					Forb	I		X								
<i>Trifolium pratense</i>	Red Clover		3		GNR	NNA	SNA					Forb	I		X								
<i>Trillium grandiflorum</i>	White Trillium	5	3		G5	N5	S5					Forb	N			X						X	
<i>Tsuga canadensis</i>	Eastern Hemlock	7	3	X	G5	N5	S5					Tree	N			X							
<i>Typha angustifolia</i>	Narrow-leaved Cattail		-5	X	G5	N5	SNA					Forb	I					X					
<i>Typha latifolia</i>	Broad-leaved Cattail	1	-5	X	G5	N5	S5					Forb	N										X
<i>Ulmus americana</i>	White Elm	3	-3	X	G5	N5	S5					Tree	N		X	X	X			X			
<i>Urtica dioica</i>	Stinging Nettle	2	0		G5	N5	S5					Forb	N					X					
<i>Urtica dioica</i> ssp. <i>gracilis</i>	Slender Stinging Nettle	2	0	X	G5T5	N5	S5					Forb	N						X				
<i>Verbena hastata</i>	Blue Vervain	4	-3	X	G5	NNR	S5					Forb	N				X		X				
<i>Veronica chamaedrys</i>	Germander Speedwell		5		GNR	NNA	SNA					Forb	I		X								
<i>Vicia cracca</i>	Tufted Vetch		5		GNR	NNA	SNA					Forb	I		X								
<i>Viola pubescens</i>	Downy Yellow Violet	5	3		G5	N5	S5					Forb	N			X						X	
<i>Viola sororia</i>	Woolly Blue Violet	4	0	X	G5	N5	S5					Forb	N			X							
<i>Wolffia borealis</i>	Northern Watermeal	4	-5	X	G5	N5	S5				W*	Forb	N										X

PLANT LIST LEGEND

Scientific Name, Common Name and Family

Based on Vascan (Feb 2020) and NHIC (Feb 2020)

Vascan: <http://data.canadensys.net/vascan/search>

NHIC: http://www.sse.gov.on.ca/sites/MNR-PublicDocs/EN/ProvincialServices/Ontario_Vascular_Plants.xlsx

¹ Coefficient of Conservatism, Coefficient of Wetness, Weediness, and Physiology/Habit

Oldham, M. J., W. D. Bakowsky and D. A. Sutherland. 1995. Floristic Quality Assessment System for Southern Ontario. Natural Heritage Information Centre, Ministry of Natural Resources. Peterborough, Ontario.

NHIC: http://www.sse.gov.on.ca/sites/MNR-PublicDocs/EN/ProvincialServices/Ontario_Vascular_Plants.xlsx

CC and CW values reflect updates by NHIC, current as of Dec. 16, 2018).

CC: Coefficient of Conservatism. Rank of 0 to 10 based on plants degree of fidelity to a range of synecological parameters: (0-3) Taxa found in a variety of plant communities; (4-6) Taxa typically associated with a specific plant community but tolerate moderate disturbance; (7-8) Taxa associated with a plant community in an advanced successional stage that has undergone minor disturbance; (9-10) Taxa with a high fidelity to a narrow range of synecological parameters.

CW: Coefficient of Wetness. Value between 5 and -5. A value of -5 is assigned to Obligate Wetland (OBL) and 5 to Obligate Upland (UPL), with intermediate values assigned to the remaining categories.

Weediness: Weediness Score, assigned to all non-native species and range from -1 (low impact of the species on natural areas) to -3 (high impact of the species on natural areas).

Habit: Physiology/Habit. The growth form of the species (e.g. forb, shrub, tree).

² OWES Wetland Plant List

Ontario Ministry of Natural Resources. 2013. Ontario Wetland Evaluation System Southern Manual. 3rd Edition, Version 3.3

Species presence or absence on the Ontario Wetland Evaluation System (OWES) Wetland Plant List.

Codes are defined as follows:

X: Present on the list

³ G-Rank (Global)

Global Status from Nature Serve (via NHIC, Feb 2020)

NS: <http://explorer.natureserve.org/>

NHIC: http://www.sse.gov.on.ca/sites/MNR-PublicDocs/EN/ProvincialServices/Ontario_Vascular_Plants.xlsx

Global ranks are assigned by a consensus of the network of Conservation Data Centres (CDCs), scientific experts, and the Nature Conservancy to designate a rarity rank based on the range-wide status of a species, subspecies, or variety.

Global (G) Conservation Status Ranks

G1: Critically Imperiled - At very high risk of extinction or elimination due to very restricted range, very few populations or occurrences, very steep declines, very severe threats, or other factors.

G2: Imperiled - at high risk of extinction or elimination due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.

G3: Vulnerable - At moderate risk of extinction or elimination due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.

G4: Apparently Secure - At fairly low risk of extinction or elimination due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors.

G5: Secure - At very low risk of extinction or elimination due to a very extensive range, abundant populations or occurrences, and little to no concern from declines or threats.

Range Rank – A numeric range rank (e.g., G2G3, G1G3) is used to indicate the range of uncertainty about the exact status of a taxon or ecosystem type. Ranges cannot skip more than two ranks (e.g., GU should be used rather than G1G4).

G#G#: Range Rank.

GX: Presumed Extinct - Not located despite intensive searches and virtually no likelihood of rediscovery.

GH: Possibly Extinct - Known from only historical occurrences but still some hope of rediscovery. Examples of evidence include (1) that a species has not been documented in approximately 20-40 years despite some searching and/or some evidence of significant habitat loss or degradation; (2) that a species has been searched for unsuccessfully, but not thoroughly enough to presume that it is extinct or eliminated throughout its range.

GU: Unrankable – Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.

GNR: Unranked – Global rank not yet assessed.

GNA: Not Applicable – A conservation status rank is not applicable because the species is not a suitable target for conservation activities. A global conservation status rank may be not applicable for several reasons, related to its

relevance as a conservation target. For species, typically the species is a hybrid without conservation value, or of domestic origin. For ecosystems, the type is typically non-native (e.g. many ruderal vegetation types), agricultural (e.g. pasture, orchard) or developed (e.g. lawn, garden, golf course).

- ?: Inexact Numeric Rank – Denotes inexact numeric rank; this should not be used with any of the Variant Global Conservation Status Ranks or GX or GH.
- T#: Intraspecific Taxon (trinomial) - The status of infraspecific taxa (subspecies or varieties) are indicated by a "T-rank" following the species' global rank. Rules for assigning T-ranks follow the same principles outlined above. For example, the global rank of a critically imperiled subspecies of an otherwise widespread and common species would be G5T1. A T subrank cannot imply the subspecies or variety is more abundant than the species, for example, a G1T2 subrank should not occur. A vertebrate animal population (e.g., listed under the U.S. Endangered Species Act or assigned candidate status) may be tracked as an infraspecific taxon and given a T rank; in such cases a Q is used after the T-rank to denote the taxon's informal taxonomic status.
- T#: Questionable taxonomy that may reduce conservation priority – Distinctiveness of this entity as a taxon or ecosystem type at the current level is questionable; resolution of this uncertainty may result in change from a species to a subspecies or hybrid, or inclusion of this taxon or type in another taxon or type, with the resulting taxon having a lower priority (numerically higher) conservation status rank. The "Q" modifier is only used at a global level and not at a national or subnational level.
- Q: Captive or Cultivated Only – Taxon or ecosystem at present is presumed or possibly extinct or eliminated in the wild across their entire native range but is extant in cultivation, in captivity, as a naturalized population (or populations) outside their native range, or as a reintroduced population or ecosystem restoration, not yet established. The "C" modifier is only used at a global level and not at a national or subnational level. Possible ranks are GXC or GHC. This is equivalent to "Extinct" in the Wild (EW) in IUCN's Red List terminology (IUCN 2001).
- C:

4 S-Ranks (Provincial)

Provincial Status from the NHIC (Feb 2020)

- NHIC: http://www.sse.gov.on.ca/sites/MNR-PublicDocs/EN/ProvincialServices/Ontario_Vascular_Plants.xlsx
- Provincial (or Subnational) ranks are used by the Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. These ranks are not legal designations. Provincial ranks are assigned in a manner similar to that described for global ranks, but consider only those factors within the political boundaries of Ontario.
- S1: Critically Imperiled – At very high risk of extirpation in the jurisdiction due to very restricted range, very few populations or occurrences, very steep declines, severe threats, or other factors.
- S2: Imperiled – At high risk of extirpation in the jurisdiction due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.
- S3: Vulnerable – At moderate risk of extirpation in the jurisdiction due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.
- S4: Apparently Secure – At a fairly low risk of extirpation in the jurisdiction due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors.
- S5: Secure – At very low or no risk of extirpation in the jurisdiction due to a very extensive range, abundant populations or occurrences, with little to no concern from declines or threats.
- S#S#: Range Rank – A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).
- SX: Presumed Extirpated – Species or ecosystem is believed to be extirpated from the jurisdiction (province). Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered. [equivalent to "Regionally Extinct" in IUCN Red List terminology]
- SH: Possibly Extirpated (Historical) – Known from only historical records but still some hope of rediscovery. There is evidence that the species or ecosystem may no longer be present in the jurisdiction, but not enough to state this with certainty. Examples of such evidence include (1) that a species has not been documented in approximately 20-40 years despite some searching and/or some evidence of significant habitat loss or degradation; (2) that a species or ecosystem has been searched for unsuccessfully, but not thoroughly enough to presume that it is no longer present in the jurisdiction.
- SNR: Unranked – subnational conservation status not yet assessed.
- SU: Unrankable – Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
- SNA: Not Applicable – A conservation status rank is not applicable because the species is not a suitable target for conservation activities (e.g., long distance aerial and aquatic migrants, hybrids without conservation value, and non-native species).
- ?: Inexact or Uncertain - Denotes inexact or uncertain numeric rank.
- T#: Intraspecific Taxon (trinomial) - The status of infraspecific taxa (subspecies or varieties) are indicated by a "T-rank" following the species' global rank. Rules for assigning T-ranks follow the same principles outlined above. For example, the subnational rank of a critically imperiled subspecies of an otherwise widespread and common species would be S5T1. A T subrank cannot imply the subspecies or variety is more abundant than the species, for example, a S1T2 subrank should not occur. A vertebrate animal population may be tracked as an infraspecific taxon and given a T rank; in such cases a Q is used after the T-rank to denote the taxon's informal taxonomic status.

⁵ COSEWIC (Committee on the Status of Endangered Wildlife in Canada)

The federal review process is implemented by COSEWIC (Status as of Feb 2020)

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) is an independent advisory panel to the Minister of Environment and Climate Change Canada that meets twice a year to assess the status of wildlife species at risk of extinction.

<https://www.canada.ca/en/environment-climate-change/services/committee-status-endangered-wildlife.html>

EXT:	Extinct – A species that no longer exists.
EXP:	Extirpated – A species no longer existing in the wild in Canada, but occurring elsewhere.
END:	Endangered – A species facing imminent extirpation or extinction.
THR:	Threatened – A species likely to become endangered if limiting factors are not reversed.
SC:	Special Concern – A species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.
NAR:	Not At Risk – A species that has been evaluated and found to be not at risk of extinction given the current circumstances.
DD:	Data Deficient – Available information is insufficient (a) to resolve a species' eligibility for assessment or (b) to permit an assessment of the species' risk of extinction.

⁶ SARA (Species at Risk Act) Status and Schedule

Federal status from the Government of Canada's Species at Risk Public Registry (Status as of Feb 2020)

<http://www.registrelep-sararegistry.gc.ca/>

The Act establishes Schedule 1, as the official list of species at risk in Canada. It classifies those species as being either Extirpated, Endangered, Threatened, or a Special Concern. Once listed, the measures to protect and recover a listed species are implemented. However, please note that while Schedule 1 lists species that are extirpated, endangered, threatened and of special concern, the prohibitions do not apply to species of special concern.

EXT:	Extinct – A species that no longer exists.
EXP:	Extirpated – A species that no longer exists in the wild in Canada, but exists elsewhere in the wild.
END:	Endangered – A species that is facing imminent extirpation or extinction.
THR:	Threatened – A species likely to become endangered if limiting factors are not reversed.
SC:	Special Concern – A species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.

⁷ SARO (Species At Risk in Ontario)

Provincial status from MNRF (Status as of Dec. 2018)

<https://www.ontario.ca/environment-and-energy/species-risk-ontario-list>

The provincial review process is implemented by the MNR's Committee on the Status of Species at Risk in Ontario (COSSARO). COSSARO is an independent advisory panel to the Ontario Ministry of Natural Resources and Forestry that assesses the status of species at risk of extinction.

EXP:	Extirpated – Somewhere in the world, and once lived in the wild in Ontario, but no longer lives in the wild in Ontario.
END:	Endangered – Lives in the wild in Ontario but is facing imminent extinction or extirpation.
THR:	Threatened – Lives in the wild in Ontario, is not endangered, but is likely to become endangered if steps are not taken to address factors threatening it.
SC:	Special Concern – Lives in the wild in Ontario, is not endangered or threatened, but may become threatened or endangered due to a combination of biological characteristics and identified threats.

⁸ Regional Status - Region of Waterloo

Regional Municipality of Waterloo, 1999. Revisions to Waterloo Region's Significant Species List: Vascular Plants Component. Report to Planning and Culture Committee PC-99-028.1. Approved by Council June 23, 1999.

Codes are defined as follows:

W:	Significant in the Region of Waterloo
W*:	Significant in the Region of Waterloo but with the expectation that additional research may prove otherwise.
W+:	Significant in the Region of Waterloo ONLY if demonstrably indigenous – most populations in RMW are thought to be of non-indigenous origin.
W#:	Significant in the Region of Waterloo but known RMW reports are treated as hypothetical.

⁹ Native Status

Based on Vascan (Feb 2020) and NHIC (Feb 2020)

Vascan: <http://data.canadensys.net/vascan/search>

NHIC: http://www.sse.gov.on.ca/sites/MNR-PublicDocs/EN/ProvincialServices/Ontario_Vascular_Plants.xlsx

Codes are defined as follows: N = Native, I = Introduced

APPENDIX E

Breeding Bird Survey Results

Appendix E - Breeding Bird Survey Results

Common Name	Scientific Name	GRANK ¹	SRANK ²	SARO (ESA) Status ³	COSEWIC Status ⁴	SARA Status ⁵	Schedule ⁵	Waterloo Region 1996 Significance ⁶	Area Sensitive Birds - Ecoregion 6E ⁷	Habitat Use ⁸	Protected Under MBCA	WSU1		WSU2a		WSU2b		WSU3		WSU4		WSU5a		WSU5b		Overall Study Area	
												Highest Abundance	Highest Breeding Evidence	Highest Abundance	Highest Breeding Evidence	Highest Abundance	Highest Breeding Evidence	Highest Abundance	Highest Breeding Evidence	Highest Abundance	Highest Breeding Evidence	Highest Abundance	Highest Breeding Evidence	Highest Abundance	Highest Breeding Evidence	Highest Abundance	Highest Breeding Evidence
American Crow	<i>Corvus brachyrhynchos</i>	G5	S5B							E				1	S							1	S			1	POSS
American Goldfinch	<i>Spinus tristis</i>	G5	S5B							E	✓	2	T					2	S			1	S	2	S	2	PROB
American Redstart	<i>Setophaga ruticilla</i>	G5	S5B					W		I	✓					1	S									1	POSS
American Robin	<i>Turdus migratorius</i>	G5	S5B							E	✓	5	T	2	T	2	T									5	PROB
Baltimore Oriole	<i>Icterus galbula</i>	G5	S4B								✓			1	S			2	T							2	PROB
Barn Swallow	<i>Hirundo rustica</i>	G5	S4B	THR	THR	THR	1				✓	1	X													1	OBS
Black-capped Chickadee	<i>Poecile atricapillus</i>	G5	S5							I/E	✓					2	T	2	S							2	PROB
Blue-gray Gnatcatcher	<i>Polioptila caerulea</i>	G5	S4B					W*		I/E	✓											2	X			1	OBS*
Blue Jay	<i>Cyanocitta cristata</i>	G5	S5							E				1	S	2	T									2	PROB
Bobolink	<i>Dolichonyx oryzivorus</i>	G5	S4B	THR	THR	THR	1			E	✓	1	X													1	OBS
Brown-headed Cowbird	<i>Molothrus ater</i>	G5	S4B							M/F		1	T					1	S					1	S	1	PROB
Canada Goose	<i>Branta canadensis</i>	G5	S5							E	✓	33	X													33	OBS
Cedar Waxwing	<i>Bombycilla cedrorum</i>	G5	S5B							E	✓			3	T			3	S							3	PROB
Chipping Sparrow	<i>Spizella passerina</i>	G5	S5B							E	✓	1	T													1	PROB
Common Grackle	<i>Quiscalus quiscula</i>	G5	S5B							E		2	S							1	S					2	POSS
Common Yellowthroat	<i>Geothlypis trichas</i>	G5	S5B							E	✓							2	S							2	POSS
Downy Woodpecker	<i>Picoides pubescens</i>	G5	S5							I	✓					1	T	1	S							1	PROB
European Starling	<i>Sturnus vulgaris</i>	G5	SNA									3	T													3	PROB
Gray Catbird	<i>Dumetella carolinensis</i>	G5	S4B							I	✓					1	S	1	S					1	S	1	POSS
Great Crested Flycatcher	<i>Myiarchus crinitus</i>	G5	S4B							E	✓			1	S	2	T									2	PROB
Horned Lark	<i>Eremophila alpestris</i>	G5	S5B,SZN								✓	2	T													2	PROB
House Wren	<i>Troglodytes aedon</i>	G5	S5B							E	✓			1	T											1	PROB
Indigo Bunting	<i>Passerina cyanea</i>	G5	S4B							E	✓			2	T	1	S							1	T	2	PROB
Killdeer	<i>Charadrius vociferus</i>	G5	S5B,S5N							E	✓	4	T													4	PROB
Least Flycatcher	<i>Empidonax minimus</i>	G5	S4B					W		E	✓			1	S											1	POSS
Mallard	<i>Anas platyrhynchos</i>	G5	S5							E	✓							8	FY							8	CONF
Mourning Dove	<i>Zenaida macroura</i>	G5	S5							E	✓	2	T													2	PROB
Northern Cardinal	<i>Cardinalis cardinalis</i>	G5	S5								✓					1	S									1	POSS
Northern Flicker	<i>Colaptes auratus</i>	G5	S4B							I/E	✓					1	T									1	PROB
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>	G5	S4					W		I/E	✓					1	S									1	POSS
Red-eyed Vireo	<i>Vireo olivaceus</i>	G5	S5B							I/E	✓			1	S	2	T									2	PROB
Red-tailed Hawk	<i>Buteo jamaicensis</i>	G5	S5							I/E						1	X									1	OBS*
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	G5	S4									1	S	6	S			18	CF	4	T	3	T	3	T	18	CONF
Ruby-crowned Kinglet	<i>Regulus calendula</i>	G5	S4B					W*			✓											1	X			1	OBS*
Savannah Sparrow	<i>Passerculus sandwichensis</i>	G5	S4B						X	E	✓	6	T													6	PROB
Song Sparrow	<i>Melospiza melodia</i>	G5	S5B							I/E	✓	2	T	1	S			2	S	1	T	1	S	1	S	2	PROB
Swamp Sparrow	<i>Melospiza georgiana</i>	G5	S5B							E	✓							2	S							2	POSS
Turkey Vulture	<i>Cathartes aura</i>	G5	S5B					W*		E		1	X													1	OBS*
Warbling Vireo	<i>Vireo gilvus</i>	G5	S5B							E	✓							1	S							1	POSS
White-breasted Nuthatch	<i>Sitta carolinensis</i>	G5	S5							E	✓					1	T									1	PROB
White-throated Sparrow	<i>Zonotrichia albicollis</i>	G5	S5B					W*			✓					1	X									1	OBS*
Wild Turkey	<i>Meleagris gallopavo</i>	G5	S5B							E						1	X									1	OBS*
Wilson's Snipe	<i>Gallinago delicata</i>	G5	S5B,SZN					W		I/E	✓							1	H							1	POSS
Wood Duck	<i>Aix sponsa</i>	G5	S5					W*		I/E	✓							2	X							2	OBS*
Wood Thrush	<i>Hylocichla mustelina</i>	G5	S4B	SC	THR	THR	1			I/E	✓			1	S											1	POSS
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	G5	S5B					W*		I/E	✓			1	X											1	OBS*
Yellow Warbler	<i>Setophaga petechia</i>	G5	S5B							S/B, M/F	✓							1	T	1	S	1	S	1	S	1	PROB
Total species with breeding evidence: 36				3	3	3	3	4	1			16		14		16		16		4		8		6		47	

* Indicates incidental observations during surveys outside of breeding bird period (i.e., Turtle Basking, Amphibian Calling

Surveys), which are likely migrant or foraging visitants

Breeding Bird Data Table Legend

Ontario Breeding Bird Atlas - Breeding Evidence Codes

OBSERVED

X Species observed in its breeding season (no breeding evidence).

POSSIBLE

H Species observed in its breeding season in suitable nesting habitat.

S Singing male(s) present, or breeding calls heard, in suitable nesting habitat in breeding season.

PROBABLE

P Pair observed in suitable nesting habitat in nesting season.

T Permanent territory presumed through registration of territorial behaviour (song, etc.) on at least two days, a week or more apart, at the same place.

D Courtship or display, including interaction between a male and a female or two males, including courtship feeding or copulation.

V Visiting probable nest site

A Agitated behaviour or anxiety calls of an adult.

B Brood Patch on adult female or cloacal protuberance on adult male.

N Nest-building or excavation of nest hole.

CONFIRMED

DD Distraction display or injury feigning.

NU Used nest or egg shells found (occupied or laid within the period of the survey).

FY Recently fledged young (nidicolous species) or downy young (nidifugous species), including incapable of sustained flight.

AE Adult leaving or entering nest sites in circumstances indicating occupied nest.

FS Adult carrying fecal sac.

CF Adult carrying food for young.

NE Nest containing eggs.

NY Nest with young seen or heard.

Conservation Status

¹G-Rank (global)

Global ranks are assigned by a consensus of the network of Conservation Data Centres (CDCs), scientific experts, and the Nature Conservancy to designate a rarity rank based on the range-wide status of a species, subspecies, or variety.

G1 Extremely rare - usually 5 or fewer occurrences in the overall range or very few remaining individuals; or because of some factor(s) making it especially vulnerable to Extinction.

G2 Very rare - usually between 5 and 20 occurrences in the overall range or with many individuals in fewer occurrences; or because of some factor(s) making it vulnerable to Extinction.

G3 Rare to uncommon - usually between 20 and 100 occurrences; may have fewer occurrences, but with a large number of individuals in some populations; may be susceptible to large-scale disturbances.

G4 Common - usually more than 100 occurrences; usually not susceptible to immediate threats.

G5 Very common - demonstrably secure under present conditions.

² S-Ranks (provincial)

Provincial (or Subnational) ranks are used by the Natural Heritage Information Centre (NHIC) to set protection priorities for rare species and natural communities. These ranks are not legal designations. Provincial ranks are assigned in a manner similar to that described for global ranks, but consider only those factors within the political boundaries of Ontario.

- S1 Critically Imperiled - Critically imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province.
- S2 Imperiled - Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province.
- S3 Vulnerable - Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
- S4 Apparently Secure - Uncommon but not rare; some cause for long-term concern due to declines or other factors.
- S5 Secure - Common, widespread, and abundant in the nation or state/province.
- S#S# Range Rank - A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).
- SAN Non-breeding accidental.
- SE Exotic - not believed to be a native component of Ontario's fauna.
- SZN Non-breeding migrants/vagrants.
- SZB Breeding migrants/vagrants.

³ Ontario Endangered Species Act (ESA) Status

Provincial status from MECP (Status as of Dec. 2020)

<https://www.ontario.ca/page/species-risk-ontario>

The provincial review process is implemented by the Committee on the Status of Species at Risk in Ontario (COSSARO). COSSARO is an independent advisory panel to the Ontario Ministry of Environment, Conservation and Parks (MECP) that assesses the status of species at risk of extinction.

MECP Conservation Status Ranks

- EXT Extinct - A species that no longer exists anywhere in the world.
- EXP Extirpated - A species that lives somewhere in the world, lived at one time in the wild in Ontario, but no longer lives in the wild in Ontario.
- END Endangered - A species that is facing imminent Extinction or extirpation.
- THR Threatened - A species that is likely to become Endangered if steps are not taken to address factors threatening to lead to its Extinction or extirpation.
- SC Special Concern – A species that may become Threatened or Endangered because of a combination of biological characteristics and identified threats.

⁴ COSEWIC (Committee on the Status of Endangered Wildlife in Canada)

The federal review process is implemented by COSEWIC (Status as of Dec. 2020)

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) is an independent advisory panel to the Minister of Environment and Climate Change Canada that meets twice a year to assess the status of wildlife species at risk of extinction.

<https://www.canada.ca/en/environment-climate-change/services/committee-status-endangered-wildlife.html>

COSEWIC Conservation Status Ranks

- EXT Extinct - A species that no longer exists.
- EXP Extirpated - A species no longer existing in the wild in Canada, but occurring elsewhere.
- END Endangered - A species facing imminent extirpation or Extinction.

- THR Threatened - A species likely to become Endangered if limiting factors are not reversed.
- SC Special Concern (formerly vulnerable) - A species that may become a Threatened or an Endangered species because of a combination of biological characteristics and identified threats.
- NAR Not At Risk - A species that has been evaluated and found to be not at risk of Extinction given the current circumstances.
- DD Data Deficient (formerly Indeterminate) - Available information is insufficient to resolve a species' eligibility for assessment or to permit an assessment of the species' risk of Extinction.

⁵ SARA (Species at Risk Act) Status and Schedule

Federal status from the Government of Canada's Species at Risk Public Registry (Status as of Dec. 2020)
<https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html>

The Act establishes Schedule 1, as the official list of wildlife species at risk. It classifies those species as being either Extirpated, Endangered, Threatened, or a Special Concern. Once listed, the measures to protect and recover a listed wildlife species are implemented.

- EXT Extinct - A wildlife species that no longer exists.
- EXP Extirpated - A wildlife species that no longer exists in the wild in Canada, but exists elsewhere in the wild.
- END Endangered - A wildlife species that is facing imminent extirpation or Extinction.
- THR Threatened - A wildlife species that is likely to become Endangered if nothing is done to reverse the factors leading to its extirpation or Extinction.
- SC Special Concern - A wildlife species that may become a Threatened or an Endangered species because of a combination of biological characteristics and identified threats.

Schedule 1: is the official list of species that are classified as Extirpated, Endangered, Threatened and Special Concern.

Schedule 2: species listed in Schedule 2 are species that had been designated as Endangered or Threatened, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.

Schedule 3: species listed in Schedule 3 are species that had been designated as Special Concern, and have yet to be re-assessed by COSEWIC using revised criteria. Once these species have been re-assessed, they may be considered for inclusion in Schedule 1.

The Act establishes Schedule 1 as the official list of wildlife species at risk. However, please note that while Schedule 1 lists species that are Extirpated, Endangered, Threatened and Special Concern, the prohibitions do not apply to species of Special Concern.

Species that were designated at risk by COSEWIC prior to October 1999 (Schedule 2 & 3) must be reassessed using revised criteria before they can be considered for addition to Schedule 1 of SARA. After they have been assessed, the Governor in Council may on the recommendation of the Minister, decide on whether or not they should be added to the List of Wildlife Species at Risk.

⁶ Waterloo Region Significance (1996)

From Regional Municipality of Waterloo Significant Species List Breeding Birds (1996).

Significant ONLY when evidence of breeding (many are common and widespread as migrants).

Main purpose of the list is in evaluation of the 'significant species' criterion for the designation of Environmentally Sensitive Policy Areas.

W = Waterloo: Regionally Significant

W* = Significant only when nesting in natural circumstances

V = Very Rare (0-3 occurrences)

R = Rare (0-5)

S = Scarce (6-20)

U = Uncommon (21-100)

C = Common (>100)

I = Introduced

CV = Canada (COSEWIC) Vulnerable; CT = Canada (COSEWIC) Threatened; CE = Canada (COSEWIC) Endangered

OV = Ontario (MNR) Vulnerable; OT = Ontario (MNR) Threatened; OE = Ontario (MNR) Endangered

Note: A number of the COSEWIC and MNR designations have changed since when the Region of Waterloo list was created in 1996. Please use the other columns for the most up-to-date COSEWIC and MNR rankings.

⁷ MNRF SWH (Significant Wildlife Habitat) Area Sensitive Species

Area Sensitivity is defined as species requiring large areas of suitable habitat in order to sustain population numbers

From: Ministry of Natural Resources and Forestry. 2015. Significant Wildlife Habitat Criteria Schedules For Ecoregion 6E. January, 2015. Regional Operations Division, Southern Region Resources Section. 39pp.

⁸ Habitat Use

I=interior species, I/E=interior edge species, E=edge species (Freemark and Collins, 1989); M/F=Marsh/Fen, S/B=Treeed Swamp/Bog. Interior bird species require habitat which is often found 100m from the forest edge while Interior/Edge species are found within both interior and edge habitat. Often Interior and Interior/Edge are more sensitive to urban encroachment as they require these large, relatively undisturbed forest habitats to support viable populations. The increasing urbanization of rural areas often results in increased parasitism and predation as well as disturbance from human recreational activities (e.g. illegal bike trails, dumping and pets.) (Freemark, K. and Collins, B. 1989. *Landscape ecology of birds breeding in temperate forest fragments*. – In: Hagan III, J. M. and Johnston, D. W. (eds), *Ecology and conservation of neotropical migrant landbirds*. Smithsonian Inst. Press, pp. 443–454)

APPENDIX F

Significant Wildlife Habitat Evaluation

This evaluation is based on the Significant Wildlife Habitat Ecoregion Criteria Schedules for Ecoregion 6E (MNRF January 2015). The following text and tables are from that document, but include an additional ‘evaluation’ column, with discussion of site-specific attributes within the Activa Baden North Lands study area. Results are as follows:

Candidate (Unconfirmed):

6. Bat Maternity Colonies

Candidate (unconfirmed) SWH is present in WSU2b where mature Sugar Maple trees are present.

7. Turtle Wintering Areas

Conclusion: Candidate (unconfirmed) SWH is present in WSU 2a, WSU4, WSU5a and WSU5b

26. Turtle Nesting Areas

Candidate (unconfirmed) SWH is present adjacent to the marsh wetlands (WSU3, WSU4, WSU5a / 5b)

Confirmed:

28. Amphibian Breeding Habitat (Woodland)

Conclusion: SWH is present in WSU3

34. Terrestrial Crayfish

Confirmed SWH is present in the wetland Ecosites (SWD – Unit 7, MAS – Unit 8 and MAM – Unit 13), and immediately adjacent to Unit 13 (the area of the burrows extended ~1 m into the agricultural field within the buffer of the wetland).

35. Special Concern and Rare Wildlife Species

- Confirmed SWH is present in WSU4 (Snapping Turtle) and WSU2a (Wood Thrush)

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SCHEDULE 6E: IDENTIFICATION OF Significant Wildlife Habitat

This schedule is designed to provide the recommended criteria for identifying Significant Wildlife Habitat (SWH) within EcoRegion 6E ^{ccxvi}. Tables 1.1 through 1.4 within the Schedules provide guidance for SWH designation for the four categories of SWH outlined in the Significant Wildlife Habitat Technical Guide and its Appendices ^{exlviii}, ^{exlix}. Table 1.5 contains and provides descriptions for exceptions criteria for ecoregional SWH which will be identified at an ecodistrict scale ^{ccxvi}. Exceptions occur when criteria for a specific habitat are different within an ecodistrict compared to the remainder of an ecoregion or if a habitat only occurs within a restricted area of the ecoregion.

The schedules, including description of wildlife habitat, wildlife species, and the criteria provided for determining SWH, are based on science and expert knowledge. The ELC Ecosite codes are described using the Ecological Land Classification (ELC) for Southern Ontario ^{lxviii}. The information within these schedules will require periodic updating to keep pace with changes to wildlife species status in the Species at Risk in Ontario (SARO) list, or as new scientific information pertaining to wildlife habitats becomes available. Therefore, MNRF will occasionally need to review and update these schedules and provide addenda. A reference document for all SWH is found after the schedules and includes citations for all ecoregional schedules. Each citation used to assist with the criteria for SWH will be indicated by a roman numeric symbol. Where no reference exists, MNRF expert opinion was used for determination of criteria, this symbol “(E)” represents when MNRF expert opinion was utilized to develop defining criteria.

Criteria For Significant Wildlife Habitat in Ecoregion 6E

1. 1 SEASONAL CONCENTRATION AREAS OF ANIMALS

Seasonal concentration areas are areas where wildlife species occur annually in aggregations at certain times of the year. Such areas are sometimes highly concentrated with members of a given species, or several species, within relatively small areas. In spring and autumn, migratory wildlife species will concentrate where they can rest and feed. Other wildlife species require habitats where they can survive winter. Examples of seasonal concentration areas include deer wintering areas, breeding bird colonies and hibernation sites for reptiles, amphibians and some mammals

cxlviii. Table 1.1 outlines what wildlife habitats and defining criteria that are considered for seasonal concentration areas within Ecoregion 6E.

Table 1.1 Seasonal Concentration Areas of Animals.

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Evaluation
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
1. Waterfowl Stopover and Staging Areas (Terrestrial) <u>Rationale:</u> Habitat important to migrating waterfowl.	American Black Duck American Wigeon Blue-winged Teal Gadwall Green-winged Teal Mallard Northern Pintail Northern Shoveler Wood Duck	CUM1 CUT1 Plus evidence of annual spring flooding from melt water or run-off within these Ecosites.	Fields with sheet water during Spring (mid-March to May). - Fields flooding during spring melt and run-off provide important invertebrate foraging habitat for migrating waterfowl. - Agricultural fields with waste grains are commonly used by waterfowl, these are not considered SWH unless they have spring sheet water available ^{cxlviii}. <u>Information Sources</u> - Anecdotal information from the landowner, adjacent landowners or local naturalist clubs may be good information in determining occurrence. - Reports and other information available from Conservation Authorities - Sites documented through waterfowl planning processes (eg. EHJV implementation plan) - Field Naturalist Clubs - Ducks Unlimited Canada - Natural Heritage Information Centre (NHIC)Waterfowl Concentration Area	Studies carried out and verified presence of an annual concentration of any listed species, evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”^{ccxi} - Any mixed species aggregations of 100[Ⓔ] or more individuals required. - The flooded field ecosite habitat plus a 100-300m radius, dependant on local site conditions and adjacent land use is the significant wildlife habitat . - Annual use of habitat is documented from information sources or field studies (annual use can be based on studies or determined by past surveys with species numbers and dates). - SWH MiSTIndex #7 provides development effects and mitigation measures.	No Candidate SWH is present. There are no suitable large CUM1/CUT1 areas and no spring flooding was noted during spring amphibian turtle basking surveys (April-May) SWH is not present

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Evaluation
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
2. Waterfowl Stopover and Staging Areas (Aquatic) <u>Rationale:</u> Important for local and migrant waterfowl populations during the spring or fall migration or both periods combined. Sites identified are usually only one of a few in the eco-district.	American Black Duck American Wigeon Black Scoter Blue-winged Teal Brant Bufflehead Cackling Goose Canada Goose Canvasback Common Goldeneye Common Merganser Gadwall Greater Scaup Green-winged Teal Hooded Merganser Lesser Scaup Long-tailed Duck Northern Pintail Northern Shoveler Red-breasted Merganser Redhead Ring-necked duck Ruddy Duck Ruddy Duck Snow Goose Surf Scoter White-winged Scoter	MAS1 MAS2 MAS3 SAF1 SAM1 SAS1 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7	• Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. Sewage treatment ponds and storm water ponds do not qualify as a SWH, however a reservoir managed as a large wetland or pond/lake does qualify. • These habitats have an abundant food supply (mostly aquatic invertebrates and vegetation in shallow water) <u>Information Sources</u> • Environment Canada • Naturalist clubs often are aware of staging/stopover areas. • OMNRF Wetland Evaluations indicate presence of locally and regionally significant waterfowl staging. • Sites documented through waterfowl planning processes (eg. EHJV implementation plan) • Ducks Unlimited projects • Element occurrence specification by Nature Serve: http://www.natureserve.org • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area	Studies carried out and verified presence of: • Aggregations of 100[Ⓔ] or more of listed species for 7 days[Ⓔ], results in > 700 waterfowl use days. • Areas with annual staging of ruddy ducks, canvasbacks, and redheads are SWH^{cxlix} • The combined area of the ELC ecosites and a 100m radius area is the SWH^{cxlviii} • Wetland area and shorelines associated with sites identified within the SWHTG^{cxlviii} Appendix K^{cxlix} are significant wildlife habitat. • Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”^{ccxi} • Annual Use of Habitat is Documented from Information Sources or Field Studies (Annual can be based on completed studies or determined from past surveys with species numbers and dates recorded). • SWH MIST^{cxlix} Index #7 provides development effects and mitigation measures.	No Candidate habitat is present. Although listed ELC types are present, these are very small areas not suitable for substantive migratory stopover use. Based on spring field surveys (April – May), none of the listed species were recorded in required abundances. SWH is not present

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Evaluation
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
3. Shorebird Migratory Stopover Area Rationale: High quality shorebird stopover habitat is extremely rare and typically has a long history of use.	American Golden-Plover Baird’s Sandpiper Black-bellied Plover Dunlin Greater Yellowlegs Hudsonian Godwit Least Sandpiper Lesser Yellowlegs Marbled Godwit Pectoral Sandpiper Purple Sandpiper Red-necked Phalarope Whimbrel Ruddy Turnstone Sanderling Semipalmated Plover Semipalmated Sandpiper Short-billed Dowitcher Solitary Sandpiper Spotted Sandpiper Stilt Sandpiper White-rumped Sandpiper	BBO1 BBO2 BBS1 BBS2 BBT1 BBT2 MAM1 MAM2 MAM3 MAM4 MAM5 SDO1 SDS2 SDT1	- Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats. - Great Lakes coastal shorelines, including groynes and other forms of armour rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October. - Sewage treatment ponds and storm water ponds do not qualify as a SWH. <u>Information Sources</u> - Western hemisphere shorebird reserve network. - Canadian Wildlife Service (CWS) Ontario Shorebird Survey. - Bird Studies Canada - Ontario Nature - Local birders and naturalist clubs - Natural Heritage Information Centre (NHIC) Shorebird Migratory Concentration Area	Studies confirming: - Presence of 3 or more of listed species and > 1000^I shorebird use days during spring or fall migration period. (shorebird use days are the accumulated number of shorebirds counted per day over the course of the fall or spring migration period) - Whimbrel stop briefly (<24hrs) during spring migration, any site with >100^I Whimbrel used for 3 years or more is significant. - The area of significant shorebird habitat includes the mapped ELC shoreline ecosites plus a 100m radius area ^{exlviii} - Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”^{ccxi} - SWH MiST^{exlix} Index #8 provides development effects and mitigation measures.	No Candidate habitat is present. Although listed ELC types are present, these are very small areas not suitable for substantive shorebird use. Based on results of spring field surveys (April – June), none of the listed species was recorded in required abundances SWH is not present
4. Raptor Wintering Area Rationale: Sites used by multiple species, a high number of individuals and used annually are most significant	American Kestrel Northern Harrier Red-tailed Hawk Rough-legged Hawk Snowy Owl Special Concern: Bald Eagle Short-eared Owl	<u>Hawks/Owls:</u> Combination of ELC Community Series; need to have present one Community Series from each land class; Forest: FOD, FOM, FOC. Upland: CUM; CUT; CUS; CUW. <u>Bald Eagle:</u> Forest community Series: FOD, FOM, FOC, SWD, SWM or SWC on shoreline areas adjacent to large rivers or adjacent to lakes with open water (hunting area).	- The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors. - Raptor wintering (hawk/owl)sites need to be > 20 ha ^{exlviii, exlix} with a combination of forest and upland. ^{xvi, xvii, xviii, xix, xx, xxi}. - Least disturbed sites, idle/fallow or lightly grazed field/meadow (>15ha) with adjacent woodlands ^{exlix} - Field area of the habitat is to be wind swept with limited snow depth or accumulation. - Eagle sites have open water and large trees and snags available for roosting^{exlix} <u>Information Sources:</u> - OMNRF Ecologist or Biologist - Naturalist clubs - Natural Heritage Information Centre (NHIC) Raptor Winter Concentration Area - Data from Bird Studies Canada - Results of Christmas Bird Counts - Reports and other information available from Conservation Authorities.	Studies confirm the use of these habitats by: - One or more Short-eared Owls or; One of more Bald Eagles or; At least10 individuals and two of the listed hawk/owl species[®] - To be significant a site must be used regularly (3 in 5 years)^{exlix} for a minimum of 20 days by the above number of birds[®]. - The habitat area for an Eagle winter site is the shoreline forest ecosites directly adjacent to the prime hunting area[®] - Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”^{ccxi} - SWH MiST^{exlix} Index #10 and #11 provides development effects and mitigation measures.	No Candidate habitat is present. Although the woodland on the Subject Property is part of a larger forested area (~30 ha, including adjacent lands), there is no suitable field / meadow areas within or adjacent to the woodland (all active agricultural or manicured lawns of golf course). SWH is not present

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Evaluation
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
5. Bat Hibernacula <u>Rationale:</u> Bat hibernacula are rare habitats in all Ontario landscapes.	Big Brown Bat Tri-coloured Bat	Bat Hibernacula may be found in these ecosites: CCR1 CCR2 CCA1 CCA2 (Note: buildings are not considered to be SWH)	- Hibernacula may be found in caves, mine shafts, underground foundations and Karsts. - Active mine sites should not be considered as SWH - The locations of bat hibernacula are relatively poorly known. <u>Information Sources</u> - OMNRF for possible locations and contact for local experts - Natural Heritage Information Centre (NHIC) Bat Hibernaculum - Ministry of Northern Development and Mines for location of mine shafts. - Clubs that explore caves (eg. Sierra Club) - University Biology Departments with bat experts.	- All sites with confirmed hibernating bats are SWH ⑤. - The area includes 200m radius around the entrance of the hibernaculum , , ⑤ for most development types and 1000m for wind farms^{ccv}. - Studies are to be conducted during the peak swarming period (Aug. – Sept.). Surveys should be conducted following methods outlined in the “Bats and Bat Habitats: Guidelines for Wind Power Projects”^{ccv}. - SWHMiST^{exlix} Index #1 provides development effects and mitigation measures.	No suitable habitat is present SWH is not present
6. Bat Maternity Colonies <u>Rationale:</u> Known locations of forested bat maternity colonies are extremely rare in all Ontario landscapes.	Big Brown Bat Silver-haired Bat	Maternity colonies considered SWH are found in forested Ecosites. All ELC Ecosites in ELC Community Series: FOD FOM SWD SWM	- Maternity colonies can be found in tree cavities, vegetation and often in buildings^{xxii, xxv, xxvi, xxvii, xxxi} (buildings are not considered to be SWH). - Maternity roosts are not found in caves and mines in Ontario^{xxii}. - Maternity colonies located in Mature deciduous or mixed forest stands^{ccix, ccx} with >10/ha large diameter (>25cm dbh) wildlife trees^{ccvii} - Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3 ^{ccxiv} or class 1 or 2 ^{ccxii}. - Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred^{ccx} <u>Information Sources</u> - OMNRF for possible locations and contact for local experts - University Biology Departments with bat experts.	- Maternity Colonies with confirmed use by; >10 Big Brown Bats ⑤ >5 Adult Female Silver-haired Bats ⑤ - The area of the habitat includes the entire woodland or a forest stand ELC Ecosite or an Ecoelement containing the maternity colonies ⑤. - Evaluation methods for maternity colonies should be conducted following methods outlined in the “Bats and Bat Habitats: Guidelines for Wind Power Projects”^{ccv}. - SWHMiST^{exlix} Index #12 provides development effects and mitigation measures.	Candidate (unconfirmed) SWH is present in WSU2b where mature Sugar Maple trees are present.

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Evaluation
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
7. Turtle Wintering Areas <u>Rationale:</u> Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant.	Midland Painted Turtle <u>Special Concern:</u> Northern Map Turtle Snapping Turtle	Snapping and Midland Painted turtles, ELC Community Classes; SW, MA, OA and SA, ELC Community Series; FEO and BOO Northern Map Turtle - Open Water areas such as deeper rivers or streams and lakes with current can also be used as over-wintering habitat.	- For most turtles, wintering areas are in the same general area as their core habitat. Water has to be deep enough not to freeze and have soft mud substrates. - Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen.^{cix, cx, cxi, cxviii} - Man-made ponds such as sewage lagoons or storm water ponds should not be considered SWH. <u>Information Sources</u> - EIS studies carried out by Conservation Authorities. - Local field naturalists and experts, as well as university herpetologists may also know where to find some of these sites. - OMNRF Ecologist or Biologist - Field Naturalist clubs - Natural Heritage Information Center (NHIC)	- Presence of 5 over-wintering Midland Painted Turtles is significant^I. - One or more Northern Map Turtle or Snapping Turtle over-wintering within a wetland is significant^I. - The mapped ELC ecosite area with the over wintering turtles is the SWH. If the hibernation site is within a stream or river, the deep-water pool where the turtles are over wintering is the SWH. - Over wintering areas may be identified by searching for congregations (Basking Areas) of turtles on warm, sunny days during the fall (Sept. – Oct.) or spring (Mar. – May)^{cvii}. Congregation of turtles is more common where wintering areas are limited and therefore significant^{cix, cx, cxi, cxii}. - Congregation of turtles is more common where wintering areas are limited and therefore significant^{cix, cx, cxi, cxii}. - SWH MiST^{cxlix} Index #28 provides development effects and mitigation measures for turtle wintering habitat.	Midland Painted Turtle and Snapping Turtle were recorded basking in the wetlands in early May as follows: - Seven Midland Painted Turtles and two Snapping Turtles in WSU4 (isolated meadow marsh / pond) - One Snapping Turtle in WSU5b (Thicket Swamp at west edge of Subject Property) Water levels were only suitable for turtle overwintering in WSU4 (estimated >0.5 m with muddy bottom in September 2019), and potentially in WSU5a (thicket swamp, off property to the west) and WSU 2a (deciduous swamp forest, off property to the north), which could only be assessed from the edge. Based on results of the targeted early May 2020 survey and incidental turtle basking observations in September 2019, overwintering in WSU4 cannot be confirmed; the recorded individuals may have moved from the adjacent WSU2a wetlands in late March - April. Conclusion: Candidate (unconfirmed) SWH is present in WSU 2a, WSU4, WSU5a and WSU5b

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Evaluation
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
8. Reptile Hibernaculum Rationale: Generally sites are the only known sites in the area. Sites with the highest number of individuals are most significant.	Snakes: Eastern Gartersnake Northern Brownsnake Northern Red-bellied Snake Northern Ring-necked Snake Northern Watersnake Smooth Green Snake Special Concern: Eastern Ribbonsnake Milksnake Lizard: Special Concern (Southern Shield population): Five-lined Skink	For all snakes, habitat may be found in any ecosite in central Ontario other than very wet ones. Talus, Rock Barren, Crevice, Cave, and Alvar sites may be directly related to these habitats. Observations of congregations of snakes on sunny warm days in the spring or fall is a good indicator. For Five-lined Skink, ELC Community Series of FOD and FOM and Ecosites: FOC1 FOC3	- For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural or naturalized locations. The existence of features that go below frost line; such as rock piles or slopes, old stone fences, and abandoned crumbling foundations assist in identifying candidate SWH. - Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line, , , . - Wetlands can also be important over-wintering habitat in conifer or shrub swamps and swales, poor fens, or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock ground cover. - Five-lined skink prefer mixed forests with rock outcrop openings providing cover rock overlaying granite bedrock with fissures . Information Sources - In spring, local residents or landowners may have observed the emergence of snakes on their property (e.g.old dug wells). - Reports and other information available from Conservation Authorities. - Field Naturalist Clubs - University herpetologists - Natural Heritage Information Centre (NHIC) - OMNRF ecologist or biologist may be aware of locations of wintering skinks	Studies confirming: - Presence of snake hibernacula used by a minimum of five individuals of a snake sp. <u>or</u>; individuals of two or more snake spp. - Congregations of a minimum of five individuals of a snake sp. <u>or</u>; individuals of two or more snake spp. near potential hibernacula (eg. foundation or rocky slope) on sunny warm days in Spring (Apr/May) and Fall (Sept/Oct)¹ . Note: If there are Special Concern Species present, then site is SWH Note: Sites for hibernation possess specific habitat parameters (e.g. temperature, humidity, etc.) and consequently are used annually, often by many of the same individuals of a local population (i.e. strong hibernation site fidelity). Other critical life processes (e.g. mating) often take place in close proximity to hibernacula. The the feature in which the hibernacula is located plus a 30 m buffer is the SWH¹ - SWHMiST^{exlix} Index #13 provides development effects and mitigation measures for snake hibernacula. - Presence of any active hibernaculum for skink is significant. - SWHMiST ^{exlix} Index #37 provides development effects and mitigation measures for five-lined skink wintering habitat.	Potentially suitable habitat may be present within the natural area in the northwest corner of the Subject Property, but it is nonspecific and none of the listed site types is present. Small rock piles that may provide spring/summer reptile cover were identified; No snake species were recorded during the spring-summer field surveys SWH is not present
9. Colonially -Nesting Bird Breeding Habitat (Bank and Cliff) Rationale: Historical use and number of nests in a colony make this habitat significant. An identified colony can be very important to local populations. All swallow population are declining in Ontario ^{excix} .	Cliff Swallow Northern Rough-winged Swallow (this species is not colonial but can be found in Cliff Swallow colonies)	Eroding banks, sandy hills, borrow pits, steep slopes, and sand piles Cliff faces, bridge abutments, silos, barns. Habitat found in the following ecosites: CUM1 CUT1 CUS1 BLO1 BLS1 BLT1 CLO1 CLS1 CLT1	- Any site or areas with exposed soil banks, undisturbed or naturally eroding that is not a licensed/permitted aggregate area. - Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil or aggregate stockpiles. - Does not include a licensed/permitted Mineral Aggregate Operation. Information Sources - Reports and other information available from Conservation Authorities. - Ontario Breeding Bird Atlas - Bird Studies Canada; NatureCounts http://www.birdscanada.org/birdmon/ - Field Naturalist Clubs.	Studies confirming: - Presence of 1 or more nesting sites with 8or more cliff swallow pairs and/or rough-winged swallow pairs during the breeding season. - A colony identified as SWH will include a 50m radius habitat area from the peripheral nests - Field surveys to observe and count swallow nests are to be completed during the breeding season. Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”^{ccxi} - SWHMiST^{exlix} Index #4 provides development effects and mitigation measures	No suitable habitat is present. SWH is not present

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Evaluation
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
10. Colonially -Nesting Bird Breeding Habitat (Tree/Shrubs) <u>Rationale:</u> Large colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Black-crowned Night-Heron Great Blue Heron Great Egret Green Heron	SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7 FET1 SWM2 SWM3 SWM5 SWM6	- Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used. - Most nests in trees are 11 to 15 m from ground, near the top of the tree. <u>Information Sources</u> - Ontario Breeding Bird Atlas ^{ccv}, colonial nest records. - Ontario Heronry Inventory 1991 available from Bird Studies Canada or NHIC (OMNRF). - Natural Heritage Information Centre (NHIC) Mixed Wader Nesting Colony - Aerial photographs can help identify large heronries. - Reports and other information available from Conservation Authorities. - MNR District Offices. - Field Naturalist Clubs	Studies confirming: - Presence of 5¹ or more active nests of Great Blue Heron or other listed species. - The edge of the colony and a minimum 300m radius or extent of the Forest Ecosite containing the colony or any island <15.0ha with a colony is the SWH ^{cc, ccvii} - Confirmation of active heronries are to be achieved through site visits conducted during the nesting season (April to August) or by evidence such as the presence of fresh guano, dead young and/or eggshells - SWHMiST^{cxlix} Index #5 provides development effects and mitigation measures.	Candidate habitat is present (SWD) on the Subject Property and adjacent lands to the north Habitat was evaluated through spring / summer field surveys (April – July) and the criteria species / abundances were not recorded. SWH is not present
11. Colonially -Nesting Bird Breeding Habitat (Ground) <u>Rationale:</u> Colonies are important to local bird population, typically sites are only known colony in area and are used annually.	Brewer’s Blackbird Caspian Tern Common Tern Great Black-backed Gull Herring Gull Little Gull Ring-billed Gull	Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1:50,000 NTS map). Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer’s Blackbird) CUM CUT CUS MAS1-3; MAM1-6;	- Nesting colonies of gulls and terns are on islands or peninsulas associated with open water or in marshy areas. - Brewers Blackbird colonies are found loosely on the ground in or in low bushes in close proximity to streams and irrigation ditches within farmlands. <u>Information Sources</u> - Ontario Breeding Bird Atlas, rare/colonial species records. - Canadian Wildlife Service. - Reports and other information available from Conservation Authorities. - Natural Heritage Information Centre (NHIC) Colonial Waterbird Nesting Area - MNR District Offices. - Field Naturalist Clubs.	Studies confirming: - Presence of > 25 active nests for Herring Gulls or Ring-billed Gulls, >5 active nests for Common Tern or >2 active nests for Caspian Tern[Ⓔ]. - Presence of 5 or more pairs for Brewer’s Blackbird[Ⓔ]. - Any active nesting colony of one or more Little Gull, and Great Black-backed Gull is significant [Ⓔ]. - The edge of the colony and a minimum 150m radius area of habitat, or the extent of the ELC ecosites containing the colony or any island <3.0ha with a colony is the SWH ^{cc, ccvii} - Studies would be done during May/June when actively nesting. Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”^{ccxi} - SWHMiST^{cxliix} Index #6 provides development effects and mitigation measures.	No suitable habitat is present. SWH is not present

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Evaluation
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
12. Migratory Butterfly Stopover Areas Rationale: Butterfly stopover areas are extremely rare habitats and are biologically important for butterfly species that migrate south for the winter.	Painted Lady Red Admiral <u>Special Concern</u> Monarch	Combination of ELC Community Series; need to have present one Community Series from each landclass: <u>Field:</u> CUM CUT CUS <u>Forest:</u> FOC FOD FOM CUP Anecdotally, a candidate site for butterfly stopover will have a history of butterflies being observed.	A butterfly stopover area will be a minimum of 10 ha in size with a combination of field and forest habitat present, and will be located within 5 km of Lake Ontario ^{cxlix} . - The habitat is typically a combination of field and forest, and provides the butterflies with a location to rest prior to their long migration south^{xxxii, xxxiii, xxxiv, xxxv, xxxvi}. - The habitat should not be disturbed, fields/meadows with an abundance of preferred nectar plants and woodland edge providing shelter are requirements for this habitat^{cxlviii, cxlix}. - Staging areas usually provide protection from the elements and are often spits of land or areas with the shortest distance to cross the Great Lakes^{xxxvii, xxxviii, xxxix, xl, xli}. <u>Information Sources</u> - OMNRF (NHIC) - Agriculture Canada in Ottawa may have list of butterfly experts. - Field Naturalist Clubs - Toronto Entomologists Association - Conservation Authorities	Studies confirm: - The presence of Monarch Use Days (MUD) during fall migration (Aug/Oct)^{xliii}. MUD is based on the number of days a site is used by Monarchs, multiplied by the number of individuals using the site. Numbers of butterflies can range from 100-500/day^{xxxvii}, significant variation can occur between years and multiple years of sampling should occur^{xl, xlii}. - Observational studies are to be completed and need to be done frequently during the migration period to estimate MUD. - MUD of >5000 or >3000 with the presence of Painted Ladies or Red Admiral’s is to be considered significant.^l - SWHMiST^{cxlix} Index #16 provides development effects and mitigation measures.	No Candidate habitat is present (not within 5km of Lake Ontario) SWH is not present
13. Landbird Migratory Stopover Areas Rationale: Sites with a high diversity of species as well as high numbers are most significant.	All migratory songbirds. Canadian Wildlife Service Ontario website: http://www.ec.gc.ca/nature/default.asp?lang=En&n=421B7A9D-1 All migrant raptors species: Ontario Ministry of Natural Resources: Fish and Wildlife Conservation Act, 1997. Schedule 7: Specially Protected Birds (Raptors)	All Ecosites associated with these ELC Community Series; FOC FOM FOD SWC SWM SWD	- Woodlots need to be >10 ha^l in size and within 5 km^{iv, v, vi, vii, viii, ix, x, xi, xii, xiii, xiv, xv} of Lake Ontario. - If multiple woodlands are located along the shoreline those Woodlands <2km from Lake Ontario are more significant^{cxlix}. - Sites have a variety of habitats; forest, grassland and wetland complexes^{cxlix}. - The largest sites are more significant^{cxlix} - Woodlots and forest fragments are important habitats to migrating birds^{cxviii}, these features located along the shore and located within 5km of Lake Ontario are Candidate SWH^{cxlviii}. <u>Information Sources</u> - Bird Studies Canada - Ontario Nature - Local birders and field naturalist club - Ontario Important Bird Areas (IBA) Program	Studies confirm: - Use of the woodlot by >200 birds/day and with >35 spp with at least 10 bird spp. recorded on at least 5 different survey dates^l. This abundance and diversity of migrant bird species is considered above average and significant. - Studies should be completed during spring (Apr./May) and fall (Aug/Oct) migration using standardized assessment techniques. Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”^{ccxi} - SWHMiST^{cxlix} Index #9 provides development effects and mitigation measures.	No Candidate habitat is present (not within 5km of Lake Ontario) SWH is not present

Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Evaluation
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
14. Deer Yarding Areas Rationale: Winter habitat for deer is considered to be the main limiting factor for northern deer populations. In winter, deer congregate in “yards” to survive severe winter conditions. Deer yards typically have a long history of annual use by deer, yards typically represent 10-15% of an areas summer range.	White-tailed Deer	Note: OMNRF to determine this habitat. ELC Community Series providing a thermal cover component for a deer yard would include; FOM, FOC, SWM and SWC. Or these ELC Ecosites; CUP2 CUP3 FOD3 CUT	- Deer yarding areas or winter concentration areas (yards) are areas deer move to in response to the onset of winter snow and cold. This is a behavioural response and deer will establish traditional use areas. The yard is composed of two areas referred to as Stratum I and Stratum II. Stratum II covers the entire winter yard area and is usually a mixed or deciduous forest with plenty of browse available for food. Agricultural lands can also be included in this area. Deer move to these areas in early winter and generally, when snow depths reach 20 cm, most of the deer will have moved here. If the snow is light and fluffy, deer may continue to use this area until 30 cm snow depth. In mild winters, deer may remain in the Stratum II area the entire winter. - The Core of a deer yard (Stratum I) is located within the Stratum II area and is critical for deer survival in areas where winters become severe. It is primarily composed of coniferous trees (pine, hemlock, cedar, spruce) with a canopy cover of more than 60% ^{cxiv}. - OMNRF determines deer yards following methods outlined in “Selected Wildlife and Habitat Features: Inventory Manual” ^{cxv} - Woodlots with high densities of deer due to artificial feeding are not significant. <u>Information Sources</u> - MNRF District Offices - LIO/NRVIS	No Studies Required: - Snow depth and temperature are the greatest influence on deer use of winter yards. Snow depths > 40cm for more than 60 days in a typically winter are minimum criteria for a deer yard to be considered as SWH. ^{lvi,lvii,lviii,lix,bx, ⑥} - Deer Yards are mapped by OMNRF District offices. Locations of Core or Stratum 1 and Stratum 2 Deer yards considered significant by OMNRF will be available at local MNRF offices or via Land Information Ontario (LIO). - Field investigations that record deer tracks in winter are done to confirm use (best done from an aircraft). Preferably, this is done over a series of winters to establish the boundary of the Stratum I and Stratum II yard in an "average" winter. MNRF will complete these field investigations. ^{cxv} - If a SWH is determined for Deer Wintering Area or if a proposed development is within Stratum II yarding area then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. - SWHMiST ^{cxlix} Index #2 provides development effects and mitigation measures.	No suitable habitat is present. SWH is not present
15. Deer Winter Congregation Areas Rationale: Deer movement during winter in the southern areas of Eco-region 6E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands to reduce or avoid the impacts of winter conditions ^{cxlviii}.	White-tailed Deer	All Forested Ecosites with these ELC Community Series; FOC FOM FOD SWC SWM SWD Conifer plantations much smaller than 50 ha may also be used.	- Woodlots will typically be >100 ha in size^⑥. Woodlots <100ha may be considered as significant based on MNRF studies or assessment. - Deer movement during winter in the southern areas of Ecoregion 6E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands. - If deer are constrained by snow depth refer to the Deer Yarding Area habitat within Table 1.1 of this Schedule. - Large woodlots > 100ha and up to 1500 ha are known to be used annually by densities of deer that range from 0.1-1.5 deer/ha . - Woodlots with high densities of deer due to artificial feeding are not significant^⑥. <u>Information Sources</u> - MNRF District Offices. - LIO/NRVIS	Studies confirm: - Deer management is an MNRF responsibility, deer winter congregation areas considered significant will be mapped by MNRF ^{cxlviii}. - Use of the woodlot by white-tailed deer will be determined by MNRF, all woodlots exceeding the area criteria are significant, unless determined not to be significant by MNRF ^í.. - Studies should be completed during winter (Jan/Feb) when >20cm of snow is on the ground using aerial survey techniques^{ccxxiv} , ground or road surveys. or a pellet count deer density survey^{ccxxv}. - If a SWH is determined for Deer Wintering Area or if a proposed development is within Stratum II yarding area then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. - SWHMiST ^{cxlix} Index #2 provides development effects and mitigation measures.	No suitable habitat is present. SWH is not present

1.2 RARE VEGETATION COMMUNITIES OR SPECIALIZED HABITAT FOR WILDLIFE

1.2.1 Rare Vegetation Communities

Rare vegetation communities often contain rare species, particularly plants and small invertebrates, which depend on such habitats for their survival and cannot readily move to or find alternative habitats. When assessing rare vegetation communities, one of the most important criteria is the current representation of the community in the planning area based on its area relative to the total landscape or the number of examples within the planning area. There are a number of criterion used to define rare vegetation communities, however the NHIC uses a system that considers the provincial rank of a species or community type as a tool to prioritize protection efforts. These ranks are not legal designations but have been assigned using the best available scientific information, and follow a systematic ranking procedure developed by The Nature Conservancy (U.S.). The ranks are based on three factors: estimated number of occurrences, estimated community aerial extent, and estimated range of the community within the province:

S1 Extremely rare - usually 5 or fewer occurrences in the province, or very few remaining hectares. **S2 Very rare** - usually between 5 and 20 occurrences in the province, or few remaining hectares. **S3 Rare to uncommon** - usually between 20 and 100 occurrences in the province; may have fewer occurrences, but with some extensive examples remaining.

The setting of criteria for significant wildlife habitat (SWH) has incorporated this ranking system into its process of determining rare vegetation communities and as such, a rare vegetation community is defined to include areas that contain a provincially rare vegetation community and/or areas that contain a vegetation community that is rare within the planning area. SWH Table 1.2.1 contains a listing of rare vegetation communities that are considered SWH for the planning area contained within Ecoregion 6E.

Table 1.2.1 Rare Vegetation Communities.

Rare Vegetation Community	CANDIDATE SWH			CONFIRMED SWH	Evaluation
	ELC Ecosite Code	Habitat Description	Detailed Information and Sources	Defining Criteria	
16. Cliffs and Talus Slopes Rationale: Cliffs and Talus Slopes are extremely rare habitats in Ontario.	Any ELC Ecosite within Community Series: TAO CLO TAS CLS TAT CLT	A Cliff is vertical to near vertical bedrock >3m in height. A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris	Most cliff and talus slopes occur along the Niagara Escarpment. <u>Information Sources</u> - The Niagara Escarpment Commission has detailed information on location of these habitats. - OMNRF Districts - Natural Heritage Information Centre (NHIC) has location information available on their website. - Field Naturalist Clubs - Conservation Authorities	- Confirm any ELC Vegetation Type for Cliffs or Talus Slopes lxxviii - SWHMiST^{exlix} Index #21 provides development effects and mitigation measures.	No suitable habitat is present. SWH is not present
17. Sand Barren Rationale: Sand barrens are rare in Ontario and support rare species. Most Sand Barrens have been lost due to cottage development and forestry	ELC Ecosites: SBO1 SBS1 SBT1 Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicket-like (SBS1), or more closed and treed (SBT1). Tree cover always ≤ 60%.	Sand Barrens typically are exposed sand, generally sparsely vegetated and caused by lack of moisture, periodic fires and erosion. Usually located within other types of natural habitat such as forest or savannah. Vegetation can vary from patchy and barren to tree covered but less than 60%.	A sand barren area >0.5ha in size [Ⓔ] . <u>Information Sources</u> - OMNRF Districts. - Natural Heritage Information Centre (NHIC) has location information available on their website. - Field Naturalist Clubs - Conservation Authorities	- Confirm any ELC Vegetation Type for Sand Barrens lxxviii - Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics)^l. - SWHMiST^{exlix} Index #20 provides development effects and mitigation measures.	No suitable habitat is present. SWH is not present

Rare Vegetation Community	CANDIDATE SWH			CONFIRMED SWH	Evaluation
	ELC Ecosite Code	Habitat Description	Detailed Information and Sources	Defining Criteria	
18. Alvar Rationale: Alvars are extremely rare habitats in Ecoregion 6E. Most alvars in Ontario are in Ecoregions 6E and 7E. Alvars in 6E are small and highly localized just north of the Palaeozoic-Precambrian contact.	ALO1 ALS1 ALT1 CUM2 CUS2 CUT2-1 CUW2 FOC1 FOC2 Five Alvar Indicator Species: 1) Carex crawei 2) Panicum philadelphicum 3) Eleocharis compressa 4) Scutellaria parvula 5) Trichostema brachiatum These indicator species are very specific to Alvars within Ecoregion 6E[Ⓔ]^{cxlix}	An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. The hydrology of alvars is complex, with alternating periods of inundation and drought. Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands and comprising a number of characteristic or indicator plant. Undisturbed alvars can be phyto- and zoogeographically diverse, supporting many uncommon or are relict plant and animals species. Vegetation cover varies from patchy to barren with a less than 60% tree cover^{lxxviii}.	An Alvar site > 0.5 ha in size^{lxxv}. <u>Information Sources</u> - Alvars of Ontario (2000), Federation of Ontario Naturalists . - Ontario Nature – Conserving Great Lakes Alvars. - Natural Heritage Information Centre (NHIC) has location information available on their website. - OMNRF Districts. - Field Naturalist Clubs. - Conservation Authorities.	- Field studies that identify four of the five[Ⓔ] Alvar Indicator Species^{lxxv,cxlix} at a Candidate Alvar site is Significant. - Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics). - The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses^{lxxv} - SWHMiST^{cxlix} Index #17 provides development effects and mitigation measures.	No suitable habitat is present. SWH is not present
19. Old Growth Forest Rationale: Due to historic logging practices, extensive old growth forest is rare in the Ecoregion. Interior habitat provided by old growth forests is required by many wildlife species.	Forest Community Series: FOD FOC FOM SWD SWC SWM	Old Growth forests are characterized by heavy mortality or turnover of over-storey trees resulting in a mosaic of gaps that encourage development of a multi-layered canopy and an abundance of snags and downed woody debris.	Woodland areas 30 ha or greater in size or with at least 10 ha interior habitat assuming 100 m buffer at edge of forest [Ⓔ]. <u>Information Sources</u> - OMNRF Forest Resource Inventory mapping - OMNRF Districts. - Field Naturalist Clubs - Conservation Authorities - Sustainable Forestry Licence (SFL) companies will possibly know locations through field operations. - Municipal forestry departments	Field Studies will determine: - If dominant trees species of the ecosite are >140 years old, then the area containing these trees is Significant Wildlife Habitat^{cxlviii} - The forested area containing the old growth characteristics will have experienced no recognizable forestry activities^{cxlviii} (cut stumps will not be present) - The area of forest ecosites combined or an eco-element within an ecosite that contains the old growth characteristics is the SWH. - Determine ELC vegetation types for the forest area containing the old growth characteristics^{lxxviii} - SWHMiST^{cxlix} Index #23 provides development effects and mitigation measures.	No suitable habitat is present. SWH is not present

Rare Vegetation Community	CANDIDATE SWH			CONFIRMED SWH	Evaluation
	ELC Ecosite Code	Habitat Description	Detailed Information and Sources	Defining Criteria	
20. Savannah Rationale: Savannahs are extremely rare habitats in Ontario.	CUS2 TPS1 TPS2 TPW1 TPW2	A Savannah is a tallgrass prairie habitat that has tree cover between 25 – 60% ^{lxxix} , ^{lxxx, lxxxi, lxxxii, lxxxiii}	No minimum size to site ^Í Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH. <u>Information Sources</u> - Natural Heritage Information Centre (NHIC) has location data available on their website. - OMNRF Districts. - Field Naturalists Clubs. - Conservation Authorities.	Field studies confirm one or more of the Savannah indicator species listed in ^{lxxv} Appendix N should be present ^Í . Note: Savannah plant spp. list from Ecoregion 6E should be used ^{exlviii} . - Area of the ELC Ecosite is the SWH. - Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics). - SWHMiST^{exlix} Index #18 provides development effects and mitigation measures.	No suitable habitat is present. SWH is not present
21. Tallgrass Prairie Rationale: Tallgrass Prairies are extremely rare habitats in Ontario.	TPO1 TPO2	A Tallgrass Prairie has ground cover dominated by prairie grasses. An open Tallgrass Prairie habitat has < 25% tree cover. ^{lxxix, lxxx, lxxxi, lxxxii, lxxxiii}	No minimum size to site ^Í . Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH. <u>Information Sources</u> - OMNRF Districts. - Natural Heritage Information Centre (NHIC) has location information available on their website. - Field Naturalists Clubs. - Conservation Authorities.	Field studies confirm one or more of the Prairie indicator species listed in ^{lxxv} Appendix N should be present ^Í . Note: Prairie plant spp. list from Ecoregion 6E should be used ^{exlviii} - Area of the ELC Ecosite is the SWH. - Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics). - SWHMiST^{exlix} Index #19 provides development effects and mitigation measures.	No suitable habitat is present. SWH is not present
22. Other Rare Vegetation Communities Rationale: Plant communities that often contain rare species which depend on the habitat for survival.	Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the SWHTG ^{exlviii} . Any ELC Ecosite Code that has a possible ELC Vegetation Type that is Provincially Rare is Candidate SWH.	Rare Vegetation Communities may include beaches, fens, forest, marsh, barrens, dunes and swamps.	ELC Ecosite codes that have the potential to be a rare ELC Vegetation Type as outlined in appendix M ^{exlviii} The OMNRF/NHIC will have up to date listing for rare vegetation communities. <u>Information Sources</u> - Natural Heritage Information Centre (NHIC) has location information available on their website. - OMNRF Districts. - Field Naturalists Clubs. - Conservation Authorities.	Field studies should confirm if an ELC Vegetation Type is a rare vegetation community based on listing within Appendix M of SWHTG ^{exlviii} - Area of the ELC Vegetation Type polygon is the SWH. - SWHMiST ^{exlix} Index #37 provides development effects and mitigation measures.	SWH is not present

1.2.2 Specialized Habitat for Wildlife

Some wildlife species require large areas of suitable habitat for their long-term survival. Many wildlife species require substantial areas of suitable habitat for successful breeding. Their populations decline when habitat becomes fragmented and reduced in size^{cxlviii}. Specialized habitat for wildlife is a community or diversity-based category, therefore, the more wildlife species a habitat contains, the more significant the habitat becomes to the planning area. The largest and least fragmented habitats within a planning area will support the most significant populations of wildlife. The specialized habitats for wildlife that are considered as SWH are outlined in Table 1.2.2.

Table 1.2.2 Specialized Habitats of Wildlife considered SWH.

Specialized Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Evaluation
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
23. Waterfowl Nesting Area Rationale: Important to local waterfowl populations, sites with greatest number of species and highest number of individuals are significant.	American Black Duck Blue-winged Teal Gadwall Green-winged Teal Hooded Merganser Mallard Northern Pintail Northern Shoveler Wood Duck	All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SWT1 SWT2 SWD1 SWD2 SWD3 SWD4 Note: includes adjacency to Provincially Significant Wetlands	A waterfowl nesting area extends 120 m^{cxlix} from a wetland (> 0.5 ha) or a wetland (>0.5ha) and any small wetlands (0.5ha) within 120m or a cluster of 3 or more small (<0.5 ha) wetlands within 120 m of each individual wetland where waterfowl nesting is known to occur^{cxlix}. - Upland areas should be at least 120 m wide so that predators such as racoons, skunks, and foxes have difficulty finding nests. - Wood Ducks and Hooded Mergansers utilize large diameter trees (>40cm dbh) in woodlands for cavity nest sites. <u>Information Sources</u> - Ducks Unlimited staff may know the locations of particularly productive nesting sites. - OMNRF Wetland Evaluations for indication of significant waterfowl nesting habitat. - Reports and other information available from Conservation Authorities.	Studies confirmed: - Presence of 3 or more nesting pairs for listed species excluding Mallards^I, or; - Presence of 10 or more nesting pairs for listed species including Mallards^I. - Any active nesting site of an American Black Duck is considered significant. - Nesting studies should be completed during the spring breeding season (April - June). Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”^{ccxi} - A field study confirming waterfowl nesting habitat will determine the boundary of the waterfowl nesting habitat for the SWH, this may be greater or less than 120 m^{cxlviii} from the wetland and will provide enough habitat for waterfowl to successfully nest. - SWHMiST^{cxlix} Index #25 provides development effects and mitigation measures.	Although candidate ELC wetland types are present (MAS2-1, MAM2-2, SWD), the surrounding upland habitat is either too narrow (<120m wide) or active agricultural lands. Field survey results: - Mallard – 8 individuals, including fledged young (likely 1 breeding pair) in WSU3 - Wood Duck – 2 individuals observed outside of breeding period (likely migrants) in WSU3. SWH is not present

Specialized Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Evaluation
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
24. Bald Eagle and Osprey Nesting, Foraging and Perching Habitat <u>Rationale:</u> Nest sites are fairly uncommon in Eco-region 6E and are used annually by these species. Many suitable nesting locations may be lost due to increasing shoreline development pressures and scarcity of habitat.	Osprey <u>Special Concern:</u> Bald Eagle	ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands	Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water. - Osprey nests are usually at the top a tree whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree’s canopy. - Nests located on man-made objects are not to be included as SWH (e.g. telephone poles and constructed nesting platforms). <u>Information Sources</u> - Natural Heritage Information Centre (NHIC) compiles all known nesting sites for Bald Eagles in Ontario. - MNRF values information (LIO/NRVIS) will list known nesting locations. Note: data from NRVIS is provided as a point and does not represent all the habitat. - Nature Counts, Ontario Nest Records Scheme data. - OMNRF Districts. - Check the Ontario Breeding Bird Atlas ^{ccv} or Rare Breeding Birds in Ontario for species documented - Reports and other information available from Conservation Authorities. - Field Naturalists clubs	Studies confirm the use of these nests by: - One or more active Osprey or Bald Eagle nests in an area^{exlviii}. - Some species have more than one nest in a given area and priority is given to the primary nest with alternate nests included within the area of the SWH. - For an Osprey, the active nest and a 300 m radius around the nest or the contiguous woodland stand is the SWH ^{ccvii}, maintaining undisturbed shorelines with large trees within this area is important ^{exlviii}. - For a Bald Eagle the active nest and a 400-800 m radius around the nest is the SWH. ^{cvi, ccvii} Area of the habitat from 400-800m is dependant on sight lines from the nest to the development and inclusion of perching and foraging habitat ^{cvi} - To be significant a site must be used annually. When found inactive, the site must be known to be inactive for ≥3 years or suspected of not being used for >5 years before being considered not significant. ^{ccvii} - Observational studies to determine nest site use, perching sites and foraging areas need to be done from mid March to mid August. - Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”^{ccxi} - SWHMiST^{exlix} Index #26 provides development effects and mitigation measures	No suitable rivers, lakes or wetlands for Osprey / Bald Eagle habitat. SWH is not present
25. Woodland Raptor Nesting Habitat <u>Rationale:</u> Nests sites for these species are rarely identified; these area sensitive habitats are often used annually by these species.	Barred Owl Broad-winged Hawk Cooper’s Hawk Northern Goshawk Red-shouldered Hawk Sharp-shinned Hawk	May be found in all forested ELC Ecosites. May also be found in SWC, SWM, SWD and CUP3	All natural or conifer plantation woodland/forest stands >30ha with >10ha of interior habitat ^{lxxxviii, lxxxix, xc, xci, xciii, xciv, xcv,xcvi, cxxxiii}. Interior habitat determined with a 200m buffer^{exlviii} - Stick nests found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests within tops or crotches of trees. Species such as Coopers hawk nest along forest edges sometimes on peninsulas or small off-shore islands. - In disturbed sites, nests may be used again, or a new nest will be in close proximity to old nest. <u>Information Sources</u> - OMNRF Districts. - Check the Ontario Breeding Bird Atlas or Rare Breeding Birds in Ontario for species documented. - Check data from Bird Studies Canada. - Reports and other information available from Conservation Authorities.	Studies confirm: - Presence of 1 or more active nests from species list is considered significant^{exlviii}. - Red-shouldered Hawk and Northern Goshawk – A 400m radius around the nest or 28 ha of suitable habitat is the SWH ^{ccvii}. (the 28 ha habitat area would be applied where optimal habitat is irregularly shaped around the nest) - Barred Owl – A 200m radius around the nest is the SWH ^{ccvii}. - Broad-winged Hawk and Coopers Hawk,– A 100m radius around the nest is the SWH^{ccvii}. - Sharp-Shinned Hawk – A 50m radius around the nest is the SWH^{ccvii}. - Conduct field investigations from mid-March to end of May. The use of call broadcasts can help in locating territorial (courting/nesting) raptors and facilitate the discovery of nests by narrowing down the search area. - SWHMiST ^{exlix} Index #27 provides development effects and mitigation measures.	No interior forest habitat (200 m from edge) is present in the study area or adjacent contiguous forests. SWH is not present

Specialized Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Evaluation
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
26. Turtle Nesting Areas <u>Rationale:</u> These habitats are rare and when identified will often be the only breeding site for local populations of turtles.	Midland Painted Turtle <u>Special Concern Species:</u> Northern Map Turtle Snapping Turtle	Exposed mineral soil (sand or gravel) areas adjacent (<100m) ^{cxlviii} or within the following ELC Ecosites: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 BOO1 FEO1	• Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals. • For an area to function as a turtle-nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH. • Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used. <u>Information Sources</u> • Use Ontario Soil Survey reports and maps to help find suitable substrate for nesting turtles (well-drained sands and fine gravels). • Check the Ontario Herpetofaunal Summary Atlas records or other similar atlases for uncommon turtles; location information may help to find potential nesting habitat for them. • Natural Heritage Information Centre (NHIC) • Field Naturalist Clubs	Studies confirm: • Presence of 5 or more nesting Midland Painted Turtles^I • One or more Northern Map Turtle or Snapping Turtle nesting is a SWH^I. • The area or collection of sites within an area of exposed mineral soils where the turtles nest, plus a radius of 30-100m around the nesting area dependant on slope, riparian vegetation and adjacent land use is the SWH. ^{cxlviii} • Travel routes from wetland to nesting area are to be considered within the SWH as part of the 30-100m area of habitat. • Field investigations should be conducted in prime nesting season typically late spring to early summer. Observational studies observing the turtles nesting is a recommended method. • SWHMiST Index #28 provides development effects and mitigation measures for turtle nesting habitat.	Candidate habitat is present adjacent to the marsh wetlands on the Subject Property. Two Snapping Turtles were observed digging nests in the agricultural field adjacent to the small meadow marsh (WSU4); however, successful nesting was not confirmed. SWH criteria are not definitive regarding exclusion of agricultural fields, but other man-made habitats are excluded (road embankments / shoulders). Active agricultural fields are less likely to provide successful nesting opportunities given frequent disturbance (e.g., ploughing, seeding, harvesting, soil compaction). Candidate (unconfirmed) SWH is present adjacent to the marsh wetlands (WSU3, WSU4, WSU5a / 5b)
27. Seeps and Springs <u>Rationale:</u> Seeps/Springs are typical of headwater areas and are often at the source of coldwater streams.	Ruffed Grouse Salamander spp. Spruce Grouse White-tailed Deer Wild Turkey	Seeps/Springs are areas where ground water comes to the surface. Often they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs.	Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system ^{cxvii, cxlix}. • Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species ^{cxix, cxx, cxxi, cxxii, cxiii, cxiv}. <u>Information Sources</u> • Topographical Map. • Thermography. • Hydrological surveys conducted by Conservation Authorities and MOE. • Field Naturalists Clubs and landowners. • Municipalities and Conservation Authorities may have drainage maps and headwater areas mapped.	Field Studies confirm: • Presence of a site with 2 or more^I seeps/springs should be considered SWH. • The area of a ELC forest ecosite or an ecoelement within ecosite containing the seeps/springs is the SWH. The protection of the recharge area considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation of the habitat. • SWHMiST Index #30 provides development effects and mitigation measures	Candidate habitat is present in the forest on the subject property (headwater area for the watercourse is present on adjacent lands to the north). Some plant species may be indicative of groundwater inputs are present, though no seepage areas were recorded on the subject property during field surveys. SWH is not present

Specialized Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Evaluation
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
28. Amphibian Breeding Habitat (Woodland) Rationale: These habitats are extremely important to amphibian biodiversity within a landscape and often represent the only breeding habitat for local amphibian populations	Blue-spotted Salamander Eastern Newt Gray Treefrog Spotted Salamander Spring Peeper Western Chorus Frog Wood Frog	All Ecosites associated with these ELC Community Series; FOC FOM FOD SWC SWM SWD Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians	• Presence of a wetland, pond or woodland pool (including vernal pools) >500m² (about 25m diameter) within or adjacent (within 120m) to a woodland (no minimum size). Some small wetlands may not be mapped and may be important breeding pools for amphibians. • Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat^{exlviii} <u>Information Sources</u> • Ontario Herpetofaunal Summary Atlas (or other similar atlases) for records • Local landowners may also provide assistance as they may hear spring-time choruses of amphibians on their property. • OMNRF Districts • OMNRF wetland evaluations • Field Naturalist clubs • Canadian Wildlife Service Amphibian Road Call Survey • Ontario Vernal Pool Association: http://www.ontariovernalpools.org	Studies confirm; • Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog species with at least 20 individuals (adults or eggs masses) or 2 or more of the listed frog species with Call Level Codes of 3[®]. • A combination of observational study and call count surveys will be required during the spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the woodland/wetlands. • The habitat is the wetland area plus a 230m radius of woodland area^{lxiii, lxv, lxvi, lxvii, lxviii, lxix, lxx, lxxi}. If a wetland area is adjacent to a woodland, a travel corridor connecting the wetland to the woodland is to be included in the habitat. • SWHMiST^{exlix} Index #14 provides development effects and mitigation measures.	Candidate habitat is present: on adjacent lands to the north (i.e., WSU2a / SWD); and WSU3, WSU 4, WSU5a and WSU5b, all of which are associated with forest in WSU2a and WSU2b . No suitable breeding habitat is present in ELC Units 7, 10 and 12 Survey results (highest abundance): • AC1 (WSU3; Unit 8; MAS) - o Spring Peeper – L3 - o Wood Frog – L3 - o Gray Treefrog – L3 - o Green Frog – L2 (10) • AC2 (WSU4: Unit 13; MAM) - o Gray Treefrog – L2 (10) - o Spring Peeper – L3 - o Green Frog – L1 (6) • AC3 (WSU5a; Unit 11; SWT) - o Spring Peeper - L3 - o Wood Frog – L2 (12) - o Gray Treefrog – L2 (12) • AC4 (WSU5b; Unit 3; SWT) - o Spring Peeper – L3 - o Wood Frog – L1 (1) - o Gray Treefrog – L1 (1) - o American Toad – L1 (1) - o Green Frog – L1 (1) • AC5 (WSU2a; Unit 6; FOD, SWD) - o Spring Peeper – L3 - o Gray Treefrog – L1 (1) Conclusion: SWH is present in WSU3

Specialized Wildlife Habitat	Wildlife Species	CANDIDATE SWH		CONFIRMED SWH	Evaluation
		ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	
29. Amphibian Breeding Habitat (Wetlands) <u>Rationale:</u> Wetlands supporting breeding for these amphibian species are extremely important and fairly rare within Central Ontario landscapes.	American Toad Blue-spotted Salamander Bullfrog Eastern Newt Four-toed Salamander Gray Treefrog Green Frog Mink Frog Northern Leopard Frog Pickerel Frog Spotted Salamander Western Chorus Frog	ELC Community Classes SW, MA, FE, BO, OA and SA. Typically these wetland ecosites will be isolated (>120m) from woodland ecosites, however larger wetlands containing predominantly aquatic species (e.g. Bull Frog) may be adjacent to woodlands	- Wetlands>500m² (about 25m diameter),supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNRF mapping and could be important amphibian breeding habitats . - Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators. - Bullfrogs require permanent water bodies with abundant emergent vegetation. <u>Information Sources</u> - Ontario Herpetofaunal Summary Atlas (or other similar atlases) - Canadian Wildlife Service Amphibian Road Surveys and Backyard Amphibian Call Count. - OMNRF Districts and wetland evaluations. - Reports and other information available from Conservation Authorities.	Studies confirm: - Presence of breeding population of 1 or more of the listed newt/salamander species or 2 or more of the listed frog/toad species with at least 20 individuals (adults or eggs masses) or 2 or more of the listed frog/toad species with Call Level Codes of 3[Ⓔ]. or; Wetland with confirmed breeding Bullfrogs are significant. - The ELC ecosite wetland area and the shoreline are the SWH. - A combination of observational study and call count surveys ^{cviii} will be required during the spring (March-June) when amphibians are concentrated around suitable breeding habitat within or near the wetlands. - If a SWH is determined for Amphibian Breeding Habitat (Wetlands) then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. - SWHMIST ^{cxlix} Index #15 provides development effects and mitigation measures.	Candidate habitat is not present. All listed ELC types are adjacent to woodland habitat; these have been evaluated under Criterion # 28 Conclusion: SWH is not present
30. Woodland Area-Sensitive Bird Breeding Habitat <u>Rationale:</u> Large, natural blocks of mature woodland habitat within the settled areas of Southern Ontario are important habitats for area sensitive interior forest song birds.	Blackburnian Warbler Black-throated Blue Warbler Black-throated Green Warbler Blue-headed Vireo Northern Parula Ovenbird Red-breasted Nuthatch Scarlet Tanager Veery Winter Wren Yellow-bellied Sapsucker <u>Special Concern:</u> Canada Warbler Cerulean Warbler	All Ecosites associated with these ELC Community Series; FOC FOM FOD SWC SWM SWD	- Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs old) forest stands or woodlots >30 ha. ^{cv, cxxxi, cxxxii, cxxxiii, cxxxiv, cxxxv, cxxxvi, cxxxvii, cxxxviii, cxxxix, cxi, cxli, cxlii, cxliii, cxliv, cxlv, cxlvi, cli, clii, cliii, cliv, clv, clvi, clvii, clviii, clix} - Interior forest habitat is at least 200 m from forest edge habitat. ^{clxiv} <u>Information Sources</u> - Local birder clubs. - Canadian Wildlife Service (CWS) for the location of forest bird monitoring. - Bird Studies Canada conducted a 3-year study of 287 woodlands to determine the effects of forest fragmentation on forest birds and to determine what forests were of greatest value to interior species - Reports and other information available from Conservation Authorities.	Studies confirm: - Presence of nesting or breeding pairs of 3 or more of the listed wildlife species. [Ⓔ] - Note: any site with breeding Cerulean Warblers or Canada Warblers is to be considered SWH.[Ⓔ] - Conduct field investigations in spring and early summer when birds are singing and defending their territories. - Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” ^{ccxi} - SWHMIST ^{cxlix} Index #34 provides development effects and mitigation measures.	No Candidate habitat is present (not interior forest habitat >200m from edge). Survey results: None of the criteria species were recorded. SWH is not present

1.3 HABITAT FOR SPECIES OF CONSERVATION CONCERN (NOT INCLUDING ENDANGERED OR THREATENED SPECIES)

Habitats of Species of Conservation Concern include wildlife species that are listed as Special Concern or rare, that are declining, or are featured species. Habitats of Species of Conservation Concern do not include habitats of Endangered or Threatened species as identified by the Endangered Species Act 2007. Table 1.3 assists with the identification of SWH for Species of Conservation Concern.

Table 1.3. Habitats of Species of Conservation Concern considered SWH.

Wildlife	Species	CANDIDATE SWH		CONFIRMED SWH	Evaluation
		ELC Ecosite	Habitat Criteria and Information Sources	Defining Criteria	
31. Marsh Breeding Bird Habitat Rationale: Wetlands for these bird species are typically productive and fairly rare in Southern Ontario landscapes.	American Bittern American Coot Common Loon Common Moorhen Green Heron Marsh Wren Pied-billed Grebe Sandhill Crane Sedge Wren Sora Trumpeter Swan Virginia Rail Special Concern: Black Tern Yellow Rail	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SAS1 SAM1 SAF1 FEO1 BOO1 For Green Heron: All SW, MA and CUM1 sites.	- Nesting occurs in wetlands. - All wetland habitat is to be considered as long as there is shallow water with emergent aquatic vegetation present^{cxxiv}. - For Green Heron, habitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently, it may be found in upland shrubs or forest a considerable distance from water. <u>Information Sources</u> - OMNRF District and wetland evaluations. - Field Naturalist clubs - Natural Heritage Information Centre (NHIC) Records. - Reports and other information available from Conservation Authorities. - Ontario Breeding Bird Atlas.	Studies confirm: - Presence of 5 or more nesting pairs of Sedge Wren or Marsh Wren or 1 pair of Sandhill Cranes; or breeding by any combination of 5 or more of the listed species[Ⓔ]. - Note: any wetland with breeding of 1 or more Black Terns, Trumpeter Swan, Green Heron or Yellow Rail is SWH[Ⓔ]. - Area of the ELC ecosite is the SWH. - Breeding surveys should be done in May/June when these species are actively nesting in wetland habitats. - Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects” - SWHMiST Index #35 provides development effects and mitigation measures	Candidate ELC types are present (MAM, SW, CUM) Habitat was evaluated through targeted Marsh Breeding Bird surveys (May-June) and none of the criteria species was recorded. SWH is not present
32. Open Country Bird Breeding Habitat Rationale: This wildlife habitat is declining throughout Ontario and North America. Species such as the Upland Sandpiper have declined significantly the past 40 years based on CWS (2004) trend records.	Grasshopper Sparrow Northern Harrier Savannah Sparrow Upland Sandpiper Vesper Sparrow Special Concern: Short-eared Owl	CUM1 CUM2	- Large grassland areas (includes natural and cultural fields and meadows) >30 ha^{clx, clxi, clxii, clxiii, clxiv, clxv, clxvi, clxvii, clxviii, clxix}. Grasslands not Class 1 or 2 agricultural lands, and not being actively used for farming (i.e. no row cropping or intensive hay or livestock pasturing in the last 5 years)^Ī. - Grassland sites considered significant should have a history of longevity, either abandoned fields, mature hayfields and pasturelands that are at least 5 years or older. - The Indicator bird species are area sensitive requiring larger grassland areas than the common grassland species. <u>Information Sources</u> - Agricultural land classification maps, Ministry of Agriculture. - Local bird clubs. - Ontario Breeding Bird Atlas - EIS Reports and other information available from Conservation Authorities.	Field Studies confirm: - Presence of nesting or breeding of 2 or more of the listed species.^Ī - A field with 1 or more breeding Short-eared Owls is to be considered SWH. - The area of SWH is the contiguous ELC ecosite field areas. - Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories. - Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”^{ccxi} - SWHMiST^{cxlix} Index #32 provides development effects and mitigation measures	No Candidate habitat is present (no CUM units >30 ha). SWH is not present

Wildlife	Species	CANDIDATE SWH		CONFIRMED SWH	Evaluation
		ELC Ecosite	Habitat Criteria and Information Sources	Defining Criteria	
33. Shrub/Early Successional Bird Breeding Habitat Rationale: This wildlife habitat is declining throughout Ontario and North America. The Brown Thrasher has declined significantly over the past 40 years based on CWS (2004) trend records ^{cxix} .	Indicator Spp: Brown Thrasher Clay-coloured Sparrow Common Spp.: Black-billed Cuckoo Eastern Towhee Field Sparrow Willow Flycatcher Special Concern: Golden-winged Warbler Yellow-breasted Chat	CUT1 CUT2 CUS1 CUS2 CUW1 CUW2 Patches of shrub ecosites can be complexed into a larger habitat for some bird species	Large field areas succeeding to shrub and thicket habitats>10ha ^{clxiv} in size. - Shrub land or early successional fields, not class 1 or 2 agricultural lands, not being actively used for farming (i.e. no row-cropping, haying or live-stock pasturing in the last 5 years) ^I. - Shrub thicket habitats (>10 ha) are most likely to support and sustain a diversity of these species ^{clxxiii}. - Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands. Information Sources - Agricultural land classification maps, Ministry of Agriculture. - Local bird clubs. - Ontario Breeding Bird Atlas - Reports and other information available from Conservation Authorities.	Field Studies confirm: - Presence of nesting or breeding of 1 of the indicator species and at least 2 of the common species.^I - A habitat with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as Significant Wildlife Habitat. ^I - The area of the SWH is the contiguous ELC ecosite field/thicket area. - Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories - Evaluation methods to follow “Bird and Bird Habitats: Guidelines for Wind Power Projects”^{ccxi} - SWHMiST ^{clix} Index #33 provides development effects and mitigation measures.	No Candidate habitat is present (CUT is present, but is <10ha) SWH is not present
34. Terrestrial Crayfish Rationale: Terrestrial Crayfish are only found within SW Ontario in Canada and their habitats are very rare. ^{ccii}	Chimney or Digger Crayfish; (<i>Fallicambarus fodiens</i>) Devil Crawfish or Meadow Crayfish; (<i>Cambarus Diogenes</i>)	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 MAS1 MAS2 MAS3 SWD SWT SWM CUM1 with inclusions of above meadow marsh ecosites can be used by terrestrial crayfish.	Wet meadow and edges of shallow marshes (no minimum size) should be surveyed for terrestrial crayfish. - Constructs burrows in marshes, mudflats, meadows, the ground can’t be too moist. Can often be found far from water. - Both species are a semi-terrestrial burrower which spends most of its life within burrows consisting of a network of tunnels. Usually the soil is not too moist so that the tunnel is well formed. Information Sources - Information sources from “Conservation Status of Freshwater Crayfishes” by Dr. Premek Hamr for the WWF and CNF March 1998	Studies Confirm: - Presence of 1 or more individuals of species listed or their chimneys (burrows) in suitable meadow marsh, swamp or terrestrial sites ^{cci} - Area of ELC Ecosite or an ecoelement area of meadow marsh or swamp within the larger ecosite area is the SWH. - Surveys should be done April to August in temporary or permanent water. Note the presence of burrows or chimneys are often the only indicator of presence, observance or collection of individuals is very difficult - SWHMiST ^{clix} Index #36 provides development effects and mitigation measures.	Candidate habitat is present in and adjacent to wetland habitats on the Subject Property. Terrestrial Crayfish were recorded along the southern edge of WSU3 and along the northern edge of WSU4 during the 2020 surveys. Confirmed SWH is present in the wetland Ecosites (SWD – Unit 7, MAS – Unit 8 and MAM – Unit 13), and immediately adjacent to Unit 13 (the area of the burrows extended ~1 m into the agricultural field within the buffer of the wetland).
35. Special Concern and Rare Wildlife Species Rationale: These species are	All Special Concern and Provincially Rare (S1-S3, SH) plant and animal species. Lists of these species are	All plant and animal element occurrences (EO) within a 1 or 10km grid.	When an element occurrence is identified within a 1 or 10 km grid for a Special Concern or provincially Rare species; linking candidate habitat on the site needs to be completed to ELC Ecosites ^{lxxviii} Information Sources Natural Heritage Information Centre (NHIC) will have	Studies Confirm: - Assessment/inventory of the site for the identified special concern or rare species needs to be completed during the time of year when the species is present or easily identifiable. - The area of the habitat to the finest ELC	Three species designated as Special Concern in Ontario were recorded: - Monarch (likely migrants, foraging over agricultural fields, and along field and wetland edges). No confirmed SWH; none of the observations was associated with defined habitat features (e.g., concentrations of Milkweed) - Barn Swallow was observed in WSU1; however, Barn Swallow was a foraging visitant, no breeding evidence was recorded, and no nesting habitat is

Wildlife	Species	CANDIDATE SWH		CONFIRMED SWH	Evaluation
		ELC Ecosite	Habitat Criteria and Information Sources	Defining Criteria	
quite rare or have experienced significant population declines in Ontario.	tracked by the Natural Heritage Information Centre (NHIC).	Older element occurrences were recorded prior to GPS being available, therefore location information may lack accuracy.	Special Concern and Provincially Rare (S1-S3, SH) species lists with element occurrences data. - NHIC Website “Get Information” : http://nhic.mnr.gov.on.ca - Ontario Breeding Bird Atlas - Expert advice should be sought as many of the rare spp. have little information available about their requirements.	scale that protects the habitat form and function is the SWH, this must be delineated through detailed field studies. The habitat needs be easily mapped and cover an important life stage component for a species e.g. specific nesting habitat or foraging habitat. SWHMiST^{exlix} Index #37 provides development effects and mitigation measures.	present. Given that no specific or unique critical habitat features are present in WSU1, and ample foraging habitat is available in the surrounding landscape, WSP concludes that WSU1 is not Significant Wildlife Habitat for Barn Swallow. - Snapping Turtle (WSU4). Confirmed SWH in this wetland. - Wood Thrush (WSU2a). Confirmed SWH in the WSU2a woodland on adjacent lands to the north. Confirmed SWH is present in WSU4 and WSU2a

1.4 ANIMAL MOVEMENT CORRIDORS

Animal Movement Corridors are elongated areas used by wildlife to move from one habitat to another. They are important to ensure genetic diversity in populations, to allow seasonal migration of animals (e.g. deer moving from summer to winter range) and to allow animals to move throughout their home range from feeding areas to cover areas. Animal movement corridors function at different scales often related to the size and home range of the animal. For example, short, narrow areas of natural habitat may function as a corridor between amphibian breeding areas and their summer range, while wider, longer corridors are needed to allow deer to travel from their winter habitat to their summer habitat.

Identifying the most important corridors that provide connectivity across the landscape is challenging because of a lack of specific information on animal movements. There is also some uncertainty about the optimum width and mortality risks of corridors. Furthermore, a corridor may be beneficial for some species but detrimental to others. For example, narrow linear corridors may allow increased access for racoons, cats, and other predators. Also, narrow corridors dominated by edge habitat may encourage invasion by weedy generalist plants and opportunistic species of birds and mammals. Corridors often consist of naturally vegetated areas that run through more open or developed landscapes. However, sparsely vegetated areas can also function as corridors. For example, many species move freely through agricultural land to reach natural areas. Despite the difficulty of identifying exact movement corridors for all species, these landscape features are important to the long-term viability of certain wildlife populations.

Animal Movement Corridors should only be identified as SWH where:

Where a Confirmed or Candidate SWH has been identified by MNRF or the planning authority based on documented evidence of a habitat identified within these Criterion Schedules or the Significant Wildlife Habitat Technical Guide. The identified wildlife habitats Table 1.4.1 will have distinct passageways or rely on well defined natural features for movements between habitats required by the species to complete its life cycle.

Table 1.4.1 Animal Movement Corridors

Habitat	SPECIES	CANDIDATE SWH		CONFIRMED SWH	Evaluation
		ELC Eco-sites	Habitat Criteria and Information Sources	Defining Criteria	
36. Amphibian Movement Corridors Rationale: Movement corridors for amphibians moving from their terrestrial habitat to breeding habitat can be extremely important for local populations.	American Toad Blue-spotted Salamander Bullfrog Eastern Newt Four-toed Salamander Gray Treefrog Green Frog Mink Frog Northern Leopard Frog Pickeral Frog Spotted Salamander Western Chorus Frog	Corridors may be found in all ecosites associated with water. Corridors will be determined based on identifying the significant breeding habitat for these species in Table 1.1	Movement corridors between breeding habitat and summer habitat ^{clxxiv, clxxv, clxxvi, clxxvii, clxxviii, clxxix, clxxx, clxxxi} . Movement corridors must be determined when Amphibian breeding habitat is confirmed as SWH from Table 1.2.2 (Amphibian Breeding Habitat –Wetland) of this Schedule I. <u>Information Sources</u> - MNRF District Office. - Natural Heritage Information Centre (NHIC). - Reports and other information available from Conservation Authorities. - Field Naturalist Clubs.	- Field Studies must be conducted at the time of year when species are expected to be migrating or entering breeding sites. - Corridors should consist of native vegetation, with several layers of vegetation. Corridors unbroken by roads, waterways or bodies, and undeveloped areas are most significant^{cxlix} - Corridors should have at least 15m of vegetation on both sides of waterway^{cxlix} or be up to 200m wide^{cxlix} of woodland habitat and with gaps <20m^{cxlix}. - Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat^{cxlix}. - SWHMiST^{cxlix} Index #40 provides development effects and mitigation measures	Candidate habitat is not present (no wetland amphibian breeding SWH was confirmed) SWH is not present

Habitat	SPECIES	CANDIDATE SWH		CONFIRMED SWH	Evaluation
		ELC Eco-sites	Habitat Criteria and Information Sources	Defining Criteria	
37. Deer Movement Corridors <u>Rationale:</u> Corridors important for all species to be able to access seasonally important life-cycle habitats or to access new habitat for dispersing individuals by minimizing their vulnerability while travelling.	White-tailed Deer	Corridors may be found in all forested ecosites. A Project Proposal in Stratum II Deer Wintering Area has potential to contain corridors.	Movement corridor must be determined when Deer Wintering Habitat is confirmed as SWH from Table 1.1 of this schedule. ⑤ - A deer wintering habitat identified by the OMNRF as SWH in Table 1.1 of this Schedule will have corridors that the deer use during fall migration and spring dispersion ^{clxxxii, clxxxiii, cxlix, cxciiv}. - Corridors typically follow riparian areas, woodlots, areas of physical geography (ravines, or ridges). <u>Information Sources</u> - MNRF District Office. - Natural Heritage Information Centre (NHIC). - Reports and other information available from Conservation Authorities. - Field Naturalist Clubs.	- Studies must be conducted at the time of year when deer are migrating or moving to and from winter concentration areas . - Corridors that lead to a deer wintering habitat should be unbroken by roads and residential areas. - Corridors should be at least 200m wide ^{cxlix} with gaps <20m ^{cxlix} and if following riparian area with at least 15m of vegetation on both sides of waterway ^{cxlix}. Shorter corridors are more significant than longer corridors, ^{cxlix}. - SWHMiST ^{cxlix} Index #39 provides development effects and mitigation measures	Not applicable.

1.5 EXCEPTIONS FOR ECOREGION 6E

Exceptions are candidate wildlife habitats that will have different criteria than what is proposed in the above schedules for an area within the Eco-region. The Exceptions will be based on Eco-Districts and municipalities can apply the exception for the eco-district within their planning area

Table 1.5.1 Significant Wildlife Habitat Exceptions for Ecodistricts within EcoRegion 6E

EcoDistrict	Wildlife Habitat and Species	Candidate SWH			Confirmed SWH	Evaluation
		Ecosites	Habitat Description	Habitat Criteria and Information	Defining Criteria	
6E-14 Rationale: The Bruce Peninsula has an isolated and distinct population of black bears. Maintenance of large woodland tracts with mast-producing tree species is important for bears. clxxxvi, ccxvii	Mast Producing Areas Black Bear	All forested habitat represented by ELC Community Series: FOM FOD	Black bears require forested habitat that provides cover, winter hibernation sites, and mast producing tree species. Clxxxv, clxxxvii, clxxxviii, clxxxix, cxc, xcxi, xcxi, xcxi, ccxvii	Woodland ecosites >30 ha with mast-producing tree species, either soft (cherry) or hard (oak and beech). <u>Information Sources</u> Important forest habitat for black bears may be identified by OMNRF.	- All woodlands > 30ha with a 50%composition of these ELC Vegetation® Types are considered significant: FOM1-1, FOM2-1, FOM3-1, FOD1-1, FOD1-2, FOD2-1, FOD2-2, FOD2-3, FOD2-4, FOD4-1, FOD5-2, FOD5-3, FOD5-7, FOD6-5 - SWHMiST cxlix Index #3 provides development effects and mitigation measures.	Not applicable.
6E- 17 Rationale: Sharp-tailed grouse only occur on Manitoulin Island in Eco-region 6E, Leks are an important habitat to maintain their population	Lek Sharp-tailed Grouse	CUM CUS CUT	- The lek or dancing ground consists of bare, grassy or sparse shrubland. There is often a hill or rise in topography ccxix. - Leks are typically a grassy field/meadow >15ha with adjacent shrublands and >30ha with adjacent deciduous woodland. Conifer trees within 500m are not tolerated ccxix.	Grasslands (field/meadow) are to be >15ha when adjacent to shrubland and >30ha when adjacent to deciduous woodland ccxix. - Grasslands are to be undisturbed with low intensities of agriculture (light grazing or late haying) - Leks will be used annually if not destroyed by cultivation or invasion by woody plants or tree planting ccxix. <u>Information Sources</u> - OMNRF District Office - Bird watching clubs - Local landowners - Ontario Breeding Bird Atlas	Studies confirming lek habitat are to be completed from late March to June. - Any site confirmed with sharp-tailed grouse courtship activities is considered significant. - The field/meadow ELC ecosites plus a 200 m radius area with shrub or deciduous woodland is the lek habitat - SWHMist cxlix Index #32 provides development effects and mitigation measures.	Not applicable.

APPENDIX G

Species at Risk Habitat Assessment

Appendix G - Species at Risk Habitat Assessment

Species At Risk Designations	
ENDANGERED	
THREATENED	
SPECIAL CONCERN	
EXTIRPATED	

Species	ESA Status and Regional Occurrence	Key Habitats Used By Species	Reasonable Likelihood of Presence in Study Area	Surveys Underaken	Field Survey Results	Likelihood and Magnitude of Impacts to Species and/or Habitats
Amphibians						
Jefferson Salamander (<i>Ambystoma jeffersonianum</i>)	Known to Occur	inhabit deciduous and mixed deciduous forests with suitable breeding areas which generally consist of ephemeral (temporary) bodies of water that are fed by spring runoff, groundwater, or springs.	None. No vernal pool habitat; no known records in the area	General Wildlife Survey / SAR Habitat Assessment	Not encountered	None. No suitable breeding habitat in study area. No impact to forest habitat.
Birds						
Acadian Flycatcher (<i>Empidonax virens</i>)	Known to Occur	generally requires large areas of mature, undisturbed forest; avoids the forest edge; often found in well wooded swamps and ravines	None. No large, mature forests on site	Two Breeding Bird Surveys, two Marsh Bird Surveys	Not recorded	None. No suitable breeding habitat in study area.
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	Known to Occur	prefers deciduous and mixed-deciduous forest; and habitat close to water bodies such as lakes and rivers; They roost in super canopy trees such as Pine	None. No suitable lakeshore / river habitat with super canopy trees	Two Breeding Bird Surveys, two Marsh Bird Surveys	Not recorded	None. No suitable breeding habitat in study area.
Bank Swallow (<i>Riparia riparia</i>)	Known to Occur	It nests in a wide variety of naturally and anthropogenically created vertical banks, which often erode and change over time including aggregate pits and the shores of large lakes and rivers	Low. Some potential for flyovers and foraging habitat in fields on site, no potential breeding habitat on site	Two Breeding Bird Surveys, two Marsh Bird Surveys	Not recorded	None. No suitable breeding habitat in study area. Suitable foraging habitat to be retained on site and in the local landscape.
Barn Swallow (<i>Hirundo rustica</i>)	Known to Occur	prefers farmland; lake/river shorelines; wooded clearings; urban populated areas; rocky cliffs; and wetlands. They nest inside or outside buildings; under bridges and in road culverts; on rock faces and in caves etc.	Moderate. Potential for flyovers and foraging habitat in fields on site, no potential nesting habitat. Potential nesting habitat in barn ~200 m north.	Two Breeding Bird Surveys, two Marsh Bird Surveys	One individual was observed foraging over the agricultural fields	None. No suitable breeding habitat in study area. Suitable foraging habitat to be retained on site and in the local landscape.
Black Tern (<i>Childonias niger</i>)	Historically Known to Occur	generally prefer freshwater marshes and wetlands; nest either on floating material in a marsh or on the ground very close to water	None. No freshwater marshes are present	Two Breeding Bird Surveys, two Marsh Bird Surveys	Not recorded	None. No suitable breeding habitat in study area.
Bobolink (<i>Dolichonyx oryzivorus</i>)	Known to Occur	generally prefers open grasslands and hay fields. In migration and in winter uses freshwater marshes and grasslands	Low. Some potential for flyovers and foraging habitat but former agricultural fields have been ploughed / cleared	Two Breeding Bird Surveys, two Marsh Bird Surveys	One individual was observed along a hedgerow	None. No suitable breeding habitat in study area.
Canada Warbler (<i>Cardellina canadensis</i> ; formerly <i>Wilsonia canadensis</i>)	Known to Occur	Generally prefers wet coniferous, deciduous and mixed forest types, with a dense shrub layer. Nests on the ground, on logs or hummocks, and uses dense shrub layer to conceal the nest.	None. No suitable forest habitat is present	Two Breeding Bird Surveys, two Marsh Bird Surveys	Not recorded	None. No suitable breeding habitat in study area.
Cerulean Warbler (<i>Setophaga cerulea</i> ; formerly <i>Dendroica cerulea</i>)	Known to Occur	generally found in mature deciduous forests with an open understorey; also nests in older, second-growth deciduous forests.	None. No suitable forest habitat is present	Two Breeding Bird Surveys, two Marsh Bird Surveys	Not recorded	None. No suitable breeding habitat in study area.
Chimney Swift (<i>Chaetura pelagica</i>)	Known to Occur	historically found in deciduous and coniferous, usually wet forest types, all with a welldeveloped, dense shrub layer; now most are found in urban areas in large uncapped chimneys	Low. Potential for occasional flyovers, but no suitable roosting / nesting habitat	Two Breeding Bird Surveys, two Marsh Bird Surveys	Not recorded	None. No suitable breeding habitat in study area.
Common Nighthawk (<i>Chordeiles minor</i>)	Known to Occur	generally prefer open, vegetation-free habitats, incl. dunes, beaches, recently harvested forests, burnt-over areas, logged areas, rocky outcrops or barrens, grasslands, pastures, peat bogs, marshes, lakeshores, and river banks. This species also inhabits mixed and coniferous forests. Can also be found in urban areas (nest on flat roof-tops)	Low. Some potential for flyovers and foraging habitat above the field on site; no suitable open habitat	Two Breeding Bird Surveys, two Marsh Bird Surveys	Not recorded	None. No suitable breeding habitat in study area.
Eastern Meadowlark (<i>Sturnella Magna</i>)	Known to Occur	generally prefers grassy pastures, meadows and hay fields. Nests are always on the ground and usually hidden in or under grass clumps.	Low. Potential for flyovers and foraging habitat but former agricultural fields have been ploughed / cleared	Two Breeding Bird Surveys, two Marsh Bird Surveys	Not recorded	None. No suitable breeding habitat in study area.
Eastern Wood-Pewee (<i>Contopus virens</i>)	Known to Occur	associated with deciduous and mixed forests. Within mature and intermediate age stands it prefers areas with little understorey vegetation as well as forest clearings and edges.	Moderate. Suitable forest habitat is present on and adjacent to the subject property	Two Breeding Bird Surveys, two Marsh Bird Surveys	Not recorded	None. Suitable breeding habitat in the forest to be retained, with setbacks and mitigation measures

Appendix G - Species at Risk Habitat Assessment

Eastern Whip-poor-will (<i>Caprimulgus vociferus</i>)	Known to Occur	generally prefer semi-open deciduous forests or patchy forests with clearings; areas with little ground cover are also preferred; In winter they occupy primarily mixed woods near open areas.	None. No semi-open / patchy deciduous forest habitat is present	Two Breeding Bird Surveys, two Marsh Bird Surveys	Not recorded	None. No suitable breeding habitat in study area.
Golden-winged Warbler (<i>Vermivora chrysoptera</i>)	Known to Occur	generally prefer areas of early successional vegetation, found primarily on field edges, hydro or utility right-of-ways, or recently logged areas.	None. No early successional habitat is present	Two Breeding Bird Surveys, two Marsh Bird Surveys	Not recorded	None. No suitable breeding habitat in study area.
Henslow's Sparrow (<i>Ammodramus henslowii</i>)	Historically Known to Occur	generally found in old fields, pastures and wet meadows. They prefer areas with dense, tall grasses, and thatch, or decaying plant material	None. No suitable habitat is present. Former agricultural fields have been ploughed / cleared. This species is very rare in Ontario.	Two Breeding Bird Surveys, two Marsh Bird Surveys	Not recorded	None. No suitable breeding habitat in study area.
Least Bittern (<i>Ixobrychus exilis</i>)	Known to Occur	generally located near pools of open water in relatively large marshes and swamps that are dominated by cattail and other robust emergent plants	Minimal. Potential breeding habitat (i.e. large wetland but dense emergent vegetation) is limited within the study area.	Two Breeding Bird Surveys, two Marsh Bird Surveys	Not recorded	None. Potentially suitable breeding habitat (marginal) will be retained, with setbacks and mitigation measures
Louisiana Waterthrush (<i>Seiurus motacilla</i>)	Known to Occur	generally inhabits mature forests along steeply sloped ravines adjacent to running water. It prefers clear, cold streams and densely wooded swamps	None. No suitable forest habitat is present	Two Breeding Bird Surveys, two Marsh Bird Surveys	Not recorded	None. No suitable breeding habitat in study area.
Northern Bobwhite (<i>Colinus virginianus</i>)	Historically Known to Occur	generally inhabits a variety of edge and grassland type - habitats including non-intensively farmed agricultural lands.	None. No suitable breeding habitat (i.e. habitat mosaic of croplands, pine-hardwood forests and fields)	Two Breeding Bird Surveys, two Marsh Bird Surveys	Not recorded	None. No suitable breeding habitat in study area.
Peregrine Falcon (<i>Falco peregrinus</i>)	Known to Occur	generally nest on tall, steep cliff ledges adjacent to large waterbodies; some birds adapt to urban environments and nest on ledges of tall buildings, even in densely populated downtown areas.	Minimal. No potential nesting habitat, may flyover / forage occasionally	Two Breeding Bird Surveys, two Marsh Bird Surveys	Not recorded	None. No suitable breeding habitat in study area.
Red-Headed Woodpecker (<i>Melanerpes erythrocephalus</i>)	Known to Occur	generally prefer open oak and beech forests, grasslands, forest edges, orchards, pastures, riparian forests, roadsides, urban parks, golf courses, cemeteries, as well as along beaver ponds and brooks	Moderate. Suitable breeding habitat (i.e. open treed habitats) occurs within study area and records are known within the vicinity of the area	Two Breeding Bird Surveys, two Marsh Bird Surveys	Not recorded	None. Potentially suitable breeding habitat in treed area in the northwest corner to be retained, with a naturalized buffer
Short-eared Owl (<i>Asio flammeus</i>)	Suspected to Occur	generally prefers a wide variety of open habitats, including grasslands, peat bogs, marshes, sand-sage concentrations, old pastures and agricultural fields	None. No suitable habitat is present. Former agricultural fields have been ploughed / cleared. This species is very rare in Ontario.	Two Breeding Bird Surveys, two Marsh Bird Surveys	Not recorded	None. No suitable breeding habitat in study area.
Wood Thrush (<i>Hylocichla mustelina</i>)	Known to Occur	Nests mainly in second-growth and mature deciduous and mixed forests, with saplings and well-developed understory layers. Prefers large forest mosaics, but may also nest in small forest fragments.	Confirmed. Suitable breeding habitat (i.e. >1ha deciduous or mixed forest with sapling understory) occurs adjacent to the study area	Two Breeding Bird Surveys, two Marsh Bird Surveys	One individual was recorded with 'possible' breeding evidence	None. Suitable breeding habitat in forest on and adjacent to the property to be retained, with a naturalized buffer
Yellow-breasted Chat (<i>Icteria virens</i>)	Historically Known to Occur	generally prefer dense thickets around wood edges, riparian areas, and in overgrown clearings	None. No suitable thicket habitat is present	Two Breeding Bird Surveys, two Marsh Bird Surveys	Not recorded	None. No suitable breeding habitat in study area.
Insects						
Monarch Butterfly (<i>Danaus plexippus</i>)	Known to Occur	exist primarily wherever milkweed and wildflowers exist; abandoned farmland, along roadsides, and other open spaces	Confirmed. Small amount of cultural meadow and edge habitat	General Wildlife Survey / SAR Habitat Assessment	Several recorded	None. No impact to habitat. Future naturalized buffer will provided additional habitat. Abundant habitat is present in the local landscape.
Rusty-patched Bumble Bee (<i>Bombus affinis</i>)	Formerly Occurred and May Still Occur	generally inhabits a range of diverse habitats including mixed farmland, sand dunes, marshes, urban and wooded areas. It usually nests underground in abandoned rodent burrows	None - potential foraging habitat (i.e. wildflowers) occurs within study area; however, this species is very rare in Ontario and has only been observed at Pinery Provincial Park since 2002.	General Wildlife Survey / SAR Habitat Assessment	Not encountered	None. No impact to potentially suitable habitat. Future naturalized buffer will provided additional habitat.
West Virginia White (<i>Pieris virginienensis</i>)	Formerly Occurred and May Still Occur	generally prefer moist, deciduous woodlands. The larvae feed only on the leaves of the two-leaved toothwort (Cardamine diphylla), which is a small, spring-blooming plant of the forest floor.	None - no suitable forest habitat	General Wildlife Survey / SAR Habitat Assessment	Not encountered	None. No suitable breeding habitat in study area.
Mammals						
American Badger (<i>Taxidea taxus jacksoni</i>)	Known to Occur	generally prefer open habitats, whether natural (grasslands) or man-made (agricultural fields, road right-of-ways, golf courses)	Minimal - No known records in the area.	General Wildlife Survey / SAR Habitat Assessment	Not encountered. No evidence of use	None. No known records in the area and no evidence of Badger use on the property (i.e., characteristic burrows).

Appendix G - Species at Risk Habitat Assessment

Eastern Red Bat (<i>Lasiurus borealis</i>)	Known to Occur	Occupy a wide diversity of habitats across their range. They use both deciduous and coniferous forests, of any age class. Trees used as maternity roosts tend to be large diameter and tall, reaching or exceeding the height of the surrounding canopy. They typically roost among the foliage of trees and occasionally shrubs. Male Eastern Red Bats in particular have been observed to use saplings as roosts, which is rarely reported for reproductive females. They forage in both forested and non-forested habitats. Heavily disturbed habitats are generally avoided. Eastern Red Bats migrate to overwintering areas in the southern United States but their migration routes are not known.	Moderate. Suitable roosting habitat (i.e. deciduous swamp and deciduous forest) occurs within the study area.	General Wildlife Survey / SAR Habitat Assessment	Not encountered	None. No impact to potentially suitable treed habitat. To be retained in full, with a naturalized buffer
Eastern Small-footed Myotis (<i>Myotis leibii</i>)	Known to Occur	Overwintering habitat: Caves and mines that remain above 0 degrees Maternal Roosts: primarily under loose rocks on exposed rock outcrops, crevices and cliffs, and occasionally in buildings, under bridges and highway overpasses and under tree bark.	Moderate. Suitable roosting habitat (i.e. deciduous/mixed forest) occurs; however, preferred breeding habitat (i.e. rock outcrops) does not occur within the study area.	General Wildlife Survey / SAR Habitat Assessment	Not encountered	None. No impact to potentially suitable forest habitat. To be retained in full, with a naturalized buffer
Little Brown Myotis (<i>Myotis lucifugus</i>)	Known to Occur	Overwintering habitat: Caves and mines that remain above 0 degrees Maternal Roosts: Often associated with buildings (attics, barns etc.). Occasionally found in trees (25-44 cm dbh).	Moderate. Suitable roosting habitat (i.e. deciduous/mixed forest) occurs within the study area	General Wildlife Survey / SAR Habitat Assessment	Not encountered	None. No impact to potentially suitable forest habitat. To be retained in full, with a naturalized buffer
Northern Hoary Bat (<i>Lasiurus cinereus</i>)	Known to Occur	Occupy a wide diversity of habitats across their geographic range. They use both deciduous and coniferous forests, of any age class. Trees used as maternity roosts tend to be large diameter and tall, reaching or exceeding the height of the surrounding canopy. They typically roost among the foliage of trees and occasionally shrubs. They forage in the open, and suitable habitats may include wetlands, grasslands and open fields with patchily distributed trees. Heavily disturbed habitats are generally avoided. Hoary Bats migrate to overwintering areas in the southern United States but their migration routes are not known.	Moderate. Suitable roosting habitat (i.e. deciduous swamp and deciduous forest) occurs within the study area.	General Wildlife Survey / SAR Habitat Assessment	Not encountered	None. No impact to potentially suitable treed habitat. To be retained in full, with a naturalized buffer
Northern Myotis (<i>Myotis septentrionalis</i>)	Known to Occur	Overwintering habitat: Caves and mines that remain above 0 degrees Maternal Roosts: Often associated with cavities of large diameter trees (25-44 cm dbh). Occasionally found in structures (attics, barns etc.)	Moderate. Suitable roosting habitat (i.e. deciduous/mixed forest) occurs within the study area	General Wildlife Survey / SAR Habitat Assessment	Not encountered	None. No impact to potentially suitable forest habitat. To be retained in full, with a naturalized buffer
Silver Haired Bat (<i>Lasionycteris noctivagans</i>)	Known to Occur	Occupy a wide diversity of habitats across their geographic range. They roost in a variety of large diameter coniferous and deciduous trees. Roosting occurs primarily under bark and in the cavities of trees, and occasionally buildings. They forage in young and old forest, as well as forest openings (canopy gaps), but are concentrated along forest edges and intact forest. Silver-haired Bats overwinter in the United States, southeastern British Columbia and sometimes the Great Lakes region. In British Columbia, they have been documented hibernating in mines, rock crevices, trees, and snags. Little else is known about their winter ecology.	Moderate. Suitable roosting habitat (i.e. deciduous swamp and deciduous forest) occurs within the study area.	General Wildlife Survey / SAR Habitat Assessment	Not encountered	None. No impact to potentially suitable treed habitat. To be retained in full, with a naturalized buffer
Plants						
American Chestnut (<i>Castanea dentata</i>)	Known to Occur	found in deciduous forest communities; this tree prefers acid forests with acid and sandy soils.	Moderate. Suitable habitat present within the study area in deciduous forests	Botanical Surveys and ELC	Not recorded	None. No impact to potentially suitable forest habitat. To be retained in full, with a naturalized buffer
American Ginseng (<i>Panax quinquefolius</i>)	Known to Occur	grows in rich, moist, undisturbed and relatively mature deciduous woods in areas of neutral soil (such as over limestone or marble bedrock).	Low. Marginally suitable habitat present within the study area in deciduous forests	Botanical Surveys and ELC	Not recorded	None. No impact to potentially suitable forest habitat. To be retained in full, with a naturalized buffer

Appendix G - Species at Risk Habitat Assessment

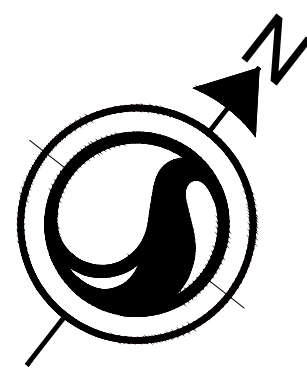
Butternut (<i>Juglans cinerea</i>)	Known to Occur	generally grows in rich, moist, and well-drained soils often found along streams. It may also be found on well-drained gravel sites, especially those made up of limestone. It is also found, though seldomly, on dry, rocky and sterile soils. In Ontario, the Butternut generally grows alone or in small groups in deciduous forests as well as in hedgerows	Confirmed. Suitable habitat present within the study area in deciduous forests and known to occur within the local area.	Botanical Surveys and ELC	One Butternut tree recorded within the woodland.	None. No development within forest and at least 50 m of habitat from the tree to be retained.
Eastern Flowering Dogwood (<i>Cornus florida</i>)	Known to Occur - Planted	generally grows in deciduous and mixed forests, in the drier areas of its habitat, although it is occasionally found in slightly moist environments; Also grows around edges and hedgerows	Low. Marginally suitable habitat present within the study area in deciduous forests	Botanical Surveys and ELC	Not recorded	None. No impact to potentially suitable forest habitat. To be retained in full, with a naturalized buffer
Green Dragon (<i>Arisaema dracontium</i>)	Known to Occur	generally grows in damp deciduous forests and along streams.	Low. Marginally habitat is present within the riparian habitat of the study area. This species is known to occur within the <i>Phillipsburg Southeast Wetland Complex</i> to the north	Botanical Surveys and ELC	Not recorded	None. No impact to potentially suitable riparian habitat on lands to the north.
Kentucky Coffee-tree (<i>Gymnocladus dioica</i>)	Known to Occur - Planted	generally inhabits open areas of floodplains and the edges of wetlands. Shade-intolerant.	Low. Marginally suitable habitat present within the study area in deciduous forests, but dense shade in most areas of wetland edges	Botanical Surveys and ELC	Not recorded	None. No impact to potentially suitable forest habitat. To be retained in full, with a naturalized buffer
Reptiles						
Blanding's Turtle (<i>Emydonidea blandingii</i>)	Known to Occur	generally occur in freshwater lakes, permanent or temporary pools, slow-flowing streams, marshes and swamps. They prefer shallow water that is rich in nutrients, organic soil and dense vegetation. Adults are generally found in open or partially vegetated sites, and juveniles prefer areas that contain thick aquatic vegetation including sphagnum, water lilies and algae. They dig their nest in a variety of loose substrates, including sand, organic soil, gravel and cobblestone. Overwintering occurs in permanent pools that average about one metre in depth, or in slow-flowing streams.	Low. A small amount of suitable habitat (i.e. meadow marsh) occurs within study area	One turtle basking/ spring emergence survey	Not recorded	None. No impact to potentially suitable wetland habitat. To be retained in full, with a naturalized buffer
Eastern Ribbonsnake (<i>Thamnophis sauritus</i>)	Known to Occur	generally occur along the edges of shallow ponds, streams, marshes, swamps, or bogs bordered by dense vegetation that provides cover. Abundant exposure to sunlight is also required, and adjacent upland areas may be used for nesting.	Moderate. Suitable habitat (i.e. swamp and densely vegetated riparian areas) occurs within study area	General Wildlife Survey / SAR Habitat Assessment	Not encountered	None - no development within 30m of water features.
Milksnake (<i>Lampropeltis triangulum</i>)	Known to Occur (No longer listed under ESA; listed as Special Concern federally)	generally occur in rural areas, where it is most frequently reported in and around buildings, especially old structures. It is also found in a wide variety of habitats, from prairies, pastures, and hayfields, to rocky hillsides and a wide variety of forest types. They must also be in proximity of water, and suitable locations for basking and egg-laying.	Minimal. No ideal habitat (i.e. buildings or pastures) occurs within the study area. Some treed and open water is present.	General Wildlife Survey / SAR Habitat Assessment	Not encountered	None. No impact to potentially suitable wetland/treed habitat. To be retained in full, with a naturalized buffer
Northern Map Turtle (<i>Graptemys geographica</i>)	Known to Occur	generally inhabits both lakes and rivers, showing a preference for slow moving currents, muddy bottoms, and abundant aquatic vegetation. These turtles need suitable basking sites (such as rocks and logs) and exposure to the sun for at least part of the day.	None. No suitable habitat (i.e. large waterbodies and watercourses) occurs within the study area	One turtle basking/ spring emergence survey	Not recorded	None. No suitable habitat in study area.
Queensnake (<i>Regina septemvittata</i>)	Known to Occur	generally require a permanent body of water, flowing or still, with a temperature remaining at or above 18.3°C throughout most of the active season; abundant cover, such as flat rocks submerged and/or on the bank; and an abundance of crayfish. Other important habitat features may include rocky, gravelly, or slate stream-bed substrates, swift to moderate current, and woodland surroundings.	None. No suitable habitat (i.e. large waterbodies and watercourses) occurs within the study area	General Wildlife Survey / SAR Habitat Assessment	Not encountered	None. No suitable habitat in study area.
Snapping Turtle (<i>Chelydra serpentina</i>)	Known to Occur	generally inhabit shallow waters where they can hide under the soft mud and leaf litter. Nesting sites usually occur on gravelly or sandy areas along streams. Snapping Turtles often take advantage of man-made structures for nest sites, including roads (especially gravel shoulders), dams and aggregate pits.	Confirmed. Suitable habitat (i.e. waterbodies with permanent water) occurs within the study area.	One turtle basking / spring emergence survey	Three individuals were observed in May 2020. Two individuals were observed nesting in June 2020.	None. No impact to suitable / confirmed wetland habitat. To be retained in full, with a naturalized buffer

Appendix G - Species at Risk Habitat Assessment

Wood Turtle <i>(Glyptemys insculpta)</i>	Historically Known to Occur	generally inhabit fresh-water rivers and streams with sandy or gravely-sandy bottoms and prefers clear meandering watercourses with a moderate current. They nest on sand or gravel-sand beaches and banks. Although they prefer riparian areas with diverse, patchy cover, females also lay in gravel holes, at the edges of roads and railways, in utility right-of-ways, in farming fields, pastures and former fields – any sunny and easily dug spot.	None. No suitable habitat (i.e. large waterbodies and watercourses) occurs within the study area	One turtle basking/ spring emergence survey	Not encountered	None. No suitable habitat in study area.
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APPENDIX H

SWM and Hydrogeological Information



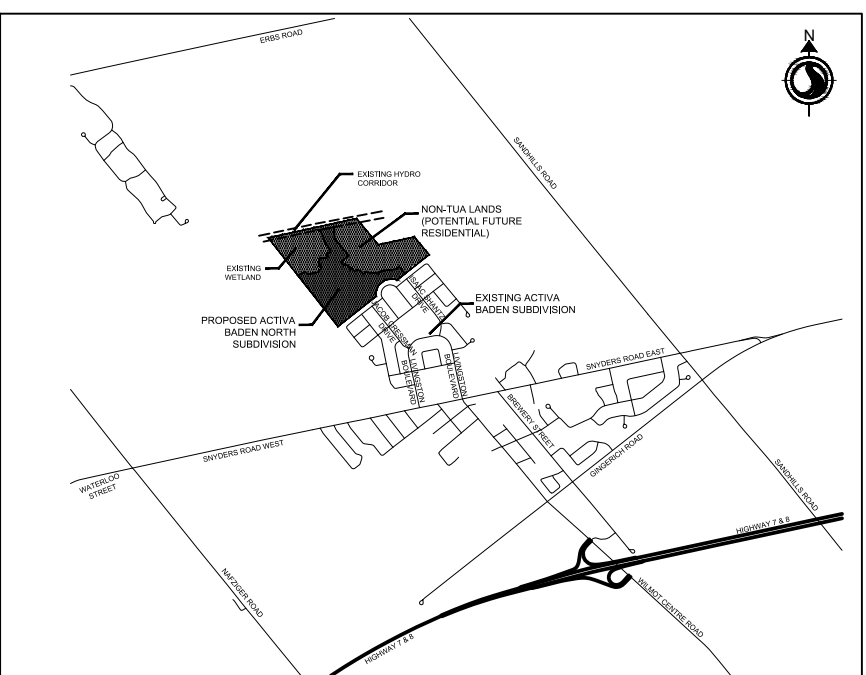
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Notes

- DRAFT PLAN PREPARED BY MHBC, DATED JULY 18, 2022.
- TOPOGRAPHICAL SURVEY PREPARED BY STANTEC CONSULTING LTD., DATED JULY 22, 2019, JULY 6, 2020 AND JUNE 3, 2022. CONTOURS OUTSIDE OF THE PROPERTY LINE HAVE BEEN OBTAINED FROM LIDAR POINT CLOUD (2016-18) LAND INFORMATION ONTARIO DATASET.

Key Map N.T.S.



Legend

- EXISTING ELEVATION
- PROPOSED ELEVATION
- FLOW DIRECTION
- EXISTING CONTOUR
- RETAINING WALL
- PROPOSED STORM SEWER
- PROPOSED STORM MANHOLE
- PROPOSED STORM CATCHBASIN MANHOLE
- PROPOSED CATCHBASIN
- PROPOSED SANITARY MANHOLE
- PROPOSED VALVE & BOX
- PROPOSED HYDRANT
- PROPOSED SLOPE (3:1 UNLESS NOTED OTHERWISE)
- OVERLAND FLOW DIRECTION
- BH/MH/DB-20(S/D) BOREHOLE/ MONITORING WELL
- ELEVATION
- HGMWL=354.25
- HIGH GROUND WATER LEVEL
- WETLAND LIMIT
- 30m WETLAND SETBACK
- 15m WETLAND SETBACK
- CORE ENVIRONMENTAL FEATURE (C.E.F.)
- 10m CORE ENVIRONMENTAL FEATURE SETBACK

0	FSR - FIRST SUBMISSION	JBM	BW	2022.07.22
Revision		By	Appd	YYYY.MM.DD
File Name:	60305680_C-800HX-FSR	JBM	HL	JBM
		Dwn.	Chkd.	Dgn.
				YY.MM.DD

Permit-Seal

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Client/Project
ACTIVA HOLDINGS INC.

ACTIVA BADEN NORTH

Baden, Ontario

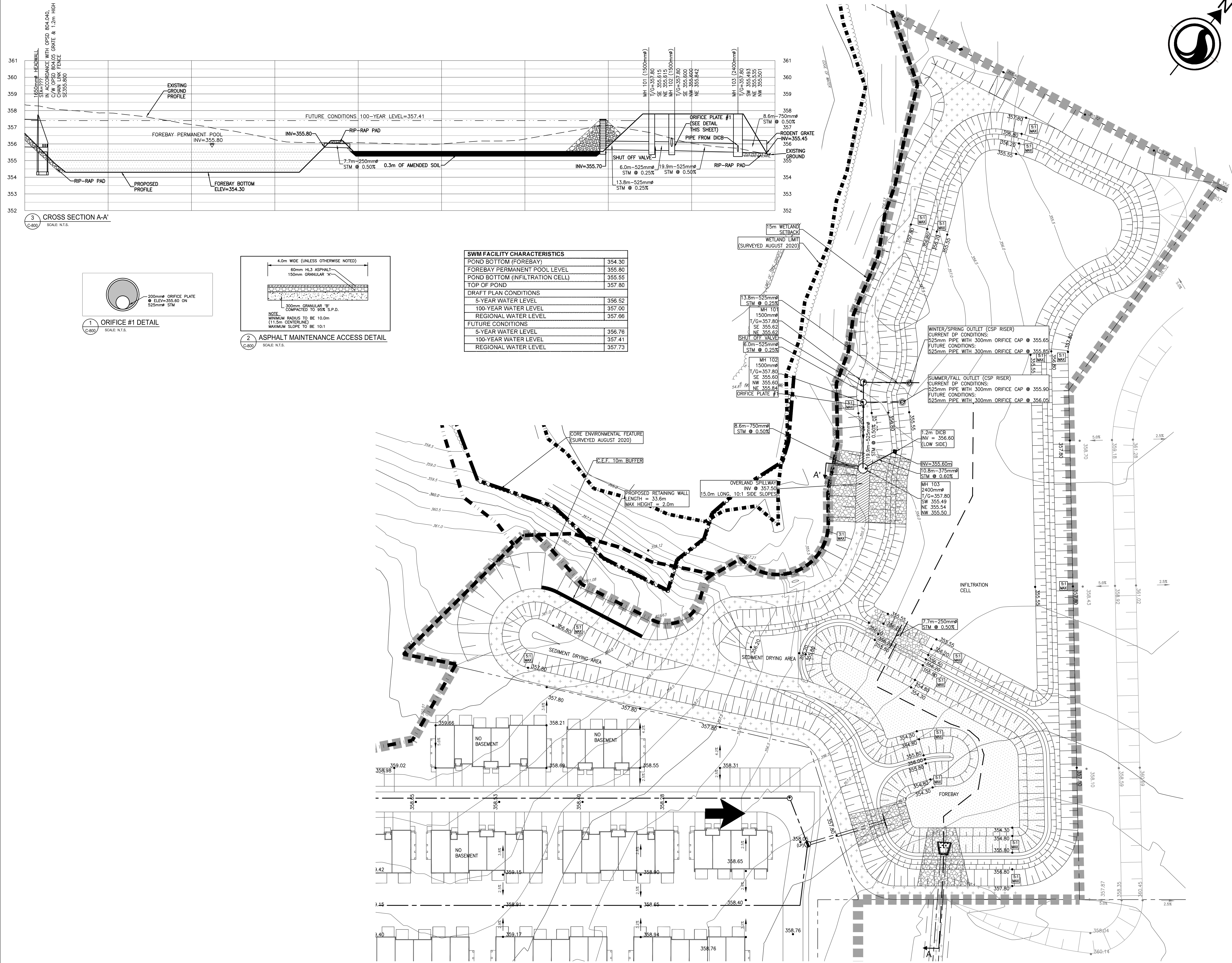
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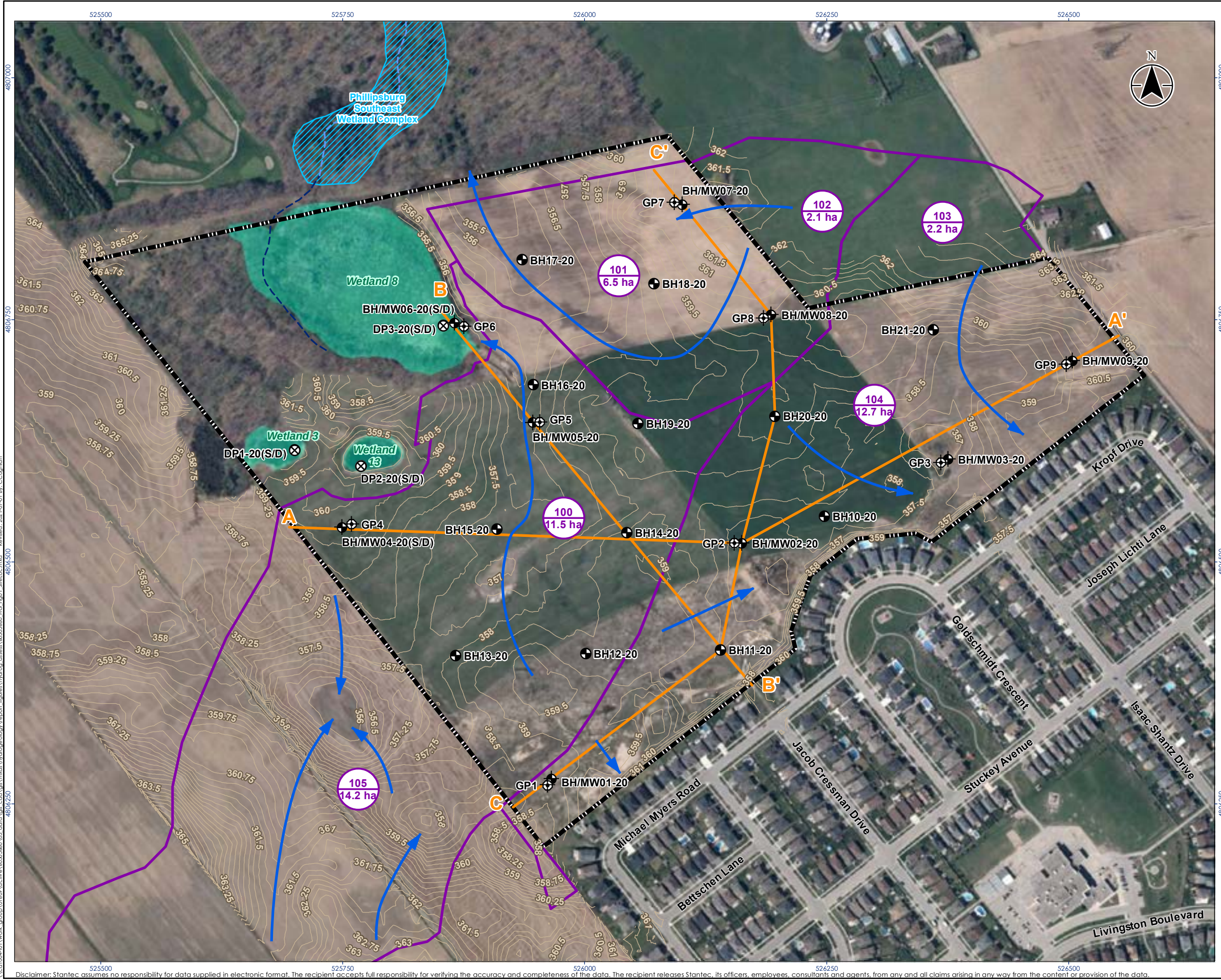
Project No.
60305680

Revision Sheet of Drawing No.

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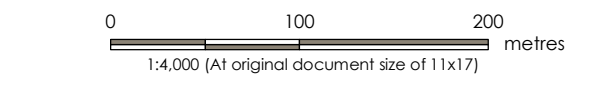
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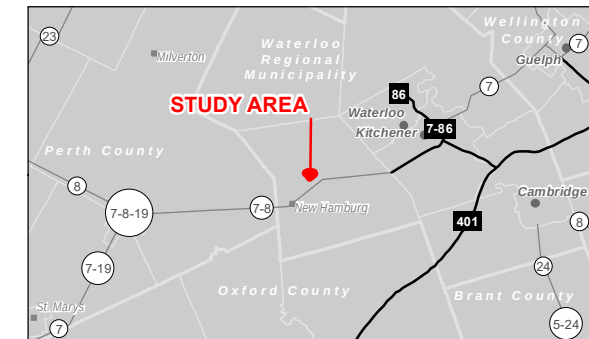
Legend

- Site Boundary
- Monitoring Well (Stantec, 2020)
- Borehole (Stantec, 2020)
- Drive-Point Piezometer (Stantec, 2020)
- Guelph Permeameter Testing (Stantec, 2020)
- Cross-Section Location
- Topographic Contour (mAMSL)
- Intermittent Watercourse (WSP) (Approximate)
- Watercourse - Intermittent (LIO)
- Overland Flow Direction
- Wetland Extent (WSP/GRCA, 2021)
- Wetland - Evaluated (Other)
- Stormwater Catchment (Existing Conditions)



Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Base features produced under license with the Ontario Ministry of Natural Resources and Forestry © Queen's Printer for Ontario, 2020.
3. Orthoimagery © First Base Solutions, 2020. Imagery Date, 2018.



Project Location
Baden, ON

60305680 REVA
Prepared by CMC on 2021-07-01
Technical Review by ABC on yyyy-mm-dd

Client/Project
ACTIVA HOLDINGS INC.
ACTIVA BADEN NORTH SUBDIVISION
HYDROGEOLOGICAL ASSESSMENT

Figure No.
1

Title
Site Location



Legend

- Site Boundary
- MECP Water Well Record
- Topographic Contour (mAMSL)
- Overland Flow Direction
- Watercourse - Intermittent (LIO)
- Intermittent Watercourse (WSP) (Approximate)
- Wetland Extent (WSP/GRCA, 2021)
- Wetland - Evaluated (Other)
- Stormwater Catchment (Existing Conditions)

Water Balance Sub-Areas

- Sub-Area A: Rolling, Silty Sand to Sandy Silt (Sand), Shallow Rooted Crops
- Sub-Area B: Rolling, Silty Sand to Sandy Silt (Sand), Pasture and Shrubs
- Sub-Area C: Rolling, Silty Sand to Sandy Silt (Sand), Mature Forest
- Sub-Area D: Rolling, Clayey Silt to Silty Clay (Clay), Pasure and Shrubs
- Sub-Area E: Rolling, Clayey Silt to Silty Clay (Clay), Shallow Rooted Crops

0 100 200 metres

1:4,000 (At original document size of 11x17)

Notes

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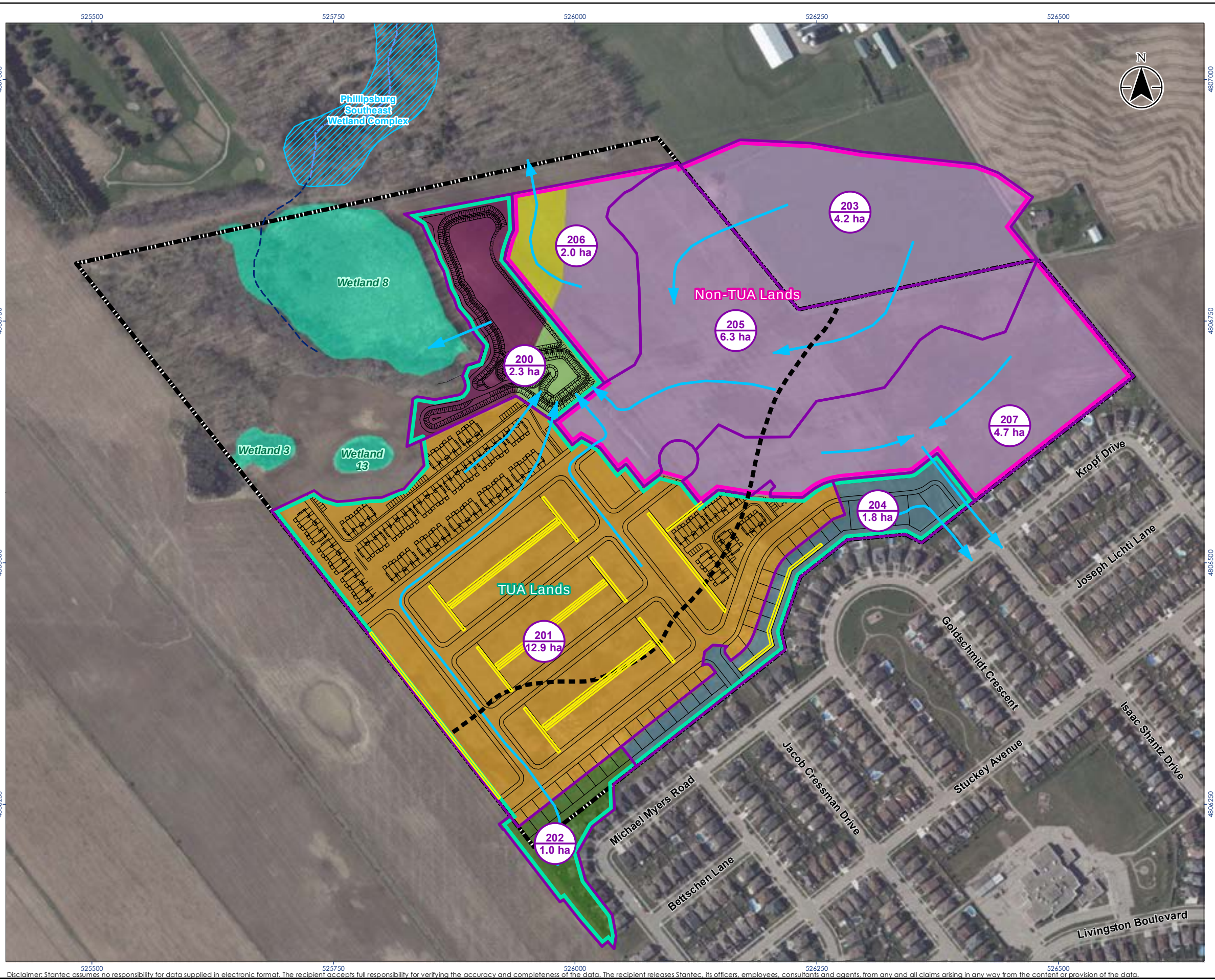
Project Location
Baden, ON

Client/Project
ACTIVA HOLDINGS INC.
ACTIVA BADEN NORTH SUBDIVISION
HYDROGEOLOGICAL ASSESSMENT

Figure No.
14

Title
Pre-Development Water Balance

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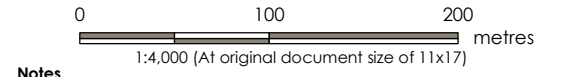


Legend

- Site Boundary
- Proposed Development Plan
- Proposed Infiltration Gallery
- Overland Flow Direction
- Interpreted Groundwater Flow Divide (Pre-Development)
- Watercourse - Intermittent (LIO)
- Intermittent Watercourse (WSP) (Approximate)
- Wetland Extent (WSP/GRCA, 2021)
- Wetland - Evaluated (Other)
- Stormwater Catchment (Proposed Conditions)
- TUA Lands Boundary
- Non-TUA Lands Boundary

Water Balance Sub-Areas

- Sub-Area A: Rolling, Silty Sand to Sandy Silt (Sand), Shallow Rooted Crops
- Sub-Area E: Shallow Rooted Crops, Clayey Silt to Silty Clay (Clay), Rolling Land
- Sub-Area G: Rolling Silty Sand to Sandy Silt (Sand), Urban Lawn, 20% Impervious
- Sub-Area H: Rolling, Clayey Silt to Silty Clay (Clay), Urban Lawn, 65% Impervious
- Sub-Area I: Rolling, Clayey Silt to Silty Clay (Clay), Urban Lawn, 60% Impervious
- Sub-Area J: Rolling, Clayey Silt to Silty Clay (Clay), Urban Lawn, 40% Impervious
- Sub-Area K: Rolling, Clayey Silt to Silty Clay (Clay), 20% Impervious



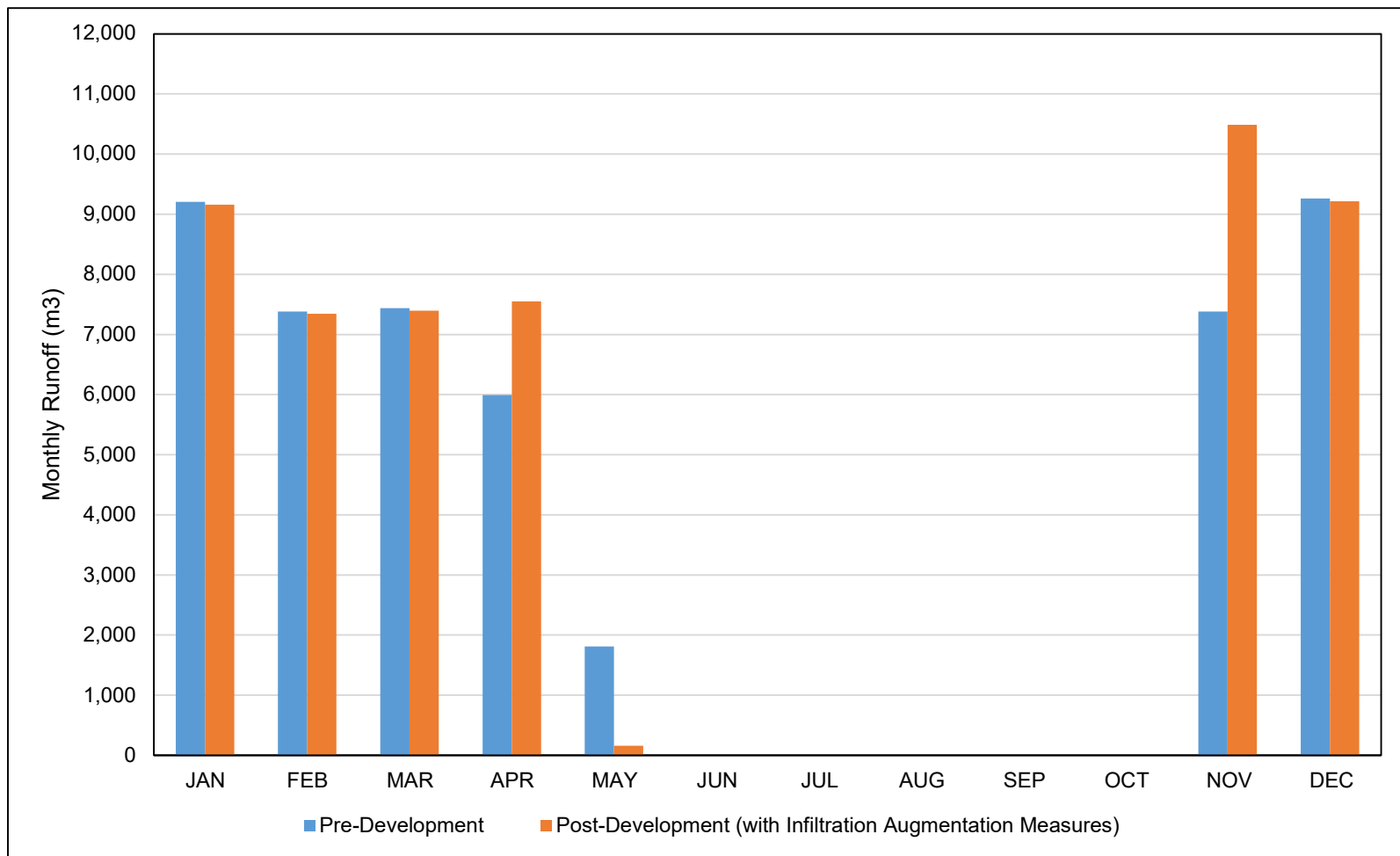
- Notes**
1. Coordinate System: NAD 1983 UTM Zone 17N
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Project Location 60305680 REVA
Baden, ON Prepared by PRM on 2022-07-11
Technical Review by GW on 2022-07-11

Client/Project
ACTIVA HOLDINGS INC.
ACTIVA BADEN NORTH SUBDIVISION
HYDROGEOLOGICAL ASSESSMENT

Figure No.
15

Title
Post-Development Water Balance



Notes:

Client/Project
Activa Holdings Inc.
Activa Baden North Subdivision
Hydrogeological Assessment

Figure No.
16



Title
**PRE- TO POST-DEVELOPMENT RUNOFF
MONTHLY DISCHARGE TO WETLANDS**