June 15, 2020

Springfield Construction Limited
240 Taylor Rd, Ancaster
L9G 1P5

Attention: Mr. Michael Corrado, President

RE: Environmental Impact Study for 4063 Upper Middle Road, Burlington, ON

At this time, Environmental Liability Management Inc. (ELM) is pleased to submit the updated Environmental Impact Study for the land located at 4063 Upper Middle Road in Burlington, Ontario to Springfield Construction Ltd. We appreciated the opportunity to work with your team, and ELM would be pleased to assist you on other projects. Please feel free to call my mobile line at: 226-606-1072.

Sincerely,

Environmental Liability Management



Dean Fitzgerald, M.Sc., Ph.D.
Senior Ecologist
Director of Environmental Services
ELM Inc.
www.elminc.ca

Executive Summary

Springfield Construction Inc. (Springfield) retained Environmental Liability Management Inc. (ELM) to update an Environmental Impact Study (EIS) prepared for the proposed development at 4063 Upper Middle Road, Burlington ON (hereinafter, the Site). This EIS is assessing the proposal to develop a condominium building on a parcel of 0.566 ha (1.4 acres). This assessment is required, as the building lot backs on to a woodland with portion of Shoreacres Creek. The requirement to assess the proposal with an EIS represents a required step under City of Burlington Official Plan (CBOP) and Halton Region Official Plan (HOP). This EIS is intended to assess the relationship between the existing natural environmental features on-Site and the current government regulations that define available development options, and follow methods presented in Conservation Halton (CH) (CH, 2005) for the EIS. Additional considerations for the EIS were also provided by Staff from Region of Halton (ROH) and City of Burlington (COB). An earlier version of this EIS was been reviewed in the past, and revised to reflect comments from CH, ROH, and COB.

This Site is identified as parcel number 07228-0147 and is legally described as Part of Lot 10, Concession 1, South of Dundas Street, geographically in the Nelson/Burlington Township. Field studies were completed on-Site during 2013 and again in 2014. In 2013, the Site contained a single detached residence, surrounded by manicured lawn, shrubs, flower beds, fruit trees, and deciduous and coniferous trees. In addition, it was observed the residential lawn ended at the stable top-of-bank of Shoreacres Creek (Shoreacres Creek Watershed; sub-watershed 308). This area at the stable top-of-bank of Shoreacres Creek was observed to contain varied plant species, including herbaceous and woody species that were not planted (i.e., naturally recruited plants). Hence, the residence and Shoreacres Creek flood plain exist on-Site. The area along the creek was identified by CH as a Regulated Area and also a component of Halton's RNHS. Due to vandalism and a fire, the house was demolished in 2014, and the foundation excavated with debris removal that avoided disturbance of the vegetation along woodland adjacent to Shoreacres Creek. This excavation of the residence created additional separation from the area proposed for the development from the adjacent natural areas, establishing a distinct ecotone defined by disturbance, slope, soils, and vegetation.

This information from the 2013 surveys was used to complete initial communications with different government agencies that provided comments on an initial development plan. This past communication also resulted in the identification of the study requirements for this EIS to assess the initial development plan. This study reports the findings from field studies completed primarily between April 2013 and July 2015, relative to the revised development plan. Based on additional guidance from government agencies, supplemental studies were completed during 2017 to 2019, to provide a more complete description of the Site. A description of the varied technical studies supporting this EIS is also included herein.

Following guidance from CH, standard surveys were completed for the following species, to represent the biodiversity on-Site:

- Amphibians using Marsh Monitoring Protocol during April, May, and June of 2013;
- Vegetation inventories during May, June, July, and September from 2013 to 2019;
- Breeding birds using Ontario Breeding Bird Atlas protocol on two dates in June of 2013;
- Tree inventory and inspection during May, July, and September from 2013 to 2017; and
- Documentation of incidental wildlife observations on all visits to Site from 2013 to 2017.

Dedicated surveys were completed to assess for potential presence of Species At Risk or possible habitat available for use by SAR on-Site, as requested by staff from Ontario Ministry of Natural Resources and Forestry (MNRF). These surveys included:

- Inspections for Barn Swallow (*Hirundo rustica*) and Chimney Swift (*Chaetura pelagica*) nests. No evidence of either bird was identified;
- Screening of trees for Butternut (*Juglans cinera*). There are no Butternut on-Site; and,
- Evaluation of potential bat (i.e., myotis) habitat in trees on-Site. All mature trees were inspected for cavities. No evidence of habitats by bats found on-Site or within 150 m.

A complete list of herbaceous species and woody stems was compiled for the Site, within 45 m of the proposed development footprint on-Site. This list included 39 species from 22 families with 25% identified as non-native to Burlington. The most common herbaceous plant within the proposed development footprint was non-native Garlic Mustard (*Alliaria petiolate*), a plant known to inhibit the growth of other herbaceous species. A total of 20 woody species from 12 families were also identified on-Site; of these 6 or 30% were non-native to Burlington. The most common tree in the proposed development footprint was native Ironwood (*Ostrya virginiana*). This high number of non-native herbaceous and woody species along with the predominantly urban location represent key reasons for low diversity of plants on-Site. The herbaceous species and woody stems contained no SAR or species of conservation importance.

Information on land, drainage, and plant community allowed for the completion of Ecological Land Classification (ELC) mapping. This resulted in an ELC map with three key polygons: the former residence designated as Low-density Residential (CVR-1); planted and volunteer trees around the residence, designated as Dry-Fresh Mixed Woodlands (WOMM-3), and the adjacent flood plain forest designated as Cultural Woodland (CUW) representing the area previously manicured with fruit trees, shrubs, etc., and FOD9-5 Fresh Moist Bitternut Hickory Deciduous Forest. An interesting observation in FOD9-5 include one large mature regionally uncommon Swamp White Oak (*Quercus bicolor*). The Swamp White Oak was located about 165 m from the edge of the proposed development footprint with no young Swamp White Oak found; an absence of young Swamp White Oak is presumably due to herbivory from species like White-tailed Deer (*Odocoileus virginianus*) observed incidentally during surveys in FOD9-5.

Routine surveys for amphibians along with incidental observations identified no SAR or species of conservation importance. Species of amphibians that were documented in the study area included Green Frog (*Lithobates clamitans*), Spring Peeper (*Pseudacris crucifer*), and American Toad (*Bufo americanus*). Amphibian activity was greatest within the FOD9-5 forest along Shoreacres Creek. Amphibians were sometimes evident in the vegetation away from the creek.

Routine surveys for birds along with incidental observations identified no SAR or species of conservation importance. The routine surveys were conducted by R.J. Burnside during 2013 and identified 13 species, including the regionally uncommon Carolina Wren (*Thryothorus ludovicianus*). Other incidental observations between 2014 and 2017 identified an additional six species, for a total of 19 species on-Site and within the forest edge of Shoreacres Creek.

A key observation was the documentation of numerous large trees along the stable top-of-bank of Shoreacres Creek. This area was identified as a no-touch zone by staff from CH and ROH during 2014, to create a buffer between the creek valley and proposed development. To ensure the protection of the mature trees, a buffer of 7.5 m along the drip line of the trees adjacent to the excavation is recommended within this EIS, to ensure protection of tree roots during future development. With no disturbance of the CUW or FOD9-5 proposed, it is expected these habitats will retain functionality as habitat for wildlife species along Shoreacres Creek.

With the field observations along with records review, communications with CH and OMNR, the following conclusions and additional recommendations were made in this EIS:

- Surveys identified the presence of common wildlife and plants on-Site;
- Surveys identified no evidence of SAR wildlife or plants on-Site;
- Integrated survey information using ELC identified four distinct polygons, as: CVR-1, WOMM-3, CUW, and FOD9-5 along Shoreacres Creek;
- The CVR-1, WOMM-3, and CUW polygons are dominated by non-native plant species;
- Excavation on-Site separate CVR-1 and WOMM-3 from the CUW and FOD9-5 polygons;
- There are no significant natural features or wildlife habitat present in CVR-1, WOMM-3 while CUW within FOD9-5 and Shoreacres Creek provides habitat to wildlife;
- Past studies by CH mapped the CUW, FOD9-5 and Shoreacres Creek as a Regulated Area, and it was designated as flood plain and wildlife habitat;
- This Regulated Area represents a portion of Halton's
- Recommendation to apply a vegetation buffer of 7.5 m on the tree drip line along the edge of the excavation and the stable top-of-bank of Shoreacres Creek, with no disturbance of this buffer area or stable top-of-bank;
- Since no disturbance of FOD9-5 or Shoreacres Creek is expected from the proposed development, these habitats are expected to retain ecological functionality in the future;
- This EIS recommends the use of BMP measures to mitigate the potential effects of the proposed development on the natural features of FOD9-5 and Shoreacres Creek;

- This EIS recommends minimally a 1:1 compensation ratio to be applied for the 60 live trees proposed for removal within CVR-1 and WOMM-3;
- This EIS recommends removal of non-native trees from the CUW with compensation plantings of native species minimally at a 1:1 compensation ratio; and
- Drainage on-Site will be maintained as status quo with flow from the development downgrade to Upper Middle Road or downslope from the environmental buffer area to Shoreacres Creek.

Overall, it is ELM's opinion that the proposed development on lands classified as CVR-1 and WOMM-3 along with the use of an environmental buffer will result in no significant disturbance on the existing ecological features within the adjacent FOD9-5 and Shoreacres Creek habitats.

This summary only represents an overview of the findings and recommendations of the EIS.

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1.0 INTRODUCTION

Environmental Liability Management Inc. (ELM) was retained by Springfield Construction (Springfield) to update the Environmental Impact Study (EIS) to assess a residential development application for land at 4063 Upper Middle Road, in Burlington, Ontario (hereinafter, the Site; Figure 1). This assessment of the development application with an EIS represents a required step under City of Burlington Official Plan (CBOP) and Halton Region Official Plan (HOP). With this basis, Halton Region is responsible for preserving natural heritage and implemented through the HOP, and requires the evaluation of development proposals with an EIS. This process evaluates the proposed development with an EIS, to confirm the activity will not result in significant environmental disturbance. Hence, the EIS acts to document the natural heritage features and then assesses the relationship between the natural heritage features and the government regulations that define available development options. This assessment process within the EIS followed methods identified in Conservation Halton (CH) (CH, 2005). This EIS represents an update to a previously submitted EIS prepared by Premier Environmental Services Inc. (Premier, 2017). The study has involved Senior Ecologist Dean Fitzgerald, M.Sc., Ph.D. since 2014 (short resume in Appendix A).

The Site is identified as parcel number 07228-0147 and is legally described as Part of Lot 10, Concession 1, South of Dundas Street, geographically in the Nelson/Burlington Township (Premier, 2014). During 2013 and again in 2014, staff from Premier inspected the Site, and documented it contained a single storey residence in 2013 that was surrounded by manicured lawn, shrubs, flower beds, fruit trees, and other planted deciduous and coniferous trees (Premier, 2014). Information from the 2013 inspections were used to complete communications with different government agencies that provided comments on the design of the EIS and the initial development plan. In 2013, it was observed the residential lawn ended at the stable top-of-bank of Shoreacres Creek (Shoreacres Creek Watershed; sub-watershed 308; CBOP 2012). Hence, a well-defined ecotone exists between the residential lot and Shoreacres Creek flood plain on-Site. This EIS assesses a revised development plan, as described in Chapter 2.0, representing revisions to the development in response to technical comments stemming from the Premier (2017) EIS. This EIS reports the findings from field studies from 2013 to 2016 and follow up inspections during 2017 to 2019.

Relationship between the Proposed Development and City of Burlington Official Plan

In the CBOP, the Site is designated Residential – High Density on Schedule B and Shoreacres Creek is conceptually shown as a Watercourse. The Regional Natural Heritage System (RNHS) is not shown on the CBOP Schedules. The RNHS will be reflected in the new CBOP. Through the subject application, the defined RNHS lands will be rezoned in the Open Space (O2 Zone).

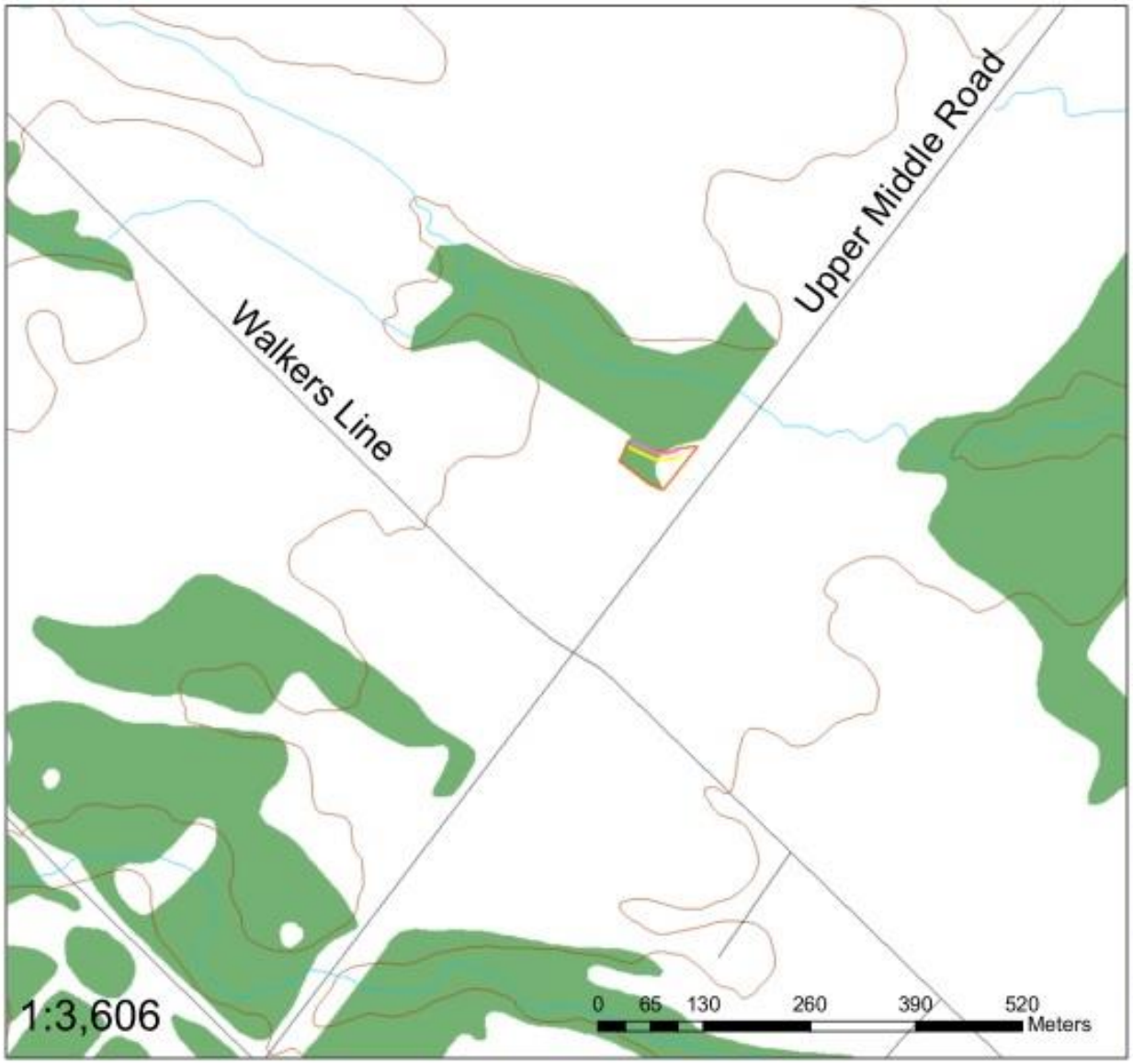


Figure 1

This drawing has been prepared for Premier and it's clients and may not be used, reproduced or transmitted in any way by third parties without permission from Premier Environmental.

UTM Zone Projection
North American Datum 1983
September 29, 2014

N
W E
S

Legend

- Drip line
- 7.5 m buffer
- Water course
- Road
- Contour line
- Woodland
- Study area



Information provided by Springfield (Michael Corrado, pers. comm. to Dean Fitzgerald, ELM, in September 2014) identified that the residence on-Site was demolished during June, 2014. This demolition was required, as the former residence had been burned via arson. Hence, the appropriate demolition permits were obtained by Springfield from the City of Burlington (COB) in 2014 and best practices were used during the demolition activity. On September 8, 2014, the Site was re-inspected, and a summary report prepared (Premier, 2014). This 2014 inspection identified no evidence of environmental contamination near the foundation of the demolished residence. When the Site was inspected, it was also noted that the majority of debris from the residence had been removed with no fire debris evident. In addition, it was also noted that some of the planted ornamental trees adjacent to the residence were removed during demolition, as the roots were close to the foundation and were likely burned (Premier, 2014). This 2014 inspection also noted the trees found along the stable top-of-bank were not disturbed during the demolition, due to the change of grade. Specifically, the foundation was removed near the stable top-of-bank and this created a change in grade that was equal to about 1 m between the excavated residential area and natural vegetation along the creek (Plates 1 and 2).



Plates 1 and 2: Images on left and right represent ecotone between excavation from the former residence and stable top-of-bank on-Site. When the former residence was excavated, it created a change of grade of about 1 m relative to the stable top-of-bank with woodland valley of Shoreacres Creek and the former residence. This change in grade is marked with black arrows. The woodland along the valley of Shoreacres Creek was not disturbed during this activity whereas damaged trees in the area were caused by a severe wind storm after the demolition.

1.1 Preparation of EIS Relative to Government Guidance

With available information for the Site, it is feasible to prepare an EIS that follows the guidance of CH (2005) and the Region of Halton and allows for the assessment of Springfield's revised residential development proposal. The preparation of this EIS will allow for the assessment the proposed development plan relative to the planning guidance included within the HOP and CBOP. Other information that requires consideration within the EIS relative to the development plan is included within Ontario's *Endangered Species Act* (ESA), Ontario's *Water Resources Act* (WRA), *Conservation Authorities Act* (CAA), Ontario's Provincial Policy Statement (PPS) as defined by Ontario's *Planning Act*, federal *Species at Risk Act* (SARA), *Fisheries Act* (FA), and *Migratory Birds Convention Act* (MBCA). In addition, this EIS will evaluate the development proposal relative to guidance from CH staff due to Shoreacres Creek on-Site. Hence, this EIS integrates the development plan from Springfield with available guidance, as follows:

- Review of proposed development plan, **Chapter 2**;
- Natural heritage planning considerations, **Chapter 2**;
- Review of biological survey methods and other resources used, **Chapter 3**;
- Survey results for vegetation, including trees and herbaceous species, **Chapter 4**;
- Survey results for amphibians (frogs and toads), **Chapter 5**;
- Survey results for breeding birds, **Chapter 6**;
- Survey results for incidental wildlife, **Chapter 7**;
- Comparison of natural heritage survey results with government guidelines, **Chapter 8**;
- Recommendations for maintenance of ecological functioning of Site relative to the proposed development plan, **Chapter 9; and**
- Evaluation of findings from the EIS relative to government guidelines, Chapter 10.0.

In summary, this EIS is required to assess a proposed development in order to support an amendment to the current zoning on-Site. This EIS will ensure the development is appropriate for the Site, as a basis to amend the zoning from Development to High Density (RH5) and Open Space (O2) zones. The residential high density (RH5) will include an 8 story apartment building while the O2 zone will include all land along Shoreacres Creek. It is noteworthy to identify the footprint of the development proposal will involve 0.199 ha (i.e., 0.494 acres) of the total 0.566 ha (i.e., 1.4 acres). The land along the creek, representing ~64% of the Site, is proposed to be conveyed to Halton for long-term conservation.

2.0 PROPOSED DEVELOPMENT AND NATURAL HERITAGE PLANNING

This chapter reviews the proposed development plan for the Site. Then this chapter reviews the consultations completed with different government agencies regarding field studies from 2012 – 2016, completed initially by Lauren Cymbaly, David Jolly, and Dean Fitzgerald, from Premier (Premier, 2017). This information then provides the basis for follow-up guidance from government agencies during 2017 to 2019 and additional field studies during this period.

2.1 Proposed Development

Springfield has prepared a development plan for the Site. This plan identifies a scenario to develop a multi-storey condominium building. The general layout of this plan for the Site is identified within Figure 2. The architect's vision for the building is presented as Plate 3. Revisions to the original layout and vision for the building were completed between 2017 and 2019 in response to additional comments from government agencies. This design revision process was complemented by four community meetings, between 2017 and 2019, where comments from neighbours were documented and used to enhance the design. Collectively, this information has shaped the design concept presented within this EIS.

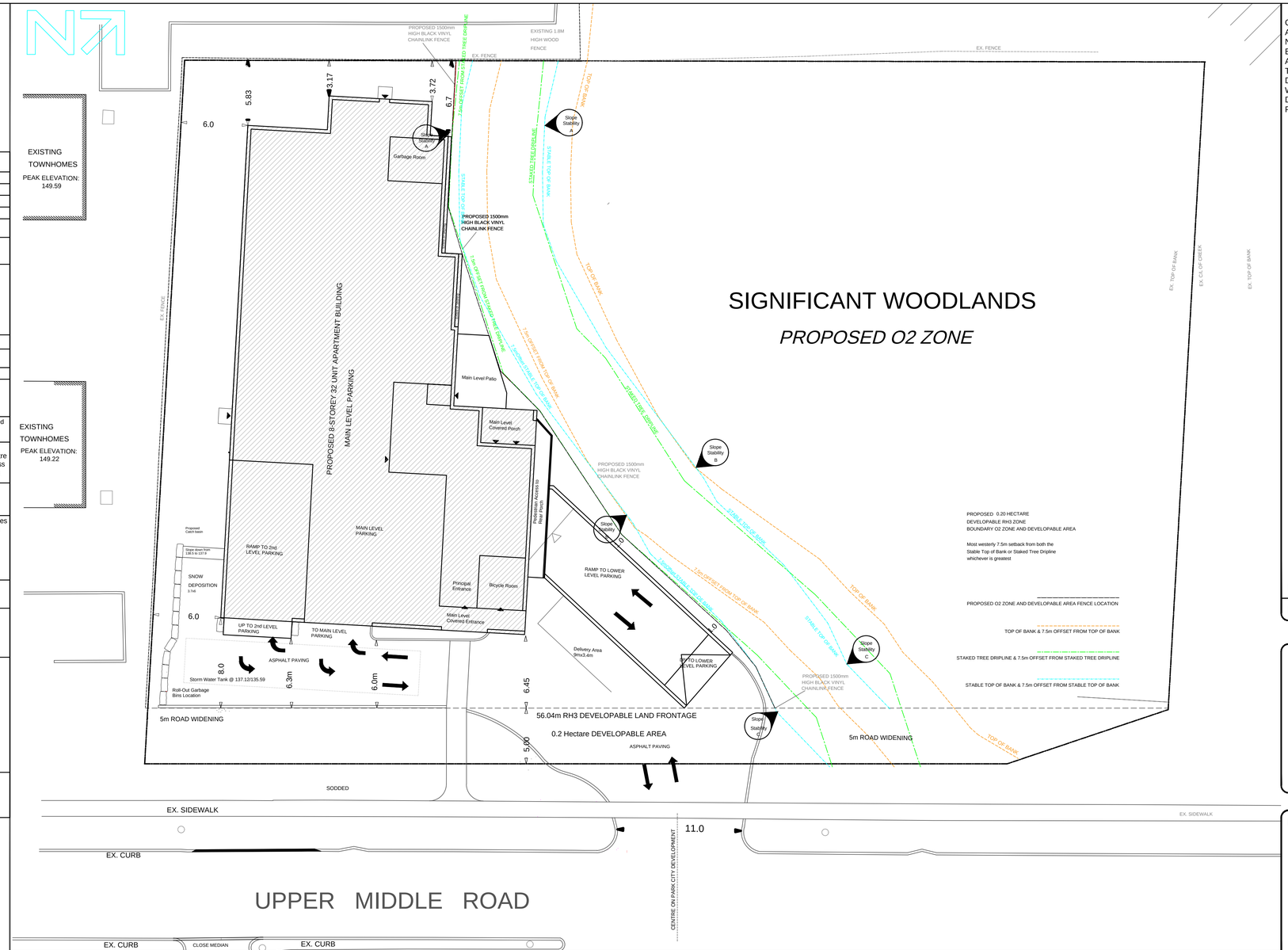
For this plan, the extent of the footprint of the development is set back from the stable top-of-bank that is located on-Site (S.Llewellyn, 2019a). This EIS will resolve the most appropriate setback from the top of bank. For this Site, the proposed disturbance for the proposed development will be focused on the former foundation of the demolished residence, and set back from Shoreacres Creek, to ensure no disturbance to this sensitive natural feature. This area of setback on the north side from the stable top-of-bank can be described as mostly flat whereas the stable top-of-bank is within 2 m of the excavated foundation. The setback area is intended to separate the future development from the flood plain and protect the roots of mature trees, leading to no disturbance of the creek valley (S.Llewellyn, 2019a,b).

For the proposed development, the future drainage is expected to drain toward Shoreacres Creek or be directed away from Shoreacres Creek, toward existing infrastructure located along Upper Middle Road (S.Llewellyn, 2019a, b, c). This expectation is due to the proposed setback from the stable top-of-bank that this flat area will allow for runoff from precipitation and snow melt to continue to drain naturally to the valley that contains Shoreacres Creek. Thus, the current natural drainage pattern will be maintained (S.Llewellyn, 2019a) due to the house excavation, and result in no net loss of water to the creek valley. In other words, water will continue to flow down to the creek from the stable top-of-bank area or flow to Upper Middle Road, as it does today. In addition, future snow management for the development will result in drainage via swales to Upper Middle Road and not to the creek valley (S.Llewellyn, 2019a,b).

Regulations for Apartment Building Use in a RH3 Zone (Table 2.14.1) Part 2 - Residential Zones of Zoning By-law 2020, As Amended			
	Required	**Provided**	**Compliance**
Regulation			
Lot Width	30 metres	56.04 metres	Yes
Lot Area	0.1 ha	0.20 ha	Yes
Front Yard	6.0 metre maximum	Minimum 6.4 metres Maximum 8.0 metres	No – exceeds maximum
Rear Yard	7.5 metres	Minimum – 3.17 metres Maximum 6.7 metres	No –
Side Yard	3.0 metres	6.0 metres (west side yard for Floors 1 and 2) increasing to 6.0 to 13 metres for Floors 3-7 and 13 metres for entire 8th Floor 0 metres (east side yard abutting proposed O2 Zone)	Yes No
Yard abutting R1, R2, R3 Zone	N/A	N/A	N/A
Density	Minimum - 50 units per ha Maximum 185 units/ha	Density is 160 units per hectare	Yes
Maximum Building Height	24 metres	8 storeys - 30 metres	No – 6 additional metres
Amenity Area	25 m2 per unit 100 m2 minimum	25 sq. m. per unit = 800 sq. m. required. 876.12 m2 provided (not including 279.6 m2 of green roof	Yes
Building Setback Abutting a Creek Block	7.5 metres; 4.5 metres if the block includes a 3 metre buffer	0 metres	No - Creek Block to be rezoned O2 Zone includes a 7.5 metre buffer
Landscape Area	6 metres abutting a street having a deemed width greater than 26 metres	0 metres	No - given 5 metre road widening dedication, 6.0 metre front yard is paved for access to parking and the building
Landscape Buffer	3 metres abutting RM1 to RM5 Zones (Lands to the north and west are zoned RM3-192)	3 metre Landscape Buffer along the north lot line and west lot line	Yes
Parking	1.5 spaces per 2-bedroom unit - 32 x 1.5 = 48 0.35 visitor parking spaces x 32 units = 11.2 parking spaces Total - 59	Total – 57	No – total of 57 parking spaces to be provided - 2 parking space deficit
Enclosed Occupant Parking	75% of all required occupant parking	100% of all required occupant parking	Yes – required occupant parking for 32 units is 48 spaces
Outside Storage	Waste stored outside shall be kept within a solid screen enclosure.	Waste to be stored inside the building	Yes
Designated Accessible Parking Spaces for Required Parking between 51-90 spaces	2 designated accessible parking spaces Each designated accessible parking space shall meet the minimum width and area requirements of subsection (1) (a) (2.75 m in width and 16.5 sq. m. in area) and shall be located adjacent to a delineated “accessible parking pathway” with a minimum width of 2.0 metres	2 designated accessible parking spaces as per the Zoning By-law	Yes
Bicycle Parking	Not required for Residential	4 outdoor bicycle parking spaces (short term) 12 indoor bicycle racks (long term)	Yes

Landscape Area - An area of land within a lot dedicated to the planting of trees, shrubs, flower beds, or a combination thereof and which may include other decorative landscape features. A Landscape Area may be crossed by a driveway or walkway provided it is substantially perpendicular to the Landscape Area. A ground sign may be located within a Landscape Area. A Landscape Buffer may be included in the calculation of Landscape Area.

Landscape Buffer - The area of a lot which serves to provide separation and to partially obstruct the view of adjacent land uses by means of a dense landscape screen consisting of evergreen trees or a combination of solid screen fencing with evergreen or deciduous trees, shrubs, or berms.



SITE VIEW



VIEW FROM TOWNHOUSES



CONTRACTOR IS TO CHECK AND VERIFY ALL DIMENSIONS ON THE JOB SITE AND NOTIFY DESIGNERS OF ALL DISCREPANCIES BEFORE INITIATING WORK.
ALL DRAWINGS ARE THE PROPERTY OF THINKGIRAFFE.
DRAWINGS ARE NOT TO BE REPRODUCED WITHOUT WRITTEN PERMISSION FROM DESIGNERS.
PRINTS ARE NOT TO BE SCALED.

June 10,2020 ISSUE FOR ZONING AMENDMENT

REMARKS	DATE	NO.
REVISIONS		

thinkGiraffe

ENVIRONMENTAL DESIGN

16 Sulphur Springs Road,
Ancaster, ON, L9G 1L8

905 304 1496

thinkgiraffe@bellnet.ca

PROJECT

Proposed 8 Storey Apartment Building
4063 Upper Middle Rd
Burlington

SHEET TITLE

SITE PLAN

FOLDER	DRAWN BY MF/MS
FILE	SCALE 1:200
DATE	NUMBER

A2



Plate 3: Architect's vision for the design of the proposed development. The footprint of the development proposal will involve 0.494 acres of 1.4 total acres. This design thereby represents use of less than ½ of the total area of the parcel. To ensure no disturbance of the mature tree canopy along Shoreacres Creek in the O2 zone, this design will involve a set back from the existing tree drip line. To achieve additional environmental protections, the proposed plan will involve a fence along the edge of the O2 zone and grading only outside of the environmental setback. The design was modified in response to comments from government agencies and comments during four community meetings over the last few years.

An evaluation of this proposed development plan relative to regulatory guidance from government agencies is included in Chapter 8.0. That is, the proposed development plan is evaluated relative to government regulatory guidance (i.e., CBOP, HOP) and observed natural heritage features on-Site. Such integration of observed natural heritage features with regulations then allows for an assessment of the conformity of the proposed development with regulatory guidance. When this information is integrated relative to natural heritage features and environmental regulations, it then allows for the assessment of risk from this proposed development. This basis then allows the recommendation of environmental management actions to preferably avoid disturbance of natural heritage features but minimally mitigate disturbance on-Site, as described in Chapter 9. For this proposed activity, four community meetings were held during the last two years, to discuss the design and modify features based on comments from neighbours. This process of reviewing regulations and guidance relative to natural heritage features and the neighbours is followed to ensure the proposed development is fully assessed using the EIS. This assessment is intended to show compliance of the proposal with government regulations, and that the proposed activity avoids significant disturbance of existing natural heritage and built features on and near the Site.

2.2 Natural Heritage Planning Considerations

In order to evaluate the proposed development, it is necessary to identify key natural heritage features located on-Site using a multi-season survey design, as reported within this EIS. For the Site, the natural heritage features include: 1) the manicured lawn, 2) the planted trees and shrubs near the former residence, 3) wildlife that may exist on-Site, and 4) the flood plain forest that exists in proximity to Shoreacres Creek.

Due to the existence of Shoreacres Creek in Burlington, it has been studied extensively in the past by CH (e.g., CH, 2013a). For example, CH studies previously described the terrestrial and aquatic features in detail, and identified that Shoreacres Creek originates as seepage from the Waterdown Moraine. Specifically, Shoreacres Creek originates as two (2) headwater (i.e., first order) creek channels that flow south from the Waterdown Moraine. These first order creek channels show a confluence south of Millcroft Park Drive in Burlington, where a larger single channel is evident. The total length of the creek, from headwaters to outlet, is ~14 km with a drainage area of 12.9 km^2. Due to the predominantly urban land use in this watershed, studies from CH have previously described the water quality, biodiversity, and habitats as 'degraded'. This designation is due to water quality degradations including stormwater runoff from urban lands (developments, roads, etc.), human activity, low summer flows, reduced benthic invertebrate diversity, and limited fish species richness, along with channel erosion (CH, 2013a). For example, benthic invertebrate and fish species evident in the creek are known to be tolerant of degraded water quality typical of urban settings. Past studies by CH identified the importance of the flood plain forest for Shoreacres Creek, leading to the designation of this area as flood plain on-Site. With this basis, it triggers the need for an EIS to consider the proposal.

Shoreacres Creek has also been assessed for vulnerability to contamination within source water protection studies (e.g., Hamilton-Halton Source, 2015). This assessment was completed to evaluate drainage from the creek that eventually enters Lake Ontario, near the drinking water intake for Burlington. Within the source water study, the average flow rates of Shoreacres Creek along with drainage path distances were used to estimate the vulnerability for transport of contaminants and quantify risk to the Burlington water intake. Shoreacres Creek was identified to exist within Intake Protection Zone 2 with a vulnerability rating of 4.1 (where 1 is low and 10 is high). The 4.1 vulnerability is linked to the estimate of 76 minutes for water to travel through this creek and possibly enter the water intake in Lake Ontario used by Burlington. For additional information, refer to Table 6.1 and Figure 6.2 in Hamilton-Halton Source (2015). In summary, this creek is within the source protection planning area for Burlington, and drainage to the creek should be carefully managed, to reduce risk of transport of hazardous materials from current activities and future developments. Such environmental management can be achieved through use of environmental setbacks along the creek and other activities such as enhancements of the vegetation communities along the creek valley.

Detailed studies of Shoreacres Creek were also presented within the *Shoreacres Creek Municipal Class Environmental Assessment* (Cole Engineering, 2015). This Municipal Class Environmental Assessment focused on existing natural features and flow conditions to develop a creek-wide erosion control plan. Cole Engineering (2015) documented vegetation features and creek attributes within land directly along the creek shoreline on-Site. The vegetation description included documentation of plant communities, tree species (e.g., most mature trees were tagged, measured, and mapped), as well as creek features such as water depth and areas of erosion upstream, on-Site, and downstream within contiguous woodland area of the valley.

2.3 Government Regulations

Assessments of land development proposals in Ontario require evaluation relative to a suite of government regulations and other regulatory guidance. This requirement for evaluation is intended to protect the existing functionality of natural heritage features and functions and adjacent area(s) that could be affected by the proposed development. For this EIS, the development proposal provided by Springfield (Figure 2) requires consideration relative to the following government regulations and regulatory guidance, as follows:

- Ontario's PPS; WRA; Conservation Authorities Act; CAA; ESA; and
- Federal SARA; FA; MBCA.

The 2014 PPS was issued under Section 3 of *The Planning Act*, and came into effect on April 5, 2014 (MMAH, 2014). Planning authorities "shall be consistent with" policy statements issued under *The Planning Act*. The PPS includes policies on development and land use patterns, resources, and public health and safety. This report deals with Policy 2.1 of the PPS, directed at protection and management of natural heritage resources. The PPS defines seven types of natural heritage features that require protection, including: significant wetlands; significant woodlands; significant valley lands; significant Areas of Natural and Scientific Interest ("ANSIs"); significant wildlife habitat; threatened and endangered species; and fish habitat. The 2014 PPS identifies environmental management strategy consistent with the 2005 version (MMAH, 2014).

Following the PPS (2014), proposed development will not be permitted in significant wetlands east and south of the Canadian Shield. Also, no development will be allowed in significant portions of the habitat of threatened and/or endangered species, generally called Species At Risk (SAR), as defined by species listed in Ontario's ESA and federal SARA. Development proposals may be permitted on lands adjacent to significant wetlands and the significant portions of the habitat of SAR if it is demonstrated that there will be no negative impacts on the natural features or the ecological functions within the area. Development may be permitted in, and adjacent to, the other five types of natural heritage features in the PPS provided there will be no negative impacts on the features and functions within the area(s) of concern. In summary, a suite of government regulations guides environmental activities within Ontario, intended to avoid disturbance of: wildlife, significant habitats, as well as maintain and/or enhance habitats.

2.3.1 Region of Halton Natural Heritage System

The ROH is responsible for preserving natural heritage features through the HOP. This preservation is achieved through management of the RNHS, represented by two components: Identified Key Features and Areas Outside the Key Features. Key Features include woodlands, valleylands, wildlife habitat, fish habitat, habitat of endangered and threatened species, and ANSIs. Proposals that include development activities within, or in close proximity to the RNHS requires evaluation of the activity through the completion of an EIS consistent with CH (2013a). Amendment 38 of the HOP was approved by the Province of Ontario in 2011 and subsequently appealed. From 2012 to 2017 several appeals were resolved with certain site-specific appeals outstanding at this time. The Official Consolidation of the HOP is dated June 19, 2018. There are no outstanding HOP appeals associated with the Site or adjacent areas. Hence, ROH requires an EIS to contemporaneously evaluate this proposed development to confirm it will not result in negative adverse effects to the RNHS lands, and to identify opportunities for environmental enhancement.

A review of the 2018 HOP identifies that the Site is now classified on land that is partially designated for residential-type land development and partially as Greenlands with flood plain. In other words, a portion of the Site is Greenland A but not Greenbelt or Escarpment Natural Area (refer to HOP Section 114). The Greenlands along Shoreacres Creek adjacent to the Site are now classified as Significant Woodlands. This recently updated HOP is also now consistent with other planning instruments for the area, including: the Growth Plan for the Great Horseshoe, 2017, Niagara Escarpment Plan 2017, the Greenbelt Plan, 2017, the Parkway Belt West Plan, 1978. To achieve consistency among the planning instruments applicable to the Site, it was necessary to update the EIS from the version presented in 2017.

2.4 Government Guidance for Site

Due to the extended period of study for the Site from 2012 until 2019, guidance from government agencies has been varied, as guidelines have changed during this period. The descriptions in Section 2.4.1 overviews regulatory guidance received from ROH, COB, and CH from 2012 to 2016. Correspondence with with Staff members from 2012 to 2016 whom inspected the Site are included in Appendix B. Then Section 2.4.2 reviews follow-up guidance from the same agencies, from 2017 to 2019, following the 2017 EIS submission. An overview of review comments and responses from 2018 to 2019 are included within Appendix C.

2.4.1 Comments from 2012 to 2016

Conservation Halton

Staff from CH participated in the inspections of the Site on different dates (see Appendices B and C for correspondence). The first inspection was completed by Mr. Charles Priddle, Coordinator, Regulations Program, on October 12, 2012. In 2012, Mr. Priddle marked the stable top-of-bank of the flood plain forest of Shoreacres Creek. This marking identified the extent of the regulated flood plain on-Site. The requirement to identify the extent of a flood plain is pursuant to the *Ontario Regulation 162/06* (Development, Interference with Wetlands and Alterations to Shorelines and Watercourses; CH, 2013b). Such identification of flood plains acts to regulate any proposed development in, near, or on areas near water (e.g., river or stream valleys, hazardous land, wetlands; CH, 2013b). Thus, any proposed development in proximity to regulated lands (i.e., near a flood plain) requires permission (approval following evaluation through an EIS) from CH. It is also for this reason that the proposed development on-Site (Figure 2) is setback from the stable top-of-bank and flood plain. This past guidance also included the scenario that if the proposed development was away from the creek, the existing drainage pattern would be retained, and no storm water management plan would be required.

On April 26, 2013, Ms. Jane Devito Senior Planner CH, participated in the inspection of the Site, to set the tree drip line along with staff from ROH and Ms. Cymbaly from Premier. Then on May 8, 2013, Ms. Devito shared a telephone conversation with Ms. Cymbaly. This conversation confirmed that a geotechnical slope stability study was not required by CH for the proposed development, as long as a 7.5 m setback is maintained from the stable top-of-bank. It was also discussed during this conversation that this 7.5 m setback would also match the majority of the noted tree drip line. That is, it was acknowledged a 7.5 m setback was very similar to the tree drip line, and would act to protect the roots of most trees found along the stable top-of-bank.

Ontario Ministry of Natural Resources

Communications were completed between Ms. Cymbaly of Premier and staff from Ontario Ministry of Natural Resources (OMNR) Aurora District Office between April and July, 2013 regarding possible SAR on-Site. Initially, Ms. Cymbaly described the project to OMNR and then OMNR provided a screening letter, issued by Ms. Natosha Fortini, OMNR *Assistant Species at Risk Biologist*, Aurora OMNR office. In this letter, OMNR identified the Site needed to be screened using proper methods by qualified ecologists for one SAR tree and two SAR birds reported in the last 25 years as being in the area of the Site, as follows: Butternut (*Juglans cinerea*), Barn Swallow (*Hirundo rustica*), and Chimney Swift (*Chaetura pelagica*). The OMNR stated that other SAR that may be encountered on-Site would need to be reported to Ms. Fortini as soon as feasible. A copy of this letter from MNRF is included in Appendix B.

Region of Halton

Staff from ROH participated in the inspection of the Site during 2013 (see Appendix B). Specifically, on April 26, 2013, Ron Reinholt, Regional Forester, and Stephen Dinka inspected the Site with Ms. Cymbaly of Premier. These individuals from ROH provided interpretations of the relationship between the flood plain forest and existing residential lawns and planted flowers, trees, and other cultural features on-Site. This information was interpreted and then used to set the tree drip line, along the stable top-of-bank line set previously by CH during 2012.

A number of trees toppled on-Site after a severe wind storm during spring 2015 following the severe ice storm of 2013 and storms during 2014. After trees toppled in 2015, Dr. Fitzgerald communicated with CH about the trees. Staff from CH recommended follow-up communications with Staff from ROH, to re-assess the suitability of the tree drip line. In response, on June 17, 2015, the tree drip line was re-set, with staff from ROH including Senior Planner Richard Clark and Senior Forester Mr. Reinholt with Dr. Fitzgerald of Premier. Since some of the toppled large trees in the past had been used to set the original tree drip line, it was necessary to re-set the dripline. In summary, the natural loss of trees following these storms led to revision of the tree drip line. No changes were made to the stable top-of-bank previously set by CH on-Site.

It is important to identify that during the re-setting of the tree drip line on-Site during June 2015, Senior Planner Mr. Clark from ROH asked if the past studies had surveyed for bats, a group of mammals referred to generally as ‘myotis’, on-Site. The response was that the original residence had been surveyed for bats prior to demolition and none were found. Mr. Clark then described that during November, 2013, OMNR elevated three myotis species to endangered status in Ontario and thereby these populations and habitats became protected under the Ontario’s *ESA*. These species that received protection included: Little Brown Myotis *lucifugus*, Northern Myotis *Myotis septentrionalis*, and Tri-colored Bat *Perimyotis subflavus* (COSEWIC, 2013). Hence, it became necessary to inspect large trees on-Site for possible habitat use by myotis. Specifically, Mr. Clark instructed that studies needed to visually evaluate all trees in proximity on-Site for possible use by myotis. This evaluation was to involve the use of binoculars to search for presence of nest cavities in the trees (live, dead) within the proposed building area and about 75 m from the stable top-of-bank. It is prudent to note that Mr. Clark’s advice was also presented for comment to CH, with approval response received via email to proceed (copies of correspondence included in Appendix B).

City of Burlington

Staff from the CB were invited to participate in the inspection of the Site during 2013 but declined to attend, due to the presence of staff from ROH. Thus, at the meeting in 2013, Staff from ROH discussed how the HOP and CBOP are complementary, and recommend similar environmental management for the Site. Such similarity is intended to ensure consistent strategies for development as well as management of land near water containing natural areas.

Within the CBOP, the Site was identified in 2013 as suitable for residential development with the recognition it is partially located on the flood plain of Shoreacres Creek and represents a portion of the RNHS. The purpose of the RNHS involves linking Core Natural Areas with the matrix of lands between them. Such linkages among natural areas allows wildlife and plants to move between habitat patches. These movements act to maintain biodiversity, and help sustain the long-term health and viability of natural systems. It is for these reasons that the natural heritage features on-Site require documentation in this EIS. When these natural heritage features are documented, then it is feasible to identify the possible environmental constraints that may exist in proximity to the proposed development. The identification of the natural heritage features allows for an analysis of possible consequences on-Site and for adjacent lands in the EIS.

Guidance was also received from Ms. Rosalind Minaji, Coordinator of Development Review, COB. Ms. Minaji informed Ms. Cymbaly of Premier on April 30, 2013 that a study of the trees planted on the manicured lawn of the Site was required, and to be presented as a Tree Inventory and Preservation Study (TIPS) within the EIS. In addition to this requirement, Ms. Minaji stated that the TIPS could be integrated as a component of the EIS (as an appendix) with no separate report necessary. It was also identified that the TIPS should follow the guidance included in the CBOP and that the findings should integrate with other ecological studies on-Site. For example, the CBOP recommends a minimum of a 1:1 compensation ratio for removed trees and that replacement trees are native to ROH (see Appendix B for correspondence).

On November 17, 2015, By-Law Enforcement Officer Tyler Morgan, COB, identified to Springfield and Premier that additional trees had toppled on-Site following a wind storm. Mr. Morgan advised Springfield that these hazard trees needed to be immediately addressed, due to safety concerns. On November 24, 2015, Mr. Morgan met with representatives from Springfield, and confirmed that the hazard trees were cut and the problem was considered resolved. It was confirmed during the meeting on November 24 that the trees requiring cutting were only those that had been previously damaged by factors such as extreme weather and insect damage, as described in detail earlier in this document. It is also noteworthy to identify that Mr. Morgan advised Springfield to discuss this matter with ROH, and this involved a phone call with Mr. Ron Reinholt, Senior Forester for ROH. Mr. Reinholt stated that no trees could be cut in the flood plain of Shoreacres Creek.

2.4.2 Government Guidance from 2017 to 2019

Additional consultations were completed during 2017 to 2019, following the revision of the review of the Premier (2017) EIS (refer to Appendix C for correspondence). It is prudent to note the Premier (2017) EIS was a revision of the Premier (2016) EIS. Since five years had passed since the original guidance was provided for the EIS, a follow-up meeting on-Site was scheduled with CH, COB, and ROH during August 2017 to discuss the current status of the vegetation and suitability of the 2015 tree drip line, given the frequent natural disturbances (e.g., ice and wind storms from 2014 to 2016; insect damage). This 2017 meeting also discussed the need to prepare an updated ELC map to reflect insights of the professionals in attendance. A second topic of discussion was the utility of installing a fence to separate Shoreacres Creek valley from the proposed development. After this topic of the need to install a fence was discussed in detail, it was decided that a fence would achieve suitable separation of the proposed development from the valley, and should be included in the revision of the design. Other topics discussed included the need to prepare a stormwater management plan with the application, in contrast to past guidance from 2012 and 2013 from CH that no stormwater management was needed.

During 2018 and 2019, additional guidance was provided from ROH by: Suzanne McInnes, Senior Planner, Adam Huycke, Senior Planner, and Richard Clark, Senior Planner. These individuals guided the revisions to the EIS, over a number of technical review cycles.

During 2019, additional guidance on revisions for this EIS were provided by Melissa Morgan of COB. This guidance identified improvements to the EIS among a number of other topics. One salient change from Ms. Minaji 2013 guidance was that a Landscape Architect was required to prepare the TIPS for the proposed project. This TIPS was to be prepared using the vegetation description and tree inventory from the EIS, and submitted as a separate document.

The chronology for the document submissions and responses for this Site includes:

- September 30, 2016 - Original EIS prepared by Premier;
- February 15, 2017 – Subsequent revised EIS prepared by Premier.
- September 27, 2017 – Slope Stability Assessment (Soil-Mat Engineers & Consultants Ltd.) was prepared to evaluate the stability of the existing slope and to determine the location of the top of stable slope. The stable top-of-bank is shown on all drawings associated with the rezoning application.
- January 17, 2018 - Premier prepared a letter responding to questions pertaining to the 2017 EIS and the Tree Inventory and Preservation Study also prepared by Premier.
- December 20, 2018 (revised to July 15, 2019) - A document titled Environmental Impact Summary was prepared by Environmental Liability Management Inc. (ELM).
- February 21, 2019 letter from ROH regarding technical review of application materials and additional questions regarding the development design;

- November 12, 2019 letter from Halton staff to Burlington staff identifying additional questions and requesting a final version of the EIS with all relevant revisions, tables and a copy of the questions of interest and responses.

Due to the nature of the questions from the government agencies presented during 2018 and 2019, additional studies were requested to support the proposed development and analyses within the EIS. This round of additional studies followed the review of the 2017 Premier EIS and December 2018 Environmental impact Summary, concerning the following topics:

- Stormwater: Stormwater management plan (Llewellyn, 2019a);
- Soils: Soil-Mat Soils Report, May, 2013 with 2017 Review Letter;
- Soils: Soil-Mat Slope Stability Assessment, September, 2017;
- Sun Shadow Study: Kristen Eccles Ph.D., Sun Shadow Study, March 2018;
- Noise: dBA Acoustical Consultants Noise Impact Study, August 2018
- Groundwater: Soil-Mat Supplemental Hydrogeological Study, November, 2018; and
- Landscape Plan: Reynolds & Associates Landscape Master Plan, November 30, 2019.

With these comments and additional technical studies from 2018 and 2019, an updated Planning Justification Report (PJR) for the Site was also prepared during 2019, and explains how this proposed development meets the requirements of the 2018 HOP (Corbett, 2019).

Key observations included in the PJR (Corbett, 2019) include:

- Part III, Sections 113 – 118 of the HOP contain the bulk of the RNHS policies. Section 118 (12) of the HOP requires that local zoning by-laws impose the appropriate development setback from Regulated Flood Plains, based on the kind, extent and severity of existing and potential hazard to public safety.
- Objectives of the RNHS include directing development to locations outside hazards lands; protecting the diversity of fauna and flora, plant communities, significant landforms, and ecosystems;
- The Key Features on the subject lands include significant woodlands. The subject lands also contain the regulated flood plain of Shoreacres Creek. The main purpose of the EIS, is to define the boundaries of the RNHS on the subject lands. The stable top-of-bank is the boundary of the hazard feature (slope associated with Shoreacres Creek) and Conservation Halton regulates an area 7.5 metres from the stable top-of-bank line. The most restrictive of these two lines becomes the boundary between the developable area, to be rezoned Residential High Density and the protected RNHS lands, to be rezoned Open Space (OS).
- Conservation Authorities Act (2006) does not include prescribed minimum buffers or prescribed minimum setbacks from natural features. The HOP also does not state a minimum buffer for Significant Woodlands in the urban area.

Map 1 to the ROH is the Regional Structure and the RNHS is identified on this map, including Shoreacres Creek on the north and south side of Upper Middle Road. Map 1G is titled "Key Features within the Greenbelt and Regional Natural Heritage Systems" and shows the subject land as part of the RNHS. The east portion of the subject lands contains the Shoreacres Creek minor valley system and the associated woodlands. To the east, residential lots within the Millcroft Community are located adjacent to the RNHS (east side of Shoreacres Creek valleyland / ravine).

2.5 Summary

The stable top-of-bank of the flood plain forest along Shoreacres Creek on-Site was marked with flags by CH staff Mr. Priddle during October 2012. Then the drip line of stable top-of-bank and associated flood plain forest was marked with flags during April 2013 by Ms. Cymbaly of Premier and Staff from ROH and CH. This information on the stable top-of-bank and dripline was surveyed by licensed Ontario Land Surveyors from Ashenhurst Nouwens Limited, Hamilton Ontario. A TIPS was requested by staff from COB to be included as a component of this EIS. Staff from CH stated that no slope stability study was required, if a 7.5 m setback was maintained from the stable top-of-bank. Guidance from OMNR stated that one tree and two bird SAR were known in the area of the Site and should be assessed for presence. Follow-up guidance in 2015 identified that SAR habitat on-Site needed to be screened for possible use by myotis. This guidance from the different government regulations and agencies was then used to revise the proposed development plan in 2015 from the original version presented in 2013. During this process, the tree drip line was also revised, due to a number of strong storms, insects, and disease that damaged and toppled trees between December 2013 and October 2015. The varied storms damaged nearly all the trees in the area of the proposed development, and as a result, a number toppled, and others fell. In general, these trees on the developable portion of the Site are dominated by non-native species and are proposed for removal. After the development is completed, all trees that are removed will be replaced using only species native to Halton, as defined by CH and ROH. Based on recent guidance, the replacement plan for vegetation was prepared by a Landscape Architect. A storm water drainage plan was also prepared and revised following technical reviews in 2019. This storm water plan identifies that drainage on-Site that drainage will flow from the natural area to Shoreacres Creek or the developed area to down gradient to Upper Middle Road, representing no change in current drainage patterns. All of the recently updated information has also been compiled in the 2019 Planning Justification Report.

3.0 DATA COLLECTION, ANALYSIS, AND ADDITIONAL RESOURCE

This chapter reviews the dates of visits to the Site, for varied purposes in 2013, 2014, and 2015.

3.1 Field Studies

Initial studies of the natural environment were initially completed on, and adjacent to, the Site between April and October, 2013 by Ms. Cymbaly; with one additional visit on September 8, 2014 by Mr. Jolly and Dr. Fitzgerald. Follow-up visits were completed on June 17, 2015 by Dr. Fitzgerald. The exact dates for these initial surveys, with descriptions of activities, as follows:

April 25th , 2013	A preliminary biological assessment of the site was conducted in order to generally describe the features and to detect obvious environmental constraints. Spring plants were also identified on-Site. Incidental bird and wildlife observations documented. Inspections of existing residence for evidence of habitat use by Barn Swallow and Chimney Swift.
April 26th, 2013	Meeting with staff from ROH and CH to identify the tree drip line along the stable top-of-bank previously demarcated by CH.
May 2nd, May 9th, May 27th, and June 14th, 2013	The site was surveyed for calling amphibians, as well as incidental nocturnal birds (owls) and other wildlife. Supplemental information on the vegetation community was also collected. Data on incidental wildlife observations also collected. Inspections of existing residence for evidence of habitat use by Barn Swallow and Chimney Swift.
May 18th and June 4th, 2013	Initial work for Ecological Land Classification (ELC) and botanical surveys on-Site.
June 15th and June 29th, 2013	Breeding bird surveys were conducted to assess the diversity of birds using the site. Inspections of existing residence for evidence of habitat use by Barn Swallow and Chimney Swift.
July 4th, 2013	Evaluation suspected Butternut trees with MNR Forester Bohdan Kowalyk R.P.F., OMNR Aurora District Forester.
August 14th to October 4th, 2013	Follow-up botanical surveys completed, to finalize ELC maps. Additional documentation of incidental wildlife.
September 8th and 15th, 2014	Follow-up inspection of the Site, to assess demolition of residence and tree cover on-Site. The purpose for this re-assessment of the tree cover was the ice storm experienced on-Site during December 2013. This storm caused a number of large trees that formed the tree drip line on-site to fall over. This ice storm was responsible for damage to trees across Burlington. These inspections also looked for evidence of myotis (i.e., bat) use in association with the large trees on-Site as well.
June 17, 2015	Inspection of Site with Staff from ROH, to re-set tree drip line. This re-set was required, due to tree damage from storms during 2013 and 2014. Hence, the tree drip line that was set on April 26th, 2013 was no longer valid. No changes made to stable top-of-bank set by CH.
July 29, 2015	Inspection of large trees on-Site for possible habitat use by myotis. This approach was approved by CH and ROH. Large trees within 120 m of the stable top-of-bank were evaluated for presence of cavities that could be used by myotis for maternal or overwinter roosting.
November, 2015	By-law enforcement from COB requested that Springfield remove hazard trees that had recently toppled due to a wind storm. The trees in question had been previously damaged by the 2013 and 2014 storms with subsequent attacks by insects and/or disease. The removal of these trees was verbally approved by ROH. No trees located in the flood plain were removed during this process, as they are not hazards.

Following the review of the 2017 Premier EIS, additional ecological field inspections and technical studies were completed on-Site by Dr. Fitzgerald. This additional study focused on addressing data gaps, generated information for new technical studies, and also to provide a tour for Staff from government agencies.

One inspection of the site, to update interpretations of the ecological features, was completed on August 27, 2017. Then a meeting with Staff from CH and ROH was convened on September 12, 2017. When the different individuals met, the entire Site was inspected, and confirmed the field findings regarding vegetation and land use collected from 2013 to 2015 and on August 27, 2017. In addition, Landscape Architect Robert Reynolds visited the Site during 2018, to update tree inventory information, due to the loss of some trees as a result of episodic events like wind storms, and chronic events like insect damage. Specifically, all Ash (*Fraxinus* spp.) trees have died since 2013 due to the infestation by non-native Emerald Ash Borer (*Agrilus planipennis*). Please see Chapter IV for additional details.

Representative photographs from the Site are included within Appendix D.

3.2 Supporting Documents and Other Resources

Aerial Photographs

Historical aerial photographs of the Site were obtained and evaluated to identify prevailing land use and evidence of disturbance. This evaluation included photographs from 1954, 1978, and 1988 (Plates 4 – 7). These photographs show a transition of increased urban development around the Site, and an absence of development in the flood plain of Shoreacres Creek.



Plate 4: Aerial photograph of land that includes the Site from 1954. This photograph reveals that agriculture was the dominant land use in the area of the Site at that time. This photograph also reveals the creek is located in an intact floodplain forest.

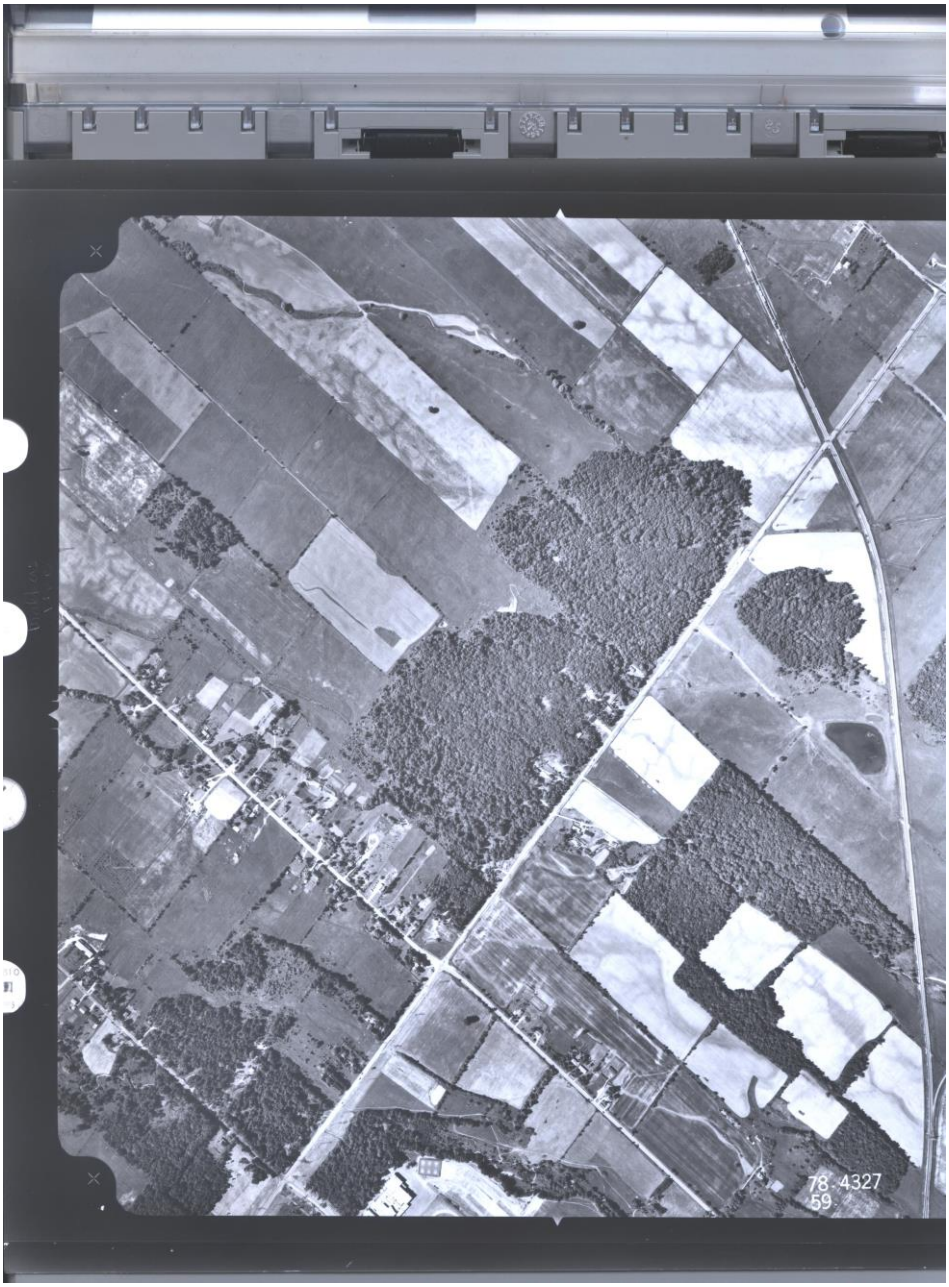


Plate 5: Aerial photograph of land that includes the Site from 1978. This photograph reveals that agriculture remained the dominant land use at that time with an intact flood plain forest.

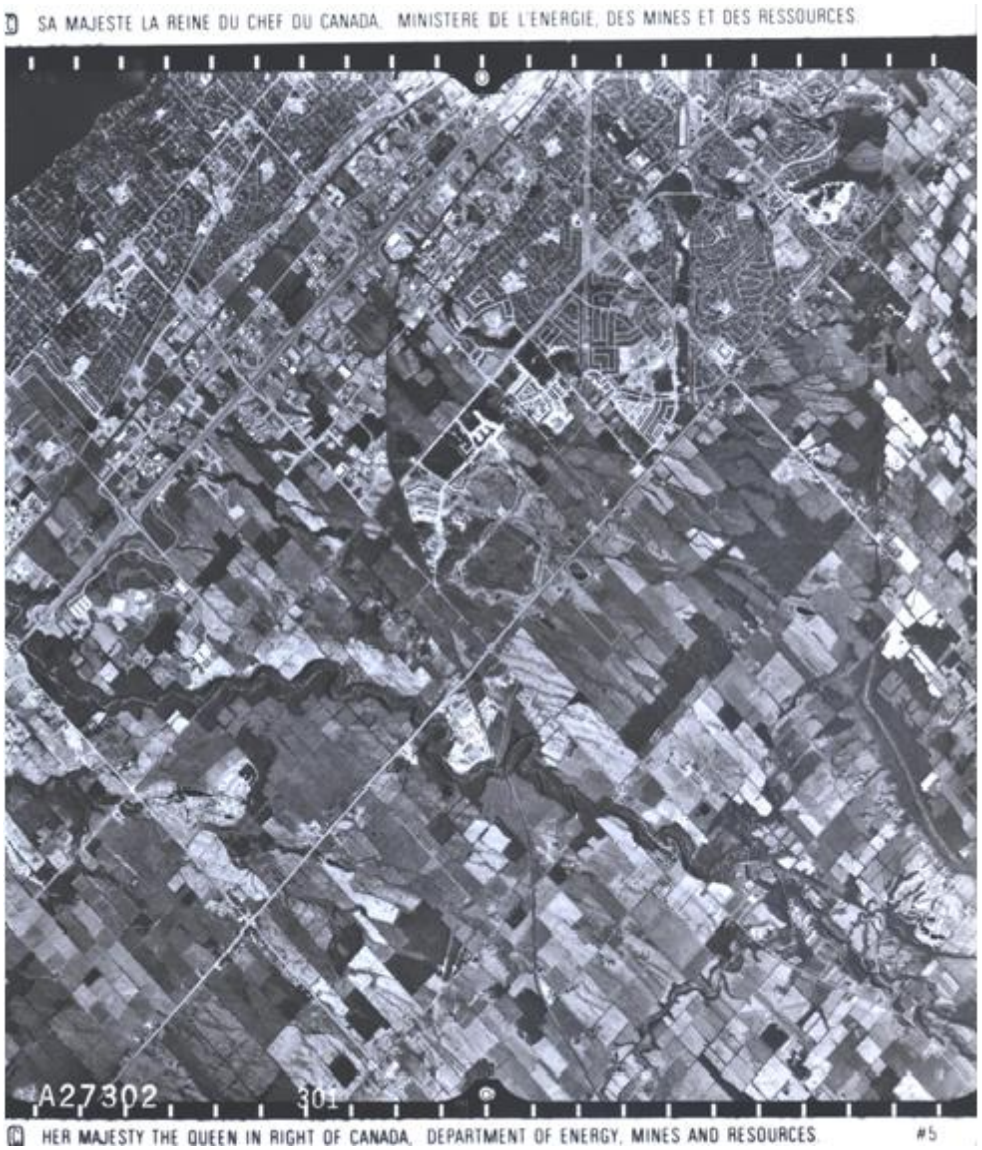


Plate 6: Aerial photograph of land that includes the Site, from 1988. This photograph reveals that agriculture remained the dominant land use at that time with an intact flood plain forest. However, urban encroachment is evident to the north and east of the Site.



Plate 7: Aerial photograph of land that includes the Site, from 2004. This photograph reveals that agriculture had been replaced by urban development all around the intact flood plain forest.

The Natural Heritage Information Centre Database

Information concerning natural heritage features and SAR for the Site was reviewed within the Natural Heritage Information Centre ("NHIC") database, maintained by the OMNR during 2014 and 2017 (OMNR, 2014, 2017). This database includes records of provincially significant vegetation and wildlife on, and in proximity with the Site. The search revealed records in 2014 for the same three SAR species as noted in the 2014 OMNR letter. Specifically: Butternut, Barn Swallow and Chimney Swift. Then the review in 2017 also identified these same SAR along with SAR myotis. With this study, the records review for the Site is complete.

4.0 VEGETATION SURVEYS

This chapter describes how the vegetation was assessed from 2013 to 2018.

4.1 Methodology for Botanical Surveys

Plants were assessed during all visits to the Site, between April and October of 2013 along with a follow-up visit on September 8, 2014. This assessment of plants focused on the identification of specimens located on the manicured lawn in proximity to the residence. In addition, cursory inspections of plants located along the stable top-of-bank was also completed. Only general surveys of vegetation were completed in the flood plain forest, due to no planned disturbance. These surveys focused on the stable top-of-bank area, as the excavation of the former house created a change in grade of 1+ m and was associated with a rock and soil-filled hole (Plate 8).

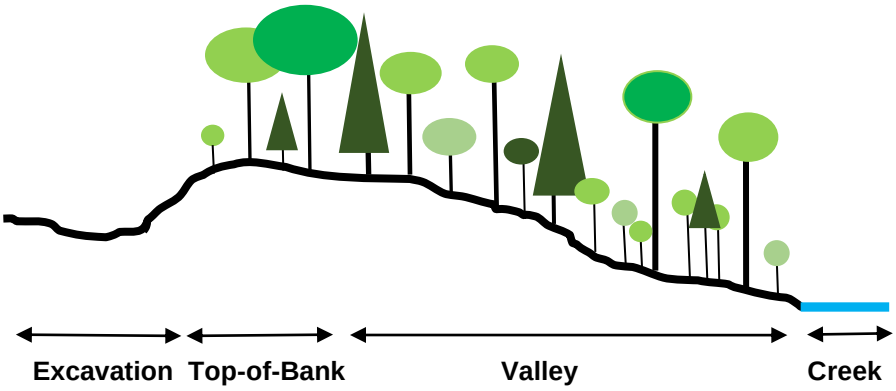


Plate 8: Schematic to represent slope profile with house excavation, stable top-of-bank, valley, and general vegetation communities on-Site.

Spatial Relationships

Inspections during 2014 identified distinct spatial patterns for vegetation on-Site due to excavation of the residence; field data sheets included in Appendix E. After the residence was excavated, as represented within Plate 8, this area was composed primarily of rock and sand, and contained no live plants. Very few plants were evident on the slope of the excavation. However, the plant community was diverse outside of the excavation area. The area away from the excavation was somewhat flat and contained varied plant species across the manicured lawn and ornamental bushes and fruit trees. Thus, four associations of plants exist on-Site.

Information on plant identity across the Site was used to prepare an ELC map, following standard methods (Bakowsky et al. 1998; Lee et al. 1998). Fieldwork included identification of vegetation communities during floristic surveys. English colloquial names and Latin binominals of plant species generally followed the syntax of Newmaster et al. (1998). The initial ELC map was presented in the 2017 EIS with revisions completed to reflect recent technical reviews.

Inspections of trees were completed on-Site on July 29, 2015 in response to guidance from CH and staff from ROH to assess the mature trees on-Site and within adjacent lands for cavities that could be possibly used by myotis. On this date, Dr. Fitzgerald visually inspected trees on-Site with a DBH > 25 cm in the proposed development area and within 120 m of the stable top-of-bank. All trees were inspected visually and with the aid of binoculars, to determine if cavities were present. This inspection of presence / absence of cavities was completed to evaluate possible habitat for myotis. Field data sheets for myotis habitat surveys included in Appendix F.

Following reviews of the 2017 EIS (Premier, 2017), Reynolds and Associates prepared an updated landscape plan and TIPS, based on field inspections during 2018 (Reynolds, 2020a).

4.2 Results

4.2.1 Herbaceous Species

The inspections of herbaceous plants completed between April and October of 2013 allowed for the common herbaceous species in proximity to the residence on-Site to be identified. This effort resulted in the identification of 39 species representing 22 families with ~25% representing non-native species (Table 4-1). The initial inspections revealed no plant species listed as SAR or with conservation status in Ontario or Canada (Table 4-1). That is, all native species were ranked as S5 – and this identifies they are known to be very common in Ontario and secure in biogeographical distribution. A number of plant species on-Site are also known to be sold at commercial greenhouses, as annual or perennial (i.e., ornamentals) and are common in urban areas. There is no real pattern with the herbaceous plant distribution other than colonization of native and non-native species across the former lawn. This herbaceous plant community can be described as being typical of a disturbed urban habitat. After the excavation of the residence, a large portion of the plant community on the lawn was destroyed. Hence, when the Site was excavated, it created a distinct ecotone in the plant community, between the disturbed area and the adjacent natural areas.

It should also be noted that the herbaceous vegetation community found within the flood plain of Shoreacres Creek was inventoried during 2013 in a general sense, as no disturbance is proposed for this area. This area within the flood plain was represented by two general habitats attributable to local moisture and shade regimes. First, the sloped area that represented by the area from the stable top-of-bank to the foot of the slope. This slope is well drained and receives direct sunlight attributable to the incomplete tree canopy on the lawn. Second, the lower area of the flood plain is directly adjacent to the creek. This latter area has been observed to contain standing water that can be attributed to runoff from snowmelt and flooding from the creek. For example, water was pooled in this area from April 2013 until June 2013. This area is also well shaded due to the closed canopy. These factors created two different herbaceous plant communities, defined by past disturbance regimes involving vegetation removal and flooding.

Table 4-1: Review of the herbaceous species identified on the manicured lawn and in proximity to the stable top-of-bank on-Site between 2013 and 2015. For each species, the global rank (GRANK), species rank (SRANK), and conservation status (COSEWIC) is identified. No SAR or species of conservation importance were identified on-Site.

Family	***Species Scientifc Name***	**Species Common Name**	**GRANK**	**SRANK**	**COSEWIC**
ANACARDIACEAE	*Rhus radicans ssp. negundo*	Climbing Poison-ivy	G5	S5	-
APOCYNACEAE	*Vinca minor*	Common Periwinkle	G?	SE5	-
ARACEAE	*Arisaema triphyllum*	Jack-in-the-pulpit	G5	S5	-
BALSAMINACEAE	*Impatiens capensis*	Spotted Jewel-weed	G5	S5	-
BORAGINACEAE	*Myosotis scorpioides*	Common Forget-me-not	G5	SE5	-
CARYOPHYLACEAE	*Cerastium vulgatum*	Mouse-ear Chickweed	G5	SE5	-
COMPOSITAE	*Arctium minus*	Common Burdock	G5	SE5	-
COMPOSITAE	*Erigeron annuus*	Annual Daisy Fleabane	G5	S5	-
COMPOSITAE	*Symphyotrichum lanceolatum*	Panicled Aster	G5	S5	-
COMPOSITAE	*Symphyotrichum nova-angilae*	New England Aster	G5	S5	-
COMPOSITAE	*Lactuca scariola*	Prickly Lettuce	G5	SE5	-
COMPOSITAE	*Solidago canadensis*	Canada goldenrod	G5	S5	-
COMPOSITAE	*Rudbeckia hirta*	Brown-eyed Susan	G5	S5	-
COMPOSITAE	*Picris hieracoides*	Oxtongue Hawkweed	G5	SE5	-
CRUCIFERAE	*Alliaria petiolata*	Garlic Mustard	G?	SE5	-
EUPHORBIACEAE	*Acalypha rombiodea*	Three-seeded Mercury	G5	S5	-
GERANIACEAE	*Geranium maculatum*	Wild Geranium	G5	S5	-
GERANIACEAE	*Geranium robertianum*	Herb Robert	G5	SE5	-
LEGUMINOSAE	*Gleditsia tricanthos* var. *forma inermis*	Honey Locust (Sunburst variety)	G5	SE5	-
LEGUMINOSAE	*Medicago lupulina*	Black Medick	G5	SE5	-
LILIACEAE	*Allium tricoccum*	Wild Leek	G5	S5	-
LILIACEAE	*Convallaria majalis*	Lily-of-the-valley	G5	SE5	-
LILIACEAE	*Erythronium americanum*	Yellow Trout Lily	G5	S5	-
LILIACEAE	*Polygonatum pubescens*	Hairy Solomon's Seal	G5	S5	-
LILIACEAE	*Maianthemum racemosum*	False Solomon's Seal	G5	S5	-
OXALIDACEAE	*Oxalis stricta*	Yellow Wood Sorrel	G5	S5	-
PLANTAGINACEA	*Plantago major*	Common Plantain	G5	S5	-
POACEAE	*Poa pratensis*	Kentucky Blue Grass	G5	S5	-
PORTULACACEAE	*Claytonia virginica*	Virginia Spring Beauty	G5	S5	-
PRIMULACEAE	*Anagallis arvensis*	Scarlet Pimpernel	G5	SE4	-
RANUNCULACEAE	*Anemone quinquefolia*	Wood Anemone	G5	S5	-
RANUNCULACEAE	*Ranunculus acris*	Common or Tall Buttercup	G5	SNA	-
ROSACEAE	*Crataegus mollis*	Downy hawthorn	G5	S5	-
ROSACEAE	*Fragaria virginiana*	Common Strawberry	G5	S5	-
ROSACEAE	*Rubus occidentalis*	Black Raspberry	G5	S5	-
SOLANACEAE	*Solanum dulcamara*	Climbing Bittersweet	GNR	SNA	-
VIOLACEAE	*Viola sororia*	Common Blue Violet	G5	S5	-
VIOLACEAE	*Viola pensylvanica*	Smooth Yellow Violet	G5	S5	-
VITACEAE	*Vitis riparia*	Wild Riverbank Grape	G5	S5	-
VITACEAE	*Parthenocissus inserta*	Virginia Creeper	G5	S5	-
COSEWIC - Committee on the Status of E	*GRANK - MNR Global Rank*	SRANK - MNR Provincial Rank			
X - Extinct; a wildlife species that no longe	*G1- Extremely rare; <5 occurences*	S1- Extremely rare in ON; <5 occurences			
XT - Extirpated; a wildlife species that no lo	*G2 - Very rare; 5-20 occurences*	S2 - Very rare in ON; 5-20 occurences			
E - Endangered; a wildlife species facing im	*G3 - Rare to uncommon; 20-100 occurences*	S3 - Rare to uncommon in ON; 20-80 occurences			
T - Threatened; a wildlife species that may	*G4 - Common; >100 occurences*	S4 - Common in ON; 80 - 1000 occurences			
is done to reverse the factors leading to	*G5 - Very common*	S5 - Very common in ON; > 1000 occurences			
SC - Special Concern; a wildlife species th	*? - Follows a rank and denotes a rank is tentatively assigned (i.e. G4?)*	SE - Exotic			
because of a combination of biologica	*G? - Unranked*	? - Follows a rank and denotes a rank is tentatively assigned (i.e. S4?)			
	GNR - Denotes a species that is not ranked	S?/SNA - Unranked or not yet ranked			

Vegetation distribution on-Site represented responses to past disturbance regimes, and degree of shading from canopy trees. Those herbaceous plant community found along the sloped area prefer well-drained soils and require direct sunlight. This plant community on the slope was dominated by goldenrods and asters (family Asteraceae) such as Canada Goldenrod (*Solidago canadensis*), New England Aster (*Symphyotrichum novae-angliae*), Panicled Aster (*Symphyotrichum lanceolatum*), Daisy Fleabane (*Erigeron annuus*) along with other plants. These other plants included: Black Raspberry (*Rubus occidentalis*), Common Blue Violet (*Viola sororia*), Common Burdock (*Arctium minus*), Common Periwinkle (*Vinca minor*), Common Red Raspberry (*Rubus idaeus*), Common Strawberry (*Fragaria virginiana*), Riverbank Grape (*Vitis riparia*), Eastern Poison Ivy (*Toxicodendron radicans*), Garlic Mustard (*Alliaria petiolata*), Herb Robert (*Geranium robertianum*), Mouse-ear Chickweed (*Cerastium vulgatum*), Queen Anne's Lace (*Daucus carota*), and Virginia Creeper (*Parthenocissus inserta*).

Follow-up inspections of vegetation on-Site were completed during September 2014 as well as June 2015 and confirmed the species diversity on-Site.

Inspections during 2017 and 2018

Follow-up inspection of the Site on August 27, 2017 and September 12, 2017 revealed expansion of a number of non-native species previously documented on-Site across the former lawn area. Plants with expanded distributions included Common Periwinkle, Garlic Mustard, and Common Burdock. A number of ~10 m^2 patches with non-native species were evident on-Site.

4.2.2 Woody Species

The inspections of woody shrubs and trees completed between April and October of 2013 allowed for all species to be identified. This effort resulted in the identification of 20 species representing 12 families; six species or 30% were non-native (Table 4-2). None of these woody species are considered SAR or hold conservation status in Ontario or Canada. However, the Black Walnut (*Juglans nigra*) shows similarity to the closely related Butternut. As such, an OMNR tree identification expert, Mr. Kowalyk, visited the Site on July 4, 2013 and confirmed that only Black Walnut was evident.

Inspections in July 2015 identified no trees on the manicured lawn or within 120 m of the stable top-of-bank that demonstrated the presence of cavities large enough that could be used by myotis. It is noteworthy to state that one very large Weeping Willow (*Salix babylonica*) and one very large Swamp White Oak were found > 150 m from the property line in the flood plain of Shoreacres Creek. Both of these trees had cavities large enough for use by myotis but were far away from the proposed development. A summary is included in Appendix F.

Table 4-2: Review of the tree species identified on the manicured lawn and in proximity to the stable top-of-bank on-Site. For each species, the global rank (GRANK), species rank (SRANK), and conservation status (COSEWIC) is identified. No SAR were identified on-Site.

Family	Species Scientifc Name	Species Common Name	GRANK	SRANK	COSEWIC
ACERACEAE	Acer negundo	Manitoba Maple	G5	S5	-
ACERACEAE	Acer saccharum	Sugar Maple	G5	S5	-
ACERACEAE	Acer platanoides	Norway Maple	G5	SE5	-
BETULACEAE	Betula papyrifera	White Birch	G5	S5	-
BETULACEAE	Ostrya virginiana	Ironwood	G5	S5	
CUPRESSACEAE	Thuja occidentalis	Eastern White Cedar	G5	S5	-
FAGACEAE	Quercus rubra	Red Oak	G5	S5	-
FAGACEAE	Quercus rubra x Q. shumardii	Hybrid Oak	G?	S?	-
FAGACEAE	Quercus macrocarpa	Bur Oak	G5	S5	-
JUGLANDACEAE	Juglans nigra	Black Walnut	G5	S5	-
JUGLANDACEAE	Carya cordiformis	Bitternut Hickory	G5	S5	-
JUGLANDACEAE	Carya ovata	Shagbark Hickory	G5	S5	
OLEACEAE	Fraxinus americana	White Ash	G5	S5	-
PINACEAE	Pinus sylvestris	Scots Pine	G?	SE5	-
PINACEAE	Pinus strobus	Eastern White Pine	G5	S5	-
PINACEAE	Pinus nigra	Black or Austrian Pine	G5	SE2	-
RHAMNACEAE	Rhamnus cathartica	Common Buckthorn	G?	SE5	-
ROSACEAE	Prunus virginiana	Choke Cherry	G5	S5	-
ROSACEAE	Malus sylvestris	Common Apple	G5	SE5	-
TILIACEAE	Tilia americana	Basswood	G5	S5	-
ULMACEAE	Ulmus americana	American Elm	G5?	S5	-
COSEWIC - Committee on the Status of E	GRANK - MNR Global Rank	SRANK - MNR Provincial Rank			
X - Extinct; a wildlife species that no longe	G1- Extremely rare; <5 occurences	S1- Extremely rare in ON; <5 occurences			
XT - Extirpated; a wildlife species that no lo	G2 - Very rare; 5-20 occurences	S2 - Very rare in ON; 5-20 occurences			
E - Endangered; a wildlife species facing in	G3 - Rare to uncommon; 20-100 occurences	S3 - Rare to uncommon in ON; 20-80 occurences			
T - Threatened; a wildlife species that may	G4 - Common; >100 occurences	S4 - Common in ON; 80 - 1000 occurences			
is done to reverse the factors leading to	G5 - Very common	S5 - Very common in ON; > 1000 occurences			
SC - Special Concern; a wildlife species th	? - Follows a rank and denotes a rank is tentatively assigned (i.e. G4?)	SE - Exotic			
because of a combination of biologica	G? - Unranked	? - Follows a rank and denotes a rank is tentatively assigned (i.e. S4?)			
	GNR - Denotes a species that is not ranked	S?/SNA - Unranked or not yet ranked			

4.2.3 Tree Inventory and Preservation Plan

Information was collected on-Site from 2013 to 2017 to prepare a tree inventory and TIPS, including all live woody stems with a DBH > 10 cm on the lawn and in proximity to the stable top-of-bank (Premier, 2017). Data on woody stems was initially collected from April to October of 2013, and again on September 8, 2014, due to a number of storms that had disturbed the tree canopy. That is, a number of trees that were live and had full canopies in 2013 were observed to have broken branches, were uprooted, or were dead when inspected again in September 2014. Then, additional inspections were completed on June 17, 2015 and July 29, 2015 due to natural damage to the trees on-Site from a number of additional severe storms. This information was then compiled and included in the 2017 EIS. Following the review of the EIS, an additional follow-up inspection was completed on August 27, 2017. Then a meeting with Staff from CH and ROH on September 12, 2017 to review the findings.

The TIPS in the 2017 EIS reported 20 species of trees and 60 live stems (Table 4-3). The analysis of the 60 stems on-Site determined the trees were located around the former residence and did not represent a significant woodland or an extension of the flood plain forest of Shoreacres Creek. This determination reflects the tree species distribution, the total number of stems, and the total volume of trees. All 60 trees were identified in 2017 to be removed and replanted. Further, these trees were also recommended for removal due to extensive damage from the past ice storm, presence of disease, or they are non-native to Halton. As noted earlier, varied trees on-Site were initially identified for preservation, but these trees were damaged during storms in 2013 and 2014 and then suffered subsequent stress from insects and/or disease. These trees were damaged again during a severe October 2015 wind storm. Following this windstorm, COB staff requested hazard trees to be removed. The removal of these trees was verbally approved by ROH. Hence, the initial strategy was to preserve as many stems as feasible, and then this approach was revised due to successive storm damage of the trees.

During initial consultations in 2013 and 2014, a compensation strategy was identified for the Site, to replace all lost trees with a 1:1 compensation ratio along with preservation methods to be followed to protect the remaining trees found on-Site, especially numerous mature woody stems found along the entire stable top-of-bank area. This strategy identified that a minimum of 60 trees native to ROH needed to be planted on-Site. The 2017 EIS recommended that these 60 trees to be planted along the edge of Shoreacres Creek. It was noted in the 2017 EIS that if compensation trees were planted in the area between the creek and the proposed development, it would provide additional enhancement of the natural features along the creek corridor.

Following reviews of the 2017 EIS, Reynolds and Associates prepared an updated TIPS after inspections were completed during 2018 (Reynolds, 2019a). The updated TIPS focused on the manicured lawn and area in proximity to the top-of-bank along the edge of the woodland. A copy of the TIPS is included in Appendix G. As a complement, a detailed landscape planting plan for the Site was prepared, to compensate for the loss of woody stems with DBH $\geq$ 10 cm within the woodland along Shoreacres Creek (Appendix H). Other landscape plans were prepared for the Site and include the provisions for the removal of non-native herbaceous species followed by planting of native herbaceous species across the developed area of the Site (Reynolds 2019b,c). For example, the landscape plan includes the removal of non-native plants such as Garlic Mustard, Periwinkle, Common Mullein, Common Burdock patches from the edge of the woodland, by hand. After non-native plants are removed, native species will be planted in these areas, by hand (Reynolds, 2020b). In addition, non-native trees will also be removed from the edge of the significant woodland by hand, followed by planting of native trees (Reynolds, 2020a,b,c; Appendix H).

Table 4-3: Summary of trees identified on the manicured lawn and in proximity to the stable top-of-bank included in the TIPS. Each tree was numbered and then the health of trees was classified as good (G), fair (F), or poor (P). Also, the proposed action for each tree is identified as remove (R) or preserve (P). These trees were also inspected for the presence of cavities that could be used by myotis (i.e., bats). None of the trees displayed features suggesting presence of cavities large enough for use by myotis. The TIPS and landscape plans included within Appendices G and H provide additional details.

Common Name	Number	Origin (I/N)	Ice damage (Y/N)	Evidence of Disease (Y/N)	Evidence of Insect Pests (Y/N)	General Health (G, F, P)	Remove (R) or Preserve (P)	Evidence of cavities?
Black Walnut	4	Native	Y	N	N	G	R	N
	39		N	N	N	G	R	N
	47		N	N	N	G	R	N
	6		N	N	N	G	R	N
Eastern White Cedar	25	Native	N	N	N	G	R	N
Shagbark Hickory	22	Native	Y	N	Y	G	R	N
	37		N	Y	Y	G	R	N
	39		Y	N	Y	G	R	N
Bitternut Hickory	14	Native	Y	N	N	G	R	N
	29		Y	N	N	G	R	N
	34		Y	N	N	G	R	N
Thornless Honey Locust	7	Native	N	N	N	G	R	N
	52		N	N	N	G	R	N
Eastern White Pine	47	Native	N	N	N	G	R	N
	10		N	N	N	G	R	N
	36		Y	N	N	G	R	N
	45		Y	N	N	P	R	N
	48		Y	N	N	P	R	N
	49		Y	N	N	P	R	N
Black Pine	2	Invasive	N	N	N	G	R	N
	1		N	N	N	G	R	N
	3		N	N	N	G	R	N
Scotch Pine	11	Invasive	Y	N	Y	P	R	N
	12		Y	N	Y	P	R	N
	31		Y	Y	Y	P	R	N
	32		Y	Y	Y	P	R	N
Ironwood	17	Native	N	N	N	G	R	N
	15		N	N	N	G	R	N
	16		Y	N	N	G	R	N
	26		Y	N	N	G	R	N
	18		N	N	N	G	R	N
	27		Y	N	N	G	R	N
	28		Y	N	N	P	R	N
	19		Y	N	N	G	R	N
	30		N	N	N	G	R	N
	50		Y	N	N	G	R	N
Hawthorn spp.	20	Native	N	Y	N	F	R	N
	21		N	Y	N	F	R	N
White Ash	5	Native	Y	N	Y	P	R	N
	8		Y	N	Y	P	R	N
	23		Y	N	Y	P	R	N
Wild Apple	42	Native	N	N	Y	F	R	N
	43		N	N	Y	F	R	N
	24		Y	N	Y	F	R	N
Choke Cherry	41	Native	N	N	N	G	R	N
American Basswood	51	Native	Y	N	Y	G	R	N
Bur Oak	9	Native	N	N	N	G	R	N
Red Oak * Shumard Oak	40	Native	Y	Y	Y	P	R	N
Norway Maple	13	Invasive	N	N	N	G	R	N
	33		N	N	N	G	R	N
	35		Y	N	N	G	R	N
White Birch multi-stem	44	Native	N	N	Y	P	R	N
multi-stem			N	N	Y	P	R	N
multi-stem			Y	N	Y	P	R	N
multi-stem			N	N	N	P	R	N
multi-stem			Y	N	N	P	R	N
multi-stem			N	N	N	P	R	N
multi-stem			Y	N	N	P	R	N

4.3 Ecological Land Classification

For this Site, the ELC information was based on the general location in southern Ontario and observation of 39 herbaceous plant species along with 20 woody shrubs and tree species representing 32 families. This ELC analysis also reflected prevailing land use, slope, soil composition, and past disturbance regimes including forest harvest, house development, flooding, and the excavation of the house.

When the flood plain forest in proximity to the stable top-of-bank was inspected, it was observed to contain a mixture of the following canopy trees: Shagbark Hickory, Bitternut Hickory, Eastern White Pine, Black Walnut, and one very large Swamp White Oak (*Quercus bicolor*); other trees in the subcanopy include American Elm, Basswood (*Tilia americana*), Ironwood, American Beech (*Fagus grandifolia*), and Red Maple. With the observation that this area floods during the spring, this ecosite was designated as Fresh Moist Bitternut Hickory Deciduous (FOD9-5). A transition zone was noted between the FOD9-5 that is due to the presence of well drained soils on the slope, with tree composition including American Elm, Black Walnut, Manitoba Maple, Sugar Maple, and White Ash. In close proximity to the stable top-of-bank, trees included Black Walnut, Common Buckthorn, Sugar Maple, Manitoba Maple, and White Ash. This transition woodland zone between the FOD9-5 and residence represents a Cultural Woodland (CUW) due to the past disturbance, slope, and tree community composition. Hence, the RNHS on-Site includes significant woodland composed of FOD9-5 and CUW components.

When these trees of the FOD9-5 were compared with the CUW, differences exist in terms of species composition, DBH and density but they form contiguous woodland. For example, the dominant species within FOD9-5 are hickory, oak, and white pine in the flood plain compared with species such as Paper Birch, Manitoba Maple, and European Buckthorn in the CUW. Although a full botanical inventory was not completed in FOD9-5, the DBH is inferred to be much higher, as the canopy trees are taller than trees in the CUW. Further, the density of trees in the FOD9-5 were also interpreted to be lower compared with the CUW. It is probable that individual trees, such as Eastern White Pine and one large Bitternut Hickory within the stable top-of-bank were retained in the CUW during the past land development.

This information on plant diversity and plant distributions was combined with soil profiles, slope, and presence of Shoreacres Creek on-Site, as reported in the 2017 EIS. Following technical reviews, a follow-up inspection was completed on August 27 and the ELC analysis was updated. This update to the ELC analysis was reviewed by Staff from CH and RH on September 12, 2017. The revised analysis included four key polygons: the former residence designated as Low-density Residential (CVR-1); planted and volunteer trees around the residence, designated as Dry-Fresh Mixed Woodlands (WOMM-3), and the FOD9-5 and CUW representing significant woodland along Shoreacres Creek, represented within Figure 3.

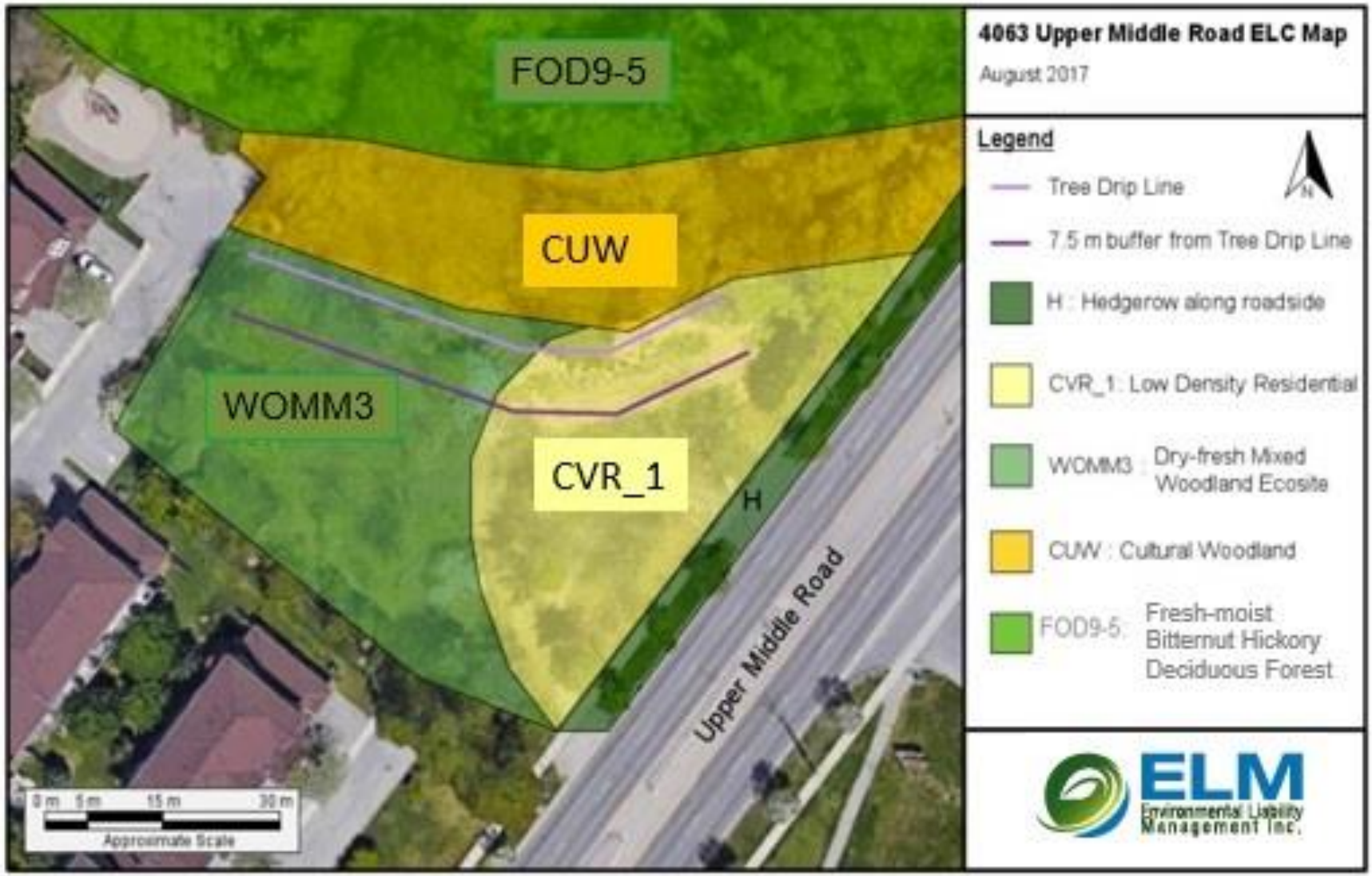


Figure 3: Ecological Land Classification map for the Site, based on studies completed from 2013 to 2017.

5.0 AMPHIBIAN SURVEYS

This chapter describes the surveys completed for amphibians (i.e., frogs and toads) on-Site.

5.1 Methodology

Four (4) amphibian calling surveys were completed to assess the presence or absence of amphibians on-Site. These surveys followed the Marsh Monitoring Program (MMP) (2008). The MMP requires surveys to occur when air temperatures exceed 5 ºC, 10 ºC, and 17 ºC across the spring season. A key requirement is that surveys for each temperature regime should occur at least 15 days apart. Conditions should be moist and calm, whereby measurable rain (i.e., usually accumulation > 1 mm) has been observed within the previous 24 hours, and winds are absent or light. Hence, heavy rain does provide the moisture preferred by amphibians but the noise of the rain makes survey efforts problematic. Thus, the ideal scenario is light rain with light winds. Also, each survey should commence at least one half hour after sunset and be completed before midnight.

The first survey was completed on May 2, 2013, when night-time air temperature was approximately 13°C, skies were observed to have a 10% cloud cover throughout the duration of the survey. The surveyor remained on-site from 21:45 to 22:50. Conditions were calm (beaufort wind scale of 0), through the entire survey.

The second survey was completed on May 9th, 2013. It was observed that rain had occurred earlier during the day, with an evening temperature of 9°C. Available climate records indicated approximately 10 mm of rain had fallen in the Burlington area during the previous 24-h period (Environment Canada). The surveyor remained on-site from 21:30 to 22:45. Calm winds were observed during the entire survey (beaufort scale of 1).

A third survey was conducted on May 27, 2013, with nighttime temperatures of approximately 15°C whereby sporadic rain showers had been observed during the previous 24-h period. The surveyor remained on-site between 21:45 and 23:00. Skies were predominantly clear (approximately 10% cloud cover) and conditions were calm; winds were essentially absent (beaufort scale of 0-1 through the duration of the visit).

A fourth survey was conducted on June 14, 2013, with temperatures of approximately 20°C whereby rain was observed consistently throughout the previous 24-h period. The surveyor remained on-site between 22:00 and 23:00. Winds were calm (beaufort scale of 0).

Given the limited breadth of the property, two (2) point count locations were used for all four surveys. These locations bordered Shoreacres Creek at the southern limit of the Site adjacent to Upper Middle Road, and at the northern extent of the property. These stations were also selected for ease of access, as it was unsafe to traverse within the flood plain forest at night. Furthermore, it was inferred that it was possible to hear the calls of amphibians in the flood plain forest from these stations. To be complete, the surveyor recorded any additional auditory or visual observations throughout the duration of each Site visit.

5.2 Results

5.2.1 Data Collection

Observations from field survey results, including weather conditions, are included on copies of field data sheets, within Appendix E.

For all four survey dates, a minimum of two (2) listening periods were conducted at each of the stations. Each listening period encompassed a duration of at least (3) minutes; on most dates, additional time was used to listen for calling amphibians. An unlimited distance, 180º arc sampling area was at each point count station. Call for each species was categorized under one of the following five (5) levels:

- Level 1 – No calls heard, no species seen;
- Level 2 – Frog(s) or toad(s) seen or heard with unknown total numbers;
- Level 3 – Frog(s) or toad(s) can be counted, calls do not overlap;
- Level 4 – Frog(s) or toads can be counted, while others are overlapping; or,
- Level 5 – Full chorus, continuous and overlapping, difficult to identify frogs or toads.

5.2.2 Amphibian Survey Results

For May 2nd, no amphibians were heard or seen during the first amphibian survey on May 2nd.

On-Site, only one (1) species of amphibian was identified during the MMP surveys: Green Frog (*Lithobates clamitans*). This species was observed (via auditory evidence of multiple calls) in the vegetation on-Site during different dates. Specifically, one individual was observed (Level 3) at point count Station No.1 (near the road crossing bridge) during both the second survey (May 9th, 2013) and the third survey (May 27, 2014). In addition, multiple specimens of Green Frog were heard calling (Level 2) during the June survey, again in habitat near station No.1. No other amphibian were observed on-Site during the MMP surveys.

Amphibians were observed off-Site. Specifically, an unknown number of Spring Peeper (*Pseudacris crucifer*) were heard calling (i.e., Level 2) in the flood plain forest during the first survey on May 2nd (i.e., Level 2) and second survey on May 9th (i.e., Level 2). An unknown number of American Toad (*Bufo americanus*) were also heard during the second (Level 2) and third surveys as well, likely about five specimens (i.e., Level 3). One American Toad was also seen on-Site during the visit. Only a limited number of American Toad were heard calling (i.e., Level 2) in the flood plain forest during the June survey. This survey information suggests the primary habitat for amphibians exists in the flood plain forest, and this is likely due to the absence of standing water on the manicured lawns or among the planted trees. The highest numbers of Spring Peepers was heard in the flood plain forest during the first survey and the highest numbers of American Toad heard in the flood plain forest during the third survey.

5.2.3 Incidental Amphibian Survey Results

During the April 25, 2013 survey, a Green Frog was observed associated with planted shrubs (Eastern Red Cedar *Juniperus virginiana*) near the residence at approximately 2:00 PM in the afternoon. An American Toad was also observed on the manicured lawn, near the base of a mature tree (Basswood *Tilia americana*) on May 18, 2013 at approximately 1:15 PM. Then on August 14, an American Toad was observed on the manicured lawn, west of the residence, at about 3:00 PM. These observations also suggest the amphibians are foraging on portions of the cultural landscape during the day, and likely using the flood plain forest for the remainder of their life history. An additional American Toad was observed among the vegetation near the same Basswood Tree on-Site on September 8th, 2014. These incidental observations of amphibians are consistent with the amphibian calls herd during the MMP surveys.

6.0 BREEDING BIRD SURVEYS

This chapter describes the surveys completed for breeding birds on-Site, during June, 2013.

6.1 Methodology

A qualified ecologist from RJ Burnside (i.e., Hannah Maciver) completed two surveys for breeding birds on-Site. These breeding bird surveys followed the methods identified in the Ontario Breeding Bird Atlas (OBBA) for southern Ontario. The surveys were conducted during the early morning hours (i.e., before 8:00 AM) on June 15, 2013 and June 29, 2013. Incidental observations of birds following the 2013 surveys are reported in Chapter 7. The report that describes the 2013 OBBA surveys includes the time of the surveys, the weather conditions, and other species observed during these survey times, and is provided as Appendix I.

6.2 Results

6.2.1 Bird Surveys

The two OBBA surveys identified a total of thirteen (13) bird species (Table 6-1; Appendix I). No SAR bird species were observed on-Site. All species are considered common and expected for the area with the exception of Carolina Wren (*Thryothorus ludovicianus*) regarded as an uncommon breeder in Ontario with a core distribution located in the central U.S.A. In other words, this bird is common to the central portions of North America and was observed north of the typical distribution. The conservation status of Carolina Wren in Ontario is S4 and secure.

It is also noteworthy to identify that Hairy Woodpecker (*Picoides villosus*) was observed on-Site during both surveys. The presence of this species is likely attributable to the large numbers of dead trees within the flood plain forest, as this represents ideal habitat for this bird. This species was readily identified as distinct from Downey Woodpecker (*Picoides pubescens*) due to differences in bill length (longer in Hairy Woodpecker) and plumage colours on the head (straight lines around eye in Hairy Woodpecker).

In summary, no area-sensitive species were observed on-Site. Similarly, no birds of Provincial or Federal concern were observed, with no Barn Swallow or Chimney Swift. Despite the presence of the creek near the Site, no waterfowl (e.g., ducks, geese) were observed. The majority of the birds identified on-Site can be described as common to the urban areas of Ontario with associations to the flood plain forest of Shoreacres Creek.

Table 6-1: Species of Birds identified on-Site. Evidence of habitats or breeding noted (also refer to detailed information in Appendix I).

Bird Species (Common Name, *Genus species*)		**Time of Sampling**			
		June 15, 2013		**June 29, 2013**	
		Habitats	**Breeding Evidence**	**Habitats**	**Breeding Evidence**
American Goldfinch	*Spinus tristis*	√	√	√	√
American Robin	*Turdus migratorius*	√	√	√	√
Black-capped Chickadee	*Poecile atricapillus*	√	√	√	√
Blue Jay	*Cyanocitta cristata*	√	√	√	√
Brown-headed Cowbird	*Molothrus ater*	√	√		
Carolina Wren	*Thryothorus ludovicianus*	√	√	√	√
Hairy Woodpecker	*Picoides villosus*	√	√		
House Wren	*Troglodytes aedon*	√	√	√	√
Mourning Dove	*Zenaida macroura*			√	√
Northern Cardinal	*Cardinalis*	√	√	√	√
Red-eyed Vireo	*Vireo olivaceus*			√	√
Song Sparrow	*Melospiza melodia*			√	√
Yellow Warbler	*Dendroica petechial*	√	√		

7.0 INCIDENTAL WILDLIFE OBSERVATIONS

This chapter describes the incidental wildlife observations during the various surveys on-Site.

7.1 Methodology

During each visit to the Site, evidence of wildlife (e.g., scat, tracks, auditory, odour, visual) was recorded. The species observed on-Site are noted by common name and latin equivalents and where appropriate, evidence of habitat use on-Site follows Dobbyn (1994). Additional information on possible incidental wildlife on-Site was sourced from Ontario Nature (http://www.ontarionature.org/discover/resources/publications.php#atlases).

7.2 Results

During the varied inspections of the Site, a number of wildlife were documented as present. The wildlife documented as present, in addition to the species noted in the previous surveys, includes 17 additional species. None of these species are regarded as SAR. It is noteworthy to identify that one Common Garter Snake (*Thamnophis sirtalis*) was observed basking on a rock on August 27, 2017 on the edge of the tree drip line, near the stable top-of-bank.

Table 7-1: List of wildlife documented on-Site. This list does not include any species listed in earlier chapters of this EIS. All species noted are considered common and secure in Ontario.

Type of Wildlife	Common Name *Genus species*	Evidence
Bird	American Crow *Corvus brachyrhynchos*	Visual, Auditory
	Chipping Sparrow *Spizella passerina*	Visual
	Rose-breasted Grosbeak *Pheucticus ludovicianus*	Visual
	Common Grackle *Quiscalus quiscula*	Visual, Auditory
	Downy Woodpecker *Picoides pubescens*	Visual, Auditory
	European Starling *Sturnus vulgaris*	Visual, Auditory
	Red-winged Blackbird *Agelaius phoeniceu*	Visual, Auditory
Mammal	Domestic cat *Felis catus*	Visual
	Eastern Gray Squirrel *Sciurus carolinensis*	Visual
	Meadow Vole *Microtus pennsylvanicus*	Visual
	North American Raccoon *Procyon lotor*	Tracks
	Red Fox *Vulpes*	Tracks
	Striped Skunk *Mephitis*	Odour
	Virginia Opossum *Didelphis virginiana*	Tracks
	White-footed Mouse *Peromyscus leucopus*	Visual
	White-tailed Deer *Odocoileus virginianus*	Visual, Scat, Tracks
Reptile	Common Garter Snake *Thamnophis sirtalis*	Visual

8.0 INTEGRATION OF INFORMATION FROM ECOLOGICAL SURVEYS

This chapter describes the integration of wildlife species with natural heritage features on-Site. When this information is integrated with the proposed development, it allows for an evaluation of possible disturbance on wildlife and natural heritage features on-Site. After this information was evaluated, it provided a basis to assess the potential for effects on these species from the proposed development. The assessment included the natural heritage features found on-Site relative to high priority nature features such as wetlands, fish habitat, woodlands, valleylands, habitat for SAR, wildlife habitat, and areas of natural and scientific interest (ANSIs). All of these features are important for environmental and social values as a legacy of natural landscapes, as defined within Ontario's PPS (MMAH, 2014).

8.1 Surface Water Features, Wetlands, and Fish Habitat

Surface water features are represented by creeks, ponds, rivers, and lakes. They can be temporary (ephemeral) and represent snow melt or permanent (Lee *et al.*, 1998). Surface water features provide habitat to wildlife when they are temporary and permanent whereas fish will use water when it is present. For example, it is common for fish to move in to a temporary habitat and when this area dries up, they then migrate to permanent water. Hence, surface waters provide habitat a range of species, in temporary and permanent settings.

Wetlands are defined as areas that are seasonally or permanently covered by shallow water, as well as lands where the water table is close to or at the surface (Lee *et al.*, 1998). A significant wetland is an area identified as provincially significant by the OMNR using evaluation procedures established by the province, as amended from time to time (Lee *et al.,* 1998). No wetlands exist on the manicured lawn or in proximity to the stable top-of-bank area. However, Land Information Ontario (LIO) geospatial data indicates that there are no wetlands present on or near the Site. Hence, wetlands do not represent a concern for the proposed development.

Fish habitats are identified as spawning grounds and nursery, rearing, food supply, and migration areas on which fish depend directly and or indirectly in order to carry out their life processes (Lee *et al.,* 1998). Fish can be identified as fish, shellfish, crustaceans, and marine animals, at all stages of their life cycle (MMAH, 2005). Lakes, rivers, streams, ponds and wetlands are known fish habitats (Lee *et al.*, 1998). Fish habitats commonly occur in many other natural heritage areas such as wetlands, valleylands, and woodlands. Fish also exist in Shoreacres Creek.

The topography of the Site in combination with the proposed development plan identifies that the current drainage of precipitation and snow melt to Shoreacres Creek and FOD9-5 will continue in a manner similar to pre-development conditions. That is, the proposed grading for the Site will not change the drainage to the creek to due to the maintenance of a vegetation buffer along the tree drip line and stable top-of-bank. In addition, the natural slope on-Site currently identifies that drainage either flows toward the creek or toward Upper Middle Road. In

the future, the development will maintain flows to the creek via the retention of the vegetation buffer while allowing drainage to continue to flow toward Upper Middle Road. Hence, the total drainage to the creek is expected to remain similar between pre- and post-development, and thereby retain the ecological functionality of the creek and woodland habitats. Also, as noted, fish have been previously documented in Shoreacres Creek valley. Due to these considerations, the proposed development is not expected to modify existing fish habitat in the future.

8.2 Woodlands

Woodlands are treed areas that provide environmental or economic benefits such as erosion prevention, water retention, recreation and the sustainable harvest of woodland products. Woodlands include treed areas, woodlots or forested areas, and vary in their level of significance (MMAH, 2014). Woodland significance is typically determined by evaluating key criteria which relate to woodland size, ecological function, uncommon woodland species, and economic and social value. Also, larger woodlands are more likely to contain a greater diversity of plant and animal species and communities than smaller woodlands, and are better buffered against edge effects or agricultural and urban activities.

The LIO geospatial data indicates that woodland is present around Shoreacres Creek (as mapped in the CBOP and HOP and Figure 3). In this EIS, this woodland is generally referred to as a flood plain forest. The proposed development will not extend into this forest, and will be setback from the tree-drip line along with a buffer on the tree drip line of 7.5 m. As such, this distance identifies that the setback of the development from the stable top-of-bank is equal to the tree drip line plus a vegetation buffer of 7.5 m on the tree drip line. This approach for the setback is intended to ensure protection for mature trees found along the stable top-of-bank and also ensure the slope stability of this area is maintained by the root systems of the trees.

8.3 Valleylands

The PPS (MMAH, 2014) identifies significant valleylands as a “natural area that occurs in a valley or landform depression that has water” for some period of the year. As noted earlier, the CBOP and HOP indicates that the area in proximity to the Site is designated as a valleyland/watercourse corridor. Development within valleyland/watercourse corridors is prohibited in order to preserve natural features, linkages and functions within the watershed. The designation of protection of land due to the identification of the tree drip line in addition to the use of a 7.5 m vegetation buffer is expected to protect the ecological functionality of the habitats within the flood plain forest (FOD9-5) of Shoreacres Creek.

It should be also re-stated that the valleyland is also regulated by *Ontario Regulation 162/06* under the *Conservation Authorities Act* for the "Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses". Development and/or alteration of areas adjacent to shorelines, river or stream valleys, hazardous lands or wetlands are prohibited under this regulation, unless permission to do so has been granted by the CH. The regulated floodplain limit generally coincides with the valleyland top-of-bank located to the east of the Site. This is why the stable top-of-bank has been previously staked by CH staff.

The findings included in this EIS for current surveys for the Site confirmed the continued presence of this valleyland, as mapped in the past and reported in CBOP and HOP.

8.4 Areas of Natural and Scientific Interest

Provincially significant ANSI are defined as areas of land and water containing natural landscapes or features that have been identified as having life science or earth science values related to protection, scientific study or education. The ANSIs are divided into two (2) types: life science ANSI and earth science ANSI. Specifically, a life science ANSI can contain specific types of forests, valleys, prairies and wetlands of ecological importance. That is, they represent examples that are relatively undisturbed in terms of community and/or landforms associated with that vegetation. Such vegetation within provincially significant life science ANSI are the best examples of the particular natural heritage features in the province. In contrast, earth science ANSI includes representative examples by bedrock, fossil, and landforms in Ontario, and on-going geological processes.

The NHIC Biodiversity Explorer indicated that no ANSI exists within 1.0 km of the Site.

8.5 Wildlife Habitat

Wildlife habitats are defined as areas where plants, animals and other organisms live and are able to find adequate amounts of food, water, shelter and space needed to sustain their populations. Specific wildlife habitats of concern may include areas where species concentrate at a point in their annual life cycle, and those areas which are important to migratory and non-migratory species.

A wildlife habitat is referred to as significant if it is deemed ecologically important in terms of feature, function, representation or amount, and contributing to the quality and diversity of an identifiable geographic area or Natural Heritage System (MMAH, 2014).

A significant wildlife habitat is described under four (4) categories:

- Seasonal concentrations of animals;
- Rare vegetation communities or specialized habitats for wildlife;
- Wildlife movement corridors; and,
- Habitats of species of conservation concern.

8.5.1 Seasonal Concentration Areas

Areas of seasonal concentrations of animals are defined as "areas where animals occur in relatively high densities at specific periods in their life cycle and/or particular seasons" (Lee *et al.*, 1998; MMAH, 2014). Areas of seasonal concentrations are typically small in comparison to larger habitat areas that the species uses at other times of the year.

An assessment of the potential for the Site to contain wildlife seasonal concentration areas was achieved through multi-season inspections. The NHIC Biodiversity Explorer records revealed that there are no wildlife concentration areas in the one (1) to two (2) kilometer area in and surrounding the Site. However, it is prudent to review the key habitats that are often evident on the landscape with direct comparison to the habitats documented for this Site. We compared these key habitats with the Site in Table 8-1, following the OMNR Significant Wildlife Habitat (SWH) Technical Guide (2000).

Table 8-1: Evaluation of the habitats on-Site relative to OMNR significant habitat features.

Habitat	ELC Communities	Observation
Waterfowl Stopover & Staging Areas (Terrestrial)	Mineral Cultural Meadow & Thicket (CUM1, CUT1) with annual spring flooding	Habitat not present on manicured lawn but likely present in flood plain forest. No waterfowl were observed during any Site investigations.
Waterfowl Stopover & Staging Areas (Aquatic)	Meadow Marsh (MAM1-6), Shallow Marsh (MAS1-3), Shallow Water (SAS1, SAM1, SAF1), & Deciduous Swamp (SWD1-7)	Habitat not present on manicured lawn but may be present in FOD9-5 flood plain forest.
Shorebird Migratory Stopover Area	Beach/Bar (BBO1-2, BBS1-2, BBT1-2), Sand Dune (SDO1, SDS1, SDT1), & Meadow Marsh (MAM1-5)	Habitat not present at the Site.
Raptor Wintering Area	Combination of Forest (FOD, FOM, FOC) & Upland Cultural (CUM, CUT, CUS, CUW) sites	Habitat likely present in the flood plain forest on-Site. However, this area is disturbed due to urban development including roads etc. No raptors were observed during any Site investigations.
Bat Hibernacula	Crevice (CCR1-2) & Cave (CCA1-2)	Habitat not present at the Site.
Bat Maternity Colonies	Mature Deciduous or Mixed Forests (FOD, FOM) with >10 large diameter (>25 cm dbh) trees per hectare	Habitat likely present in FOD9-5 flood plain forest adjacent to Site.
Bat (Myotis) Migratory Stopover Area	No specific ELC communities. Location & characteristics of habitat unknown & being determined.	No bats observed during any Site investigations. Follow up surveys identified no evidence of suitable habitat for bats on the manicured lawn or within adjacent FOD9-5 forest.
Turtle Wintering Areas	Swamp (SW), Marsh (MA), Open & Shallow Water (OA, SA), Open Bog (BOO), & Open Fen (FEO)	Habitat may be present in flood plain forest on-Site.But location in an urban area that is bounded by roadways identify this is not ideal turtle habitat.
Snake Hibernaculum	Talus (TA), Rock Barren (RB), Crevice & Cave (CC), Alvar (AL), & other dry ecosites	Habitat not present on-Site.

Habitat	ELC Communities	Observation
Colonially-Nesting Bird Breeding Habitat (Bank & Cliff)	Mineral Cultural (CUM1, CUT1, CUS1), Bluff (BLO1, BLS1, BLT1), Carbonate Cliff (CLO1, CLS1, CLT1), & other areas with eroding banks, sandy hills, borrow pits, steep slopes, sand piles, cliff faces, bridge abutments, silos or barns	Habitat not present at the Site. No colonially-nesting birds were observed during any Site investigations.
Colonially-Nesting Bird Breeding Habitat (Tree/Shrubs)	Deciduous & Mixed Swamp (SWD1-7, SWM2-3, SWM5-6), & Treed Fen (FET1)	Habitat not present at the Site.
Colonially-Nesting Bird Breeding Habitat (Ground)	Meadow & Shallow Marsh (MAM1-6, MAS1-3), & Cultural (CUM, CUS, CUT) with rocky islands or peninsulas or in close proximity to watercourse	Habitat not present at the Site.
Migratory Butterfly Stopover Areas	Combination of Cultural field (CUM, CUS, CUT) & Forest/Plantation (FOD, FOM, FOC, CUP) that are >10 ha & within 5 km of Lake Ontario	Habitat likely present in flood plain forest. However, this area is small and surrounded by urban features.
Landbird Migratory Stopover Areas	Forest (FOD, FOM, FOC), & Swamp (SWD, SWM, SWC) that are >10 ha & within 5 km of Lake Ontario	Habitat likely not present on-Site.
Deer Winter Congregation Areas	Forest (FOD, FOM, FOC), & Swamp (SWD, SWM, SWC) that are >100 ha	Habitat likely not present on-Site.

8.6 Rare Vegetation Communities and / or Specialized Habitats

Rare or specialized habitats include rare vegetation communities. These specialized areas may also provide habitat to rare animal species. According to the SWH Technical Guide (2000), the following definition of each was provided:

Rare vegetation communities include:

- Areas that contain a provincially rare vegetation communities or one that is rare within a planning area.

Specialized Habitats include:

- Areas that support wildlife species that have highly specific habitat requirements;
- Areas with high species and community diversity; and,
- Areas that provide habitat that greatly enhance species survival.

Habitats that meet these definitions of rare vegetation communities or specialized habitats were considered during the Site visits. The NHIC Biodiversity Explorer records revealed that there are no rare plant communities in the one (1) to two (2) kilometer area in and surrounding the Site classified as rare or specialized. Guidelines contained within the SWH Technical Guide (OMNR, 2000) were used to evaluate possible presence of these habitats on-Site. The typical ELC communities that occur in rare vegetation communities or specialized habitats are noted and compared to existing habitats on-Site, as presented in **Table 8-2** and **Table 8-3** below.

Table 8-2: Comparison of existing habitats on-Site with typical vegetation communities.

Habitat	ELC Communities	Observation
Cliffs & Talus Slopes	Open, Shrub & Treed Talus (TAO, TAS, TAT) Open, Shrub & Treed Cliff (CLO, CLS, CLT)	Habitat not present on-Site.
Sand Barren	Open, Shrub & Treed Sand Barren (SBO1, SBS1, SBT1)	Habitat not present on-Site.
Alvar	Open, Shrub & Treed Alvar (ALO1, ALS1, ALT1) Dry-Fresh Pine or Cedar Coniferous Forest (FOC1, FOC2) Bedrock Cultural Meadow, Thicket, Savannah & Woodland (CUM2, CUT1, CUS2, CUW2)	Habitat not present on-Site.
Old Growth Forest	Deciduous, Coniferous & Mixed Forest (FOD, FOC, FOM)	Habitat may exist in FOD9-5 forest located > 120 m from Site but not on CVR-1 or WOMM-3.
Savannah	Tallgrass Savannah (TPS1, TPS2) Tallgrass Woodland (TPW1, TPW2) Bedrock Cultural Savannah (CUS2)	Habitat not present on-Site.
Tallgrass Prairie	Open Tallgrass Prairie (TPO1, TPO2)	Habitat not present on-Site.
Other Rare Vegetation Communities	Provincially rare S1-S3 vegetation communities.	Habitat not present on-Site.

Table 8-3: Comparison of existing habitats on-Site with specialized wildlife habitat.

Habitat	ELC Communities	Observation
Waterfowl Nesting Area	Include all upland areas that are adjacent to: Meadow & Shallow Marsh (MAM, MAS), Shallow Water (SA), Bedrock & Mineral Thicket Swamp (SWT1, SWT2), & Mineral Deciduous Swamp (SWD1, SWD2, SWD3, SWD4).	Habitat may exist in FOD9-5 flood plain forest but not in CVR-1 or WOMM-3. No waterfowl were observed during any Site investigations.
Bald Eagle & Osprey Nesting, Foraging & Perching Habitat	Deciduous, Mixed & Coniferous Forest (FOD, FOM, FOC), & Deciduous, Mixed & Coniferous Swamp (SWD, SWM, SWC) communities adjacent near water.	Habitat may exist in FOD9-5 flood plain forest > 120 m from top-of-bank but not in CVR-1 or WOMM-3.
Woodland Raptor Nesting Habitat	Deciduous, Mixed & Coniferous Forest (FOD, FOM, FOC), Deciduous, Mixed & Coniferous Swamp (SWD, SWM, SWC), & Coniferous Plantation (CUP3).	Habitat may exist in FOD9-5 flood plain forest > 120 m from top-of-bank but not in CVR-1 or WOMM-3.
Turtle Nesting Areas	Exposed mineral soil areas (sand/gravel) adjacent to: Meadow Marsh (MAM), Shallow Marsh (MAS), Shallow Water (SA), Open Bog (BOO1) & Open Fen (FEO1).	Habitat may exist in FOD9-5 flood plain forest but not in CVR-1 or WOMM-3.
Seeps & Springs	Any forested ecosite (FOD, FOM, FOC) located in headwater areas.	Habitat not present on-Site.
Amphibian Breeding Habitat (Woodland)	Deciduous, Mixed & Coniferous Forest (FOD, FOM, FOC), & Deciduous, Mixed & Coniferous Swamp (SWD, SWM, SWC).	Habitat exists in FOD9-5 flood plain forest but not in CVR-1 or WOMM-3.
Amphibian Breeding Habitat (Wetlands)	Swamp (SW), Marsh (MA), Fen (FE), Bog (BO), Open water (OA) & Shallow Water (SA).	Habitat exists in FOD9-5 flood plain forest but not in CVR-1 or WOMM-3. Amphibians only seemed to forage on manicured lawn, due to absence of standing water required for breeding.

8.7 Wildlife Movement Corridors

Wildlife often use habitat corridors for movement between and among habitat patches. In this context, a corridor is defined as habitat that links two (2) or more other wildlife habitats that are critical to the maintenance of a population of a particular species or group of species. The key ecological function of wildlife movement corridors is to enable wildlife to move to and between areas of significant habitat or core natural areas with minimum mortality. They can provide critical links between shelter, feeding, watering, growing and nesting locations (Lee *et al.,* 1998).

According to the OMNR Significant Wildlife Habitat (SWH) Technical Guide (2015), the flood plain forest on-Site is likely an animal movement corridor for amphibians, birds, and mammals. Amphibian movement corridors may be present in all eco-sites that are associated with water. These corridors link breeding and summer habitats, and may be extremely important for local populations. Since the flood plain forest will remain free of disturbance, it is expected the functionality of this likely movement corridor will be maintained in to the future.

8.8 Habitat for Species-At-Risk

Habitats for SAR include:

- Features such as vegetation communities or creeks that are rare or substantially declining, or have high percentage of their global population in Ontario and are rare or uncommon in the planning area;
- Species that are rare in a planning area, even though they may not be provincially rare;
- SAR identified under the ESA or the SARA;
- Species that are listed as rare or historical in Ontario based on records kept by the NHIC (S1 is extremely rare, S2 is very rare, S3 is rare to uncommon, SH is historical); and,
- Species identified as nationally endangered or threatened by the COSEWIC, which are not protected in regulation under ESA or SARA

A summary of the ELC communities that occur in each of the species of conservation concern habitats, and observations of these features are compared with the habitats on-Site (Table 8-4).

Table 8-4: Comparison of habitats of species of conservation for habitats on-Site.

Habitat	ELC Communities	Observation
Marsh Bird Breeding Habitat	Meadow Marsh (MAM), Shallow Water (SA), Open Fen (FEO1) & Open Bog (BOO1)	Habitat may exist in FOD9-5 forest but not manicured lawn or WOMM-3 on-Site.
Woodland Area-Sensitive Bird Breeding Habitat	Deciduous, Mixed & Coniferous Forest (FOD, FOM and FOC), & Deciduous, Mixed & Coniferous Swamp (SWD, SWM, SWC)	Habitat may exist in FOD9-5 forest but not manicured lawn or WOMM-3 on-Site.
Woodland roosting or hibernacula habitat for Myotis	Deciduous, Mixed & Coniferous Forest (FOD, FOM and FOC), & Deciduous, Mixed & Coniferous Swamp (SWD, SWM, SWC)	Habitat may exist in FOD9-5 forest but not in proximity to manicured CVR-1 or WOMM-3.
Open Country Bird Breeding Habitat	Mineral & Bedrock Cultural Meadow (CUM1, CUM2)	Habitat not present on-Site.
Shrub/Early Successional Bird Breeding Habitat	Cultural Thicket (CUT1, CUT2), Cultural Savannah (CUS1, CUS2), & Cultural Woodland (CUW1, CUW2)	Habitat may exist in FOD9-5 forest but not manicured lawn or WOMM-3 on-Site.
Terrestrial Crayfish	Meadow Marsh (MAM) & Shallow Marsh (MAS)	Habitat may exist in FOD9-5 forest but not in CVR-1 or WOMM-3. However, this creek is located in a dense urban area, and is bounded by major roadways.
Special Concern (SC) & Rare (S1-S3, SH) Wildlife Species	Ecosites associated with any SC, S1-S3 or SH plant or animal element occurrences within 1 or 10 km from project location.	Habitat not present on-Site.

Communications with OMNR identified a suite of SAR were previously reported to occur in proximity to the Site. A geographical search for significant, threatened or endangered species and associated habitat was conducted using the OMNR NHIC Biodiversity Explorer for SAR. A search of OMNR's NHIC database was conducted on the one (1) km^2 and two (2) km^2 area surrounding the Site (OMNR, 2014). It is understood that the NHIC information is based on public regional reports, and habitat boundaries, and may be variable and incomplete. However, the list of species from these two sources identified the same list of SAR for species observations during the last 25 years. The search revealed results for three SAR: Butternut, Barn Swallow, and Chimney Swift.

The habitat characteristics of the three SAR are reviewed, as follows:

Butternut

It was reported in Chapter 4 that habitats on-Site support Black Walnut, a tree that is ecologically similar to Butternut. For this reason, it was interpreted the Site could possibly also support Butternut. Investigations of all trees on the manicured lawn and within 120 m of the stable top-of-bank in FOD9-5 confirmed an absence of Butternut. An OMNR District Forester, Mr. Kowalyk, also confirmed the absence of Butternut on-Site on July 4, 2013. Hence, Butternut is determined to be absent from the Site and within 120 m of the stable top-of-bank of the flood plain forest found along Shoreacres Creek.

Barn Swallow

Barn Swallow is a bird that has developed an ability to nest on many man-made structures. It also nests on natural features such as cliffs and in cavities of large trees. For these reasons, the Site was screened on multiple dates for Barn Swallow. All of the screening inspections identified no evidence of Barn Swallow. For example, the inspection of the residence during April of 2013, prior to demolition, showed no nests or birds. Also, no Barn Swallow were observed on-Site during surveys from 2013 to 2017. Also, the bird breeding season survey of 2013 identified no specimens. Thus, Barn Swallow was confirmed as absent from the Site.

Chimney Swift

Chimney Swift is similar to Barn Swallow, in that it has developed an ability to nest on many man-made structures. This bird species also nests on natural features such as cavities in large trees. During multiple visits to the Site from 2013 to 2017, no Chimney Swift were observed. This screening period included site visits in April and May before the residence on-Site was demolished. Thus, no Chimney Swift nests or specimens were observed during multiple visits to the Site. Thus, this SAR was confirmed as absent.

Summary for SAR other than Myotis

No evidence of SAR or specimens was observed on Site from 2013 – 2017. For this reason, it is inferred the Site has been cleared for possible interaction with SAR identified as possibly evident in communications with OMNR and via literature reviews.

Myotis Screening

Regarding the screening for possible myotis habitat, it was reported in Chapter 4 that no cavities were observed in the trees located on-Site. This screening was conducted across CVR-1, WOMM-3, and FOD9-5 within the flood plain forest. There were no caves or other features in the vicinity of the Site where myotis could possibly roost or overwinter located. Hence, habitat that could be possibly used by myotis for roosting or as winter hibernacula is inferred as absent.

8.9 Summary

Studies on-Site documented the existing ecological and environmental features. This documentation used field surveys along with ELC classification and documented four key ecosites that vary in their environmental sensitivities. These were: CVR-1 and WOMM-3 in the area of the former residence and Shoreacres Creek and FOD9-5 found in the creek valley. These past studies confirmed that CVR-1 and WOMM-3 represented disturbed habitats and were not extensively used by wildlife whereas more sensitive habitats exist near Shoreacres Creek and within FOD9-5. This evaluation of habitats on-Site also identified that no candidate SWH or SWH exists on-Site or within 120 m of the stable top-of-bank of Shoreacres Creek. That is, there is no evidence for SWH used by wildlife, no wildlife concentration areas, and no rare habitats or other features of high conservation concern. With this information, we expect that no significant disturbance will result to Shoreacres Creek or FOD9-5 due to the establishment of a 7.5 m vegetation buffer on the tree drip line along the stable top-of-bank. This buffer is expected to separate the creek and FOD9-5 from the proposed development.

With this information, it is feasible to expect that no significant negative disturbance are anticipated on the existing natural features of Shoreacres Creek or the FOD9-5 flood plain forest from the proposed development. As noted, this proposed development will result in the removal of existing trees on the manicured lawn however this activity also includes re-planting trees on-Site as compensation, with a ratio of 1:1. When these trees are re-planted, it is anticipated they will be located within 120 m of the stable top-of-bank, with an expected overall net benefit to the FOD9-5 flood plain forest of Shoreacres Creek.

Species at Risk and Associated Habitats

No evidence of SAR specimens or habitats used by SAR was observed on Site from 2013 – 2015. For this reason, it is inferred the Site and proposed development has been cleared for possible interaction with SAR such as Barn Swallow, Butternut, Chimney Swift, and myotis.

9.0 RECOMMENDATIONS FOR ENVIRONMENTAL MANAGEMENT

This Chapter describes how the findings from the ecological surveys are used as the basis for recommendations regarding environmental management. When these environmental management measures are recommended, they provide the opportunity to reduce and / or eliminate environmental disturbance from the proposed development.

9.1 Existing Habitats on-Site

Surveys on-Site resulted in the identification of a range of habitats, based on vegetation communities, slope, soils, disturbance history, and presence of wildlife. This natural heritage information of all habitats was evaluated within Chapter 8 and reviewed in Table 9-1. This evaluation identified the most sensitive habitats as Shoreacres Creek and associated FOD9-5 flood plain forest. Other habitats include development areas, identified as CVR-1 and WOMM-3. Hence, two areas exist on-Site that require contrasting environmental management regimes.

9.2 Environmental Management Strategies

To achieve long-term environmental management, it is necessary to identify strategies to protect Shoreacres Creek and FOD9-5 flood plain forest from disturbance associated with the proposed development. A well-established strategy for environmental protection is to maintain vegetation buffers to separate contrasting land uses (Hamilton Conservation, 2006). For this Site, the excavation created a well-defined ecotone along the edge of the FOD9-5 forest. This ecotone is represented by a no-touch tree drip line along the stable top-of-bank that is 7.5 – 8.5 m wide in addition to a natural vegetation buffer that is 7.5 m wide. Specifically, the existing tree drip line was established along the stable top-of-bank during 2013 with revision in 2015. Then a vegetation buffer was maintained along the stable top-of-bank during excavation in 2014 of at least 7.5 m. This 7.5 m vegetation buffer will ensure the roots of trees and other natural heritage features of FOD9-5 and adjacent creek will not be disturbed during the future development. In addition, this natural area is also proposed to be separated from the development by a chain-link fence, to avoid disturbance from recreational activities. This approach reflects an integration of existing features on Site as well as the excavation to achieve long-term protection of FOD9-5.

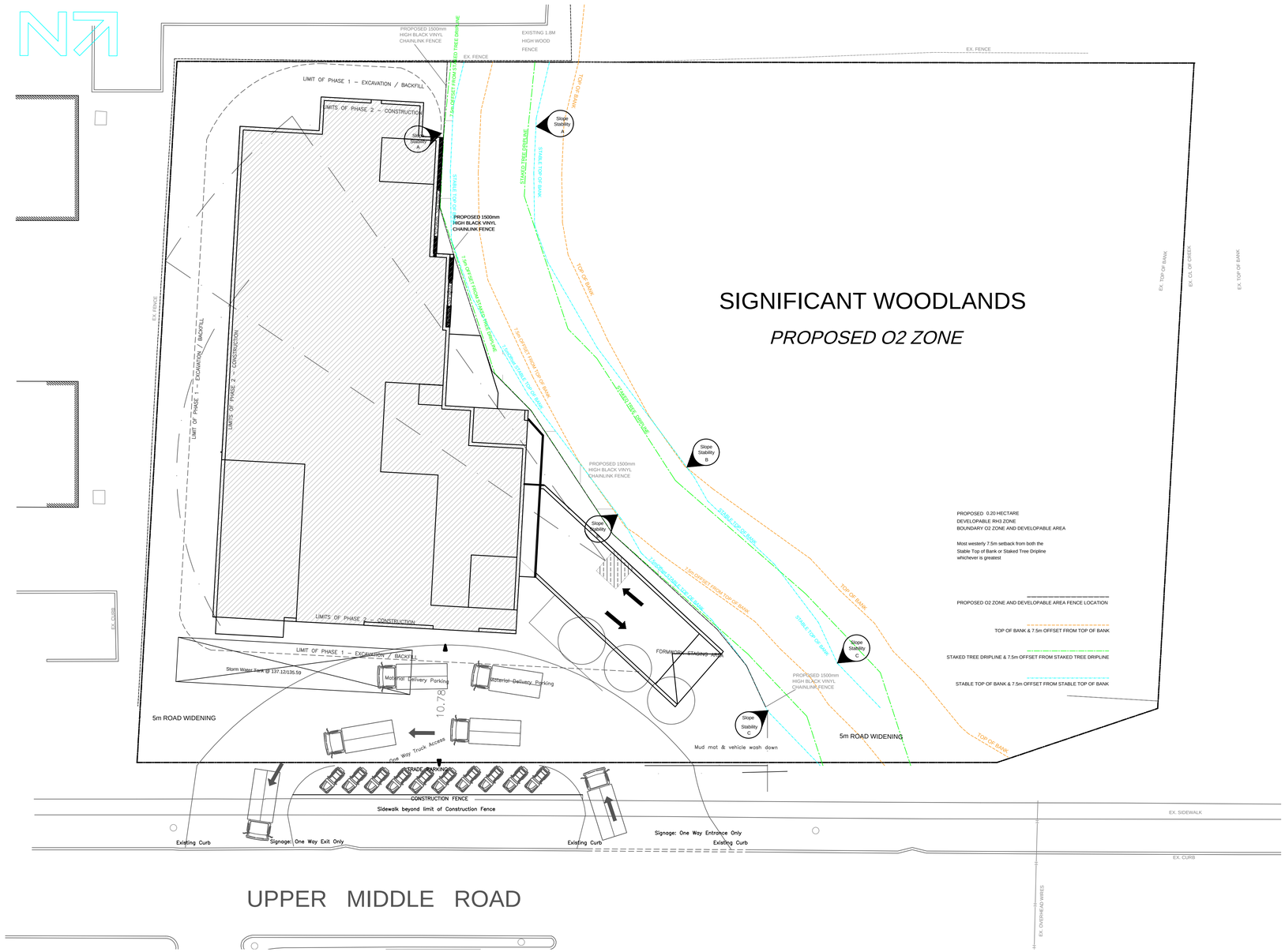
Future environmental management activities will also rely on the recently approved landscape plans (Reynolds, 2019a,b,c) that describe how future tree and herbaceous plantings will be completed on-Site. These additional plantings will provide compensation for the losses of woody stems due to the development. In contrast, rehabilitation activities will involve removal of non-native plants from the edge of FOD9-5 followed by planting of native species. Hence, it is important to include recommendations for environmental management during the future construction phase. A summary of these habitat features and the expected effect(s) of the proposed development along with mitigation are presented as Table 9-1.

Table 9-1: Summary of the expected effects of the proposed development on the documented environmental features on-Site. Each of these features are classified as non-sensitive (i.e., Low), somewhat sensitive (i.e., Moderate), or sensitive (i.e., High).

Feature	Sensitivity	Land Use	Area of Possible Disturbance	Proposed Mitigation
FOD9-5 Flood Plain Forest	High	Natural Area/ Wildlife habitat	Low	No negative effects expected due to retention of a 7.5 metre buffer from tree drip line.
Shoreacres Creek	High	Wildlife Habitat	Low	No negative effects expected, as drainage from the top-of-bank area will continue to flow downslope to creek. In contrast, water from the development will drain to Upper Middle Road.
CVR-1 cultural lawn	Low	Cultural	Low	Loss of grass and ornamental plants not expected to disturb wildlife, creek, or FOD9-5 woodland. Future landscape plantings will compensate for losses.
WOMM-3 trees adjacent to CVR-1	Low	Cultural	High	Replacement native trees will be planted on-Site to compensate for losses.

9.3 Construction Impact Avoidance Activities

This EIS has identified key natural features at and around the Site, and resolved the effects of the proposed development on these features. This resolution allows for the identification of a Best Management Practices (BMPs) to avoid disturbance of the significant woodland along Shoreacres Creek, including: 1) no-touch tree drip line, 2) vegetation buffer, 3) fence separating the development from significant woodland, and 4) activities during the development process. Use of BMPs is intended to avoid negative effects that may occur as a result of the proposed development. The layout of the proposed construction staging is presented as Figure 4. These stages of construction will act to avoid disturbance as well as reduce disturbance. For example, the pad of the construction crane will be placed within the proposed parking lot area and be readily accessible via the driveway to Upper Middle Road. Another strategy for effects avoidance is to place the footings of the foundation outside of the environmental buffer, as represented in Figure 5. This process of effects avoidance concerning the FOD9-5 woodland along Shoreacres Creek is preferable to the implementation of mitigation measures after environmental effects are created. Where possible, avoidance measures should be implemented before resorting to mitigation, and lastly, rehabilitation to minimize negative effects on natural features on-Site.



CONTRACTOR IS TO CHECK AND VERIFY ALL DIMENSIONS ON THE JOB SITE AND NOTIFY DESIGNERS OF ALL DISCREPANCIES BEFORE INITIATING WORK.
ALL DRAWINGS ARE THE PROPERTY OF THINKGIRAFFE.
DRAWINGS ARE NOT TO BE REPRODUCED WITHOUT WRITTEN PERMISSION FROM DESIGNERS.
PRINTS ARE NOT TO BE SCALED.

June 10,2020 ISSUE FOR ZONING AMENDMENT

REMARKS	DATE	NO.
REVISIONS		

thinkGiraffe

ENVIRONMENTAL DESIGN

16 Sulphur Springs Road,
Ancaster, ON, L9G 1L8

905 304 1496

thinkgiraffe@bellnet.ca

PROJECT

Proposed 8 Storey Apartment Building
4063 Upper Middle Rd
Burlington

SHEET TITLE

CONSTRUCTION & MOBILITY MANAGEMENT

FOLDER	DRAWN BY M F / M S
FILE	SCALE 1:200
DATE	NUMBER

A6

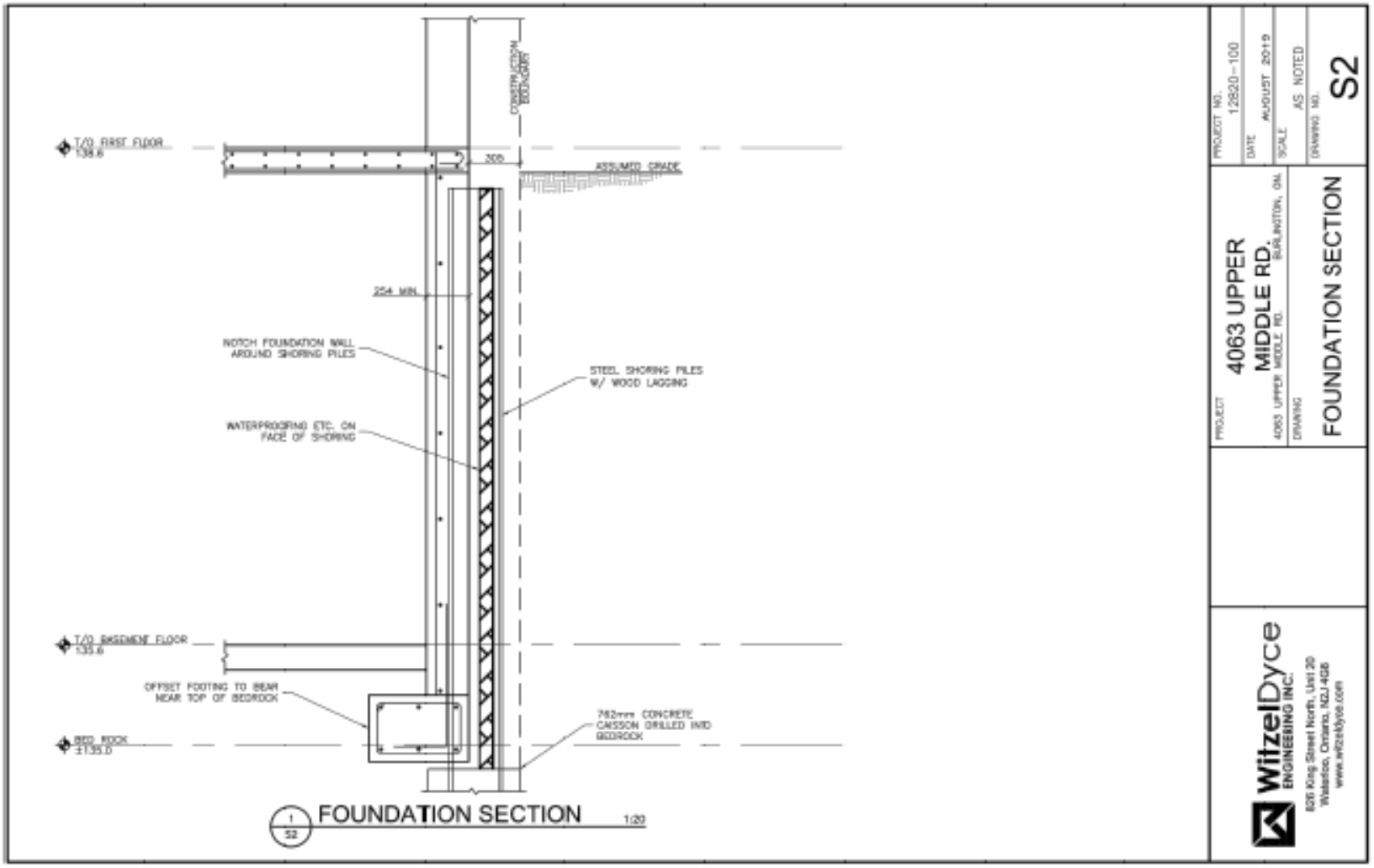


Figure 5: Design of the foundation and concrete caisson to be drilled in to the bedrock, offset from the environmental buffer. This approach will ensure no disturbance of the environmental buffer and tree roots in proximity to the stable top-of-bank.

Additional BMPS are identified as available for implementation for this proposed development. If the BMPs are implemented, they will likely reduce the possible effects from the proposed development. Examples of standard BMPs for construction activities are proposed for use, to mitigate other types of disturbance on the environment, including the generation of dust, noise, vehicle exhaust and water runoff from the Site. The use of these mitigation measures is expected to reduce the extent and duration of the negative effects of the proposed development. In addition, prescribed mitigation measures with respect to natural heritage features observed at or adjacent to the Site are presented. After these BMPs are noted, the timing of development on-Site is considered.

Sediment and Erosion Control

It is important to recognize the difference between erosion control and sediment control measures when preparing an effective erosion and sediment control plan. The difference between erosion and sediment control methods is reviewed for the purposes of this document:

- Erosion control is the process by which the potential for erosion is minimized; and,
- Sedimentation control is the process by which the potential for eroded soil to be transported and/or deposited beyond the limits of the construction site is minimized.

Measures to address both erosion control and sedimentation control are required. Therefore, the design of erosion and sedimentation control measures is expected to be flexible and evolve throughout the construction process. This approach will limit effects on surrounding area. Various BMPs can be applied to limit the effects of erosion and sedimentation during the construction phase of the proposed development, as reviewed by Hamilton Conservation (Hamilton Conservation, 2006). A summary of this review is presented in Table 9-2.

All BMPs should be regularly inspected to ensure functionality as construction proceeds. For example, inspections should occur after rain events to ensure they are functioning as designed. It is also important that construction staff pay attention to weather forecasts. To prepare for upcoming rain events, operators should walk around the construction site to ensure that BMPs functional and all facets of the Site are secure. Identification of these BMPs represents an opportunity to avoid the negative effects of the proposed development on the environment.

Operators should also visually inspect all BMPs when the site will be inactive for several days, such as weekends or holidays. This will help to prepare for rain events that may occur when workers are off-Site. These planned preparation procedures with help minimize the risk of on or off-Site property damage. The exact use of the BMPs will occur in conjunction with different phases of the proposed development. Use of BMPs also requires proper timing of the use, to ensure they reflect typical seasonal constraints, such as high runoff during autumn rains, frozen ground, and runoff following snowmelt during spring.

Table 9-2: Examples of BMPs for sediment and erosion control for construction sites lacking significant surface waters or wetlands

BMP	Advantage	Limitation
Silt Fence	• Effective way to prevent off-site transport • Relatively inexpensive • Reduces runoff and sediment transport • Mitigates erosion	• Must be installed properly to prove effective • Not suitable in areas with concentrated runoff volumes • Not suitable on rock or hard surfaces • Not suitable in areas exposed to high wind • Regular inspection required
Vegetative Buffer	• Retains existing vegetation for use by wildlife • Reduces erosion, especially during precipitation events • Reduces runoff, especially following snow melt • Filters air	• May require maintenance • Ensure protective measures are taken • Space consuming depending on size • Can be costly if buffer covers large area of land
Straw Bales	• Mitigates erosion • Relatively inexpensive • Reduces runoff	• Must be installed properly to prove effective • Not suitable in areas with concentrated runoff volumes • Require some maintenance
Dust Mitigation	• Reduces the amount of airborne dust particles • Reduces the amount of sedimentation and by association water pollution to nearby water bodies. • Reduces the impact on respiratory systems	• Can be costly • May increase muddy conditions on-Site
Spill Prevention	• Reduces the amount of pollution • Reduce total clean up costs if spill response is fast	• Requires Site preparation • Space consuming depending on size • Time consuming

9.3.1 Shading

For the proposed development, a sun shadow study was completed, to evaluate if the building would shade the FOD-5 woodland for three times of day across four seasons (Eccles, 2018). This evaluation of the hourly and seasonal pattern of sun exposure on-Site revealed the orientation of the building to the southwest of the woodland results in minimum shade interference during the leaf-on season (May to September), as the sun rises in the east and shadows do not influence the woodland (Figure 6). This sun shadow study also revealed that the maximum shade influence of the woodland occurs on December 21, when no leaves are evident, and the trees are dormant due to the winter weather (Figure 7). This pattern confirms that shade from the building will be limited during the spring and summer months whereas it will be largest during the winter months. Such a pattern identifies the shade from the building is not expected to have any meaningful influence on the FOD9-5 woodland.

9.3.2 Lighting and Terraces for Proposed Development

Light can be a concern where it is directed towards a variety of natural features and functions (Toronto, 2007). Primary sources for “new light” on-Site will be from the proposed development. It is also prudent to review that a mounted light can illuminate in three directions: directly upward, directly to the ground, or at an angle away from the ground. For this Site, it is recommended that the placement of lights on the future building and parking areas avoid illumination of the adjacent FOD9-5 woodland and Shoreacres Creek valley. Different strategies can be used to achieve this goal (Toronto, 2007). For example, to minimize light being directed into the woodland, outdoor common area lighting for walkways and parking spots should be directed toward the ground and/or angled toward the building. For this Site, it is recommended that to minimize impacts of light on birds, use of upward light should be avoided and the lighting should illuminate only non-reflective surfaces.



Figure 6A: View of the building on June 21 at 9:30 AM, with annual shadow minimum identified.



Figure 6B: View of the building on June 21 at 12:30 PM, with annual shadow minimum identified.



Figure 6C: View of the building on June 21 at 3:30 PM, with annual shadow minimum identified..



Figure 7A: View of the building on December 21 at 9:30 AM, with shadow maximum of 125 m.



Figure 7B: View of the building on December 21 at 12:30 PM, with shadow maximum of 70 m.



Figure 7C: View of the building on December 21 at 3:30 PM, with shadow maximum of 165 m.

10.0 INTEGRATION OF ENVIRONMENTAL MANAGEMENT MEASURES

This chapter provides an integration of environmental management measures proposed for the Site, as a strategy to protect Shoreacres Creek and FOD9-5 flood plain forest and achieve long term sustainability of this area. This chapter also reviews environmental management features of the developed area, to clarify environmental management measures.

10.1 Integration of Natural Heritage Features and Proposed Development

Surveys on-Site resulted in the identification of a range of habitats, based on vegetation communities, drainage, disturbance regimes, soils, and the presence of wildlife. Past land use involved a single residence with lawn and ornamental gardens. This past land use activity included cutting the herbaceous vegetation in the edge of woodland with a lawn mower as well as extensive tree removals. Since the herbaceous vegetation and trees were previously cut and disturbed, inactivity during the last six years has allowed this woodland vegetation community to recover. Such recovery now identifies the current edge of the woodland is more dense and thereby more like a woodland and less like a lawn with gardens. This woodland edge is proposed to be protected by a no-touch tree drip line plus 7.5 m vegetation buffer.

m. Due to the change in grade, to the past excavation, it is inferred this vegetation buffer will provide adequate protection, as it has naturalized since 2014. Within this context, it is prudent to review that the Conservation Authorities Act (2006) does not include prescribed minimum buffers or prescribed minimum setbacks from natural features. Appropriate land development needs to include buffers expected to protect and maintain natural features.

The project also proposes to remove non-native herbs and trees within the vegetation buffer area and recovered edge of the woodland by hand followed by planting of native herbs and trees. Such removal of non-native species followed by planting of native species is intended to enhance this vegetation community and create a more resilient vegetation buffer and woodland edge. This removal of non-native species will also benefit the woodland by removing future seeds of non-native species that could cause future harm to the woodland. The corresponding landscape plan that represents the removal of non-native plants followed by planning of native plants was prepared by Reynolds and Associates and has been reviewed by COB.

In this project, the vegetation buffer area is proposed in conjunction with other suitable mitigation measures. The buffer width of 7.5 m is deemed sufficient to ensure they will perform their intended function resulting from the adjacent development (before, during and after construction). Other BMPs will be implemented to mitigate impacts near the buffer and woodland, such as installation of sediment erosion fences to protect the O2 zone. These erosion fences will protect the vegetation buffer from direct disturbance, transport of materials, and redirect water runoff. Other activities will include grading only outside of the O2 zone. The construction activities will also limit dust and avoid dust transport to the O2 zone. This approach will ensure the sensitivity of the of the buffer and woodland will be protected.

In addition to the protection of the recovered FOD9-5 woodland edge with the no-touch tree drip line and vegetation buffer, this project proposes the installation of a fence between the developed area and natural area. This chain link fence will have no gate, and be placed outside of the vegetation buffer along the edge of the FOD9-5. With no gate, the fence will limit access by residents; access to the FOD9-5 woodland will be via the east edge of the Site, near the bridge that crosses Shoreacres Creek.

Findings from the sun shadow study demonstrated the building is located south and west of the FOD9-5 woodland. For this reason, the shade maximum estimated for the woodland by the building will occur on December 21 whereas the shade minimum of the woodland by the building will occur on June 21. This pattern identifies the building will shade the woodland during the late autumn and winter months when the trees are dormant whereas the woodland will receive full sun exposure during the spring and summer months. For these reasons, shade is interpreted to have no consequence on the FOD9-5 woodland.

No water from the development area will enter or drain to the FOD9-5 woodlands. Specifically, due to the existing grade, the drainage from the tree drip zone and vegetation buffer will continue to drain toward the creek valley. Due to the excavation and future grading, the development will drain water from the building and parking to Upper Middle Road. As such, future drainage to the creek valley can be expected to be *status quo* for current drainage volumes. In summary, since no interaction will occur between the development area and drainage to the FOD9-5 woodland, it is inferred the drainage water quality will not be degraded by the development as it will continue to run through established vegetation communities. Also, snow storage area will be near the development and graded to drain to Upper Middle Road.

Per ROH policies, vegetation buffers are to be considered components of the RNHS located adjacent to key features of the natural heritage system and watercourses. These vegetation buffers are intended to provide physical separation between development and FOD9-5 woodland to help mitigate potential negative impacts on these features and their associated ecological functions. Such protection and mitigation activities are expected to result in long-term sustainability of the FOD9-5 woodlands leading to protection of Shoreacres Creek.

11.0 SUMMARY AND CONCLUSIONS

The proposed development required the completion of an EIS to assess and mitigate the potential effects on natural heritage features present at and in the immediate vicinity of the Site. Therefore, a combination of a review of existing records and a series of Site visits were completed from 2013 - 2017 to document and evaluate natural features that are present on-Site. The visits in 2013, 2015, and 2017 involved government staff to address questions and update the description due to natural disturbances. This extended period of study allowed for the documentation and identification of dominant plant and wildlife species as well as ELC classification. This collection of extensive information allowed for the evaluation of possible consequences of the proposed development on the existing natural heritage features on-Site.

As a result of findings produced from a review of existing records, field study, and government consultations, the following conclusions and recommendations were made in this EIS:

- Site within a highly urbanized area, and subjected to disturbances over last 100+ years;
- Surveys revealed the Site contains three distinct habitats that reflect existing vegetation, wildlife, and surface waters;
- There are no significant natural features or wildlife habitat present in CVR-1 or WOMM-3 while FOD9-5 woodland surrounding Shoreacres Creek does provide habitat to wildlife;
- Collated information was interpreted using ELC and identified three distinct polygons, as: CVR-1, WOMM-3, FOD9-5 containing Shoreacres Creek;
- It was noted FOD9-5 and Shoreacres Creek was mapped by CH as a Regulated Area, and provides habitat for a number of bird and wildlife species in the area, but all observed species are considered common with no SAR observed;
- To protect FOD9-5, we propose a no-touch tree drip line at the stable top-of-bank of Shoreacres Creek with vegetation buffer of 7.5 m, to follow the excavation, as discussed extensively with Staff from CH and ROH;
- Since no disturbance of FOD9-5 or Shoreacres Creek is expected from the proposed development, these habitats are expected to retain ecological functionality in the future;
- When disturbance in FOD9-5 and Shoreacres Creek is avoided, it will enhance protection of the groundwater recharge zone known to exist in the general area;
- This EIS recommends the use of BMP measures to mitigate the potential effects of the proposed development on the natural features of FOD9-5 and Shoreacres Creek;
- This EIS recommends following the approved landscape plans to compensate for lost trees and remove non-native species in the future within CVR-1 and WOMM-3; and
- Stormwater management will follow a plan that is currently in preparation. However, future drainage is expected to continue to the creek valley or to Upper Middle Road.

Overall, it is ELM's opinion that the proposed development on lands classified as CVR-1 and WOMM-3 along with the use of a vegetation buffer will result in no significant disturbance on the existing ecological features located in the adjacent FOD9-5 and Shoreacres Creek habitats. The removal of large numbers of planted non-native trees on-Site with future planting of native trees will also represent a net benefit to the Site, including FOD9-5 containing Shoreacres Creek.

12.0 CLOSURE AND LIMITATIONS OF THIS STUDY

Thank you for providing ELM with the opportunity to complete this EIS for the Site.

The findings reported in this EIS were based on observations on plants, wildlife, and other environmental features collected during varied visits to the Site, from 2013 to 2017. As such, the use of this report is subject to the Statement of Limitations (SOL) presented in Appendix J of this report. The reader's attention is specifically drawn to the SOL as it is considered essential that they be followed for the proper use and interpretation of this report.

If you have any questions concerning this EIS, please contact Dean Fitzgerald via electronic mail (Dean@elminc.ca) or telephone (226-606-1072) at your earliest convenience.

Sincerely,

Environmental Liability Management Inc.



Dean Fitzgerald, M.Sc., Ph.D.
Senior Ecologist
Director of Environmental Services
ELM Inc.

13.0 CITED REFERENCES

1. Bakowsky, J. Riley, J. Bowles, M. Puddister, H. P. Uhlig, and S. McMurry. 1998. Ecological Land Classification for Southern Ontario: First Approximation and its Application. Ontario Ministry of Natural Resources, South-central Science Section, Science Development and Transfer Branch. SCSS Field Guide FG-02.

2. City of Toronto (Toronto). 2007. Bird-friendly development guidelines. City of Toronto, Toronto, ON, Green Development Standard. Prepared March, 2007. Available at: http://www1.toronto.ca/city_of_toronto/city_planning/zoning__environment/files/pdf/development_guidelines.pdf

3. Cole Engineering Group Ltd. (Cole Engineering). 2015. Class Municipal Assessment for the Shoreacres Creek Erosion Control Project in the City of Burlington. Report available at: https://www.burlington.ca/en/resources/Teresa/Sho-Millcroft-CNR-Class-EA-Rept.pdf

4. COSEWIC. 2013. COSEWIC assessment and status report on the Little Brown Myotis *Myotis lucifugus*, Northern Myotis *Myotis septentrionalis* and Tri-colored Bat *Perimyotis subflavus* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xxiv + 93 pp. (www.registrelep-sararegistry.gc.ca/default_e.cfm)

5. Dobbyn, JS. 1994. Atlas of the Mammals of Ontario. Published by the Federation of Ontario Naturalists. http://www.ontarionature.org/discover/resources/publications.php#atlases.

6. Eccles, K. 2018. Sun Shadow Study for 4063 Upper Middle Road, Burlington, ON. Submitted to Springfield Developments, March 2018.

7. Government of Ontario. 2007. Endangered Species Act, 2007 – Ontario Regulation 230/08 (last amended O. Reg. 25/13).

8. http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_080230_e.htm

9. Hamilton Conservation Authority (Hamilton Conservation). 2006. Erosion and Sediment Control Guidelines for Urban Construction. Available at: https://conservationhamilton.ca/images/documents/pdf/ESCGuideline.pdf.

10. Hamilton-Halton Source Protection Region (Hamilton-Halton Source). 2015. Assessment Report Halton Region Source Protection Area. Hamilton-Halton Source Protection Region, 4052 Milburough Line, R.R. #2, Campbellville, ON L0P 1B0. Available at: http://protectingwater.ca/uploads/Documents/Approved%20documents/V3-3_Halton_AR_20150724-er.pdf

11. Halton Region Conservation Authority (Conservation Halton; CH). 2013a. Long Term Environmental Monitoring Program 2012 Bronte Creek, Urban Creeks and Supplemental Monitoring. Burlington, ON. 173 pp. (Available at www.hrca.on.ca\).

12. Halton Region Conservation Authority (Conservation Halton; CH). 2013b. O. Reg. 162/06: Halton Region Conservation Authority: Regulation Of Development, Interference With Wetlands And Alterations To Shorelines And Watercourses, enacted February 8, 2013. Available at: https://www.ontario.ca/laws/regulation/060162.

13. Jalava, J.V., J.L. Riley, D.G. Cuddy and W.J. Crins. 1997. Natural Heritage Resources of Ontario: Revised Site Districts in Ecological Site Regions 6E and 7E, Part I: Rationale & Methodology. Natural Heritage Information Centre, Ontario Ministry of Natural Resources, Peterborough, Ontario. Manuscript. 18 pp.

14. Lee, H., W. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig, and S. McMurray. 1998. Ecological Land Classification for Southern Ontario: First approximation and its application. Ontario Ministry of Natural Resources, Southcentral Science Section, Science Development and Transfer Branch. SCSS Field Guide FG-02.
15. Natural Resources Canada. 2014. Available at: http://geogratis.gc.ca/api/en/nrcan-rncan/ess-sst/d22354e8-cb01-5262-aed5-1de48d1ffb0a.html
16. Newmaster, S., A. Lehela, P. Uhlig, S. McMurray, and M. Oldham. 1998. Ontario Plant List. Forest Research Information Paper No. 123, Ontario Forest Research Institute. Ontario Ministry of Natural Resources, Sault Ste. Marie, Ontario.
17. Ontario Base Map. 2014 http://www.geographynetwork.ca/website/obm/viewer.htm
18. Ontario Ministry of Municipal Affairs and Housing (MMAH). 2014. Provincial Policy Statement. Toronto, ON, M5G 2E5.
19. Ontario Ministry of Natural Resources (OMNR). 2007. Ecological Land Classification Primer Central and Southern Ontario. 8 p.
20. Ontario Ministry of Natural Resources (OMNR). 2012. Significant Wildlife Habitat Ecoregion Criteria Schedule for 7E. 37 p.
21. Ontario Ministry of Natural Resources (OMNR). 2014. Natural Heritage Information Centre (NHIC). http://nhic.mnr.gov.on.ca.
22. Premier Environmental Services Inc. (Premier). Phase I Report for 4063 Upper Middle Road, Burlington, Ontario. Cambridge, Ontario, N3H 2H7.
23. Premier Environmental Services Inc. (Premier). 2014. Phase I Report for 4063 Upper Middle Road, Burlington, Ontario. Cambridge, Ontario, N3H 2H7.
24. Premier Environmental Services Inc. (Premier). 2017. Environmental Impact Study for 4063 Upper Middle Road, Burlington, Ontario. Cambridge, Ontario, N3H 2H7.
25. Reynolds & Associates (Reynolds). 2020a. Tree Inventory & Preservation Plan. Submitted to Springfield Construction. Revised April 29, 2020.
26. Reynolds & Associates (Reynolds). 2020b. Landscape Master Plan, May 2019. to Springfield Construction. Revised April 29, 2020.
27. Reynolds & Associates (Reynolds). 2019c. Woodlot Planting Plan. Submitted to Springfield Construction. Revised April 29, 2020.
28. S.Llewellyn & Associates Ltd. (S.Llewellyn). 2019a. Functional Servicing Report May 2019 Functional Servicing Report. Submitted to Springfield Construction.
29. S.Llewellyn & Associates Ltd. (S.Llewellyn) 2019b. Preliminary Grading and Soil Erosion Plan. Submitted to Springfield Construction.
30. S.Llewellyn & Associates Ltd. (S.Llewellyn) 2019c. Preliminary Site Servicing Plan. Submitted to Springfield Construction.