Valery Homes

Chedoke Browlands

801, 820, 828, 855, 865, and 870 Scenic Drive, Hamilton

Environmental Impact Study




September 14, 2020

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Novus (*Environmental Noise Study*)

NexTrans (*Transportation*)

Hammershlag Joffe (*Photometric Plan*)

Adesso (*Landscape Concept Plan*)

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF MAPS

LIST OF APPENDICES

1. INTRODUCTION

Dougan & Associates (D&A) were retained by Valery Homes to prepare this Environmental Impact Statement (EIS) for the lands at 801, 820, 828, 855, 865, and 870 Scenic Drive, Hamilton, also known as the Chedoke Browlands site.

The Chedoke Browlands site was formerly the location of the Chedoke Hospital and has an interesting and unique natural and cultural history. The study lands are located within the Westcliffe West neighbourhood of Hamilton, bounded by the brow of the Niagara Escarpment to the north and Scenic Drive, which runs in a semi-circle around the site. The north terminus of Sanatorium Road runs through the center of the site. An unnamed watercourse which is a tributary of Chedoke Creek bisects the site, running through a culvert under Sanatorium Road and over the Niagara Escarpment at Sanatorium Falls. The site contains many trees, some part of cultural landscapes planted as part of the former hospital grounds, and some in natural forest communities. The greater landscape context of the site is largely urban, but the site is connected ecologically to other natural areas via the Niagara Escarpment.

1.1. DEVELOPMENT PROPOSAL

The 9.43 ha Chedoke Browlands site is owned by Valery Homes, who wish to redevelop this site for residential uses. The proposed site plan, included in this report as **Appendix A**, includes townhouses and multi-storey condominium units, associated parking, amenity, and stormwater management facilities, and recreational features including a trail connection along the Niagara Escarpment. The heritage Long & Bisby building is being retained and repurposed as part of the development. The existing Chedoke Creek tributary is being realigned in order to mitigate existing erosion hazards, and the natural forest communities on site are being protected and enhanced.

1.2. STUDY PURPOSE

Natural heritage studies are required as part of the redevelopment process, as natural heritage features including the Niagara Escarpment, a City of Hamilton Core Feature (Hamilton Escarpment West ESA, HAMI-65), mature trees, and a tributary of Chedoke Creek are located in and/or directly adjacent to within the study area boundaries. The purpose of this study is to gather data on the ecological features and functions of the study area and adjacent lands, complete an assessment of environmental impacts based on the proposed development plan, and recommend mitigation measures to avoid impacts to natural features on the study area.

The relevant environmental and municipal agencies who will be reviewing this study include:

- City of Hamilton;
- Hamilton Conservation Authority (HCA);
- Niagara Escarpment Commission (NEC); and
- Ministry of Environment, Conservation, and Parks (MECP).

A Terms of Reference (ToR) was prepared for this Environmental Impact Study (EIS); following comments received from the City of Hamilton, HCA, and NEC; the ToR was approved on May 29, 2019. The full ToR, with revisions following agency comments, is provided as **Appendix B**.

2. METHODS

2.1. BACKGROUND REVIEW

2.1.1. EXISTING STUDIES

Extensive natural heritage, forestry, and engineering studies were completed for this site in the past, and an Ontario Municipal Board (OMB) decision was issued in 2012 pertaining to an active application at that time. Available background reports and documents include the following:

- **No date.** Notice of Intent to Cut, Burn, or Destroy Trees… Woodland Conservation By-Law No.R00-054 (includes memorandum by Kuntz Forestry Consulting Inc.)
- **2006, May. Jagger Hims Ltd.** Phase 1 Environmental Site Assessment, Chedoke Hospital Browlands, 565 Sanatorium Road, Hamilton, ON.
- **2007, July. A.J. Clarke and Associates Ltd.** Preliminary Engineering Report, Chedoke Browlands, City of Hamilton.
- **2009, January. Aboud & Associates Inc.** Chedoke Browlands Development (Block 3, Building #12), Tree Protection Plan.
- **2009, January. Aboud & Associates Inc.** Chedoke Browlands Development, Part of Lot 57, City of Hamilton, Vegetation Community Assessment Plan and ESA Woodlot Buffer.
- **2009, February. G. O'Connor Consultants Inc.** Scoped Environmental Impact Statement, Report for the North Scenic Planning Area, Chedoke Browlands, Hamilton, Ontario.
- **2009, September. Parish Geomorphic.** Meander Belt Width Assessment, Chedoke Creeks (Scenic & Sanatorium).
- **2012. Ontario Municipal Board.** OMB Decision. Deanlee Management appeal. PL100691
- **2016. S. Llewellyn & Associates Ltd.** Technical Memorandum – Browlands Hydraulic Analysis
- **2016, October. GeoProcess Research Associates.** Browlands Tree Inventory & Hazard Tree Assessment.
- **2017, February. Williams & Associates.** Browlands Forest Operating Prescription.

These previous studies were used to form a preliminary understanding of the site; where appropriate, data from these previous studies was used to scope the ToR and/or as a secondary source of information for this report.

2.1.2. NATURAL HERITAGE DATA

Natural heritage data was received for the study area from the following sources, and was used to scope the field work undertaken by D&A.

2.1.2.1. MAKE A MAP: NATURAL HERITAGE AREAS

The Government of Ontario's Make a Map: Natural Heritage Areas mapping application was queried on June 19, 2019 in order to provide a preliminary understanding of potential Species at Risk within and adjacent to the study area. Two map squares were queried, 17NH8788 and 17NH8888.

2.1.2.2. HAMILTON CONSERVATION AUTHORITY

D&A's project manager corresponded with HCA by email in order to be provided data on known records of a known significant vegetation species on the study area. Location information was provided by HCA staff on May 27, 2019.

2.2. FIELD STUDIES

2.2.1. WILDLIFE RESOURCES

2.2.1.1. BREEDING BIRD SURVEYS

Breeding bird area search surveys were conducted by an avian ecologist on May 27 and June 24, 2019, following the protocols outlined by the Ontario Breeding Bird Atlas (OBBA) (Cadman *et al*., 2007). These protocols stipulate that the surveys be conducted between sunrise and 10:00 a.m., between May 24 and July 12, during appropriate weather conditions (*i.e.,* light winds, no heavy rains). In addition, City of Hamilton EIS Guidelines require the first survey to occur between May 24 and June 15 and the second survey between June 15 and July 12. The survey visits were conducted a week apart in order to be able to gather enhanced breeding evidence. **Appendix C** contains additional survey details.

2.2.1.2. NOCTURNAL AMPHIBIAN CALL SURVEYS

Nocturnal amphibian call surveys were conducted on April 25 and May 22, 2019, targeting the ravine which generally runs north-south through the study area, and the deciduous forest in the northeast portion of subject lands (ref. Map 5). Surveys were completed according to the protocol outlined in the Marsh Monitoring Program (MMP) (BSC, 2009), including seasonal timing and weather conditions. However, note that a third visit, as recommended by this protocol in June, was not conducted due to the complete lack of amphibians during the first two surveys. During each visit, surveyors documented amphibian calls for a 6-minute duration at each of the monitoring stations. The duration of each point count was extended from the standard 3-minutes to 6 minutes to help ensure that all species present were documented and that calling intensity was accurately recorded. The four (4) amphibian call stations are shown on **Map 3. Wildlife Findings**.

2.2.1.1. REPTILE SURVEYS

Snake surveys were undertaken on May 15 and May 27, 2019, to search for any active snakes on site as well as for features that may represent hibernacula. The surveys were conducted during warm (at least 15°C) and sunny conditions with light winds, when snakes would be most likely active in spring. The surveys involved searching all areas of the site and adjacent lands, taking care to look under debris and rotting logs in order to find snakes and other herpetofauna (e.g. salamanders).

2.2.1.2. BAT HABITAT SUITABILITY ASSESSMENT

Eastern Small-footed Myotis (*Myotis leibii*), Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*) and Tri-colored Bat (*Perimyotis subflavus*) are listed as provincially Endangered and receive species and general habitat protection under the Endangered Species Act, 2007 (ESA). The Guelph District MNRF released a five (5) phase survey protocol for SAR bats in treed habitats in April of 2017, which is applicable in Hamilton:

- Phase I: Bat Habitat Suitability Assessment;
- Phase II: Identification of Suitable Maternity Roost Trees;
- Phase III: Acoustic Surveys;
- Phase IV: Snag Density Survey; and
- Phase V: Complete an Information Gathering Form.

D&A have determined through air photo interpretation and a fall visit on September 21, 2018 that the criteria for Phase I has been fulfilled; namely "any coniferous, deciduous or mixed wooded ecosite, including treed swamps, that includes trees at least 10 cm diameter-at-breast height (DBH) should be considered suitable maternity roost habitat". The main ELC community on the study area which fulfils these criteria is ELC Polygons 2 and 4 (Deciduous Forest). However, ELC Polygons 1 and 5 are cultural successional communities that contain a high number of trees and have been taken into consideration with regards to potential bat habitat. D&A undertook a leaf-off bat habitat assessment on May 1, 2019 to identify suitable maternity roost trees for Little Brown and Northern Myotis. The study area was searched for both live and dead standing trees of a diameter at breast height (DBH) greater than 10 cm that have loose or naturally exfoliating bark, cavities, hollows, or cracks following the Guelph District MNRF protocol. The data collected during the bat habitat assessment are provided in **Appendix D.**

D&A has submitted an Information Gathering Form (IGF) to the Ministry of Environment, Conservation, and Parks (MECP) for this project in September 2020.

2.2.1.3. INCIDENTAL WILDLIFE OBSERVATIONS

Observations of incidental wildlife were recorded during all field visits.

2.2.2. VEGETATION RESOURCES

2.2.2.1. ECOLOGICAL LAND CLASSIFICATION & VASCULAR PLANT INVENTORY

Vegetation communities within the study area were characterized according to the Ecological Land Classification (ELC) System protocol for Southern Ontario, 1st approximation (Lee *et. al*., 1998). ELC classification and mapping were produced via aerial photo interpretation and confirmation through field surveys.

Site visits were carried out by D&A's ecologists on September 21st 2018, May 24, 2019, and July 24, 2019 during which all vascular plant species encountered were recorded following standard ELC protocol; this included identifying species within the canopy, sub-canopy, understory, or ground layer and recording relative abundance. Soil texture and moisture regime were also characterized by representative topographic positions (*e.g*. table lands, valley slope, bottom lands). Additional information collected for each Polygon included human disturbance (e.g. trails, garbage), invasive species, and features requiring further investigation for potential candidate significant wildlife habitats such as cavity trees. The ELC data collected was compiled into a Microsoft Access database and linked to mapped ELC units in an ArcGIS feature class where it could be managed, reviewed, and exported for analysis and reporting.

Spring and mid-summer botanical surveys were carried out simultaneously with ELC surveys. These surveys involved taking an inventory of vascular plant species growing within each ELC Polygon. The data from these surveys were supplemented with additional species observations made during other surveys (*e.g*. breeding bird surveys). The taxonomy, nomenclature and provincial ranks for each of the

species are consistent with the Natural Heritage Information Centre (NHIC, 2017). Plant rarity status was assessed using COSEWIC rankings for federal status (COSEWIC, 2018), S-rank for provincial status (NHIC, 2017), and the City of Hamilton rankings for local significance (City of Hamilton, 2014).

The vascular plant species and status list containing the species observed during the survey is included as **Appendix E**.

2.2.2.2. WOODLAND EDGE DELINEATION

On August 14, 2019 D&A staff delineated the edge of ELC vegetation community 3 where it abuts communities 2 and 4. The edge was delineated by determining the outermost tree canopy of communities 2 and 4, then marking these points with flagging tape and D&A's high-accuracy Trimble GPS device. Note that City of Hamilton and Hamilton Conservation Authority staff did not participate in the edge delineation.

2.2.2.3. ARBORIST ASSESSMENT

A tree inventory and assessment was conducted by International Society of Arboriculture certified arborists for all trees >10cm DBH outside the Significant Woodland / ESA. The surveys were carried out by D&A staff on June 14, July 10, and July 24, 2019, and in 2016 by GeoProcess Research Associates. Each tree was tagged with a sequentially numbered metal forestry tag, its location was mapped using a Trimble high-accuracy GPS device, and the following information was recorded for each tree:

- Species (common name, botanic name);
- DBH, recorded at 1.4m (in cm);
- Canopy diameter (in m);
- Biological health (high/medium/low);
- Structural health (high/medium/low);
- Preservation priority (high/medium/low); and
- Any additional comments.

Following the site visit the data gathered was synthesized into an Excel spreadsheet, which is presented in this report as **Appendix F**. This appendix also includes D&A's tree assessment criteria. The full details of arborist work for this project can be found in the Tree Management Plan prepared by D&A (2020).

2.3. SPECIES AT RISK SCREENING

The MECP provided a list of Species at Risk (SAR) known to be extant in the City of Hamilton, current as of November 2018. The habitats on site and field data collected were screened against this species list to determine the potential for any of these species to exist. Most of the species with potential to occur will have been addressed by the field investigations conducted as part of this EIS; the screening is intended to flag any species that may be present that would require additional, specialized survey protocols in order to determine this status at the site. The screening also includes undertaking a background review to determine local species' status. The results of the screening are found in Section 3.3. The full SAR screening table is presented as **Appendix G**.

2.3.1. BUTTERNUT INVENTORY

The study area and adjacent lands were screened during the ELC and vascular plant inventory work for Butternut trees. The staff present during these surveys included International Society of Arboriculture

(ISA) certified arborists with training in Butternut Health Assessment (BHA). This work was undertaken on the dates given in Section 2.2.2.1.

2.3.2. BAT HABITAT SUITABILITY ASSESSMENT

Described under Wildlife Resources, see Section 0.

2.3.3. CHIMNEY SWIFT ASSESSMENT

The former Chedoke Hospital Bisby & Long building was identified during the ToR development as potential Chimney Swift habitat. In order to determine the suitability of this building as habitat, D&A staff accessed the building's roof on May 24, 2019 via the external fire escape in order to determine whether chimneys were present, and to document the condition of the chimneys that were found. Due to structural concerns of the roof itself, walking on the roof itself was not possible so observations were made from the fire escape at the building's edge.

2.4. SIGNIFICANT WILDLIFE HABITAT SCREENING

During all field investigations, habitats on site were screened against the Significant Wildlife Habitat (SWH) categories contained within the *Significant Wildlife Habitat Technical Guide* (OMNR 2000) and the *Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E* (OMNRF 2015). A full screening is presented in **Appendix H**.

2.5. WATERCOURSE CHARACTERIZATION

A watercourse characterization was carried out by Wood PLC, consisting of a fish survey and an aquatic habitat characterization. Field work was carried out on August 1, 2019 using a backpack electrofisher set to 60 Hz and 180 V, with shocking occurring for 669 seconds. The site conditions were suitable to access the entire Study Area during the fish survey. The air temperature was 20˚C, with a mainly clear sky. See **Appendix I** for full details.

3. FINDINGS

3.1. BACKGROUND REVIEW

3.1.1. EXISTING STUDIES

The background studies listed in Section 2.1.1 were reviewed for information applicable to this study. Below are summaries of information that was found, presented by background study.

No date. Notice of Intent to Cut, Burn, or Destroy Trees… Woodland Conservation By-Law No.R00-054 (includes memorandum by Kuntz Forestry Consulting Inc.)

This notice is the permit application for proposed tree cutting on the site. The document appends the 2017 Kuntz Forestry Consulting report, which contains the following information about the former Coniferous Plantation, identified in this report as Polygon 3 (Anthropogenic).

- *Explains forest assessment protocol used to evaluate the CUP3 area*
- *In the CUP, non-native species were 69% of composition, many dead ash, native tree species include shagbark hickory, white oak, red oak. Little to no native tree or shrub understory, and groundcover is highly disturbed*
- *Recommended removal and compensation by planting along brow edge*

2006, May. Jagger Hims Ltd. Phase 1 Environmental Site Assessment, Chedoke Hospital Browlands, 565 Sanatorium Road, Hamilton, ON.

This report documents the conditions of the site, focusing on contaminants and hazards as a result of historic and current land uses. Useful information about soils and physiography.

- *Haldimand Clay Plain physiographic region of Southern Ontario (Chapman & Putnam, 1988)*
- *Surficial soils characterized as silty to clayey till of the Vinemount Moraine. Underlying bedrock is dolostone of the Lockport Formation (Bolton 1975)*
- *Depth of bedrock is likely less than 5m (Feenstra, 1981)*
- *Regional groundwater flow is toward Hamilton Harbour and Lake Ontario, however this has been affected by anthropogenic features. The shallow groundwater in the vicinity of the site likely discharges as seeps along the Escarpment face or moves vertically into the deeper bedrock units through fracture networks along the Escarpment.*
- *Long & Bisby Building:*
    - *No notes provided on attic space that may be useful for bat habitat analysis*
- *Natural areas*
    - *"Brow trail" was formerly maintained by the Chedoke Hospital*
    - *Perimeter of woodlot on site is fenced*
    - *Aerial photograph review found little change in extent of woodlands from 1934 – 1999, main changes recorded were additions of buildings.*

2009, January. Aboud & Associates Inc. Chedoke Browlands Development (Block 3, Building #12), Tree Protection Plan.

This report is the Tree Preservation Plan carried out for the area adjacent to the Long & Bisby Building, which has "moderate to high quality tree specimens and warrants more detailed analysis" (Aboud & Associates 2009). As tree data has been updated as part of the current study, the Aboud & Associates report was not reviewed further.

2009, January. Aboud & Associates Inc. Chedoke Browlands Development, Part of Lot 57, City of Hamilton, Vegetation Community Assessment Plan and ESA Woodlot Buffer.

This report describes the methods and findings vegetation assessment and analysis work carried out as part of the 2009 EIS. This report contains valuable information about the physical characteristics of the edge of the ESA, which except for adjacent to Polygon 3 should be consistent in 2019 as the ESA edge has not changed.

- *Limits of ESA (dripline) were staked and approved by City and HCA on April 14, 2008*
- *Study characterized the first 15-25m inside the edge of the ESA and the tennis court area. Purpose: to determine vegetation type and constraint level of the woodland edge in order to provide information about size and function of buffer*
- *Soils: 4 test pits excavated at 4 and 10m outside the limit of the woodland (i.e. within the buffer), test pits were excavated using a rubber-tired backhoe. Pits were 1m w x 2m l x 1.2m d. Soils were characterized using Field Manual for Describing Soils in Ontario*
- *No test pits dug adjacent to Long & Bisby building, as the buffer in this area is a driveway*
- *Roots found within 4m of dripline in one location, no roots found at other 4m test pit or in either 10m test pit*
- *Total of 23 vegetation communities were defined; constraint rankings and tree quality ratings were provided for all vegetation communities*
- *Recommendations:*
    - *10m buffer from ESA, no impact to the woodlot or encroachment into the buffer*
    - *Edge Management Plan*
    - *Determine where detailed tree assessment is required*
    - *Protect and enhance the site's watercourse and its riparian areas*
    - *Any plantings should be regionally native and/or non-invasive to natural areas*

2009, February. G. O'Connor Consultants Inc. Scoped Environmental Impact Statement, Report for the North Scenic Planning Area, Chedoke Browlands, Hamilton, Ontario.

This was the EIS carried out for the study in support of the previous development application. Results of this study were used to help scope the Terms of Reference for the current assignment, i.e. data regarding Chimney Swifts, Cooper's Hawk, Eastern Wood Pewee, and American Toad. Some notable findings include:

- *States that the only natural feature is the significant woodland forest; was 2.71 ha at the time of that study. 3 distinct areas within forest identified:*
    - *FOD2: Dry-fresh Oak-Maple-Hickory Deciduous Forest Ecosite. Forest in good ecological health, understory shows signs of disturbance and invasive species. Wood Betony (Pedicularis canadensis) noted as historically present in this Polygon but not observed*
    - *FOD4: Dry-fresh Deciduous Forest Community Series (FOD4). More open, younger stand of deciduous trees with some scattered larger trees*
    - *CUP3: Cultural Conifer Plantation (now cleared)*
- *Creek corridor noted as having "semi-natural character". Part of creek defined as FOD7, Fresh-Moist Lowland Deciduous Forest*
- *The report notes that the population of Virginia Bluebells may be the only record in all of Hamilton-Wentworth, and so may be particularly significant. Exact location of the plants was obscured in the 2009 EIS*
- *10m buffer to ESA proposed, with 1.5m metal fencing along outer buffer edge. 10m buffer assumes no disturbance, no grading zone*
- *Buffer for Chedoke Creek tributary not defined; creek noted as "direct fish habitat"*

- *Edge management & restoration actions recommended*

2012. Ontario Municipal Board. OMB Decision. Deanlee Management appeal. PL100691

This is the decision document related to the OMB appeal of the 2009 development application.

- *Agreements related to natural heritage:*
    - *30m setback from escarpment brow agreed upon*
    - *10m setback from ESA agreed upon*
    - *Chedoke Creek not dedicated to City*
    - *Site is Urban in NEC plans, does not require development permit under NEC*
    - *Should provide access to Bruce Trail*
    - *SWM in private ownership*
    - *Norway Maples along Scenic Dr are important part of current visual landscape*
    - *Board satisfied that requirement of TPP will ensure appropriate protection of the trees*
    - *Board satisfied that significant natural areas have been identified and protected*

2016. S. Llewellyn & Associates Ltd. Technical Memorandum – Browlands Hydraulic Analysis

This report reviews floodline constraints and opportunities with respect to the Browlands site; this information is being updated by Geomorphix, so this previous report has not been reviewed further.

2016, October. GeoProcess Research Associates. Browlands Tree Inventory & Hazard Tree Assessment.

This report inventoried a total of 228 trees >10cm DBH outside ESA and outside Chedoke Creek corridor. The data has been integrated into the arborist report being prepared in tandem with the current study.

2017, May and June. GeoProcess Research Associates. Browlands Wildlife Surveys

This report includes details of breeding bird surveys carried out on the site in 2017. This data was used in development of the ToR for this EIS.

2017, February. Williams & Associates. Browlands Forest Operating Prescription.

This report details forestry recommendations for current Polygons 2, 3 and 4.

- *Recommendation for removals of trees in current Polygons 3 and 4– split this area into 4 "stands", Polygon 2 is Stand 1, Polygon 3 is Stand 2, and Polygon 3 is Stand 3. An area Polygon 3 and adjacent homes along Scenic Drive is Stand 4.*
- *Recommends removal of some Ash, some understory of Norway Maple and Buckthorn from Stand 4 and the Scots Pine plantation (stand 3)*
- *Recommends compensating for these removals by "naturalizing a 1.03 ha strip along the brow of the escarpment", with the replanting to be an oak/hickory maple forest. 5:1 replacement ratio of the area of stand 3 lost.*

3.1.2. NATURAL HERITAGE DATA

3.1.2.1. MAKE A MAP: NATURAL HERTITAGE AREAS

The results for the Make a Map query for map squares 17NH8788 and 17NH8888 were as follows:

NHIC Data -- Grid ID = 986922

Element Type	Common Name	Scientific Name	SRank	SARO Status	COSEWIC Status	Last Obs Date	EO ID
SPECIES	Perfoliate Bellwort	Uvularia perfoliata	S1S2			1962-05-14	3239
SPECIES	Perfoliate Bellwort	Uvularia perfoliata	S1S2			2001-05-11	3241
SPECIES	Spotted Wintergreen	Chimaphila maculata	S2	END	THR	1886-07-01	5507
SPECIES	Timber Rattlesnake	Crotalus horridus	SX	EXP	EXP	1950	17355
SPECIES	Northern Bobwhite	Colinus virginianus	S1	END	END	1904	21077
SPECIES	Virginia Bluebells	Mertensia virginica	S3			1999-05-20	23350
SPECIES	American Burying Beetle	Nicrophorus americanus	SH	EXP	EXP	1970-00-00	115935

American Burying Beetle and Timber Rattlesnake are considered extirpated from the province of Ontario so are no longer extant in the Hamilton region. Northern Bobwhite only remains in Ontario at Walpole Island, Lambton County, and no longer breeds in the Hamilton area. The SAR list provided by the MECP (November 2018) for the Hamilton Region does not list these three species.

The Spotted Wintergreen record is historic (1886) and as it is not noted in any other previous studies for the property is assumed not to persist on the study site. The two other plants listed – Perfoliate Bellwort and Virginia Bluebells – were searched for in 2019 using suitable survey protocols. Only Virginia Bluebells was detected during surveys, with details provided in Section 2.2.2.1.

3.1.2.1. HAMILTON CONSERVATION AUTHORITY

HCA provided details about the location and abundance of Virginia Bluebells (*Mertensia virginiana*) on the study lands so that D&A staff could reconfirm its location and abundance during the 2019 spring vascular plant survey. This species is ranked S3 (Vulnerable) provincially and H (rare) in the City of Hamilton (Goodban 2014).

3.2. FIELD STUDIES

3.2.1. WILDLIFE RESOURCES

3.2.1.1. BREEDING BIRD SURVEYS

A total of 28 species of birds was detected during the breeding bird surveys and other wildlife surveys; 27 of these species were considered as at least possibly breeding on the site. One species – Ring-billed Gull – was observed flying over the site only and was not considered breeding.

Of the 27 species of breeding birds, all are native except for the following two species: House Finch and House Sparrow. One species is considered a Species at Risk (SAR) at a Federal and/or Provincial level: Eastern Wood-Pewee (*Contopus virens*) (Special Concern). Two singing males were heard, one during the first breeding bird survey on May 27, heard in Polygon 2; the second was heard during the second survey on June 24, singing offsite in the forest downstream from Sanatorium Falls. See **Map 3. Wildlife Findings** for its location and Section 2.3, Species at Risk Screening for further details.

At a provincial level, all of the native breeding species have been assigned Sranks of either S4 or S5 by the Natural Heritage Information Centre (NHIC 2019), which indicates that their provincial populations are "apparently secure" or "secure", respectively (NHIC 2019).

At a local level, 22 of the native breeding species are considered common to abundant and widespread to ubiquitous in the City of Hamilton (Smith 2014). The following three species are considered uncommon in the City: Cooper's Hawk (scattered), Red-bellied Woodpecker (very widespread), and American Redstart (widespread). Note that Red-bellied Woodpecker continues to expand in numbers and range within the Hamilton area so its status has changed since the last Natural Areas Inventory. Also, the American Redstart was only observed on May 27 so may represent a migrant. No species that are considered rare in the City were observed during 2019 field investigations. See **Map 3. Wildlife Findings** for the location of these uncommon avian species.

The Ontario Ministry of Natural Resources and Forestry (OMNR 2000) considered White-breasted Nuthatch and American Redstart to be area sensitive. This indicates that these species requires large areas of suitable habitat for its long-term survival and thus can be sensitive to development.

The highest level of breeding evidence obtained during the surveys was "confirmed" breeding (OBBA 2001), with fledged young (FY) or a nest (N) observed. This evidence was observed for Cooper's Hawk (N), Northern Flicker (FY), American Robin (FY), Red-winged Blackbird (FY), and Indigo Bunting (FY). The next highest level of breeding evidence is "probable" breeding (OBBA 2001), either by the observation of agitated birds (code A), pairs of birds (code P) or territorial males (code T), which is defined as a singing male being present at the same location at least seven days apart. This evidence was the highest level obtained for eight species. The next highest level of breeding evidence was "possible" breeding (OBBA 2001), as seen with singing males (code S) or birds being present in appropriate breeding habitat during the breeding season (code H); this evidence was the highest breeding level for the remaining 15 species.

For application of the Migratory Birds Convention Act (MBCA 1994), eight of the breeding species observed are not protected under the Act: Cooper's Hawk, Blue Jay, American Crow, House Finch, House Sparrow, Red-winged Blackbird, and Brown-headed Cowbird. All other species recorded as at least possibly breeding are protected by the Act. As such, it means that it is illegal to harm or kill these species, or to harm or destroy their nests and/or nesting habitat.

For full results of the breeding bird surveys for this site, please see Appendix C.

3.2.1.1.1 CHIMNEY SWIFT ASSESSMENT

The Long & Bisby building roof review found three chimneys on the building, along with a number of other features (see Figure 1*: Chedoke Hospital Long & Bisby Building*). All three chimneys have metal mesh over the chimney openings (see Figure 2*: Metal grating covering chimneys*). As previously noted, due to structural concerns, D&A staff could not walk on the roof surface nor access any attic spaces within the building. However, within areas of the building which were accessible there was no evidence of swifts having been present in the past (e.g. nests, droppings).

Figure 1: Chedoke Hospital Long & Bisby Building roof

Since the building is not being demolished, there are no requirements per the Endangered Species Act for Chimney Swift. However, the chimneys are capped so swifts could not have used them in the past nor will they be able to utilize them for nesting or roosting (e.g. during migration) in the future. Therefore, if in the future the building is slated for demolition or extensive renovations, there are no ESA requirements for Chimney Swift.

Figure 2: Metal grating covering chimneys

3.2.1.2. NOCTURNAL AMPHIBIAN CALL SURVEYS

During nocturnal amphibian call surveys, no calling frogs or toads were detected at any of the monitoring stations during the two (2) site visits in April and May. This demonstrates the lack of suitable habitat for these species on the subject lands, which may be due in part to steep slopes along the ravine

edges, lack of ponding and open marsh areas, fairly dense tree and shrub cover along the extent of the ravine, ongoing anthropogenic disturbance, and a lack of standing water in the deciduous forest community.

3.2.1.3. REPTILE SURVEYS

During the May 15 reptile survey, six Eastern Gartersnakes were observed in the deciduous forest habitat associated with the Niagara Escarpment (in adjacent lands). This species is not a SAR (MNRF 2019), has provincially secure populations (NHIC 2019), and is abundant in the City of Hamilton (Schwetz 2014). A single Eastern Red-backed Salamander was also observed offsite in the escarpment forest; this species is common in the City and has no provincial status. No reptiles were observed during the May 27 survey.

3.2.1.4. BAT HABITAT ASSESSMENT

The Guelph District MNRF released a five (5) phase survey protocol for SAR bats in treed habitats in April of 2017:

- Phase I: Bat Habitat Suitability Assessment,
- Phase II: Identification of Suitable Maternity Roost Trees,
- Phase III: Acoustic Surveys,
- Phase IV: Snag Density Survey; and,
- Phase V: Complete an Information Gathering Form.
  (MNRF 2017)

D&A have determined through air photo interpretation and a fall site visit that the criteria for Phase I has been fulfilled; namely "*any coniferous, deciduous or mixed wooded ecosite, including treed swamps, that includes trees at least 10cm diameter-at-breast height (DBH) should be considered suitable maternity roost habitat*". The main ELC communities on the study area which fulfil these criteria are ELC Polygons 2 and 4 (Deciduous Forest), as well as Polygon 7 (offsite). However, Polygons 1 and 5 are cultural successional communities that contain a high number of trees and have also been taken into consideration with regards to bat habitat. The data collected during the bat habitat assessment are provided in **Appendix G**.

Leaf-off and leaf-on screenings were completed on May 1, 2019, and on June 14, July 10, and July 24, 2019 concurrently with the arborist assessments. The purpose of the leaf-off survey is to screen for maternity roosting habitat for Little Brown Myotis (*Myotis lucifugus*) and Northern Myotis (*Myotis septentrionalis*); any tree greater than 10 cm DBH with suitable features for roosting (e.g. loose bark, crevasses, holes) could be a potential roost tree for these species. The leaf-on survey screens for Tri-colored Bat (*Perimyotis subflavus*) which prefers to roost in live or dead leaf clusters in oaks (*Quercus* sp.) greater than 10 cm DBH and maples (Acer sp.) from 10 to 25 cm. Large maples (greater than 25 cm) with no such dead leaf clusters may also be used for forming maternity roosts.

<u>Leaf-off Screening</u>

A total of 61 suitable roosting trees were recorded within forested and Cultural Woodland ELC communities in the study area during the leaf-off screening (**Table 1**). Guelph MNRF (2017) does not set a minimum threshold of roost density but does state that Polygons with a density of 10 suitable trees/ha should be considered high quality potential maternity roost habitat.

Table 1. Leaf-off suitable roosting tree density for FOD and CUW ELC Polygons

ELC Polygon	ELC Community	ELC Polygon size (ha)	# of Suitable Maternity Roost Trees	Suitable Maternity Roost Tree Density (trees/ha)
1	Cultural Woodland	1.05	16	15.24
2	Deciduous Forest	2.62	33	12.60
4	Deciduous Forest	Not assessed, offsite		
5	Cultural Woodland	0.36	3	8.33
7	Deciduous Forest	1.07	9	8.41

Of the Deciduous Forest (FOD) ELC communities on the Browlands site, ELC Polygon 2 has both a sufficiently dense canopy and a high density of suitable roosting trees. This community provides suitable maternity roosting habitat for Little Brown Myotis and Northern Myotis and is considered Significant Wildlife Habitat for two non-SAR bats (Big Brown and Silver-haired). Polygon 7 has suitable habitat but a low density of suitable roosting trees. Polygons 4 was not assessed due to access and safety issues, however it is an extension of Polygon 3 and is dominated by mature deciduous trees so likely contains suitable snag trees in sufficient densities to be suitable maternity roost habitat. Therefore, it is assumed that Polygons 2 and 4 likely contain Endangered bat maternity roosting habitat.

ELC polygons 1 and 5 are Cultural Woodlands (CUW) contain a total of 24 suitable maternity roost trees. Polygon 5 has sufficient suitably maternity roost density to be considered high quality potential maternity roost habitat, however it does not fulfil the MNRF (2017)'s Phase I habitat criteria: "*any coniferous, deciduous or mixed wooded ecosite, including treed swamps, that includes trees at least 10cm diameter-at-breast height (DBH) should be considered suitable maternity roost habitat*". The MECP is being consulted via the submission of an Information Gathering Form (IGF) to determine if further studies are required for the Cultural Woodland ELC communities.

Leaf-on Screening

A detailed leaf-on screening to assess maternity roost habitat suitability for Tri-colored Bat. was undertaken as part of the arborist assessment for the study area. As the arborist assessment was conducted only outside the ESA boundaries on the site, the forest ELC Polygons (#2, 4, 7) were not screened. However, those communities are dominated by mature Oak and Maple trees and therefore are assumed to provide suitable roosting habitat for Tri-colored bats. ERROR! REFERENCE SOURCE NOT FOUND. summarizes the roost tree trees found during the arborist surveys in Polygons 1 and 5.

Table 2. Leaf-on suitable roosting trees by CUW ELC Polygon

ELC Polygon	ELC Community	# of maples 10 to 25 cm DBH	# of maples greater than 25 cm DBH	# of oaks greater than 10 cm DBH	TOTAL
1	Cultural Woodland	62	34	6	102
5	Cultural Woodland	6	5	0	11

Per **Error! Reference source not found.**, a total of 68 maples from 10 to 25 cm DBH, 39 maples over 25 cm DBH, and 6 oaks over 10 cm DBH were found in the two CUW Polygons outside of the ESA.

Assessment of Buildings for Bat Habitat

The Long & Bisby building was reviewed for potential to harbor roosting bats (both maternity roosts and temporary roosts during migration. Note that, due to structural concerns, D&A staff could not access any attic spaces within the building. However, within areas of the building which were accessible there was no evidence of bats having been present in the past (e.g. guano, urine stains, dead pups,

insect casings). Also, the structure of the attic (not raised with timber beams and uncluttered flying space) is not suitable for roosting bats so it is unlikely that bats will utilize it in the future for roosting.

Since the building is not being demolished, there are no requirements per the Endangered Species Act for Endangered bats. However, if the building is slated for demolition or extensive renovations in the future, we would recommend acoustic surveys to ensure that no Endangered bats have started utilizing it for roosting in the meantime. If any Endangered bats are found, MECP should be consulted to determine how best to proceed. If non-SAR bats are found (e.g. Big Brown Bat) we would recommend the demolition or construction activities occur outside of April 1 to October 31 to ensure that no roosting bats are injured or killed.

Potential impacts to SAR bats and their habitat have been outlined in the IGF prepared for this project and submitted to the MECP; when a response is provided by the MECP D&A will amend this EIS.

3.2.1.5. INCIDENTAL WILDLIFE OBSERVATIONS

During the spring snake surveys, five species of birds were observed that were not observed later in the June 2019 breeding bird surveys. These are as follows:

- **Least Flycatcher** – an uncommon breeder in the City (Schwetz 2014; this species is a very common migrant in May so this bird likely represents a migrant.
- **Magnolia Warbler** – a rare and local breeder in the City (Schwetz 2014); a very common migrant so this bird likely represents a migrant.
- **Black-throated Blue Warbler** – a rare and local breeder in the City (Schwetz 2014); common during spring migration so this individual was likely a migrant.
- **Scarlet Tanager** – an uncommon and widespread breeder in the City (Schwetz 2014); a common migrant so this bird was most likely a migrant.
- **Rose-breasted Grosbeak** – a common and ubiquitous breeding species in Hamilton (Schwetz 2014), and conspicuous when on territory; therefore, this individual was most probably a migrant.

Two species of insects were observed during breeding bird surveys: Common Ringlet (*Coenonympha tullia*) and Ebony Jewelwing (*Calopteryx maculata*); both are common and widespread insects with no conservation concerns.

During the bat assessment (leaf-off survey) on May 1, 2019, the following avian species were recorded that were not observed during either of the two breeding bird surveys. Due to this absence during the breeding season, along with the early date and the required breeding habitat and/or ranges of these species, all were considered as either non-breeders or migrants:

- Double-crested Cormorant;
- Turkey Vulture;
- Eastern Phoebe;
- Red-breasted Nuthatch;
- Ruby-crowned Kinglet;
- Golden-crowned Kinglet;
- White-throated Sparrow; and
- Purple Finch.

During the spring ELC surveys on May 24, 2019 two Eastern Gartersnakes were observed, one within polygon 2 and the other in polygon 7.

3.2.2. VEGETATION RESOURCES

3.2.2.1. VASCULAR PLANT INVENTORY

During the plant inventories, a total of 221 vascular plants were observed. Of the 200 plants identified to species level, 116 (58%) are native to Ontario and 84 (42%) are introduced. The remaining 21 species could only be identified to genus level due to immaturity or lack of key identification attributes at the time of the survey.

One plant species was observed which is significant at the federal and/or provincial level: Virginia bluebells (*Mertensia virginica*). This observation is discussed further in the description of polygon 4.

At the local level, two species are considered significant, with City of Hamilton rankings of *h* or *H* (uncommon or rare). A rare ranking reflects species known at five or fewer sites while an uncommon ranking means they're known at six to ten sites. The S ranks of these species ranged from S3 (vulnerable) to S5 (secure). A number of Hawthorn (*Crataegus* sp.) were observed in Polygon 1, but were not included in Table 3 as they were not identified to species level and are not necessarily rare or uncommon in the City of Hamilton.

All significant species detected on site are summarized in **Table 3**.

Table 3. Significant vascular plant species detected in the study area

Scientific Name	Common Name	Conservation Status				ELC Polygon where observed	Notes
		National	Provincial		Local		
		COSEWIC (2017, 2018)	MNRF (2017)	S-Rank (2017)	City of Hamilton (2014)		
Mertensia virginica	Virginia Bluebells			S3	H	4	See Section 3.4
Solidago bicolor	White Goldenrod			S4?	h	2	

3.2.2.2. ECOLOGICAL LAND CLASSIFICATION

A total of seven ELC Polygons were delineated within the study area, comprised of six different vegetation community types (see **Map 2. Ecological Land Classification** and Table 3 below). A total of 2.68 ha, or 24% of the study area, contains natural vegetation communities; the remaining 8.44 ha, or 76% of the site contains cultural (human-influenced) vegetation communities. See Error! Reference source not found. for details**.**

Table 4. ELC Vegetation Community Descriptions

Polygon ID	ELC Code	Description	Area (ha)	Area (%)
1	CUW1	Mineral Cultural Woodland	1.05	11.13%
2	FOD5-3	Dry – Fresh Sugar Maple – Oak Deciduous Forest	2.62	27.78%
3	ANTH	Anthropogenic	0.33	3.5%
4	FOD	Deciduous Forest	0.35	3.71%
5	CUW1	Mineral Cultural Woodland	0.36	3.82%
6	ANTH	Anthropogenic	6.2	65.75%

7	FOD5	Dry – Fresh Sugar Maple Deciduous Forest *NOTE: this community is the Niagara Escarpment Slope located outside the study site but which was included for ecological context.*	1.07	11.35
Total			**11.98**	**127.4%***

*Area calculations add up to >100% of the study area because Polygon 7 is outside the study site and several other polygons have been digitized such that they extend slightly outside the boundary.

Forest Communities

Deciduous Forest (FOD)

Deciduous forests are characterized by their canopy layer, which are dominated by deciduous species and have greater than 60% canopy cover (Lee et al 1998).

Polygon 2: Dry – Fresh Sugar Maple - Oak Deciduous Forest (FOD5-3)

Polygon 2 is a Dry – Fresh Sugar Maple - Oak Deciduous Forest with a tree canopy dominated by mature sugar maple *(Acer saccharum)* and northern red oak *(Quercus rubra)*. Trees in this community include a mixture of many size classes, with a high proportion of mature trees of a large trunk diameter. Other species occasionally to rarely found in the forest canopy were basswood *(Tilia americana)*, shagbark hickory *(Carya ovata)*, and white oak *(Quercus alba)*. The forest understory was also dominated by sugar maple, with basswood, sweet cherry *(Prunus avium),* European buckthorn *(Rhamnus cathartica)* and white oak *(Quercus alba)* observed intermittently. Common groundcover species found were Eurasian woodland bluegrass (*Poa nemoralis),* zigzag goldenrod (*Solidago flexicaulis),* blue-stemmed goldenrod (*Solidago caesia),* and garlic mustard (*Alliaria petiolata*). One large patch of Periwinkle (*Vinca minor*) was observed near the Long & Bisby building. Many spring ephemeral ground species were also observed within this forest, including yellow trout lily *(Erythronium americanum),* Eastern star sedge *(Carex rosea),* and May-apple *(Podophyllum peltatum)* however none in high abundance. Soil samples taken in this area were identified as silty clay loam and silty clay in the A and B layers, respectively. Mottles were present starting at the 50cm mark. No vernal pools were observed within this community during the spring field visits. This community was, in general, a good quality native forest community with low invasive species intrusion for such an urban site.

Disturbances in this community included localized trails and litter, mostly close to the Long & Bisby building and yard waste dumping along the neighbouring residential backyards along Scenic drive.

This community is part of the Hamilton Escarpment Environmentally Sensitive Area, ESA # HAMI-65. This ESA is 237 ha in size in total and includes Polygon 4 (also within the study area) and Polygon 7 (on the slope of the Niagara Escarpment). Polygon 2 shares the majority of its canopy species characteristics with Polygon 7.

Figure 3: Polygon 2: Dry – Fresh Sugar Maple - Oak Deciduous Forest

Polygon 4: FOD

Polygon 4 was determined to be a Deciduous Forest, however the vegetation species and soil findings were not definitive of any ELC Ecosite or vegetation type. Trees in this area were on average of much smaller diameter than those found in Polygon 2, and the canopy species were a mixture sugar maple, silver maple (*Acer saccharinum*) and shagbark hickory. Declining and dead ash (*Fraxinus* sp) were occasional throughout this community. The understory and shrub layer was dominated by European buckthorn, with occasional ash, and Tatarian honeysuckle *(Lonicera tatarica)*. Common ground species were garlic mustard, ground-ivy *(Glechoma hederacea),* and European lily-of-the-valley *(Convallaria majalis)*. Despite the variable canopy and abundance of non-native and invasive ground cover and shrub species, this community had a high abundance of sedges (*Carex pensylvanica*, *C. radiata*, and *C. spicata*) as compared to the other forest communities within the study area. Virginia bluebells *(Mertensia virginica)* were also found in a small area within the Polygon and is considered to be rare both locally (H) and provincially (S3). The Virginia Bluebells plants observed appeared to be associated with an intermittent drainage feature draining into the feature from Polygon 6 to the west (see Figure 4). Soil analysis completed at this site found silty clay loam in the A layer and silty loam in the B layer. Mottles were present at 70cm.

Many disturbances were observed in this community, mostly of a historic nature. A derelict tennis court, including chain link boundary fence, is located in the western portion of this community. This tennis court is being colonized by non-native plants, mostly common stonecrop (*Sedum acre*) which was not observed elsewhere on the study site. In addition to the tennis court, a remnant roadway / trail is present connecting the tennis court to the gravel road behind the Long & Bisby building. Litter and debris have been dumped in this community along the gravel road. See **Map 5 Opportunities & Constraints** for the location of the tennis court and remnant roadway / trail.

This community is part of the Hamilton Escarpment Environmentally Sensitive Area, ESA # HAMI-65. This community is contiguous with Polygon 2, which is part of the ESA, but has many more indicators of

ecological disturbance than Polygon 2, such as the invasive species observed, tennis court, trail, and evidence of dumping.

Figure 4: *Polygon 4, showing general character and drainage feature*

Figure 5: Tennis court, view from inside

Polygon 7: FOD5-1

Polygon 7 is a Dry-Fresh Sugar Maple Deciduous Forest Type vegetation community which is separated from the study area by a chain link fence. This area encompasses the edge of the Niagara Escarpment and the associated slope, and includes the Sanatorium Falls waterfall where the tributary of Chedoke Creek which runs through the site spills over the Niagara Escarpment. This community is outside of the direct study area for this project and was surveyed from the top of slope out of consideration of access to these lands and safety of field staff on the steep slope. This community extends throughout the City of Hamilton along the Niagara Escarpment, with species variations throughout. Therefore the species list and comments here are only for the areas directly adjacent to the Browlands study area. The forest canopy observed was dominated by sugar maple, with Norway maple (*Acer platanoides)* and northern red oak observed occasionally throughout. The sub-canopy and shrub layers mainly consist of eastern hop-hornbeam *(Ostrya virginiana),* chokecherry *(Prunus virginiana),* and Tatarian honeysuckle. Eurasian woodland bluegrass, zigzag goldenrod, common dandelion, and garlic mustard were the most abundant ground plants observed. Due to the steep slopes and lack of access, soil samples were not taken in this community, but are likely composed of silty clay associated with bedrock and talus.

Disturbance in this community is limited, due to the chain link fence separating it from the Browlands site and the steep slope. Some dumping of a minor nature was observed over the fence, and a small foot trail was present adjacent to Sanatorium Falls. The Cross of Lorraine, built in 1953 as part of the former sanatorium facility, is located close to the Niagara Escarpment edge within this vegetation community. See **Map 5 Opportunities & Constraints** for the location of the Cross of Lorraine.

This community is part of the Hamilton Escarpment Environmentally Sensitive Area, ESA # HAMI-65, and has a contiguous forest canopy with Polygon 2. See **Map 4. ESA BoundariesMap 4** for the ESA boundaries within the study site.

Figure 6: Polygon 7 – top of Escarpment slope, showing chain link fence between site and slope

Wetland Communities

Wetland communities include areas primarily influenced by site hydrology. Wetlands are typically low-lying areas dominated by hydrophytic (water-loving) vegetation. They may have standing water during parts or all of the year (Lee et al 1998).

There are no wetlands on the study area; a tributary of Chedoke Creek runs through the Browlands property but no ELC-classified wetland communities were observed along this watercourse. Indications of localized seasonal ponding were observed in Polygon 2 with some moisture associated sedges but of too limited extent to be mappable.

Cultural Communities

Cultural communities include lands that are formed or maintained by human influence, and those which are dominated by non-native and invasive species.

Polygons 1 and 5: Mineral Cultural Woodland

Polygons 1and 5 are designated as Mineral Cultural Woodland. Cultural Woodland communities are classified by tree cover between 35 and 60%, often with a large proportion of non-native plant species.

Polygon 1 is located along the tributary of Chedoke Creek and includes both planted and naturalized vegetation. The most abundant tree species was Manitoba maple (*Acer negundo)* and Norway maple, with occasional sugar maple, black maple, blue spruce (*Picea pungens)* and white spruce *(Picea glauca)*. Some of the trees present may predate the sanatorium development and subsequent landscaping, such as several shagbark hickories and bur oaks, and other trees are horticultural introductions that would have been planted such as one cut-leaf European beech (*Fagus sylvatica 'Aplenifolia'*) and one Shingle Oak (*Quercus imbricaria*). In the sub-canopy and shrub layers European buckthorn *(Rhamnus cathartica)*, basswood and Manitoba maple were found throughout. Common ground cover species included garlic mustard, wild strawberry *(Fragaria virginiana)*, and common dandelion (*Taraxacum officinale)*. Along the creek there are some areas with better quality ground cover including sedges (*Carex* sp). There is a great deal of variability in the canopy cover in this community, with some areas having closed canopy and others completely open. The creek banks showed evidence of erosion causing tree failure, particularly toward the culvert where the creek runs under Sanatorium Road. Soils were found to be heavy, mainly clay. In Polygon 1, the A and B horizons were comprised of silty clay and clay, respectively. Mottles were seen at 40cm, indicating the depth of seasonally saturated soils.

Disturbance is high in this cultural community, both recent and historic in nature. An encampment was observed in one of the areas of more closed canopy, although it was unclear whether the makeshift shelter was still being used. Extensive dumping of garbage and debris was also observed. Historic disturbance was observed in the form of a small foot bridge and trail across the watercourse, poles which may have at one time supported lights or hydro lines, and a small gazebo platform which is currently surrounded by litter. Several small footpaths were observed within this community, mostly associated with the encampment.

Figure 7: Polygon 1: Mineral Cultural Woodland, showing encampment along creek

Figure 8: Chedoke Creek tributary

Polygon 5 consists of a treed area along the former internal roads of the Chedoke Hospital grounds. All of the mature trees within this community are assumed to have been planted as part of the former

hospital landscaping, as they are dominated by the non-native and commonly planted ornamental species including black pine (*Pinus nigra*), Norway maple, Thornless Honeylocust (*Gleditsia tricanthos var. intermis*) and Scots Pine (*Pinus sylvestris*). The understory consists of thicket and meadow species; the most common species included European buckthorn, Tartarian honeysuckle (*Lonicera tartarica),* garlic mustard, and Canada goldenrod. In Polygon 5, heavy clay soils were also present; the A and B horizons were comprised of silty clay loam and silty clay. Mottles were observed at 60cm.

Dumping and litter were observed along the edges of this community, including larger items such as construction debris and abandoned furniture.

Figure 9: Polygon 5: Mineral Cultural Woodland

Figure 10: Dumping along edges of Polygon 5

Anthropogenic Communities

Anthropogenic includes areas that have been altered for human use and no longer function as natural systems.

Polygon 3: Anthropogenic

Polygon 3 was classified as anthropogenic due to the majority of trees and shrubs having been mechanically cleared; this area was characterized in earlier ecological studies as a Coniferous Plantation. Remnant debris from the clearing activities was observed throughout this community, including uprooted stumps and haphazardly piled logs. Remaining trees, including Scots pine *(Pinus sylvestris)* and Norway maple are largely found around the perimeter of this community, with one remaining northern red oak in its center. The cleared areas are undergoing succession to a thicket community dominated by European buckthorn with occasional grey dogwood *(Cornus racemosa),* multiflora rose *(Rosa multiflora)*, and black raspberry *(Rubus occidentalis).* Abundant ground species in open areas included tall goldenrod *(Solidago altissima),* Canada goldenrod *(Solidago canadensis),* devils' beggarticks *(Bidens frondosa),* and great burdock *(Arctium lappa).* A soil sample taken in this Polygon was determined to be clay, with an A layer consisting of silty clay loam and a B layer of clay. Mottles were present at 40cm and gley began at 60cm.

Figure 11: Polygon 3 – Anthropogenic, former Cultural Plantation

Polygon 6: Anthropogenic

Polygon 6 was also determined to be anthropogenic due to the lack of natural features. The majority of the area consists of mown fields and parking lots, with scattered mature trees; formerly this Polygon was the grounds of the Chedoke Hospital and contained a number of buildings of which the Long & Bisby Building is the only remaining structure. Mature northern red oak trees were found occasionally throughout, along with smaller European buckthorn in the shrub layer. Norway Maple (Acer platanoides) have been planted along Scenic Drive and the western-most portion of Sanatorium Road. Kentucky bluegrass *(Poa pratensis)* was the dominant ground plant, with orchard grass *(Dactylis glomerata),* curled dock *(Rumex crispus),* and garlic mustard being present occasionally. Dumping of garbage was found throughout this area, consisting both of litter and larger debris.

Figure 12: Mature trees along Sanatorium Road

Figure 13: Polygon 6 – Anthropogenic

3.2.2.1. WOODLAND EDGE DELINEATION

The woodland edge determined through the August 14, 2019 field exercise with City of Hamilton and Hamilton Conservation Authority staff was used as the basis for the ELC vegetation Polygon boundaries shown on **Map 2**.

3.2.2.2. ARBORIST ASSESSMENT

A total of 522 trees were tagged and assessed during the tree inventory and assessment field; of these trees 1 was dead and 521 were alive. Overall the vast majority of trees surveyed were not native to Ontario – a difference of 54% non-native trees to 40% native trees. An additional 6% of trees were identified to genus only so could not definitively be designated as native or non-native.

A total of 56 species of trees were found during the tree surveys. Of the species identified, 28 are native to Ontario and 22 are non-native. The most abundant species was Norway Maple *(Acer platanoides*), a non-native tree, with a total of 154 trees tagged, followed by Red Pine *(Pinus resinosa*), at 30 trees and Green Ash *(Fraxinus pennsylvanica*), at 26 trees. 9.7% of the Red Pine and 52.6% of the Norway Spruce observed are in Polygon 5 (CUW1), and 46.1% of Norway Maple are in Polygon 1 (CUW1).

Please see the Tree Management Plan prepared by D&A (under separate cover) for the full arborist assessment findings.

3.3. SPECIES AT RISK (SAR) SCREENING

A list of SAR for the City of Hamilton and surrounding areas, updated to November 2018, was provided by Guelph District MNRF. The habitats on site were screened against known habitat requirements of these species to determine if any potential species could be present. The results of this screening are found in **Appendix G.**

The following SAR were found during 2019 field investigations:

- **Eastern Wood-Pewee (Special Concern)** – one territorial bird was heard singing on both breeding bird surveys in the escarpment forest to the east of the study area (Polygon 7). This species nests in a number of habitats, including parkland and other anthropogenic habitats so it is not particularly sensitive to development. Furthermore, these forests are being retained and buffered appropriately so, if this species is breeding, it will not be negatively impacted by the proposed development. See **Map 3 Wildlife Findings** for the location of this territorial bird.
- **Monarch (Special Concern)** – small numbers were seen in open areas on site during breeding bird surveys.

Considering the location of the site, and the habitats found on site, the following SAR could be found during some phase of their life cycle, however none were observed during the 2018 – 2019 field surveys:

- **Barn Swallow (Threatened**) – this bird could nest on the Long & Bisby building, and open foraging habitat is available on-site. However, none were detected during 2019 breeding bird surveys and no nests were observed on or inside the Long & Bisby Building.
- **Chimney Swift (Threatened)** – this bird could nest on the Long & Bisby building, and open foraging habitat is available on-site. However, none were detected during 2019 breeding bird surveys and no nests were observed on or inside the Long & Bisby Building. See Section 3.2.1.1.1 for more details.
- **Wood Thrush (Special Concern)** – suitable habitat is present in the adjacent Niagara Escarpment forests (ELC Polygon 7) for this bird, and there are recent breeding records from the

bottom of the Escarpment (GeoProcess 2017). However, none were detected during 2019 breeding bird surveys of the study site.

- **Monarch (Special Concern)** – this site is too far from Lake Ontario to represent Significant Wildlife Habitat from a migration concentration perspective (see Section 2.4) but the species may breed in small numbers as its hostplant (Common Milkweed) is present.
- **Endangered bats (Eastern Small-footed Myotis, Little Brown Myotis, Northern Myotis, and Tri-colored Bat)** – suitable habitat is present in the forested habitats on the study site (ELC Polygons 2, 4, and 7). Cultural Woodland habitats on the study site (ELC Polygons 1, 5) may present suitable habitat; an IGF has been submitted to the MECP to determine if any further study is required. See Section 3.2.1.4 for more details.

See **Appendix G** for the full SAR screening.

3.4. SIGNIFICANT WILDLIFE HABITAT SCREENING

Of the 38 categories of SWH, two are considered as "Candidate" within the study area and adjacent lands (within 120 metres):

- **Seasonal Concentration Areas of Animals: Bat Maternity Colonies** – the Niagara Escarpment forest (ELC Polygon 7) and adjacent Significant Woodland on the study site (Polygons 2, 4) contain snag trees that meet the size and density thresholds for significance (greater than 25 cm DBH with a density of 10 or more snags per hectare). These forests are being retained and buffered appropriately so will not be adversely impacted by the proposed development. One Cultural Woodland habitats on the study site (ELC Polygons 1) may present suitable habitat; an IGF has been submitted to the MECP to determine if any further study is required.
- **Habitat for Species of Conservation Concern**: Two Special Concern (SC) and Rare Wildlife Species were detected on the study site during field surveys, and several others may be present based on available habitat. Species detected during field surveys were Eastern Wood-Pewee was detected as "probable" breeding in the adjacent Escarpment forest (Polygon 7), and Virginia Bluebells was observed in Polygon 4. Species that may be present include:
    - Monarch butterfly, which may be present during migration, but in non-significant numbers, and may breed where Common Milkweed is available;
    - Wood Thrush (SC) may nest along escarpment forest.
    - See Section 3.3 for details on SAR.

Note that the City of Hamilton has not determined significance thresholds for SWH categories or mapped SWH. Therefore, it is not possible to confirm SWH at this time. The full SWH screening table is found in **Appendix H.**

3.5. CONCURRENT STUDIES

3.5.1. WATERCOURSE CHARACTERIZATION

The following information is summarized from the Watercourse Characterization study prepared by Wood PLC. The full report can be found in Appendix I.

No fish were observed within the watercourse or collected during the fish survey conducted by Wood on August 1, 2019. The watercourse originates from urban runoff approximately 1.1 km upstream of the Study Area and flows over the Niagara Escarpment downstream of Sanatorium Road. The drop off following Sanatorium Road would prevent fish from entering the Study Area from downstream end.

Little flow was observed during the field investigation. The water was clear with predominantly sand and silt substrate, and minor amounts of gravel. Little to no instream vegetation or instream cover is present, however dense riparian vegetation comprised of deciduous trees and herbaceous vegetation is present on both sides of the watercourse, providing an average of 50% riparian cover. Minor undercutting of the banks is present however the banks are stable. Based on the low water depth, (depths as low as 0.01 m), the lack of observable flow, the fish barriers present, and the Escarpment Valley downstream of Sanatorium Road, and the intermittent water observed upstream of the Scenic Drive, the watercourse did not seem suitable to support fish.

3.5.2. TECHNICAL DESIGN BRIEF: TRIBUTARY OF CHEDOKE CREEK REALIGNMENT

The following information is summarized from the Technical Design Brief: Tributary of Chedoke Creek Realignment study prepared by GeoMorphix. The full report has been included in the project submission under separate cover.

This report provides design recommendations for a realignment and enhancement of the tributary of Chedoke Creek on the study site. The study found that the existing channel is degraded, with entrenchment and erosion causing bank undercutting and tree failure. A re-design of the channel is proposed to "replace the existing degraded and previously disturbed channel with a watercourse that will offer significant improvements to channel form and function per unit length" (GeoMorphix 2020). The design includes naturalized riffles and pools, a well-developed bankfull channel with morphological variability, and proposed habitat features such as root wad bank treatments, brush mattresses, and offline wetlands.

3.5.3. HERITAGE IMPACT ASSESSMENT

The following information is summarized from the Heritage Impact Assessment (HIA) prepared by Megan Hobson, Built Heritage Consultant. The full report has been included in the project submission under separate cover.

The HIA notes that the Browlands site has been identified by the City of Hamilton as the Chedoke Browlands Cultural Landscape and is Listed on the City's Municipal Heritage Register; it was designated as a cultural landscape as an example of sanatorium design that capitalizes on the natural landscape attributes of the site for therapeutic purposes. The HIA focuses on the Long & Bisby building as the main cultural heritage component of the site. Other landscape elements which contribute to the cultural heritage landscape include the siting and orientation of the Long & Bisby building in relation to the mountain brow, the wood lot and Sanatorium Road, the park-like setting and relationship to the woodlot that wraps around the sides and back of the building, and views towards Sanatorium Road.

LEGISLATION & POLICIES

Current Federal, Provincial, Regional, and Local land use policy and regulations relevant to the site and the proposed development were reviewed and are documented in this section. Policy is referenced in subsequent sections as a key context to evaluate the opportunities and constraints imposed by the existing natural heritage features and ecological functions documented at the site.

Federal:

- Species at Risk Act (2002)
- Migratory Birds Convention Act (1994)

Provincial:

- Provincial Policy Statement (2014)
- Endangered Species Act (2007)
- Niagara Escarpment Plan (2017)
- Conservation Authorities Act (1990)

Regional/Local:

- Urban Hamilton Official Plan (2013)

Following are discussion of the portions of the policy documents relevant to the study area. All discussion of impacts, direct and indirect, can be found in Section 5, Constraint Analysis & Impact Assessment.

To reduce confusion with references to sections of this report, sections of the policy documents referenced herein are written in *italics*.

3.6. FEDERAL

3.6.1. SPECIES AT RISK ACT (GOVERNMENT OF CANADA, 2002)

Enacted in 2002, the Species at Risk Act (SARA) provides legal protection for species at risk at a federal level (Government of Canada, 2002). This act also helps to protect species identified as sensitive from becoming extinct and secure the actions for their recovery. This may include protecting critical habitat, and rehabilitation of impacted critical habitat.

Site Implications: On private lands, SARA only applies to listed aquatic species and listed migratory birds that are also listed in the Migratory Birds Convention Act, 1994 (Government of Canada, 1994). See Appendix C for the wildlife survey results, which includes a list of avian species protected by this Act. Eastern Wood-Pewee is listed as Special Concern under SARA but protection does not apply here as it is private land. However, Eastern Wood-Pewee is also protected under provisions of the PPS for Significant Wildlife Habitat, and under the MBCA.

No aquatic species protected by SARA are present within the study area or adjacent lands, so the legislation is not triggered.

3.6.2. MIGRATORY BIRDS CONVENTION ACT (GOVERNMENT OF CANADA, 1994)

This federal legislation protects the nests, eggs and offspring of listed migratory bird species from destruction or disturbance (Government of Canada 1994a, b). In its application, it requires best management practices to detect and avoid disturbance to active nests during development activities.

Site Implications: Incidental take of migratory birds, nests or eggs must be avoided by limiting activities during sensitive periods and mitigation measures to ensure appropriate nesting areas are re-established in the site. Vegetation clearing should not take place within the active nesting season between approximately April 15 and August 15. If this cannot be accommodated construction may be permitted if the areas proposed for development are thoroughly checked prior to clearing and construction during the active breeding season for bird nests by a qualified biologist, and it is determined that no active nests are present. Appendix C lists the avian species known from the study area that are protected by this Act.

3.7. PROVINCIAL

3.7.1. PROVINCIAL POLICY STATEMENT (GOVERNMENT OF ONTARIO, 2020)

The Provincial Policy Statement (PPS) is issued under the authority of Section 3 of the Planning Act (Government of Ontario, 1990a). Section 3 requires that decisions affecting planning matters "shall be consistent with" policy statements under the Act. It should also be noted that Page 2 of the PPS establishes that the PPS is to be read in its entirety and all relevant policies are to be applied to each situation.

Section 2.1 of the Provincial Policy Statement, which relates specifically to natural heritage, establishes clear direction on the adoption of an ecosystem approach, and the protection of resources that have been identified as 'significant': wetlands, woodlands, valleylands, wildlife habitat, areas of natural and scientific interest, and coastal wetlands. Relevant portions of Section 2.1 include the following:

Section 2.1.5 of the PPS states that development and site alteration of the following features is not permitted unless it has been demonstrated that there will be *no negative impacts* on the natural features or their ecological functions:

a) significant wetlands in the Canadian Shield north of Ecoregions 5E, 6E and 7E1;
b) significant woodlands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River);
c) significant valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Marys River);
d) significant wildlife habitat;
e) significant areas of natural and scientific interest; and
f) coastal wetlands in Ecoregions 5E, 6E and 7E1 that are not subject to policy 2.1.4(b)

Section 2.1.8 of the PPS states that development and site alteration on *adjacent lands* to natural heritage features identified in Section 2.1.4 are not permitted unless there has been an evaluation of the ecological function of the adjacent lands and it has been demonstrated that there will be *no negative impacts* on the natural features or on their ecological functions (OMMAH, 2005).

Site Implications: The study area contains significant woodlands (Polygons 2 and 4), and is adjacent to the Niagara Escarpment, a Life Science ANSI, mapped as Polygon 7. ELC Polygons 4 and 7 are also considered Significant Wildlife Habitat due to the presence of significant wildlife species. Site alteration and development within these features or within their adjacent lands or only permitted if a study demonstrates that there will be *no negative impacts* on the features and their ecological functions.

ELC Polygons 2, 4, and 7 are not being disturbed as part of the proposed development, which is occurring on adjacent lands to these features. Mitigation and restoration in the form of fencing, edge plantings, removal and re-planting of an existing tennis court creating a gap within Polygon 4, and invasive species control are proposed to protect and enhance these forest communities, and ensure that this development will have no negative impacts on the ecological features or functions of these vegetation communities. See **Section 4** for a discussion of impacts and **Section 5** for proposed mitigation measures.

3.7.2. ENDANGERED SPECIES ACT (GOVERNMENT OF ONTARIO, 2007)

This legislation provides the provincial mandate for the protection of species identified as Endangered, Threatened or Special Concern at the provincial level. Significant habitats of provincially Endangered and Threatened species are specifically protected from development in the PPS, and habitats of provincial Special Concern species are recognized under the Province's Significant Wildlife Habitat categories.

Site Implications: Since Special Concern SAR are protected under SWH policies per the PPS, only Endangered and Threatened species are protected by the ESA. The field investigations on the site screened for but did not detect any Endangered or Threatened species. Endangered bats (four species possible) may be present Polygons 2, 4, and 7 as they meet bat habitat requirements set out by the MNRF (2017) and may be used by Endangered bats for maternity roosting. Maternity roost habitat must not be disturbed unless it is permitted by the Ministry of Environment, Conservation, and Parks (MECP).

The forested habitats on the study site (Polygons 2, 4, and &) will not be disturbed by the proposed development and therefore habitat for Endangered species of bats will not be disturbed. In order to ensure compliance with the ESA an Information Gathering Form has been submitted to the MECP in conjunction with preparation of this EIS. See **Section 3.3** for more details.

3.7.3. THE NIAGARA ESCARPMENT PLAN (GOVERNMENT OF ONTARIO, 2017)

The property is located within an Urban Area as defined in the Niagara Escarpment Plan (NEP) and is adjacent to an Escarpment Natural Area (per Map 2, City of Hamilton, of the Niagara Escarpment Plan 2017). NEP lands are regulated by the Niagara Escarpment Commission (NEC) under the Niagara Escarpment Planning and Development Act (NEPDA). The Niagara Escarpment is a United Nations Educational, Scientific and Cultural Organization (UNESCO) Biosphere Reserve, and the NEP upholds the biosphere reserve principles. The purpose of the NEP is to "*provide for the maintenance of the Niagara Escarpment and land in its vicinity substantially as a continuous natural environment, and to ensure only such development occurs as is compatible with that natural environment*" (NEP 2017).

Relevant policies pertaining to this EIS are as follows:

- *Section 1.3* defines what features in the NEP area are included as ENA (e.g. woodlands) and defines policies to protect such areas. The Criteria for Designation, per Section 1.31., also include ANSIs (Life Science) and valleylands. Where woodlands abut the escarpment, the designation

includes woodlands within 300 metres of the brow of the escarpment. Note that, per Section 1.3.3 (Permitted Uses), subdivisions and other such intensive development are not permitted in ENAs.

- *Section 1.7* defines the objectives, criteria for designation, boundaries, permitted uses, and development objectives for Urban Areas within the NEP. The overall objective of these policies is to minimize the impacts and prevent further encroachment of these areas (of which the City of Hamilton is included in the list in Section 1.7.2). Of the ten development objectives presented in *Section 1.7.5*, those pertinent to this EIS are items 4, 5, and 6 which pertain to development and new lots not encroaching into ENAs, and items 9a and 9b, pertaining to the protection of natural heritage and hydrologic features and functions.
- *Section 2.6* Outlines policies that are in place to protect hydrological features and functions including the quality, quantity and character of ground water and surface water, at the local and watershed level.
    - *2.6.3:* If a proposal for development is within 120 meters of a hydrological feature and has the potential to result in a negative impact, a hydrological evaluation is required. 3(a) It must demonstrate that the development will protect: the key hydrological feature or hydrological functions of that feature, the quality and quantity of groundwater and surface water, natural streams or drainage patterns and the overall water budget for the watershed, including existing and planned municipal drinking water systems. 3(b) identifies planning, design and construction practices that will minimize erosion, sedimentation and the introduction of nutrients or pollutants and protect, and where possible enhance or restore, diversity and size of the key hydrological feature. 3(c) determines the minimum Vegetation Protection Zone require to protect and where possible enhance the key hydrological feature and its functions.
    - *2*.6.4: A Vegetation Protection Zone (VPZ) shall: a) be of sufficient width to protect the key hydrological feature and its function from the impacts of the proposed change and associated activities that may occur before, during and after construction, and where possible, restore or enhance the feature and/or its function and b) be established to achieve , and be maintained as natural self-sustaining vegetation. In section 2.6.5: in the case of permanent and intermittent streams and seepage areas and springs, the determination of the VPZ shall include, without limitation, an analysis of land use, soil type and slope class.
    - 2.6.8: No sewage system shall be allowed closer than 30m from a key hydrological feature. Where the setback cannot be achieved on an existing lot of record, the distance may be varied depending upon sensitivity of the feature, to the satisfaction of the implementing authority.
    - Section 2.6.9: Development shall protect the quality and quantity of groundwater and surface water.
    - Section 2.6.10: Changes to the natural drainage feature shall be avoided.
- *Section 2.7* outlines policies that are in place to protect and enhance (where possible) natural heritage features and functions. This includes the objective of protecting and enhancing natural heritage features and functions. Potential and known Key Natural Heritage Features (KNHF) as defined in the NEP (*Section 2.7.1*), that are within 120 metres of the study area are *Habitat of endangered species and threatened species*, *Life Science ANSI*, *Significant woodlands*,

Significant wildlife habitat (Candidate only; see Section 2.4), and *Habitat of special concern species in Escarpment Natural and Escarpment Protection areas.*

- *2.7.6:* If a proposed development is within 120 metres of a KNHF, such as this one (which is adjacent to the ENA), it must: demonstrate that the KNHF or its related functions will be protected; identify practices to minimize erosion, sedimentation and introduction of nutrients or pollutants, and protect and enhance or restore the health, diversity and size of the KNHF; determine minimum Vegetation Protection Zones (VPZ) to protect and enhance the KNHF and its functions; and, demonstrate that the connectivity between KNHF and Key Hydrologic Features within 240 metres will be maintained and enhanced for movement for native plants and animal across the landscape.
- *2.7.7:* The VPZ shall: be of sufficient width to protect and enhance the KNHF and its functions from impacts from the proposed development that may occur before, during and after construction; be established and maintained as natural self-sustaining vegetation; and, in the case of ANSIs (Earth Science and Life Science), include an analysis of land use, soil type and slope class.

- *Section 2.10* addresses cultural heritage aspects of the Escarpment and was requested to be included in this EIS by the NEC.
- *Section 2.12* outlines policies regarding the design and location of infrastructure so that the least possible impact occurs on the Escarpment environment.
- *Section 2.13* outlines policies with the object of ensuring that development preserves the natural scenery and maintains related landforms and open landscapes of the Escarpment.

Site Implications:

ELC Polygon 7 is classified as ENA according to NEP Map 2, and Polygons 2 and 4 are also designated ENA according to policy 1.3 as they abut the Escarpment and are contiguous with Polygon 7. These Polygons are also considered KNHF's due to the presence of significant species and SWH. The proposed development, therefore, needs to be located outside these Polygons and set back by an appropriate VPZ. The proposed development does not encroach into the ENA, with buildings set back a minimum of 30m from the brow of the Escarpment and all development set back a minimum of a 10m VPZ from the significant woodlands on and adjacent to the Escarpment (ELC Polygons 2, 4, and 7). In this way the significant natural features and functions of these significant woodlands are protected and mitigation is proposed for any residual impacts.

ELC Polygon 1 contains a warmwater watercourse that is not classified as fish habitat (see **Section 3.5.1** and **Appendix I**). As this watercourse is located within the NEP policy area it is considered a Key Hydrological Feature. See study Hydrogeologic Investigation Proposed Residential Development, 801, 820, 828, 855, 865 and 870 Scenic Drive, Hamilton, Ontario (2020) by Landtek for full details on the hydrogeological evaluations carried out for this project. As described in the Technical Design Brief for Chedoke Creek by GeoMorphix (see **Section 3.5.2**) the existing creek is degraded, and full reconstruction of this creek is proposed to enhance the existing structure and ecological function of this creek. See the Technical Design Brief (2020, submitted under separate cover) for full details on the creek's existing condition and details of the proposed reconstruction.

The remainder of the study area is classified as Urban Area.

See **Section 4** for a discussion of impacts and **Section 5** for proposed mitigation measures.

For a discussion on cultural heritage and the application of NEP policy, please see Heritage Impact Assessment (2020) by Megan Hobson.

3.7.4. CONSERVATION AUTHORITIES ACT - ONTARIO REGULATION 161/06 (2006) - HAMILTON CONSERVATION AUTHORITY

The Hamilton Conservation Authority (HCA) is authorized under Regulation 161/06 of the Conservation Authorities Act to implement and enforce the regulation of development, interference with wetlands and alterations to shorelines and watercourses. Permits are required to identify potential interference in areas within the 100-year floodline, 15 metres of the shoreline, 15 metres within a valley's top bank, hazard lands and 120 metres around all Provincially Significant Wetlands and 30 metres of all other wetlands. The Chedoke Creek tributary on the study site is regulated by HCA, and they are a commenting agency on this EIS.

Site Implications:

Please see the hydrogeological study by Landtek for a detailed explanation of the existing and proposed hydrology of the site, and the Technical Design Brief report by GeoMorphix detailing the proposed channel improvements.

3.8. LOCAL

3.8.1. CITY OF HAMILTON URBAN OFFICIAL PLAN (CITY OF HAMILTON, 2013)

The Urban Hamilton Official Plan provides long-term direction and guidance over planning matters, such as land use and development, within the amalgamated communities within the City of Hamilton. This includes the development of a natural heritage system to protect natural areas and features within the Greenbelt Plan, the Niagara Escarpment Plan, and additional locally and provincially significant natural areas within the City that are beyond these planning areas. Furthermore, policies applicable to the study site are presented in the Chedmac Secondary Plan (2018).

<u>Urban Hamilton Official Plan (OP) Policies</u>

Part of the site has been designated a Hamilton Core Area, comprised of Significant Woodlands and an Environmentally Significant Area (Hamilton Escarpment, ESA #47). Core Areas are defined in OP *Section 2.3.1* as key natural heritage features, key hydrological features or other locally and provincially significant natural areas (City of Hamilton 2009) and are the most important components of the City's Natural Heritage System in terms of biodiversity, productivity, and ecological and hydrological functions. For the study area, Core Areas are mapped on Schedules B, B-1 to B-8 of the Hamilton Official Plan:

- *Schedule B* (Natural Heritage System) identifies the forested areas of the study site as a Core Area (City of Hamilton 2018).
- *Schedule B-2* (Detailed Natural Heritage Features Significant Woodlands) defines the forest areas of the site as Significant Woodlands;
- *Schedule B-6* (Detailed Natural Heritage Features Environmentally Significant Areas) defines some, but not all of the Schedule B and Schedule B-2 lands as Environmentally Significant Areas; and
- *Schedule B-8* (Natural Heritage Features Key Hydrologic Features Streams).

The limits of the Core Areas on the site was defined as part of this EIS study through a site walk with City of Hamilton and Hamilton Conservation Authority staff; see **Map 4, ESA Boundaries**.

New development or site alterations within or adjacent to Core Areas shall require the approval of an EIS which demonstrates the following (as per *Section 2.5.8*):

a) There shall be no negative impacts on the Core Area's natural features or their ecological functions;
b) Connectivity between Core Areas shall be maintained, or where possible, enhanced for the movement of surface and ground water, plants and wildlife across the landscape;
c) The removal of other natural features shall be avoided or minimized by the planning and design of the proposed use or site alteration wherever possible.

According to *Section 2.5.9* of the OP, the EIS should also propose a vegetation protection zone (VPZ) of sufficient width to protect the Core Area and its ecological functions during and after construction, where VPZs are to be maintained as natural, self-sustaining vegetation. *Section 2.5.10 f*) indicates that the recommended VPZ for Significant Woodlands is 15 metres measured from the edge (drip line) of the woodland. Section 2.5.10 states Warmwater Watercourse and Important and Marginal Habitat – 15 metre vegetation protection zone on each side of the watercourse, measured from the bankfull channel. *Section 2.5.11* further states that VPZs greater or less than 15 m may be acceptable as determined through an approved EIS, and that "*widths shall be determined on a site-specific basis, by considering factors such as the sensitivity of the habitat, the potential impacts of the proposed land use, the intended function of the vegetation protection zone, and the physiography of the site*."

With regard to what happens within the VPZ, the OP states the following: "*Permitted uses within a vegetation protection zone shall be dependent on the sensitivity of the feature, and determined through approved studies. Generally, permitted uses within a vegetation protection zone shall be limited to low impact uses, such as vegetation restoration, resource management, and open space. Permitted uses within the vegetation protection zone shall be the same uses as those within the Core Area in Policy C.2.5.1 and the vegetation protection zone should remain in or be returned to a natural state*." The OP also states that plantings proposed within the VPZs should be non-invasive plant species native to Hamilton.

Water Resources

Section 2.13.1

The City shall protect, improve or restore the quality and quantity of water by using the watershed as the ecologically meaningful scale for planning and minimizing potential negative impacts, including cross-jurisdictional and crosswatershed impacts.

Section 2.13.2

The City shall promote efficient and sustainable use of water resources, including practices for water conservation and sustaining water quality.

Section 2.13.3

Development and site alteration shall be restricted in or near sensitive surface water features and sensitive ground water features and tributaries including those tributaries defined by the City's Source Protection Plan such that these features and their related hydrologic functions and water quality functions shall be protected, improved or restored. Mitigative measures and/or alternative development approaches may be required in order to protect, improve or restore sensitive surface water features, sensitive ground water features, and their hydrologic functions.

Chedmac Secondary Plan

Area Specific Policy – Area B (OPA 109) of the Chedmac Secondary Plan and the Chedmac Secondary Plan Land Use Plan (*Map B.6.3-1*) address the study area for this EIS. *Policy 6.3.7.2* states:

> *The Chedoke Browlands are located north of the intersection of Scenic Drive and Sanatorium Road, known municipally as 801-780 Scenic Drive, designated Medium Density Residential 3, General Open Space and Natural Open Space, and identified as Area Specific Policy Area B on Map B.6.3.1 – Chedmac Secondary Plan – Land Use Plan.*

Relevant policies pertaining to this EIS are as follows:

Section 6.3.7.2.1 Objectives

> iv. To integrate natural and cultural heritage features into the design of the site with specific focus on the open space areas as well as providing a strong link to the Niagara Escarpment;
> x. To provide and/or protect significant views and encourage sensitive development adjacent to the Niagara Escarpment.

Section 6.3.7.2.3 Natural Open Space

> a) Lands designated "Natural Open Space" and identified as B-3 and B-4 on Map B.6.3-1 Chedmac Secondary Plan – Land Use Plan shall be preserved as natural open space and no development shall be permitted. Conservation, flood and erosion control, and passive recreation uses shall be permitted.
>
> c) A vegetative protection zone (buffer) will be provided along B-3, as identified through an approved Environmental Impact Statement, and revegetated in accordance with the recommendations of this study.

Section 6.3.7.2.4 Urban Design

> n) A minimum of 30% of landscaped open space shall be maintained for each of Areas B-1 and B-2. In order to preserve the open, park-like setting, the established groupings of trees shall be preserved, where possible.

Section 6.3.7.2.6 Cultural Heritage Resources

> d) Development within the Chedoke Browlands (Area B) shall have regard to the following cultural heritage landscape requirements:
>
> ii) The existing topography of the perimeter roads, woodlots and Chedoke Creek and stormwater management facility shall be maintained, where feasible.
>
> iii) The existing trees and vegetation within the Chedoke Creek/stormwater management facility shall be maintained and enhanced.
>
> iv) A tree preservation plan shall be submitted to determine the opportunities for the protection and preservation of individual trees and the recommendations shall be implemented to the satisfaction of the City. The plan shall be prepared in association with the Heritage Impact Assessment so that trees that contribute to the cultural heritage landscape can be identified and considered for preservation;

The ELC Polygons in this report relate to the designations on the Chedmac Secondary Plan Land Use Plan as follows:

- Area B-1: Polygon 6 ANTH and Polygon 5 CUW1;
- Area B-2: Polygon 6 ANTH;
- Area B-3: Polygon 2 FOD5-3, Polygon 3 ANTH and Polygon 4 FOD; and

- Area B-4: Polygon 1 CUW1.

Site Implications:

The City of Hamilton policies define and protect the environmentally significant portions of the study area, and provide guidelines with regard to urban design, development, heritage preservation, and tree preservation for the remainder of the site.

The ESA Core Area includes ELC Polygons 2, 4, and 7; the limit of the ESA was defined through a site walk with the City of Hamilton and Hamilton Conservation Authority, see **Map 4, ESA Boundaries**. The ESA will be protected from development with a minimum 10m buffer / VPZ proposed in combination with fencing, edge plantings consisting of native species, removal and re-planting of an existing tennis court creating a gap within Polygon 4, and invasive species control to protect and enhance the ESA. See **Section 4** for a discussion of impacts and **Section 5** for proposed mitigation measures, including a rationale for the proposed buffer width.

The warmwater watercourse (ELC Polygon 1) on the site is being realigned as discussed in the Technical Design Brief: Chedoke Creek Realignment (2020) by GeoMorphix (submitted under separate cover). The realignment is proposed to improve the hydrological and ecological quality of the watercourse on the study area. As the entire creek corridor is affected by this realignment, no VPZ is proposed as no vegetation will be preserved. See **Section 4** for a discussion of impacts and **Section 5** for proposed mitigation measures.

Tree impacts are discussed in a Tree Management Plan (TMP), prepared by Dougan & Associates. See the TMP (submitted under separate cover) for full details, and **Section 2.2.2.3** for a summary of the tree findings for the site.

4. CONSTRAINT IDENTIFICATION AND IMPACT ASSESSMENT

This section of the report describes the natural features or functions with sensitivity to development and/or constrained by environmental policies on the property or nearby the property with the potential to be impacted by the proposed development and the potential impacts which may occur as a result of the proposed site alterations.

The natural heritage constraints present on the Browlands property include:

- Significant Woodland / ESA
- Arboricultural resources (trees)
- Species-at-Risk (Eastern Wood-Pewee, Monarch, Bats)
- Provincially rare plants (Virginia Bluebells)
- Locally rare plants (White Goldenrod)
- Significant Wildlife Habitat
- Wildlife (general)
- Chedoke Creek tributary corridor

For the purposes of mapping (Map 4) these have been identified as High, Medium, or Low constraint as follows:

- **High Constraint** (areas with provincially significant features and/or functions):
    - Significant Woodland (ELC communities 2, 4, 7);

- Species-at-Risk (ELC communities 2, 7);
- Provincially & locally rare plants (ELC community 4);
- Significant Wildlife Habitat (ELC communities 2, 4, 7)

- **Medium Constraint** (areas with locally significant features and/or functions, or cultural communities with some natural heritage value):
  - Chedoke Creek tributary corridor (ELC community 1*);

- **Low Constraint** (anthropogenic and/or maintained communities):
  - Arboricultural resources (trees) not associated with Significant Woodlands or Chedoke Creek tributary corridor (ELC communities 3, 5, 6);

*Note that ELC community 1 may be High Constraint pending input from the MECP regarding potential bat maternity roost habitat in this community.

These constraints were identified through desktop and field assessments as described in **Section 3**. This EIS considers the direct, indirect, and cumulative impacts that may occur to these natural heritage constraints due to the proposed development and proposes recommendations for mitigation and restoration where needed.

4.1. DIRECT IMPACTS

Table 5: **Direct Impact Summary Matrix** presents an analysis of direct impacts to natural features and functions on the Browlands site. It contains the following information:

- **Natural Heritage Constraint:** natural features or functions with sensitivity to development and/or constrained by environmental policies on the property or nearby the property with the potential to be impacted by the proposed development.
- **ELC Polygon Where Constraint Found:** physical location of natural heritage constraint. Refer to Map 3.
- **Potential Impact:** a description of potential direct impacts that may occur to the ecological features and/or functions of the study site and adjacent natural features as a result of proposed development if no avoidance or mitigation is undertaken.
- **Magnitude / Extent of Impact:** anticipated direct impact for the natural heritage constraint given the proposed development plan.
- **Mitigation & Enhancement:** where impacts are anticipated to occur, mitigation and/or enhancement actions are recommended, with section references provided details in to **Section 5, Mitigation Measures**.

Table 5: **Direct Impact Summary Matrix**

Natural Heritage Constraint	ELC Polygon Where Constraint Found	Potential Impact	Anticipated Magnitude / Extent of Impact	Mitigation Required?
Significant Woodland / ESA	*2, 4, 7*	*Modification and/or loss of Significant Woodland / ESA due to development.*	No direct impacts, ELC polygons 2, 4, and 7 are not being disturbed as part of the proposed development.	No mitigation required for direct impacts, as none are anticipated. See discussion under Indirect Impacts (Section 4.2).
Arboricultural resources (trees)	*1, 3, 5, 6* *(note: trees are also present in polygons 2, 4, and 7 but as these are within the Significant Woodland / ESA which will be protected individual trees were not assessed)*	*Removal of trees due to development.*	Total # of trees assessed which are proposed for removal: **438** Total # of trees assessed which are proposed as "injure" (grading to be reviewed at time of construction to determine if trees can be retained): **35**	Yes, see **Section 5.1.2.**
Species-at-Risk **(Eastern Wood-Pewee, Monarch, Bats)**	*1, 2, 4, 7*	*Kill, harm or take Species at Risk, or disrupt habitat of Species at Risk.*	No direct impacts to ELC polygons 2, 4, and 7 as they are not being disturbed as part of the proposed development so impacts to Eastern Wood-Pewee and Bat habitat in these areas will be avoided. Creek reconstruction in Polygon 1 may represent direct impacts to bat maternity roost habitat; awaiting direction from MECP. Monarch present in low numbers throughout site, vegetation clearing may affect Milkweed host plants.	Eastern Wood-Pewee: No mitigation required for direct impacts, as none are anticipated. Bats: Pending direction from MECP, see **Section 5.1.3.1** Monarch: Yes, see **Section 5.1.3.2**
Provincially rare plants (Virginia Bluebells)	*4*	*Remove or disrupt habitat of provincially rare plants.*	No direct impacts, ELC polygon 4 is not being disturbed as part of the proposed development.	No mitigation required for direct impacts, as none are anticipated.
Locally rare plants **(White Goldenrod)**	*2*	*Remove or disrupt habitat of locally rare plants.*	No direct impacts, ELC polygon 2 is not being disturbed as part of the proposed development.	No mitigation required for direct impacts, as none are anticipated.
Significant Wildlife Habitat	*2, 4, 7*	*Modification and/or loss of SWH due to development.*	No direct impacts, ELC polygons 2, 4, and 7 are not being disturbed as part of the proposed development.	No mitigation required for direct impacts, as none are anticipated.
Wildlife (general)	*All*	*Potential for breeding bird disruption through removal of vegetation.* *Potential for incidental mortality of small mammals and reptiles due to construction conflicts.*	ELC communities 1, 3, 5, and 6 will be disturbed by construction, with all vegetation removed.	Yes, see **Section 5.1.5**
Chedoke Creek tributary corridor	*1*	*Creek and creek corridor reconstruction.*	ELC polygon 1, the Chedoke creek tributary corridor, is being completely reconstructed as part of development in order to address flooding, hazard, and SWM requirements. Potential loss of migratory bird & bat roosting habitat. No existing amphibian breeding or fish habitat.	Yes, see **Section 5.1.6**

4.2. **INDIRECT IMPACTS**

Table 6: **Indirect Impact Summary Matrix** presents an analysis of indirect impacts to natural features and functions on the Browlands site. The information in this table is presented in the same format as **Table 5**.

Table 6: **Indirect Impact Summary Matrix**

Natural Heritage Constraint	ELC Polygon Where Constraint Found	Potential Impact	Anticipated Magnitude / Extent of Impact	Mitigation Required?
Significant Woodland / ESA	*2, 4, 7*	*Degradation of Significant Woodland / ESA due to development and use of site post-construction*	Increased human use of site post-construction, could result in degradation due to encroachment.	Yes, see **Section 5.1.1**
Arboricultural resources (trees)	*1, 3, 5, 6* *(note: trees are also present in polygons 2, 4, and 7 but as these are within the Significant Woodland / ESA which will be protected individual trees were not assessed)*	*Disruption of trees to remain.*	All impacts are direct, see Direct Impacts table.	No indirect impacts, see **Table 5**: **Direct Impact Summary Matrix**
Species-at-Risk (Eastern Wood-Pewee, Monarch, Bats)	*1, 2, 4, 7*	*Kill, harm or take Species at Risk, or disrupt habitat of Species at Risk*	See Significant Woodland / ESA	See discussion under Significant Woodland / ESA, **Section 5.1.1**
Provincially rare plants (Virginia Bluebells)	*4*	*Remove or disrupt habitat of provincially rare plants.*	See Significant Woodland / ESA Potential alteration in habitat due to water regime changes.	See discussion under Significant Woodland / ESA, **Section 5.1.1**, also **Section 5.1.4**
Locally rare plants (White Goldenrod)	*2*	*Remove or disrupt habitat of locally rare plants.*	See Significant Woodland / ESA	See discussion under Significant Woodland / ESA, **Section 5.1.1**
Significant Wildlife Habitat	*2, 4, 7*	*Degradation of SWH due to development and use of site post-construction*	See Significant Woodland / ESA	See discussion under Significant Woodland / ESA, **Section 5.1.1**
Wildlife (general)	*All*	*Disturbance to wildlife during and post-construction.*	Sensory disturbance due to machinery noise. Potential for habitat continuity disruption. Increased human use of site post-construction, could result in habitat degradation due to encroachment.	Yes, see **Section 5.1.5**
Chedoke Creek tributary corridor	*1*	*Creek and creek corridor reconstruction.*	All impacts are direct, see Direct Impacts table.	No indirect impacts, see **Table 5**: **Direct Impact Summary Matrix**

4.3. **CUMULATIVE IMPACTS**

Cumulative effects as defined for the Canadian Environmental Assessment Act (2012) are "changes to the environment that are caused by an action in combination with other past, present and future human actions". In the context of the proposed Browlands development, the study area has been occupied by post-settlement land uses for more than a century, and the surrounding area above the Escarpment has been occupied by largely single family residential uses for approximately the same time period, although the density of population and ancillary effects has increased over time. The nearby residential areas show signs of infilling and increased development as larger older homes have been replaced by more dense residential uses.

The former Chedoke Hospital was a sanitarium built in 1906 for the treatment of tuberculosis patients; the site had apparently been used prior to hospital construction f in a tent-based treatment site prior to construction. The operation of the hospital for approximately a century was accompanied by expansion of buildings and amenities such as parking, and activity areas (such as tennis court, Cross of Lorraine). and parking; all except the monument and tennis court were demolished when the hospital was decommissioned, leaving only the original hospital building (building name?)

The adjoining forested Escarpment formed the historical physical limit of development, however it was also impacted by past deforestation and introductions over time of non-native canopy trees such as Norway and Sycamore maples. Previously cleared areas of the hospital site were selectively planted with a variety of native and non-native tree species, and some coniferous plantation was established, that was subsequently cleared. Based on our previous studies near the Escarpment, complete deforestation was pretty much the pattern on most lands; only a few older growth forest areas remain above and below the Escarpment.

The close proximity of the site to long-standing human settlement and institutional uses promoted impacts such as informal trail development, introduction of non-native species, localized erosion of shallow soils, and compaction impacts affecting the health of the forest. In addition, tableland runoff was gradually consolidated in the built area, and road infrastructure upgraded to direct runoff into storm sewers eventually outletting to remnant watercourses such as the Chedoke Creek tributary on the site. Modern stormwater management practices that were first introduced beginning in the 1980's have not yet been implemented in this area, and flows are currently partially managed with swale and catchbasin level controls, with outlets over the Escarpment and minimal attenuation of water quantity and quality.

The proposed development will largely occupy lands previously disturbed by the sanitarium and ancillary uses. There are a number of indirect effects (negative and positive) that should also be considered cumulative, as follows:

- Introduction of new residents to the area which will increase pedestrian activities and vehicular traffic
- Increased road traffic which will likely result in greater mortality of common wildlife species
- Resumed and likely intensified proximity effects from noise, light, encroachment and introduction of non-native plant species; however is in the context of existing and long-standing residential uses which have already created such effects
- Introduction of buffers and fencing which will confine and direct pedestrian movements
- Introduction of stormwater management for the subject lands, and replacement of an existing channel with a better-functioning, intentionally designed and planted, natural channel design

- This EIS includes recommendations for management of existing invasive species, and vegetative enhancements, which when implemented will provide net benefits to the natural system in the ESA.

The project will complete the build-out of the area in accordance with the vision of the NAME Secondary Plan and is unlikely to lead to subsequent development unless the City and Province mandate further density. The development will extend existing effects but will provide more protective measures than have been employed in the neighbourhood previously. Protective and enhancement measures are proposed which will better manage problems such as uncontrolled pedestrian access, encampments and fire pits, litter dumping, and invasive species. Therefore in our opinion the cumulative effects to the local environment will be nominal and there will be some net benefits of development. Although regional-scale impacts are likely primarily related to increased population impacts on regional infrastructure, air quality etc., these effects are matters considered in the UHOP and Growth Plan for the GTAH and are therefore outside the scope of this EIS.

5. MITIGATION MEASURES

Having identified the activities associated with the proposed development and assessed the potential impacts of those activities on the existing natural heritage features characterized for the Chedoke Browlands study area, the following mitigation and restoration strategies are proposed in order to achieve a net result of no negative impacts through a net gain in quantity and/or quality for onside and adjacent natural heritage features and functions.

The objective of mitigating identified impacts is to protect the natural heritage features and functions or minimize impacts. Mitigation can be described as actions taken during the planning, design, construction and operation of works and undertakings to alleviate (avoid or reduce/minimize) potential adverse effects on features and functions.

Restoration is distinct from mitigation in that it addresses the 'residual' impacts that remain after mitigation measures have been implemented. Restoration can take different forms, however the ultimate objective is to ensure that the project will not result in negative impacts. Restoration is the replacement and/or enhancement in either the quantity or quality of the existing features and functions.

The main principles behind mitigation/restoration are:

1. To limit the extent of impacts through site specific mitigation responses;
2. To plan for the recovery from remaining impacts with effective restoration; and,
3. To identify opportunities for enhancements to improve ecosystem function and overall biodiversity.

5.1. PROPOSED MITIGATION & RESTORATION MEASURES

The proposed mitigation measures to be implemented for this property are summarized in

Table 7. Mitigation and Restoration Measures.

Table 7. Mitigation and Restoration Measures

Natural Heritage Constraint	ELC Polygon Where Constraint Found	Mitigation & Enhancement
Significant Woodland / ESA	*2, 4, 7*	All impacts are **indirect** and have the potential to occur due to changes in human use of site. Mitigation is proposed to strengthen forest edge and resiliency of existing degraded portions of the ESA: • Install tree protection fencing, including silt cloth, at limits of development prior to construction commencing to prevent unintentional direct impacts during construction. • VPZ along edge of Significant Woodland to be vegetated with dense, ecologically appropriate vegetation. • Re-establish forest edge within Polygon 3. • Remove and revegetate derelict tennis court in ELC Polygon 4 to fill the existing forest canopy gap. • Manage Common Buckthorn within Polygons 3, 4. See **Section 5.1.1**
Arboricultural resources (trees)	*1, 3, 5, 6*	Mitigation proposed to protect trees to remain, compensation required for trees lost due to construction: • Install tree preservation fencing, including silt cloth, at limits of development prior to construction commencing to protect remaining trees and root zones. • Have tree preservation fencing inspected and approved by arborist prior to start of construction. • 1:1 tree compensation for all trees ≥10cm DBH which are proposed for removal. See **Section 5.1.2.**
Species-at-Risk (Eastern Wood-Pewee, Monarch, Bats)	*1, 2, 4, 7*	Potential for habitat disruption for SAR; mitigation is proposed to avoid construction impacts, protect habitat, and replace potential lost habitat: • Eastern Wood-Pewee: See discussion under Significant Woodland / ESA, **Section 5.1.1** • Bats: See discussion under Significant Woodland / ESA, **Section 5.1.1.** For potential maternity roost habitat in Polygon 1 (awaiting MECP direction), tree removal should occur outside of April 1 to October 31 to avoid disturbing, harming, or killing any bats. Bat boxes to be installed in reconstructed creek corridor and woodland habitat to be re-established. See **Section 5.1.3.1** • Monarch: Any areas containing Common Milkweed can be removed outside of the Monarch breeding season (June to September, when chrysalises and/or pupae are present) and compensated for in plantings elsewhere on the site. See **Section 5.1.3.2**
Provincially rare plants (Virginia Bluebells)	*4*	Measures are proposed to avoid construction impacts, maintain existing hydrological regime, and protect existing habitat: • See discussion under Significant Woodland / ESA, **Section 5.1.1** • Monitoring is proposed to evaluate population levels, changes.

		See **Section 5.1.4**
Locally rare plants **(White Goldenrod)**	*2*	All potential impacts are indirect and related to changes in human use of site. See discussion under Significant Woodland / ESA, **Section 5.1.1**
Significant Wildlife Habitat	*2, 4, 7*	All potential impacts are indirect and related to changes in human use of site. See discussion under Significant Woodland / ESA, **Section 5.1.1**
Wildlife (general)	*All*	Mitigation is proposed to avoid construction impacts, protect habitat, and replace potential lost habitat: • See discussion under Significant Woodland / ESA, **Section 5.1.1** • Conduct vegetation clearing outside of core breeding bird and bat maternity roosting windows (May 1 to Oct 31) to avoid impacts to migratory birds and roosting bats. • Install sediment & erosion control fencing at limits of development prior to construction commencing to prevent small mammals and reptiles from moving into construction zone. • Bird-friendly building and lighting design principles to be incorporated into architectural design for buildings adjacent to Significant Woodland / ESA. • Implement tree compensation to restore lost tree canopy. • Re-establish riparian woodland vegetation community (see **Section 5.1.6**) See **Section 5.1.5**
Chedoke Creek tributary corridor	*1*	Mitigation is proposed to minimize construction impacts and improve ecological quality as compared to existing creek corridor. • Conduct vegetation clearing outside of core breeding bird and bat maternity roosting windows (May 1 to Oct 31) to avoid impacts to migratory birds and roosting bats. • Install paige wire tree preservation fencing, including silt cloth, at limits of development prior to construction commencing to prevent small mammals and reptiles from moving into construction zone. • Creek restoration planting plan to be developed integrating native, self-sustaining vegetation local to Hamilton, using ecological restoration principles. See **Section 5.1.6**

Following are detailed explanations of these recommended measures, organized by natural heritage feature.

5.1.1. SIGNIFICANT WOODLAND / ESA

The most ecologically significant portion of the study area is ELC polygons 2, 4, and 7, which have been designated as Significant Woodland and a City ESA. These are mature deciduous forest communities which are contiguous with the Niagara Escarpment which creates an ecological corridor through the built-up portions of the City of Hamilton. Vegetation and wildlife found that these communities provide habitat for both significant and non-listed species, however the surveys also found that these habitats

have been degraded through invasive species, past and current human encroachment, and edge changes. The most abundant invasive species was Common Buckthorn, which is primarily in Polygon 4 and in the edge between Polygons 2 and 3. Human encroachment includes a derelict tennis court, and gravel access path to the tennis court, which are present within Polygon 4, dumping around the back side of the Long & Bisby building, and localized trampling associated with unsanctioned use of the Long & Bisby building. The edges of this community are mostly well-established, dating to the development of the Chedoke Sanatorium grounds. However the recent removal of the Coniferous Plantation in Polygon 3 has resulted in a new forest edge at the boundary of Polygons 2 and 3.

The Browlands site plan was developed to avoid direct impacts to the Significant Woodland communities. All of the mitigation proposed aims to protect the existing ecological features and functions and provide enhancements to reduce existing stressors and prevent new stressors from further degrading the forest communities.

5.1.1.1. VEGETATION PROTECTION ZONE (VPZ)

A Vegetation Protection Zone (VPZ) is proposed along the boundary of the Significant Woodland / ESA. The VPZ proposed is a minimum of 10m in width, with a wider VPZ proposed in sensitive areas. A 10m VPZ was supported by the previous development application for this site and was supported by the forest edge study completed by Aboud & Associates in 2009(b). The 10m VPZ, is appropriate for this site due to the existing condition of the edge and because functional enhancements to the ESA, including invasive species removal, fencing, forest gap filling are proposed .

An explanation of the variable widths of the VPZ across the site are as follows:

i. Where Polygon 2 wraps around the Long & Bisby building, a minimum 10m VPZ is proposed. In this part of the site an existing gravel laneway is present directly adjacent to the ESA, and in many places is underneath the tree canopy of the ESA. The Long & Bisby building is also in close proximity to Polygon 2 and is within the VPZ. There have been no recent edge impacts in this area. The Aboud & Associates study (2009b) found that the tree roots in this area do not extend within the gravel laneways. The main function of the VPZ in this area will be to avoid future tree impacts and prevent encroachment, as this area will have the most foot traffic as it is adjacent to a well-used trail. This can be achieved within the 10m width through fencing and/or strategic plantings. Any future work on the Long & Bisby building must be carried out in a manner which is sensitive to the VPZ; this may include restrictions to vehicle access and foundation work.

ii. Around Polygon 4 a minimum 10m VPZ is proposed with additional mitigation measures to maintain habitat of significant plant species. Between Polygon 4 and Polygon 6 (anthropogenic) the edge is well established, having been maintained for many years. This area was also studied in the 2009(b) Aboud & Associates edge study, which recommended a 10m VPZ. This portion of the VPZ also includes SWM measures to maintain existing hydrology for provincially significant plant species, see **Section 5.1.4** for more details.

iii. Along the Niagara Escarpment (ELC Polygon 7) on the west half of the site, a wider VPZ has been proposed to create additional tableland habitat adjacent to the Escarpment slope. Buildings across the site have also been set back a minimum of 30m from the Escarpment crest. This new tableland area will also include a trail system to connect to an existing trail that runs eastwards from the site, and potentially a parkette at the Cross of Lorraine.

iv. Polygon 3 represents a gap where the removal of a Cultural Plantation (previous to the initiation of this EIS) created new edge conditions for the adjacent ESA (Polygons 2, 4). A wider VPZ is

proposed within this Polygon to allow for tree replanting and re-establishment of a stable forest edge. See **Section 5.1.1.2** for more details.

The total area of the proposed VPZ is 0.97 ha, whereas a 10m consistent VPZ would be 0.8 ha. It is D&A's opinion that the proposed VPZ, in combination with the measures proposed in Sections 5.1.1.3 to 5.1.1.6 will be effective in protecting the ESA's ecological features and functions.

We recommend that a detailed restoration and enhancement plan be developed for the VPZ based on the recommendations provided in this report. This planting plan should consist of trees and shrubs native and common to the City of Hamilton, and should focus on creating a dense forest edge which transitions from canopy trees, to younger saplings, to shrubs. This plan should be coordinated with the fencing plan (**Section 5.1.1.3**).

Recommended tree size for enhancement is 100 – 150 cm whips, and recommended shrubs size is 2-year seedlings or 30-50 cm container grown. D&A recommends a nodal planting approach, which allows new plantings to better resist competition from existing herbaceous plants. If bare soil is present a native seed mix should be included in the design to stabilize soils.

5.1.1.2. **RE-ESTABLISH FOREST EDGE WITHIN POLYGON 3**

A Restoration Planting Plan has been prepared by Adesso Design to re-establish the forest edge in ELC Polygon 3 where a former Cultural Plantation was removed. The restoration planting plan was developed in consultation with the City of Hamilton's Natural Heritage Planning staff and consists of ecologically appropriate native species. These plantings will serve to create a more natural forest edge. Invasive species management is also recommended for Polygon 3, see **Section 5.1.1.5** for details. There are also some remnant forest understory plants in this community, such as Sedges (Carex sp), which should be retained when the invasive species removal and re-planting is undertaken. If site preparation is such that the new plantings cannot be planted around these understory plants, they should be salvaged and re-planted in the new forest edge zone. See Appendix J for the planting plan by Adesso.

5.1.1.3. **PREVENT ENCROACHMENT INTO WOODLANDS**

A fencing plan should be completed at the detailed design stage to prevent future encroachment and dumping into significant woodlands. Polygon 7 is already fenced, so this plan should target Polygons 2, 3, and 4. This plan may include "living fences" (i.e. dense plantings of thicket-forming vegetation), treed screening buffers, physical fences, or a combination of all three. This fencing plan should be coordinated with the VPZ restoration and enhancement plan.

5.1.1.4. **CANOPY GAP FILLING**

One significant canopy gap, 900 m2 in size, exists within the Significant Woodland / ESA on the study site. This is the derelict tennis court within Polygon 4, and the associated access lane from the rear of the Long & Bisby building. We recommend that the tennis court surface, chain link fence surrounding the court, and the access lane be removed, the soil decompacted, and this area be replanted with native forest species.

5.1.1.5. **INVASIVE SPECIES REMOVAL**

Polygons 3 and 4 have populations of Common Buckthorn, an invasive exotic species, that should be considered high priority for removal. The removal of this invasive exotic species is recommended to improve the quality of the flora that comprise these features and to reduce the threat of habitat loss

posed by invasive species. It will also help prevent its spread to neighbouring natural areas and will provide opportunity for reestablishing native vegetation cover within the restoration and enhancement areas.

Specific methods for removing these species vary and may involve cutting or treatment with herbicides. Specific recommendations for the removal and control of many of this species are available through the Ontario Invasive Plant Council. Care should be taken when removing invasive species to have as little impact as possible on the native vegetation and wildlife within the woodlands, particularly the population of Virginia Bluebells in Polygon 4 (see **Section 5.1.4**).

An Invasive Species Management Plan should be prepared to guide the management of Common Buckthorn on the study site and the replanting of treatment areas.

5.1.1.6. MONITOR PLANTINGS FOR 2 YEARS FOLLOWING CONSTRUCTION

All plantings should be monitored and maintained during a two-year warranty period and follow-up replacement planting will be required for all trees and/or shrubs that do not survive.

5.1.2. ARBORICULTURAL RESOURCES (TREES)

5.1.2.1. TREE MANAGEMENT

A trees within the ESA and select trees along Scenic Dr will be retained and will require protective measures.

To minimize impacts to trees from the development works, a tree protection zone should be established around each tree as described in the Tree Management Plan prepared by D&A (2020) and shown on the City's Tree Protection Guidelines (2010). Tree protection fencing should be installed prior to construction to the satisfaction of the contract administrator. The fence must be at least 1.2 meters tall and be supported by steel posts; the number of posts is not specified as long as the fencing material remains erect. Tree protection fencing will be installed at the limits of disturbance or 1 metre beyond the dripline of trees, whichever is greater.

The tree protection fencing should be inspected by the Contract Administrator prior to clearing and grubbing to ensure that it is installed correctly and should be inspected following each rain event to ensure that the filter cloth has not been breached. The fencing must remain in place for the duration of construction operations.

Additional mitigation techniques to minimize damage to retained trees and other vegetation and wildlife include:

- No construction equipment or materials are to be stored within the tree protection fencing;
- Machinery must not be driven in the root zones of trees to be preserved.
- If construction work results in the crushing or severing of roots of trees to remain, these roots should be re-cut by a qualified arborist to create a clean wound; and
- If construction work results in the breaking or tearing of branches of trees to remain, these branches should be re-cut by a qualified arborist to create a clean wound.

According to the City of Hamilton's Draft Tree Protection Guidelines (2010), the City requires 1:1 compensation for trees to be removed. These guidelines do not state any exceptions to this compensation ratio. See the Tree Management Plan prepared by D&A (under separate cover) for details of required compensation.

5.1.3. SPECIES-AT-RISK

5.1.3.1. BATS

The status of SAR bat habitat for Polygon 1 is pending review by MECP, and the extent of impacts to potential SAR bat habitat (snag trees) are to be revised and addressed in the detailed design phase. At minimum no trees identified as suitable maternity roost habitat should be removed between May 1 and September 30 in case migratory bats (Endangered or otherwise) are using them.

Additional opportunities for bat roosting may be provided by installing bat boxes within the realigned Chedoke Creek tributary corridor (see **Section 5.1.6**)

5.1.3.2. MONARCH

Any areas containing Common Milkweed should only be cleared of vegetation outside of the Monarch breeding season (June to September, when chrysalises and/or pupae are present). Milkweed (*Asclepias incarnata* or *A. syriaca*) should be included in detailed Landscape Plans for the VPZ and the creek corridor in order to provide host plants for future Monarch which may use the site. Incorporating multi-season flowering plants in any groundcover seed mixes in the VPZ and creek corridor will also help to provide nectar for Monarchs which may forage on the site.

5.1.4. PROVINCIALLY SIGNIFICANT PLANT SPECIES (VIRGINIA BLUEBELLS)

The one provincially significant plant species, Virginia Bluebells, observed within the study site was found in Polygon 4. This habitat is part of the Significant Woodland / ESA on the study site and is contained within the ESA's VPZ (see **Section 5.1.1**).

The EIS has identified a potential interaction between an existing drainage feature and the habitat of provincially significant vegetation species in this polygon. As part of the engineering plans for the site a bioswale has been incorporated into the VPZ to match pre-existing flows for smaller storm events so that the hydrology of this feature is maintained. See engineering drawings by Wood PLC for more details. At the detailed design stage, the stormwater design for the site will be finalized.

Polygon 4 is the most degraded portion of the ESA on the study site, with the highest abundance of Common Buckthorn, canopy loss due to Ash death from Emerald Ash Borer, as well as the presence of a derelict tennis court that creates a canopy gap. Removal of the tennis court and associated access lane and management of Common Buckthorn are proposed as part of the ESA improvements for this site; these actions must be planned and carried out in a manner which places top priority on the preservation of the Virginia Bluebells population.

A monitoring plan should be developed for the Virginia Bluebells population to determine the number of existing plants, whether these numbers are changing, and what appropriate adaptive management actions would be.

5.1.5. WILDLIFE (GENERAL)

5.1.5.1. TIMING VEGETATION CLEARING TO AVOID IMPACTS TO MIGRATORY BIRDS AND BATS

To be in compliance with the Migratory Birds Convention Act (MBCA, 1994), any vegetation removal on the site should be done outside of the breeding bird window, which for this site would be approximately April 1 to August 1. If any vegetation removal is to occur within this window, a qualified avian ecologist should first check the vegetation to be removed to ensure that there are no migratory birds covered by the Act nesting within it. If any birds are found nesting then, in consultation with Environment Canada, a suitable buffer should be established around the nest, and no activities will be permitted with this buffer until the birds have left.

Vegetation removal should not occur within the active nesting season (i.e., April 1 to August 31). If the areas proposed for development are thoroughly checked during the active breeding season for bird nests by a qualified biologist during the construction phase, and no nests are found, then construction may be permitted.

The status of SAR bat habitat within Polygon 1 is pending review by MECP, and the extent of impacts to potential SAR bat habitat (maternity roost trees) are to be revised and addressed in the detailed design phase. At minimum no trees identified as suitable maternity roost habitat should be removed between May 1 and September 30 in case migratory bats (Endangered or otherwise) are using them.

5.1.5.2. BUILDING & LIGHTING DESIGN

Windows on proposed buildings adjacent to the Significant Woodlands / ESA should be designed to minimize bird strikes, particularly for those within the height of the canopy (e.g. up to 20 m). Birds do not perceive glass and can be injured or killed by collisions when they attempt to fly into reflections or apparent spaces that can be seen through windows on corners. Window glazing at street level should be chosen to minimize the risk for bird collisions. This can be achieved by treating glass with a densely-patterned custom window film for windows within the height of canopy; this pattern should have a minimum density of 5 cm (vertical) x 10 cm (horizontal) apart (FLAP, 2016). Further guidance is provided in the Toronto Green Standard, version 3.0.

Bird-friendly lighting practices also apply to outdoor lighting design. This includes using of minimal or muted lighting, minimizing direct upward lighting, using reflectors to minimize the spread of light, using motion sensors to minimize light pollution, positioning light standards to minimize reflections in windows, and avoiding up-lighting (City of Toronto, 2007).

5.1.5.3. MINIMIZE ACCIDENTAL MORTALITY OF SMALL MAMMALS AND REPTILES

Construction has the potential to directly impact small mammals and reptiles, but this can be avoided through proper exclusion of the site during the construction stage. A sediment and erosion control plan will need to be prepared at the detailed design stage; this plan should include silt fence at the limit of all buffers, and any other areas where water may discharge to adjacent lands. The silt fence will serve to minimize the opportunity for water borne sediments to be washed on to the adjacent properties and ensure that no terrestrial wildlife, such as snakes or amphibians, can access the construction site and potentially be injured. Inspection and maintenance of all silt fencing should start after installation is complete, with inspections occurring on a weekly basis during active construction or after a rainfall

event of 13 mm or greater. Maintenance should be carried out, within 48 hours, on any part of the facility found to need repair. Once construction and landscaping has been substantially completed, the silt fence should be removed, any accumulated sediment will be removed to be disposed of offsite, and the landscaping will be completed.

5.1.6. RECONSTRUCT AND REVEGETATE CHEDOKE CREEK TRIBUTARY CORRIDOR

The Chedoke Creek tributary corridor will be directly impacted by the proposed realignment and reconstruction works. At the detailed design stage, a detailed restoration and enhancement plan should be developed integrating native, self-sustaining vegetation local to Hamilton, using ecological restoration principles. This planting plan will need to be coordinated with the detailed design of the creek corridor in order to improve ecological quality as compared to existing creek corridor. Components of this design could include:the detailed restoration and enhancement plan should identify the approach used for transplanting, as well as the timing for transplanting. Ideally, plants should be transplanted in the fall when they can be identified and have gone dormant. Transplanting during other times of the year may require that the plants are stored temporarily on or off site while grading and site preparation is being completed. If temporary storage is required, the plants should be watered frequently to avoid desiccation.

At the construction stage, in order to avoid impacts to migratory wildlife that may use the existing corridor, vegetation removal should be undertaken outside the windows for breeding birds and roosting bats (see **Sections 5.1.2.1** and **5.1.3.1)**.

6. RECOMMENDATIONS AND CONCLUSIONS

This EIS has completed the site characterization based on a Terms of Reference agreed to by the City, NEP, and HCA. An assessment of ecological features and functions was completed and the limits of the ESA on the site were staked by the City and HCA. Natural areas occur throughout and around the Subject Property including elements of the City's Natural Heritage System (Core Areas – Key Natural Heritage Features Woodlands) and HCA regulated features (Chedoke creek tributary). These features and functions have been studied and characterized using standard methodology as per the agreed-upon ToR. The study area contain high-quality upland forest that provide habitat for wildlife, contain habitat for Candidate Significant Wildlife Habitat and Species at Risk (Eastern Wood-Pewee, Monarch, Bats) and provincially significant species (Virginia Bluebells), and support a high diversity of native species. The Chedoke Creek corridor was found to be degraded through invasive species establishment, erosion, and alteration by human uses, and the remainder of the property is anthropogenic in nature with a mixture of open areas and scattered mature trees.

Based on the current plan and concept grading plan, the anticipated impacts include:

- Indirect impacts on Significant Woodland / ESA during and after construction due to noise and human use;
- Removal of 438 trees within anthropogenic and Cultural Woodland ELC communities;
- Potential loss of maternity roost habitat for SAR bats (NOTE: awaiting feedback from MECP);
- Indirect impacts to SAR birds, insects, and provincially significant plants;
- Indirect impacts on wildlife during and after construction;
- Removal of Cultural Woodland community along the Chedoke Creek corridor, which will be replaced through the creek realignment works.

These impacts can be mitigated or compensated for through implementation of the recommendations in this report, which include:

- Vegetation Protection Zone (VPZ) along edges of Significant Woodland / ESA;
- Preparation of a detailed restoration and enhancement plan for the VPZ, canopy gap areas, invasive species management zones, and Chedoke Creek tributary corridor;
- Invasive species management, forest gap filling, and fencing plan to reduce existing stressors and prevent new stressors from further degrading the forest communities;
- 1:1 compensation for trees removed;
- Installation of tree protection fencing to protect trees to remain;
- Vegetation removal window restrictions to protect migratory birds, roosting bats;
- Installation of sediment and erosion control fencing around site to prevent accidental mortality of small mammals and reptiles;
- Design coordination to protect habitat of Provincially Significant Species;
- Bird-friendly building design elements for buildings adjacent to Significant Woodlands / ESA; and
- Integration of improved habitat and ecological features in reconstructed Chedoke Creek corridor.

The study site offers ample opportunity for the creation of woodland, wetland, and meadow habitats through restoration of Vegetation Protection Zones and the Chedoke Creek tributary realignment; the proposal represents a "net gain" in ecological features and function as compared to the existing site. These recommendations will be further refined through the detailed design stages.

7. REFERENCES

A.J. Clarke and Associates Ltd. 2007. Preliminary Engineering Report, Chedoke Browlands, City of Hamilton.

Aboud & Associates Inc. 2009a. Chedoke Browlands Development (Block 3, Building #12), Tree Protection Plan.

Aboud & Associates Inc. 2009b. Chedoke Browlands Development, Part of Lot 57, City of Hamilton, Vegetation Community Assessment Plan and ESA Woodlot Buffer.

Bolton, T.E. et al. 1976. Paleozoic Geology Grimsby. Map 2343. Scale 1:50,000.

Cadman, M.D., D.A. Sutherland, G.G. Beck, D. Lepage, and A.R. Couturier (eds.) 2007. Atlas of the Breeding Birds of Ontario, 2001 – 2005. Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, Ontario Ministry of Natural Resources, and Ontario Nature, Toronto. xxii + 706 pp.

Chapman & Putnam. 1984. Physiography of Southern Ontario, Ontario Geological Survey, M.2715. Scale 1:600,000.

City of Hamilton, 2005. Groundwater Resources Characterization and Wellhead Protection Study.

COSEWIC (Committee on the Status of Endangered Wildlife in Canada). 2019. COSEWIC Species Assessments (detailed version), Accessed at: https://www.canada.ca/content/dam/eccc/documents/pdf/cosewic/wsam-results/april-2018/2018-wildlife-species-assessments-detailed-april-en.pdf

Feenstra, B.H. 1981. Bedrock Topography of the Grimsby Area, Southern Ontario; Ontario Geological Survey Preliminary Map P.2401, Bedrock topography series. Scale 1:50,000.

GeoProcess Research Associates. 2016. Browlands Tree Inventory & Hazard Tree Assessment.

G. O'Connor Consultants Inc. 2009. Scoped Environmental Impact Statement, Report for the North Scenic Planning Area, Chedoke Browlands, Hamilton, Ontario.

Goodban, A.G. 2014. The Vascular Plants of Hamilton, Ontario. In Schwetz, N. (ed.). 2014. Hamilton Natural Areas Inventory Project 3rd Edition - Species Checklist Document. Pages 1 to 91.

Government of Canada. 1994a. Migratory Birds Convention Act, Statutes of Canada (1994, c. 22). Retrieved from the Department of Justice Laws Website: http://laws-lois.justice.gc.ca/eng/acts/M-7.01/FullText.html

Government of Canada. 1994b. Migratory Birds Regulations, Consolidated Regulations of Canada (1994, c. 1035). Retrieved from the Department of Justice Laws Website: http://laws-lois.justice.gc.ca/eng/regulations/C.R.C., c. 1035/FullText.html

Government of Canada. 2002. Species at Risk Act, Statutes of Canada (2002, c. 29). Retrieved from the Department of Justice Laws Website: http://laws-lois.justice.gc.ca/eng/acts/S-15.3/index.html

Government of Ontario. 1990a. Planning Act, Revised Statutes of Ontario (1990, c. P.13). Retrieved from the ServiceOntario e-Laws website: http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90p13_e.htm (e-Laws currency date = April 12, 2018)

Government of Ontario. 1990b. Conservation Authorities Act. R.S.O. 1990, c. C.27. Available online at: https://www.ontario.ca/laws/statute/90c27?search=e+laws (e-Laws currency date = April 3, 2018).

Government of Ontario. 2007. Endangered Species Act, Statutes of Ontario (2007, c. 6). Retrieved from the ServiceOntario e-Laws website: http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_07e06_e.htm

Government of Ontario. 2017. NEP (Niagara Escarpment Plan). Available at: https://files.ontario.ca/appendix_-_niagara_escarpment_plan_2017_-_oc-10262017.pdf

Jagger Hims Ltd. 2006. Phase 1 Environmental Site Assessment, Chedoke Hospital Browlands, 565 Sanatorium Road, Hamilton, ON.

Kuntz Forestry Consulting Inc. No date. Notice of Intent to Cut, Burn, or Destroy Trees… Woodland Conservation By-Law No.R00-054.

Landtek Ltd. 2020. Hydrogeologic Investigation Proposed Residential Development, 801, 820, 828, 855, 865 and 870 Scenic Drive, Hamilton, Ontario. 124pp.

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 Sciences Section, Science Development and Transfer Branch, SCSS Field Guide FG-02.

MNRF (Ministry of Natural Resources and Forestry). 2014. Significant Wildlife Habitat Mitigation Support Tool. Version 2014. 533 pp

MNRF. 2015. Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E. January, 2015. 41 pp

MNRF. 2017. Survey Protocol for Species at Risk Bats within Treed Habitats Little Brown Myotis, Northern Myotis & Tri-Colored Bat. 13 pp.

NatureServe Explorer. 2019. National and Subnational Conservation Status Definitions web page. Available at: http://explorer.natureserve.org/nsranks.htm

NHIC (Natural Heritage Information Centre). 2019. NHIC Species Lists. Available at: https://www.ontario.ca/page/get-natural-heritage-information

Ontario Municipal Board. 2012. OMB Decision. Deanlee Management appeal. PL100691

Parish Geomorphic. 2009. Meander Belt Width Assessment, Chedoke Creeks (Scenic & Sanatorium).

Schwetz, N. (ed.). 2014a. Hamilton Natural Areas Inventory Project 3rd Edition – Site Summaries Document. Report prepared by the City of Hamilton, Hamilton Conservation Authority, and Hamilton Naturalists Club.

Schwetz, N. (ed.). 2014b. Hamilton Natural Areas Inventory Project 3rd Edition - Species Checklist Document. Report prepared by the City of Hamilton, Hamilton Conservation Authority, and Hamilton Naturalists Club.

S. Llewellyn & Associates Ltd. 2016. Technical Memorandum – Browlands Hydraulic Analysis

Smith, P.D. 2014. The Breeding Birds of Hamilton, Ontario. *In* Schwetz, N. (ed.). 2014. Hamilton Natural Areas Inventory Project 3rd Edition - Species Checklist Document. Pages 216 to 265.

Williams & Associates. 2017. Browlands Forest Operating Prescription.

8. APPENDICES

Map 1. Site Context Map

Map 2. Ecological Land Classification

Map 3. Wildlife Findings

Map 4. ESA Boundaries

Map 5. Opportunities & Constraints

Map 6. Mitigation Opportunities

Appendix A. Proposed Site Plan

Appendix B. Terms of Reference

Appendix C. Wildlife Survey Results

Appendix D. Bat Habitat Suitability Assessment Findings

Appendix E. Vascular Plant Species and Status List

Appendix F. Tree Inventory Data

Appendix G. Species at Risk Screening

Appendix H. Significant Wildlife Habitat Screening

Appendix I. Watercourse Characterization (by Wood PLC)

Appendix J. Restoration Planting Plan

PROJECT: DA18-029-01

CLIENT: Valery (Chedoke Browlands) Developments Inc.

DATE: 09, September 2020

DRAWN BY: N. White

Map 1:
Site Location & Context
Browlands EIS

STUDY AREA

HAMILTON

Study Area (As per received survey of site)

Watercourse

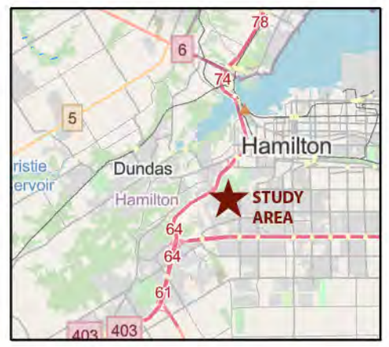
Waterbody

Wetland

Evaluated-Other

Evaluated-Provincial

Not evaluated per OWES



Data Sources:
Hydrography, Road Network, and Vegetation Vector Data: Land Information Ontario
Wetlands: Ontario Ministry of Natural Resources

0 0.5 1
Kilometres

SCALE: 1:25,000

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UTM Zone 17N NAD83

PROJECT: DA18-029-01

CLIENT: Valery (Chedoke Browlands) Developments Inc.

DATE: 09, September 2020

DRAWN BY: N. White/J.Sauder

Map 2: Vegetation Communities

Browlands EIS

Study Area (As per received survey of site)

ELC Community

ELC Communities

ANTH: Anthropogenic
CUW1: Mineral Cultural Woodland
FOD: Deciduous Forest
FOD5-1: Dry – Fresh Sugar Maple Deciduous Forest
FOD5-3: Dry – Fresh Sugar Maple – Oak Deciduous Forest

Orthoimagery Source: First Base Solutions (2019).

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Metres
SCALE: 1:1,700

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UTM Zone 17N NAD83

Disclaimer:
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DOUGAN & ASSOCIATES
ECOLOGICAL CONSULTING & DESIGN

PROJECT: DA18-029-01

CLIENT: Valery (Chedoke Browlands) Developments Inc.

DATE: 09, September 2020

DRAWN BY: J.Sauder

Map 3: Wildlife Findings
Browlands EIS

Study Area (As per received survey of site)

Amphibian Point Count Stations

Locally Uncommon Species

(within City of Hamilton per Schwetz 2014)

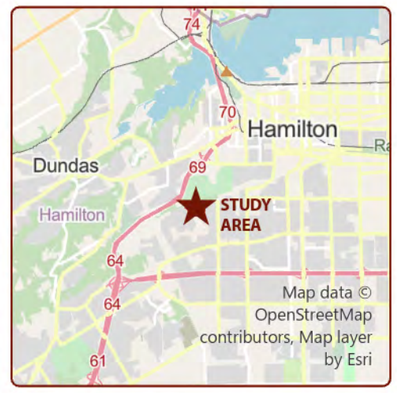
- American Redstart
- Cooper's Hawk
- Red-bellied Woodpecker

Special Concern Species

(federally and provincially)

- Eastern Wood-Pewee

ELC Community



Orthoimagery Source: First Base Solutions (2019).
ESA vector data source: Land Information Ontario.

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UTM Zone 17N NAD83

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DOUGAN & ASSOCIATES
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PROJECT: DA18-029-01

CLIENT: Valery (Chedoke Browlands) Developments Inc.

DATE: 09, September 2020

DRAWN BY: JSauder

Map 4: Environmentally Sensitive Area Boundaries

Browlands EIS

SANATORIUM ROAD

SAN PAULO DRIVE

SAN PEDRO DRIVE

HEPBURN CRESCENT

GEM COURT

JEWEL STREET

REDFERN AVENUE

SCENIC DRIVE

WEST 35TH STREET

WEST 34TH STREET

ANGELA AVENUE

WEST 33RD STREET

Study Area

ESA Limit (Established by Hamilton Conservation Authority and City of Hamilton, October 2019)

Orthoimagery Source: First Base Solutions (2019).
ESA vector data source: Land Information Ontario.

0 12.5 25 50
Metres
SCALE: 1:2,000

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UTM Zone 17N NAD83

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ECOLOGICAL CONSULTING & DESIGN

PROJECT: DA18-029-01

CLIENT: Valery (Chedoke Browlands) Developments Inc.

DATE: 09, September 2020

DRAWN BY: J. Sauder/N. White

Map 5: Opportunities & Constraints

Browlands EIS

Study Area (As per received survey of site)

Site Plan (KNYMH, Aug. 2020)

Constraints

- High
- Medium
- Low

Opportunities

- Edge Restoration Plantings
- Invasive Species Removal
- Forest Gap Restoration

Orthoimagery Source: First Base Solutions (2019).

0 25 50

Metres

SCALE: 1:2,000

N

UTM Zone 17N NAD83

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ECOLOGICAL CONSULTING & DESIGN

PROJECT: DA18-029-01

CLIENT: Valery (Chedoke Browlands) Developments Inc.

DATE: 09, September 2020

DRAWN BY: N. White

Map 6:
Mitigation Opportunities
Browlands EIS

Site Features

- Study Area (As per received survey of site)
- Limit of Disturbance
- ESA Boundary
- Site Plan Site Plan (KNYMH, Aug. 2020)
- Tree Protection Fencing
- Buffer Zone

Mitigation Opportunities

- Buckthorn Management
- Tree Replanting
- Creek Reconstruction
- Edge Restoration Plantings

Orthoimagery Source: First Base Solutions (2019).

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Metres
SCALE: 1:1,700

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UTM Zone 17N NAD83

Disclaimer:
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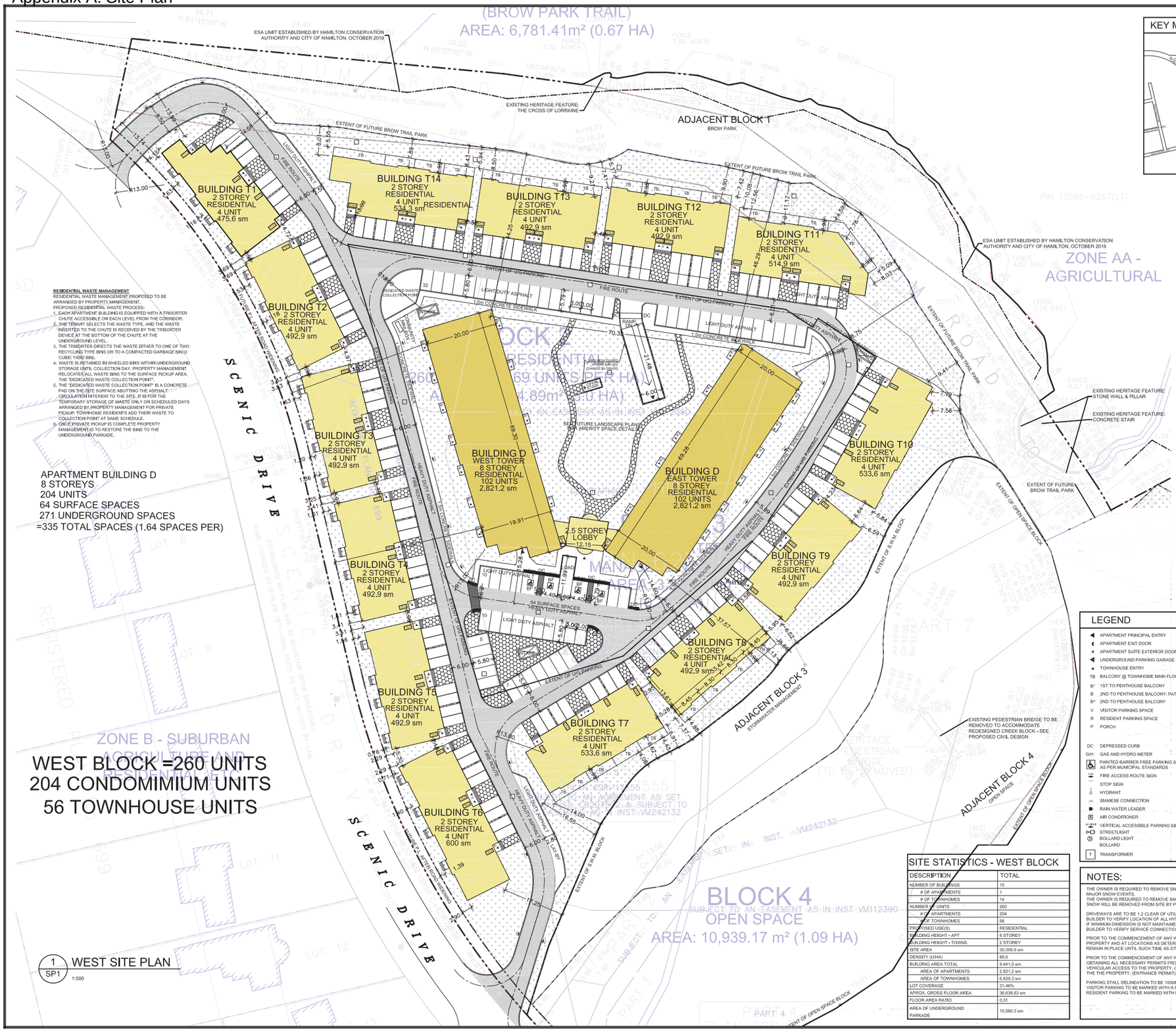
DOUGAN & ASSOCIATES
ECOLOGICAL CONSULTING & DESIGN

Appendix A: Site Plan



RESIDENTIAL WASTE MANAGEMENT

RESIDENTIAL WASTE MANAGEMENT PROPOSED TO BE ARRANGED BY PROPERTY MANAGEMENT.
PROPOSED RESIDENTIAL WASTE PROCESS:

1. EACH APARTMENT BUILDING IS EQUIPPED WITH A TRISORTER CHUTE ACCESSIBLE ON EACH LEVEL FROM THE CORRIDOR.
2. THE TENANT SELECTS THE WASTE TYPE, AND THE WASTE INSERTED TO THE CHUTE IS RECEIVED BY THE TRISORTER DEVICE AT THE BOTTOM OF THE CHUTE AT THE UNDERGROUND LEVEL.
3. THE TRISORTER DIRECTS THE WASTE EITHER TO ONE OF TWO RECYCLING TYPE BINS OR TO A COMPACTED GARBAGE BIN (3 CUBIC YARD BIN).
4. WASTE IS RETAINED IN WHEELED BINS WITHIN UNDERGROUND STORAGE UNTIL COLLECTION DAY. PROPERTY MANAGEMENT RELOCATES ALL WASTE BINS TO THE SURFACE PICKUP AREA, THE "DEDICATED WASTE COLLECTION POINT".
5. THE "DEDICATED WASTE COLLECTION POINT" IS A CONCRETE PAD ON THE SITE SURFACE ABUTTING THE ASPHALT CIRCULATION INTERIOR TO THE SITE. IT IS FOR THE TEMPORARY STORAGE OF WASTE ONLY ON SCHEDULED DAYS ARRANGED BY PROPERTY MANAGEMENT FOR PRIVATE PICKUP. TOWNHOME RESIDENTS ADD THEIR WASTE TO COLLECTION POINT AT SAME SCHEDULE.
6. ONCE PRIVATE PICKUP IS COMPLETE PROPERTY MANAGEMENT IS TO RESTORE THE BINS TO THE UNDERGROUND PARKADE.

APARTMENT BUILDING D
8 STOREYS
204 UNITS
64 SURFACE SPACES
271 UNDERGROUND SPACES
=335 TOTAL SPACES (1.64 SPACES PER)

WEST BLOCK =260 UNITS
204 CONDOMIMIUM UNITS
56 TOWNHOUSE UNITS

1 / SP1 WEST SITE PLAN
1:500

SITE STATISTICS - WEST BLOCK

DESCRIPTION	TOTAL
NUMBER OF BUILDINGS	15
# OF APARTMENTS	1
# OF TOWNHOMES	14
NUMBER OF UNITS	260
# OF APARTMENTS	204
# OF TOWNHOMES	56
PROPOSED USE(S)	RESIDENTIAL
BUILDING HEIGHT - APT	8 STOREY
BUILDING HEIGHT - TOWNS	2 STOREY
SITE AREA	30,006.6 sm
DENSITY (U/HA)	86.6
BUILDING AREA TOTAL	9,441.5 sm
AREA OF APARTMENTS	2,821.2 sm
AREA OF TOWNHOMES	6,620.3 sm
LOT COVERAGE	31.46%
APROX. GROSS FLOOR AREA	36,638.63 sm
FLOOR AREA RATIO	0.31
AREA OF UNDERGROUND PARKADE	10,590.3 sm

LEGEND

- APARTMENT PRINCIPAL ENTRY
- APARTMENT EXIT DOOR
- APARTMENT SUITE EXTERIOR DOOR
- UNDERGROUND PARKING GARAGE ENTRY
- TOWNHOUSE ENTRY
- TB BALCONY @ TOWNHOME MAIN FLOOR LEVEL
- B* 1ST TO PENTHOUSE BALCONY
- B 2ND TO PENTHOUSE BALCONY; PATIO 1ST FL
- B* 2ND TO PENTHOUSE BALCONY
- V VISITOR PARKING SPACE
- R RESIDENT PARKING SPACE
- P PORCH
- DC DEPRESSED CURB
- G/H GAS AND HYDRO METER
- PAINTED BARRIER FREE PARKING SYMBOL AS PER MUNICIPAL STANDARDS
- FIRE ACCESS ROUTE SIGN
- STOP SIGN
- HYDRANT
- SIAMESE CONNECTION
- RAIN WATER LEADER
- AIR CONDITIONER
- VERTICAL ACCESSIBLE PARKING SIGN
- STREETLIGHT
- BOLLARD LIGHT
- BOLLARD
- T TRANSFORMER

HATCH KEY

- HEAVY DUTY ASPHALT
- PAVERS
- CONCRETE SIDEWALK
- LANDSCAPE/SOD
- 6 STOREY BUILDING
- 4-5 STOREY BUILDING
- 2 STOREY BUILDING

BLOCK LINETYPE KEY

REFERENCED FROM ELECTRONIC SURVEY BY ATMcLAREN
- LOT BOUNDARY LINE
- VESTIGIAL BOUNDARY LINE
- 3.0m ROAD WIDENING BOUNDARY LINE
- ESA BOUNDARY EST. OCT 2019

REFERENCED FROM SUBDIVISION DWG BY URBAN SOLUTIONS
- LOT LINE

LINETYPE KEY

- EXTENT OF UG PARKING
- FIRE ROUTE
- BUILDING OUTLINE
- PHASE LINE
- OVERHEAD BALCONY

NOTES:

THE OWNER IS REQUIRED TO REMOVE SNOW OFF SITE AND MAINTAIN REQUIRED PARKING UNENCUMBERED BY SNOW DURING MAJOR SNOW EVENTS.
THE OWNER IS REQUIRED TO REMOVE SNOW AND ICE FROM ALL EXIT PATHS AND STAIRS.
SNOW WILL BE REMOVED FROM SITE BY PRIVATE COMPANY.

DRIVEWAYS ARE TO BE 1.2 CLEAR OF UTILITY STRUCTURES AND HYDRANTS.
BUILDER TO VERIFY LOCATION OF ALL HYDRANTS, STREET LIGHTS, TRANSFORMERS, AND OTHER SERVICES.
IF MINIMUM DIMENSION IS NOT MAINTAINED, BUILDER IS TO RELOCATE AT HIS OWN EXPENSE.
BUILDER TO VERIFY SERVICE CONNECTION ELEVATIONS PRIOR TO CONSTRUCTING FOUNDATIONS.

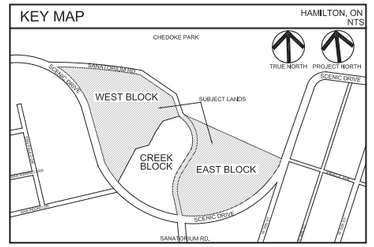
PRIOR TO THE COMMENCEMENT OF ANY WORKS ON THE SITE, SNOW FENCE IS INSTALLED ON THE PERIMETER OF THE PROPERTY AND AT LOCATIONS AS DETERMINED BY THE MANAGER, DEVELOPMENT ENGINEERING. THE SNOW FENCE SHALL REMAIN IN PLACE UNTIL SUCH TIME AS OTHERWISE DIRECTED BY THE MANAGER, DEVELOPMENT ENGINEERING.

PRIOR TO THE COMMENCEMENT OF ANY WORKS WITHIN THE MUNICIPAL ROAD ALLOWANCE, THE OWNER IS RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS FROM THE ENGINEERING SERVICE DEPARTMENT, TOWN OF OAKVILLE, FOR THE PURPOSE OF VEHICULAR ACCESS TO THE PROPERTY, (ENTRANCE PERMIT), AND SERVICING EXCAVATIONS (ROAD ALLOWANCE PERMIT) WITHIN THE THE PROPERTY, (ENTRANCE PERMIT), AND SERVICING.

PARKING STALL DELINEATION TO BE 100MM WIDE WHITE OR YELLOW MARKINGS.
VISITOR PARKING TO BE MARKED WITH A PAINTED V.
RESIDENT PARKING TO BE MARKED WITH PAINTED NUMBERS.

KEY MAP

HAMILTON, ON NTS



ELECTRONIC DRAWINGS OF SUBJECT LANDS:

REVISED DRAFT PLAN OF "THE BROWLANDS"
BEING A PROPOSED SUBDIVISION OF PARCEL "A", MOUNTAIN VIEW HEIGHTS • REGISTERED PLAN NO. 555
PART OF LOT SANATORIUM ROAD
ESTABLISHED BY BY-LAW VALUA RECO AS INST.2586748
PART OF LOT SANATORIUM ROAD
ESTABLISHED ACCORDING TO REGISTERED PLAN NO. 575 AS MOUNTAIN VIEW BOULEVARD NAME CHANGED BY BY-LAW 78T-14566, RECO AS INST.61605
AND
PART OF LOT 57, CONCESSION 2
GEOGRAPHIC TOWNSHIP OF SALTFLEET
CITY OF HAMILTON

ALL DRAWINGS ARE UNDERSTOOD TO BE SUBJECT TO CHANGE DUE TO COMMENTS FROM MUNICIPAL DEPARTMENTS AND OTHER AGENCIES WITH AUTHOURITY

KEY TO DETAIL LOCATION

No. DETAIL NUMBER
No. DRAWING SHEET NUMBER

DRAWING SETS ISSUED	No.	DATE (DD.MM.YY)	BY
PLANNING APP. 1st SUBMISSION	1.	02.07.20	BF
SITE PLAN APPLICATION	2.	01.09.20	BF

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

REVISIONS TO DRAWING	No.	DATE (DD.MM.YY)	BY
-	-	-	-
-	-	-	-

NOT FOR CONSTRUCTION

BUILDING PERMIT NUMBER:
NOT FOR CONSTRUCTION WITHOUT PERMIT

KNYMH
ARCHITECTURE • SOLUTIONS
KNYMH INC.
1006 SKYVIEW DRIVE • SUITE 101
BURLINGTON, ONTARIO • L7P 0V1
T 905.639.6595
F 905.639.0394
www.knymh.com info@knymh.com

PROJECT NORTH TRUE NORTH

ONTARIO ASSOCIATION OF ARCHITECTS
PRZEMYSLAW MYSZKOWSKI
LICENCE
7984

CHEDOKE BROWLANDS
HAMILTON, ONTARIO

DRAWING SHEET TITLE:
BLOCK 2
WEST SITE PLAN

DRAWING SCALE: -
PROJECT NUMBER: 19066
DRAWN BY: -
CHECKED BY: -
DRAWING VERSION: 2020-09-01
PLOT DATE: September 2, 2020
DRAWING SHEET NUMBER: SP1

LEGEND

- APARTMENT PRINCIPAL ENTRY
- APARTMENT EXIT DOOR
- APARTMENT SUITE EXTERIOR DOOR
- UNDERGROUND PARKING GARAGE ENTRY
- TOWNHOUSE ENTRY
- TB BALCONY @ TOWNHOME MAIN FLOOR LEVEL
- B* 1ST TO PENTHOUSE BALCONY
- B 2ND TO PENTHOUSE BALCONY; PATIO 1ST FL
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- PAVERS
- CONCRETE SIDEWALK
- LANDSCAPE/SOD
- 8 STOREY BUILDING
- 4-5 STOREY BUILDING
- 2 STOREY BUILDING

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REFERENCED FROM ELECTRONIC SURVEY BY ATMcLAREN

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- VESTIGIAL BOUNDARY LINE
- 3.0m ROAD WIDENING BOUNDARY LINE
- ESA BOUNDARY EST, OCT 2019

REFERENCED FROM SUBDIVISION DWG BY URBAN SOLUTIONS

- LOT LINE

LINETYPE KEY

- EXTENT OF UG PARKING
- FIRE ROUTE
- BUILDING OUTLINE
- PHASE LINE
- OVERHEAD BANK

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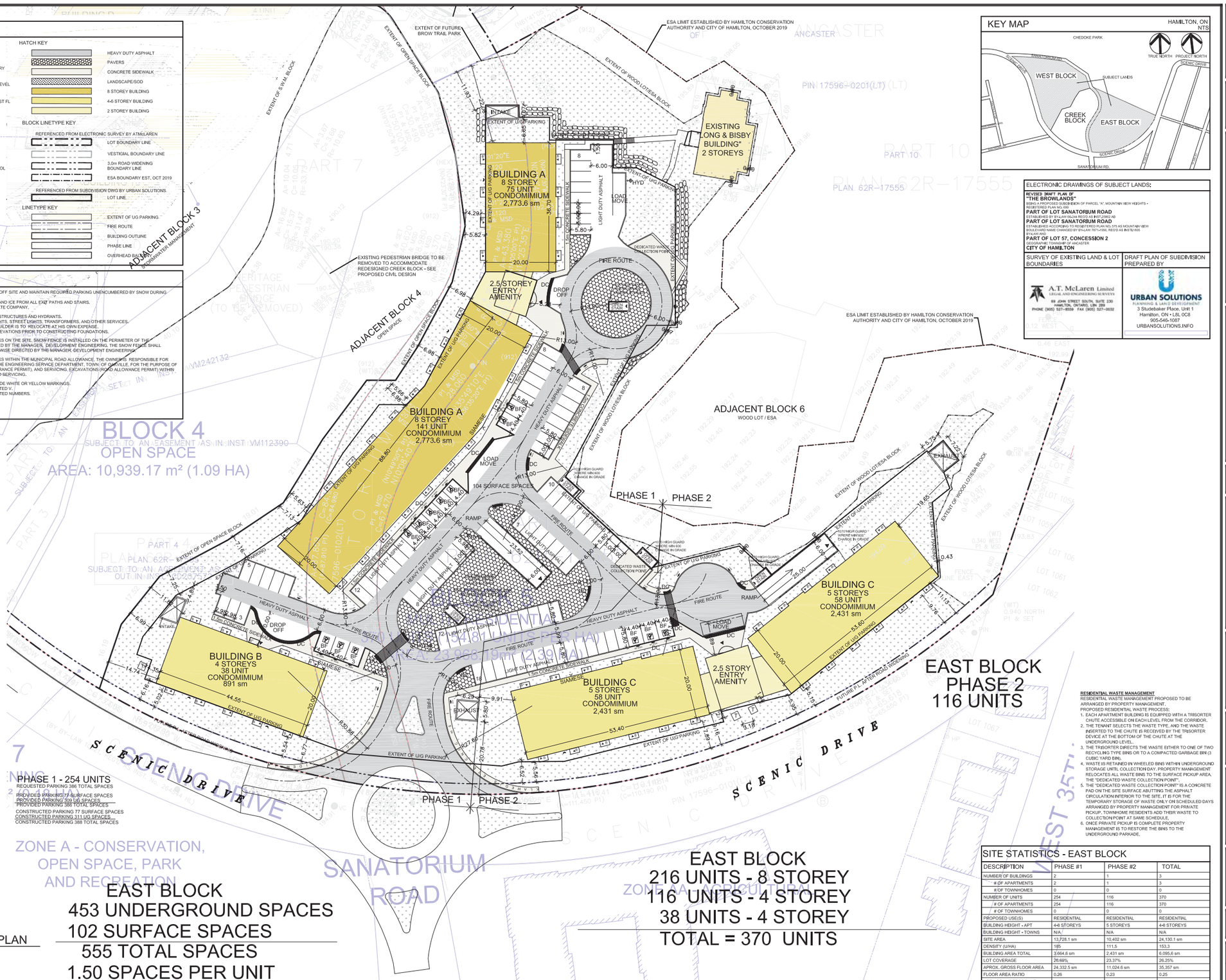

PHASE 1 - 254 UNITS
REQUESTED PARKING 386 TOTAL SPACES
PROVIDED PARKING 77 SURFACE SPACES
PROVIDED PARKING 309 U/G SPACES
PROVIDED PARKING 386 TOTAL SPACES
CONSTRUCTED PARKING 77 SURFACE SPACES
CONSTRUCTED PARKING 311 U/G SPACES
CONSTRUCTED PARKING 388 TOTAL SPACES

EAST BLOCK
453 UNDERGROUND SPACES
102 SURFACE SPACES
555 TOTAL SPACES
1.50 SPACES PER UNIT

EAST BLOCK
216 UNITS - 8 STOREY
116 UNITS - 4 STOREY
38 UNITS - 4 STOREY
TOTAL = 370 UNITS

EAST BLOCK
PHASE 2
116 UNITS

1 / SP2 EAST SITE PLAN
1:500

RESIDENTIAL WASTE MANAGEMENT
RESIDENTIAL WASTE MANAGEMENT PROPOSED TO BE ARRANGED BY PROPERTY MANAGEMENT.
PROPOSED RESIDENTIAL WASTE PROCESS:
1. EACH APARTMENT BUILDING IS EQUIPPED WITH A TRISORTER CHUTE ACCESSIBLE ON EACH LEVEL FROM THE CORRIDOR.
2. THE TENANT SELECTS THE WASTE TYPE, AND THE WASTE INSERTED TO THE CHUTE IS RECEIVED BY THE TRISORTER DEVICE AT THE BOTTOM OF THE CHUTE AT THE UNDERGROUND LEVEL.
3. THE TRISORTER DIRECTS THE WASTE EITHER TO ONE OF TWO RECYCLING TYPE BINS OR TO A COMPACTED GARBAGE BIN (3 CUBIC YARD BIN).
4. WASTE IS RETAINED IN WHEELED BINS WITHIN UNDERGROUND STORAGE UNTIL COLLECTION DAY. PROPERTY MANAGEMENT RELOCATES ALL WASTE BINS TO THE SURFACE PICKUP AREA, THE "DEDICATED WASTE COLLECTION POINT".
5. THE "DEDICATED WASTE COLLECTION POINT" IS A CONCRETE PAD ON THE SITE SURFACE ABUTTING THE ASPHALT CIRCULATION INTERIOR TO THE SITE. IT IS FOR THE TEMPORARY STORAGE OF WASTE ONLY ON SCHEDULED DAYS ARRANGED BY PROPERTY MANAGEMENT FOR PRIVATE PICKUP. TOWNHOME RESIDENTS ADD THEIR WASTE TO COLLECTION POINT AT SAME SCHEDULE.
6. ONCE PRIVATE PICKUP IS COMPLETE PROPERTY MANAGEMENT IS TO RESTORE THE BINS TO THE UNDERGROUND PARKADE.

SITE STATISTICS - EAST BLOCK

DESCRIPTION	PHASE #1	PHASE #2	TOTAL
NUMBER OF BUILDINGS	2	1	3
# OF APARTMENTS	2	1	3
# OF TOWNHOMES	0	0	0
NUMBER OF UNITS	254	116	370
# OF APARTMENTS	254	116	370
# OF TOWNHOMES	0	0	0
PROPOSED USE(S)	RESIDENTIAL	RESIDENTIAL	RESIDENTIAL
BUILDING HEIGHT - APT	4-8 STOREYS	5 STOREYS	4-8 STOREYS
BUILDING HEIGHT - TOWNS	N/A	N/A	N/A
SITE AREA	13,728.1 sm	10,402 sm	24,130.1 sm
DENSITY (U/HA)	185	111.5	153.3
BUILDING AREA TOTAL	3,664.6 sm	2,431 sm	6,095.6 sm
LOT COVERAGE	26.69%	23.37%	26.25%
APPROX. GROSS FLOOR AREA	24,332.5 sm	11,024.6 sm	35,357 sm
FLOOR AREA RATIO	0.26	0.23	0.25
AREA OF UNDERGROUND PARKADE	12,835.9 sm	5,358.4 sm	18,184.3 sm

KEY MAP

HAMILTON, ON
NTS

ELECTRONIC DRAWINGS OF SUBJECT LANDS:
REVISED DRAFT PLAN OF "THE BROWLANDS"
BEING A PROPOSED SUBDIVISION OF PARCEL "A", MOUNTAIN VIEW HEIGHTS • REGISTERED PLAN NO. 555
PART OF LOT SANATORIUM ROAD
ESTABLISHED BY BYLAW VM.204 AS INST.218642 AB
PART OF LOT SANATORIUM ROAD
ESTABLISHED ACCORDING TO REGISTERED PLAN NO. 573 AS MOUNTAIN VIEW BOULEVARD NAME CHANGED BY BYLAW 78TH-5566, REG'D AS INST.81655
AND
PART OF LOT 57, CONCESSION 2
GEOGRAPHIC TOWNSHIP OF ANCASTER
CITY OF HAMILTON

SURVEY OF EXISTING LAND & LOT BOUNDARIES

A.T. McLaren Limited
LEGAL AND ENGINEERING SURVEYS
69 JOHN STREET SOUTH, SUITE 330
HAMILTON, ONTARIO, L8N 2B9
PHONE (905) 527-8559 FAX (905) 527-0032

DRAFT PLAN OF SUBDIVISION PREPARED BY

URBAN SOLUTIONS
PLANNING & LAND DEVELOPMENT
3 Studebaker Place, Unit 1
Hamilton, ON • L8L 0C8
905-546-1087
URBANSOLUTIONS.INFO

ALL DRAWINGS ARE UNDERSTOOD TO BE SUBJECT TO CHANGE DUE TO COMMENTS FROM MUNICIPAL DEPARTMENTS AND OTHER AGENCIES WITH AUTHOURITY

ALL DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF THE ARCHITECTS AND MUST BE RETURNED AT THE COMPLETION OF THE WORK

THE CONTRACTOR WORKING FROM DRAWINGS NOT SPECIFICALLY MARKED "FOR CONSTRUCTION" MUST ASSUME FULL RESPONSIBILITY AND BEAR COSTS FOR ANY CORRECTIONS OR DAMAGES RESULTING FROM HIS OR HER WORK.

KEY TO DETAIL LOCATION
No. DETAIL NUMBER
No. DRAWING SHEET NUMBER

DRAWING SETS ISSUED	No.	DATE (DD.MM.YY)	BY
PLANNING APP. 1st SUBMISSION	1.	02.07.20	BF
SITE PLAN APPLICATION	2.	01.09.20	BF

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

REVISIONS TO DRAWING	No.	DATE (DD.MM.YY)	BY
-	-	-	-

NOT FOR CONSTRUCTION

BUILDING PERMIT NUMBER:
NOT FOR CONSTRUCTION WITHOUT PERMIT

KNYMH
ARCHITECTURE • SOLUTIONS
KNYMH INC.
1006 SKYVIEW DRIVE • SUITE 101
BURLINGTON, ONTARIO • L7P 0V1
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PROJECT NORTH / TRUE NORTH

ONTARIO ASSOCIATION OF ARCHITECTS
PRZEMYSLAW MYSZKOWSKI
LICENCE
7984

CHEDOKE
BROWLANDS
HAMILTON, ONTARIO

DRAWING SHEET TITLE:
BLOCK 5
EAST SITE PLAN

DRAWING SCALE: 1:500
PROJECT NUMBER: 19066
DRAWN BY: WH/HV
CHECKED BY: BF/WH
DRAWING VERSION: 2020-09-01
PLOT DATE: September 2, 2020
DRAWING SHEET NUMBER: SP2

Appendix B: Terms of Reference

DOUGAN & ASSOCIATES
ECOLOGICAL CONSULTING & DESIGN
77 Wyndham Street South • Guelph ON N1E 5R3 • T 519.822.1609 • F 519.822.5389 • www.dougan.ca

May 9, 2019

To:
Melissa Kiddie, Natural Heritage Planning, City of Hamilton
Sam Brush, Urban Forest Health Technician, City of Hamilton
Darren Kenny, Watershed Officer, Hamilton Conservation Authority
Nancy Mott, Senior Strategic Advisor, Niagara Escarpment Commission

CC:
Jim Dougan, Mary Anne Young; Dougan & Associates
Sergio Manchia, Urban Solutions
Anthony Valeri, Valery Homes

RE: Final Terms of Reference for Environmental Impact Study for Chedoke Browlands Site, 801, 820, 828, 855, 865, and 870 Scenic Drive Hamilton

NOTE: This final terms of reference has been updated from the original November 2, 2018 submission and the March 5, 2019 resubmission to reflect comments received from City of Hamilton, HCA, and NEC. Edits are provided in red.

Dougan & Associates (D&A) was retained in August 2018 to prepare a Terms of Reference (ToR) for an Environmental Impact Statement (EIS) for the lands at 801, 820, 828, 855, 865, and 870 Scenic Drive, Hamilton, also known as the Chedoke Browlands site. The Chedoke Browlands site was formerly the location of the Chedoke Hospital, and has an interesting and unique natural and cultural history. D&A has been retained for this work by Valery Homes, who wish to redevelop this site into residential use. Natural heritage studies are required as part of the redevelopment process, as natural heritage features including the Niagara Escarpment, woodlands, trees, and Chedoke Creek are located within the study area boundaries.

Comments were provided by the City of Hamilton (Forestry and Horticulture Section as well as Natural Heritage Planning), the Hamilton Conservation Authority, and the Niagara Escarpment Commission. These comments as well as the City of Hamilton's EIS guidelines (2015) have been used to prepare this ToR.

The study lands are located within the Westcliffe West neighbourhood of Hamilton, bounded by the brow of the Niagara Escarpment to the north and Scenic Drive, which runs in a semi-circle around the site. The north terminus of Sanatorium Road runs through the center of the site. Chedoke Creek bisects the site, running through a culvert under Sanatorium Road and over the Niagara Escarpment at Sanatorium Falls. The site contains a large number of trees, some part of cultural landscapes planted as part of the former hospital grounds, and some in natural forest communities. The greater landscape context of the site is largely urban, but the site is connected ecologically to other natural areas via the Niagara Escarpment.

Extensive natural heritage, forestry, and engineering studies have been completed for this site in the past, and an OMB decision was made in 2012 pertaining to an active application at that time. D&A will review the background information and use it to form a preliminary understanding of the site. Where natural heritage information has been gathered from background reports this will be referenced accordingly in the report. Available background reports and documents include the following:

- **No date.** Notice of Intent to Cut, Burn, or Destroy Trees… Woodland Conservation By-Law No.R00-054 (includes memorandum by Kuntz Forestry Consulting Inc.).*
- **2006, May. Jagger Hims Ltd.** Phase 1 Environmental Site Assessment, Chedoke Hospital Brow Lands, 565 Sanatorium Road, Hamilton, ON.
- **2007, June. Stevens Burgess Architects, Wendy Shearer, Landscape Architect**. Heritage Assessment.
- **2007, July. A.J. Clarke and Associates Ltd.** Preliminary Engineering Report, Chedoke Browlands, City of Hamilton.
- **2007, August. Young-Wright Architects.** Chedoke Browlands, Sub-Neighbourhood Urban Design Guidelines.
- **2008. Siteline Research**. Visual Impact Assessment for subject property.
- **2009, January. Aboud & Associates Inc.** Chedoke Browlands Development (Block 3, Building #12), Tree Protection Plan. *
- **2009, January. Aboud & Associates Inc.** Chedoke Browlands Development, Part of Lot 57, City of Hamilton, Vegetation Community Assessment Plan and ESA Woodlot Buffer. *
- **2009, February. G. O'Connor Consultants Inc.** Scoped Environmental Impact Statement, Report for the North Scenic Planning Area, Chedoke Browlands, Hamilton, Ontario. *
- **2009, September. Parish Geomorphic.** Meander Belt Width Assessment, Chedoke Creeks (Scenic & Sanatorium).
- **2012. Ontario Municipal Board.** OMB Decision. Deanlee Management appeal. PL100691
- **2016. S. Llewellyn & Associates Ltd.** Technical Memorandum – Browlands Hydraulic Analysis
- **2016, October. GeoProcess Research Associates.** Brow Lands Tree Inventory & Hazard Tree Assessment. *
- **2017, February. Williams & Associates.** Browlands Forest Operating Prescription. *

Field data from previous studies will be used as a secondary source of information for the EIS.

The intent of D&A's natural heritage work is to support approval of planning approvals for the Chedoke Browlands. Some earlier studies may warrant scoping of the seasonal studies for the new EIS; these are noted with an asterisk, above. Other concurrent studies which are ongoing include engineering, urban design, cultural heritage, noise, transportation, fluvial geomorphology, and planning.

Final Accepted TERMS OF REFERENCE

The following activities are proposed as the Terms of Reference for this study:

Activity	Details	Timing
Background Review		
Background Review	The Natural Heritage Information Centre (NHIC) database, the background studies referred to previously in this document, and relevant City of Hamilton municipal lists will be reviewed for natural heritage information to form a preliminary understanding of natural heritage features and functions on the study site.	Fall 2018
Natural Feature Staking		
Core Area Boundary Delineation / Demarcation	The limits of the ESA on site will be identified on site by the consulting team and representatives from the City of Hamilton and HCA and surveyed by a professional surveyor.	Spring 2019
Niagara Escarpment Brow Delineation / Demarcation	Niagara Escarpment Brow has already been surveyed for this property and would only need to be resurveyed in the event that there has been significant erosion or alteration has occurred. The client's geotechnical consultant will review if significant erosion has occurred. If significant erosion has occurred, the limits of the Niagara Escarpment Brow on site will be updated on site by the consulting team with representatives from the NEC and surveyed by a professional surveyor.	Spring/summer 2019
Vegetation Surveys		
Ecological Land Classification	Three (3) (spring: May to June; summer: early July to August; fall: September to October) vegetation surveys will confirm the ELC communities occurring within the study area using Lee et al. (1998), including characterization of soils.	September 2018 (completed), May-June, July-Aug 2019.
Vascular Plant Inventory	Vegetation inventories will be completed for each ELC polygon. All vascular plants observed on site will be recorded, and the species status for all species identified will be determined. This inventory will also determine if locally or regionally significant species are present. Local status will be based on the information provided within the Hamilton Natural Areas Inventory Project 3rd Edition Species Checklist (2014). HCA has a record of an S3 species located on the subject lands. D&A will contact HCA before the next field season for a detailed description of where this species might be located, so that surveys can establish its presence/absence.	Concurrent with ELC site visits
Wildlife Surveys		

Activity	Details	Timing
Breeding Bird Survey	Breeding bird surveys will take place following protocols outlined in the Ontario Breeding Bird Atlas (OBBA 2001), i.e. two surveys taking place at least seven days apart between May 24 and July 10. Surveys will occur between sunrise and approximately 10:00 a.m. under suitable weather conditions (i.e. light winds, good visibility, and no heavy rain).	Survey 1: May 24 – June 15; Survey 2: June 15 – July 10
Reptile Area Search	Active hand search surveys will be carried out to review the site for reptiles, primarily snakes, which may be present. Two surveys are proposed from mid-April to mid-May, at least ten days apart. Surveys are proposed for spring only because detectability of snakes is best in this season, as they are very active after recently emerging from hibernacula and vegetation cover is low. The surveys will take place when snakes are most likely to be emerging from hibernacula and/or active, that is, during sunny weather, with light winds and temperatures of at least 15°C. The surveys will generally take place after mid-morning as, at this time of year, temperatures will not reach the minimum required for snake activity until this time.	April to May
Amphibian Surveys	Surveys to detect presence and abundance of breeding amphibian species within vernal pools on the study site. To be conducted following Marsh Monitoring Program protocols. *The need for the third survey, June 15 – 30, will be based on the findings of the first and second surveys. D&A to correspond with City prior to cancelling the third round of surveys.	April 15 – 30, May 15 – 30, June 15-30*
Incidental Wildlife Observations	Wildlife will be noted on an incidental basis during all field investigations.	Concurrent with all field investigations
Significant Wildlife Habitat Screening	Significant wildlife habitat criteria for Ecoregion 7E (per MNRF 2015) will be compared to the results of the site characterization and wildlife survey results to identify whether Candidate Significant Wildlife Habitat exists on the study site.	Following 2019 vegetation and wildlife field surveys
Concurrent Studies ***(To be undertaken concurrently with EIS work; findings to be summarized in main body or EIS and taken into account for impact assessment. Full versions of concurrent studies to be submitted in application package along with EIS.***		
Watercourse Characterization **(to be undertaken by Wood PLC)**	A watercourse characterization will be undertaken in Summer 2019 to assess fish habitat in Chedoke Creek within the study area. As no specific information about fish occurrence is available for Chedoke Creek, it is proposed that a half day of electrofishing in the creek system within the study area be completed.	After spring spawning – after July 15th

Activity	Details	Timing
	Consultation with the Ministry of Natural Resources and Forestry (MNRF) will be undertaken prior to undertaking the work to ensure a License to Collect Fish for Scientific Purposes is obtained. Aquatic habitat characterization will be carried out by following the Ministry of Transportation/Fisheries and Oceans Canada/MNRF fisheries protocol. This will include collection of data pertaining to the general morphology of the reach (bankfull depth, channel width, and stream gradient), instream and riparian vegetation, occurrences of seeps or springs, general description of substrates as they relate to potential fish habitat, and flow. Information collected will be used to identify fisheries constraints and evaluate impacts on existing fisheries resources (as needed). The Ministry of Transportation/Fisheries and Oceans Canada/MNRF fisheries protocol was chosen instead of the Ontario Stream Assessment Protocol (OSAP) is because this is a fish assessment – to determine if fish are present, and identify if this stretch of the creek is in fact fish habitat (since there are no records). The OSAP protocol is a very detailed and rigorous assessment that looks to characterize the stream and its morphology amongst other details. The methods proposed will provide the necessary details pertaining to fish and fish habitat, and is more conducive to this type of project, and this type of creek corridor. Flood and erosion hazard limits will be identified by Wood as part of the civil and watercourse characterization works. The flood and erosion hazard limits of the watercourse will be evaluated and mapped as part of the Wood studies and will be discussed as part of the development proposal, impact assessment and mitigation sections of the EIS.	
Arborist Assessment & Tree Preservation Plan	An Arborist Assessment will be carried out following relevant City of Hamilton tree policies (Tree Protection Guidelines 2010, By-Law 15-125, Public Tree Preservation and Sustainability Policy 2015) for all areas proposed to be disturbed by development on the Browlands site. The arborist assessment and accompanying Tree Preservation Plan will be prepared by a qualified tree management professional (certified arborist, registered professional forester or landscape architect). The Arborist Assessment and Tree Protection Plan will be prepared as a stand-alone report, with the findings discussed as part of the EIS. The TPP will be included as an appendix to the EIS. For all trees outside of ESA and Chedoke Creek corridor, the data found in the arborist assessment completed by GeoProcess Research Associates in 2016 will be used. For any additional areas proposed to be disturbed, new data will be collected. Tree preservation plan will be updated with any new	Any additional arborist assessments required to be completed prior to (January – March) or following leaf-out (May-June 2019).

Activity	Details	Timing
	trees to be surveyed and the final development proposal base plan. The cultural heritage aspects of trees on the study site which have been previously identified in the June 22, 2012 OMB Decision and/or Chedmac Secondary Plan will be identified and discussed in this study.	
Species-at-Risk (SAR) Screening		
MECP Liaison	D&A will liaise with the Ministry of Environment, Conservation, and Parks (MECP) regarding SAR records and/or potential on the study site. Note that previous versions of this ToR stated that an Information Request and an Information Gathering Form would be part of the SAR tracking and approvals work for this project. As responsibility for the Endangered Species Act and therefore SAR have recently moved to the MECP, it is unclear what the proper protocols now are. However, our team will continue to work through the project assuming an equal level of SAR survey requirements and MECP oversight. All agency correspondence will be included in the final EIS.	Liaison to commence upon approval of ToR
Butternut Inventory	Screening of property for Butternut (*Juglans cinerea*) trees by BHA-certified arborist. If Butternut trees are found, the appropriate process described in Endangered Species Act, (O.Reg 242/08 Section 23.7) will be followed and all Butternut Health Assessments and correspondence with the MECP will be included as appendices to the EIS.	Concurrent with ELC surveys
Bat Habitat Suitability Assessment	The site has potentially suitable SAR bat habitat (wooded ecosites). Therefore, D&A will undertake a habitat assessment for SAR bats within treed habitats, in accordance with the most current standards (Guelph District MNRF, 2017). Trees and snags with suitable cavities will be identified during appropriate seasonal windows (leaf on for Tri-colored bat, leaf off for other SAR bats). If suitable cavities for SAR bats are detected in trees slated for damage or removal, the MECP may request the completion of an acoustic monitoring program (June) to verify the occupancy and diversity of SAR bat species in the study area. D&A typically liaises with the MECP following the identification of suitable roost / snag trees to confirm the need for acoustic surveys work, and locations for detectors. The large building on the eastern portion of the site will also be assessed as to its suitability for roosting bats. A preliminary desktop screening of the building indicates that it is not suitable for maternity roosts (e.g. it's a modern building, lacking a large, unobstructed roof void with roof timbers);	Habitat assessment: leaf-off (completed early May 2019) Identification of suitable maternity roost trees: concurrent with arborist surveys Visual exit and acoustic surveys: June 2019

Activity	Details	Timing
	however, it could harbour roosting bats on a temporary basis during migration. If suitable for bats, survey protocols specific to buildings (MNRF 2014) will be conducted from in June, which would involve two nights of visual exit surveys and sweeps with handheld detectors at dusk, and four nights of acoustic monitoring.	
Chimney Swift Assessment	A large building is located on the eastern portion of the site. Preliminary screening of aerial photography indicates that chimneys may be present. Field investigations in spring 2019 will assess any chimneys as to their suitability for Chimney Swifts (e.g. dimensions, materials, whether they are capped). If there is potential for swifts to nest, specific surveys for Chimney Swift will be conducted, following guidelines by Bird Studies Canada (2009). Two dusk surveys for swifts will be conducted at this building between mid-May and early July. If none are found during this period, additional dusk surveys in fall will be conducted to check for swifts using the chimneys as a roost during migration.	Assessment of building for suitable chimneys: January to April. Breeding bird surveys: mid-May to early July for potential breeding birds. Migrant roosting surveys (*if required*): late August to early October for roosting migrants.
Additional SAR surveys	Depending on the results of the background review and MECP correspondence, additional SAR surveys may be required. If further surveys are required D&A will carry out surveys according to the specific protocols for the SAR identified. All methods and findings, as well as correspondence with MECP, will be included in the report.	Varies depending on species identified by background review and results of MECP correspondence.
Reporting		
Methods	Methods for all field surveys will be described	Following completion of field surveys

Findings	Findings for all field surveys will be described, and appendices including all data will be provided regarding:
	• Vegetation
	• Wildlife
	  o Birds
	  o Amphibians
	  o Incidental Wildlife
	• Watercourse characterization
	• SAR Screening
	• SWH Screening
		Following completion of field surveys

Policy Analysis	Federal, provincial, and local environmental policy will be reviewed and interpreted in the context of the study site and proposal. Policy documents include (but are not limited to): • Provincial Policy Statement; • Urban Hamilton Official Plan;	Following completion of field surveys

Activity	Details	Timing
	• HCA Policies; and • Niagara Escarpment Plan (Relevant policies include, but are not limited to Parts 1.3 and 1.7; Parts 2.5, 2.6, 2.7, 2.10, 2.12, 2.13).	
Development Proposal	Discussion of the proposed development, particularly non-ecological components and a brief discussion of activities associated with the Cross of Lorraine on the neighbouring property.	Following completion of concurrent studies and upon receipt of current development plan
Impact Assessment	Direct, indirect, and cumulative impacts to the natural heritage features and functions on the study site as a result of the proposed plan will be identified and discussed. Note that D&A will consult with other team members to ensure that concurrent studies (i.e. Cross of Lorraine restoration) are taken into consideration in the Impact Assessment and mitigation Measures sections of the report.	Following completion of field surveys and upon receipt of current development plan
Mitigation Measures	Mitigation measures will be recommended to avoid impacts to natural features on the study site. Matters discussed may include vegetation protection zone width, habitat restoration, and/or invasive species management.	Following completion of policy analysis and impact assessment
Mapping	GIS will produce mapping products that support a comprehensive report. Anticipated maps are: • Site Context Map • ELC Vegetation Communities • Wildlife Findings • ESA Boundaries • Opportunities & Constraints • Mitigation Opportunities	Following completion of field surveys
Table of Contents	The following Table of Contents will be used for the EIS: Introduction Development Proposal Study Purpose Methods Background Review Field Studies Wildlife Resources Vegetation Resources Species at Risk Screening Significant Wildlife Habitat Screening Watercourse Evaluation (*by others*) Findings Background Review Field Studies Wildlife Resources Vegetation Resources	Following completion of field surveys

Activity	Details	Timing
	Concurrent Studies Watercourse Evaluation (*by others*) Visual Impact Assessment (*by others*) Legislation & Policies Federal Provincial Local Constraint Identification & Impact Assessment Direct Impacts Indirect Impacts Cumulative Impacts Mitigation Measures Recommendations & Conclusions References Appendices	

Next Steps

~~Please review this draft Terms of Reference and provide any comments you may have. If requested, Dougan & Associates will complete any required revisions and resubmit for your approval.~~ The Terms of Reference has been accepted by all Agency stakeholders, and work on the EIS is being undertaken. ~~Following acceptance of this ToR by the City of Hamilton and HCA, D&A and other consultants working on the file will complete the required field studies and D&A will prepare the EIS report for the Chedoke Browlands lands.~~

~~Please feel free to contact us with any questions or concerns.~~

Yours truly,

Jim Dougan, BSc, MSc, OALA (Hon)
Director & Senior Ecologist

Mary Anne Young BLA, OALA, CSLA, ISA
Landscape Architect, Ecologist

Appendix C. Wildlife Survey Results

Common Name	Scientific Name	CONSERVATION STATUS				Area Sensitivity (OMNR 2000)	Protected by MBCA (1994)	Breeding Evidence (OBBA 2001)	Comments
		NATIONAL	PROVINCIAL		LOCAL				
		COSEWIC Designation (COSEWIC 2018)	ESA Status per O.R. 230/08 (Gov. of Ont. 2019)	S Rank (NHIC 2019)	City of Hamilton - Based on N.A.I. (Schwetz 2014) Birds - (Smith 2014)				
Birds									
American Crow	*Corvus brachyrhynchos*	---	---	S5	common - ubiquitous	---	N	Possible	
American Goldfinch	*Spinus tristis*	---	---	S5	abundant - ubiquitous	---	Y	Probable	
American Redstart	*Setophaga ruticilla*	---	---	S5	uncommon - widespread	AS	Y	Possible	Observed on May 27 only, possible migrant.
American Robin	*Turdus migratorius*	---	---	S5	abundant - ubiquitous	---	Y	Confirmed	Fledged young observed
Baltimore Oriole	*Icterus galbula*	---	---	S4	common - ubiquitous	---	Y	Possible	
Black-capped Chickadee	*Poecile atricapillus*	---	---	S5	abundant - ubiquitous	---	Y	Possible	
Black-throated Blue Warbler	*Setophaga caerulescens*	---	---	S5	rare - local	AS	Y	X	Incidental, migrant
Blue Jay	*Cyanocitta cristata*	---	---	S5	abundant - ubiquitous	---	N	Possible	
Brown-headed Cowbird	*Molothrus ater*	---	---	S4	abundant - ubiquitous	---	N	Probable	
Chipping Sparrow	*Spizella passerina*	---	---	S5	abundant - ubiquitous	---	Y	Possible	

Cooper's Hawk	*Accipiter cooperii*	---	---	S4	uncommon - scattered	AS	N	Confirmed	One bird on a nest was observed on May 27; the location was well to east of site in escarpment forest.
Double-crested Cormorant	*Phalacrocorax auritus*	---	---	S5	abundant - restricted	---	N	X	Incidental
Downy Woodpecker	*Dryobates pubescens*	---	---	S5	common - ubiquitous	---	Y	Probable	
Eastern Pheobe	*Sayornis phoebe*	---	---	S5	uncommon - widespread	---	Y	Possible	Incidental
Eastern Wood-Pewee	*Contopus virens*	SC	SC	S4	common - very widespread	---	Y	Probable	One bird singing in escarpment forest to east of study area (in adjacent lands). See report for details.
Golden-crowned Kinglet	*Regulus satrapa*	---	---	S5	rare - local	---	Y	X	Incidental, migrant
Gray Catbird	*Dumetella carolinensis*	---	---	S4	abundant - ubiquitous	---	Y	Probable	
Hairy Woodpecker	*Picoides villosus*	---	---	S4	common - ubiquitous	AS	Y	Possible	
House Finch	*Haemorhous mexicanus*	---	---	SNA	abundant - widespread; exotic; introduced	---	N	Possible	
House Sparrow	*Passer domesticus*	---	---	SNA	abundant - widespread; exotic; introduced	---	N	Possible	
House Wren	*Troglodytes aedon*	---	---	S5	common - ubiquitous	---	Y	Possible	
Indigo Bunting	*Passerina cyanea*	---	---	S4	common - ubiquitous	---	Y	Confirmed	Fledged young observed
Killdeer	*Charadrius vociferus*	---	---	S5	abundant - ubiquitous	---	Y	Possible	
Least Flycatcher	*Empidonax minimus*	---	---	S4	uncommon - widespread	AS	Y	X	Incidental, migrant

Magnolia Warbler	*Setophaga magnolia*	---	---	S5	rare - local	AS	Y	X	Incidental, migrant
Mourning Dove	*Zenaida macroura*	---	---	S5	abundant - ubiquitous	---	Y	Possible	
Northern Cardinal	*Cardinalis cardinalis*	---	---	S5	abundant - ubiquitous	---	Y	Probable	
Northern Flicker	*Colaptes auratus*	---	---	S4	common - ubiquitous	---	Y	Confirmed	Fledged Young Observed
Purple Finch	*Haemorhous purpureus*	---	---	S4	rare - restricted	---	Y	Possible	Incidental, possible migrant
Red-bellied Woodpecker	*Melanerpes carolinus*	---	---	S4	uncommon - very widespread	---	Y	Possible	Observed May 27 only in escarpment forest (adjacent lands). See report for details.
Red-breasted Nuthatch	*Sitta canadensis*	---	---	S5	uncommon - widespread	AS	Y	Possible	Incidental
Red-eyed Vireo	*Vireo olivaceous*	---	---	S5	common - very widespread	---	Y	Possible	
Red-winged Blackbird	*Agelaius phoeniceus*	---	---	S4	abundant - ubiquitous	---	N	Possible	
Ring-billed Gull	*Larus delawarensis*	---	---	S5	abundant - very restricted	---	Y	X	Observed flying over site only; not considered breeding.
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	---	---	S4	common - ubiquitous	---	Y	Possible	Incidental
Ruby-crowned Kinglet	*Regulus calendula*	---	---	S4	---	---	Y	X	Incidental, migrant
Scarlet Tanager	*Piranga olivacea*	---	---	S4	uncommon - widespread	AS	Y	Possible	Incidental
Song Sparrow	*Melospiza melodia*	---	---	S5	abundant - ubiquitous	---	Y	Probable	
Turkey Vulture	*Cathartes aura*	---	---	S5	uncommon - widespread	---	N	X	Incidental, flyover
White-breasted Nuthatch	*Sitta carolinensis*	---	---	S5	common - very widespread	AS	Y	Probable	

White-throated Sparrow	*Zonotrichia albicollis*	---	---	S5	uncommon - restricted	---	Y	X	Incidental, migrant
Reptiles & Amphibians									
Eastern Gartersnake	*Thamnophis sirtalis sirtalis*	---	---	S5	abundant	---	---	---	
Eastern Red-backed Salamander	*Plethodon cinereus*	---	---	S5	common	---	---	---	
Insects									
Ebony Jewelwing	*Calopteryx maculata*	---	---	S5	common permanent resident	---	---	---	Incidental
Common Ringlet	*Coenonympha tulia*	---	---	S5	common permanent resident	---	---	---	Incidental
Monarch	*Danaus plexippus*	END	SC	S2N,S4B	common breeding immigrant				Incidental

Appendix D: Bat Habitat Suitability Assessment Findings

Tree Tag	Common Name	Scientific Name	Tree Status	Decay Class	Snag Attributes	Snag Attributes Comments	DBH1	DBH2	DBH3	DBH4	Crown Reserve	Height	ELC Polygon number	ELC Community
1	Sugar Maple	Acer saccharum	Alive	2	Cavity, LooseBark	Cavities 15m	43				7	15-20	2	FOD - Deciduous Forest
2	Black Cherry	Prunus serotina var. serotina	Dead	3	Cavity, Crack		34				0	15-20	2	FOD - Deciduous Forest
3	Northern Red Oak	Quercus rubra	Alive	2	Crack, Cavity, OtherSnag	Hollow all the way up	79				7	20-25	2	FOD - Deciduous Forest
4	Northern Red Oak	Quercus rubra	Alive	2	Cavity, Crack	Crown missing	80				14	20-25	2	FOD - Deciduous Forest
5	Northern Red Oak	Quercus rubra	Alive	1	LooseBark, KnotHole		60	45	45		15	20-25	2	FOD - Deciduous Forest
6	Black Cherry	Prunus serotina var. serotina	Alive		OtherSnag, LooseBark, KnotHole		40				7	20-25	2	FOD - Deciduous Forest
7	Maple Species	Acer sp	Dead	5	Cavity, LooseBark, OtherSnag		22				0	10-15	2	FOD - Deciduous Forest
8	Maple Species	Acer sp	Dead	5	OtherSnag, Cavity, LooseBark		35				0	15-20	2	FOD - Deciduous Forest
9	Northern Red Oak	Quercus rubra	Alive	2	LooseBark, KnotHole		84				12	20-25	2	FOD - Deciduous Forest
10	Sugar Maple	Acer saccharum	Alive	2	OtherSnag, Cavity, KnotHole, LooseBark		70				12	20-25	2	FOD - Deciduous Forest
11	Northern Red Oak	Quercus rubra	Alive	1	Cavity, KnotHole		68				12	20-25	2	FOD - Deciduous Forest
12	Bur Oak	Quercus macrocarpa	Alive	1	KnotHole, LooseBark		84				10	20-25	2	FOD - Deciduous Forest
13	Sugar Maple	Acer saccharum	Alive	2			60				10	20-25	2	FOD - Deciduous Forest
15	Sugar Maple	Acer saccharum	Alive	1	KnotHole, Cavity, OtherSnag		73				12	15-20	2	FOD - Deciduous Forest
16	Sugar Maple	Acer saccharum	Alive	1	OtherSnag, Cavity, LooseBark		64				8	20-25	2	FOD - Deciduous Forest
18	Sugar Maple	Acer saccharum	Alive	2	Cavity, OtherSnag, KnotHole	Cavity 20m	89				15	20-25	2	FOD - Deciduous Forest
19	Sugar Maple	Acer saccharum	Dead	4	Cavity, OtherSnag, LooseBark	Crown missing	65				0	20-25	2	FOD - Deciduous Forest
20	Northern Red Oak	Quercus rubra	Alive	2	Cavity, LooseBark, OtherSnag		92				12	20-25	2	FOD - Deciduous Forest
21	Northern Red Oak	Quercus rubra	Alive	2	LooseBark, KnotHole, Cavity, OtherSnag		71				17	20-25	2	FOD - Deciduous Forest
22	Sugar Maple	Acer saccharum	Alive	2	LooseBark, Crack		2				5	10-15	2	FOD - Deciduous Forest
23	Black Cherry	Prunus serotina var. serotina	Alive	1	LooseBark		59				10	20-25	2	FOD - Deciduous Forest
24	Sugar Maple	Acer saccharum	Alive	1	KnotHole, OtherSnag		70				13	20-25	2	FOD - Deciduous Forest
25	Maple Species	Acer sp	Dead	4	Cavity, LooseBark, OtherSnag		41				0	10-15	2	FOD - Deciduous Forest
26	Eastern Hemlock	Tsuga canadensis	Dead	3	Cavity, OtherSnag		48				0	10-15	2	FOD - Deciduous Forest
27	Sugar Maple	Acer saccharum	Alive	1	LooseBark, KnotHole		64				10	20-25	2	FOD - Deciduous Forest
28	Sugar Maple	Acer saccharum	Dead	4	Cavity, LooseBark, Crack, KnotHole	Big cavity at 20, hollow	68				0	20-25	2	FOD - Deciduous Forest
29	Sugar Maple	Acer saccharum	Alive	1	Crack, LooseBark, Cavity	Dead branch at top	81				15	20-25	2	FOD - Deciduous Forest
30	Sugar Maple	Acer saccharum	Alive	1	KnotHole, OtherSnag	Read branch	61				10	20-25	2	FOD - Deciduous Forest
31	Northern Red Oak	Quercus rubra	Alive	1	Cavity, Crack, OtherSnag	Cavity 29m	77				16	20-25	2	FOD - Deciduous Forest
32	Shagbark Hickory	Carya ovata var. ovata	Alive		KnotHole, Cavity		52				12	20-25	2	FOD - Deciduous Forest
33	Sugar Maple	Acer saccharum	Alive	2	Cavity, LooseBark, OtherSnag		63				9	20-25	2	FOD - Deciduous Forest
34	Sugar Maple	Acer saccharum	Alive	2	LooseBark, OtherSnag		42				5	20-25	2	FOD - Deciduous Forest
35	Sugar Maple	Acer saccharum	Dead	4	Cavity, LooseBark, Crack		47				0	20-25	2	FOD - Deciduous Forest
36	Sugar Maple	Acer saccharum	Dead	4	LooseBark, Crack	Most bark missing or loose	55				0	15-20	2	FOD - Deciduous Forest
36	Sugar Maple	Acer saccharum	Alive	2	Cavity, ForestEdge, LooseBark	Cavity 10 m up	32				7	15-20	2	FOD - Deciduous Forest
37	Sugar Maple	Acer saccharum	Alive	3	Interior, Cavity	Cavity at top	31				5	15-20	2	FOD - Deciduous Forest
38	Black Cherry	Prunus serotina var. serotina	Dead	4	LooseBark, Interior, OtherSnag, KnotHole	No branches; Cavity at top	27				0	10-15	2	FOD - Deciduous Forest
39	Sugar Maple	Acer saccharum	Dead	3	LooseBark, Cavity	Oh dead branch w cavity 15m up	33				0	20-25	2	FOD - Deciduous Forest
40	Sugar Maple	Acer saccharum	Dead	5	LooseBark, Crack		27				0	10-15	2	FOD - Deciduous Forest
40	Sugar Maple	Acer saccharum	Alive	1	LooseBark, KnotHole		71				15	20-25	2	FOD - Deciduous Forest
41	Sugar Maple	Acer saccharum	Dead	4	Crack, LooseBark		14				0	10-15	2	FOD - Deciduous Forest
42	Sugar Maple	Acer saccharum	Alive	1	Cavity, Interior		23				7	15-20	2	FOD - Deciduous Forest
43	Sugar Maple	Acer saccharum	Dead	4	LooseBark, Cavity	Cavity at 10 m	17				0	10-15	2	FOD - Deciduous Forest
44	Northern Red Oak	Quercus rubra	Alive	1	Interior, KnotHole, LooseBark		45				8	20-25	2	FOD - Deciduous Forest
45	Northern Red Oak	Quercus rubra	Alive	2	Cavity, LooseBark, Crack, KnotHole		86				10	20-25	2	FOD - Deciduous Forest
46	Sugar Maple	Acer saccharum	Alive	1	KnotHole		51				10	20-25	2	FOD - Deciduous Forest
46	Black Cherry	Prunus serotina var. serotina	Alive	2	LooseBark	Dead leader	17				6	10-15	2	FOD - Deciduous Forest
47	Sugar Maple	Acer saccharum	Alive	2	LooseBark, Cavity, KnotHole		53				8	15-20	2	FOD - Deciduous Forest
48	Maple Species	Acer sp	Dead	5	Cavity, LooseBark, Crack		24				0	10-15	2	FOD - Deciduous Forest
49	Sugar Maple	Acer saccharum	Alive	1	KnotHole		44				9	20-25	2	FOD - Deciduous Forest
50	Sugar Maple	Acer saccharum	Dead	5	Cavity, ForestEdge	Cavity15 m up	45				0	15-20	2	FOD - Deciduous Forest
51	Maple Species	Acer sp	Dead	5	ForestEdge, Crack, Cavity	Cavity 7m up	17				0	10-15	2	FOD - Deciduous Forest

Appendix D: Bat Habitat Suitability Assessment Findings

Tree Tag	Common Name	Scientific Name	Tree Status	Decay Class	Snag Attributes	Snag Attributes Comments	DBH1	DBH2	DBH3	DBH4	Crown Reserve	Height	ELC Polygon number	ELC Community
52	Sugar Maple	Acer saccharum	Dead	4	ForestEdge, Cavity, LooseBark, Crack, KnotHole	Cavity ranging from 20mto 5m	71				0	20-25	2	FOD - Deciduous Forest
53	Sugar Maple	Acer saccharum	Dead	4	LooseBark, Cavity		38				0	15-20	2	FOD - Deciduous Forest
54	Sugar Maple	Acer saccharum	Alive	2	Cavity, LooseBark	Cavity 15m up	27				5	15-20	2	FOD - Deciduous Forest
55	Maple Species	Acer sp	Dead	5	LooseBark, Cavity, Crack, Interior	Cavity 13m up	23				0	10-15	2	FOD - Deciduous Forest
56	Sugar Maple	Acer saccharum	Alive	2	KnotHole		51				8	15-20	2	FOD - Deciduous Forest
57	Sugar Maple	Acer saccharum	Alive	2	Crack, Cavity	Leader snapped off cavities 20m up	39				10	20-25	2	FOD - Deciduous Forest
58	Maple Species	Acer sp	Dead	5	LooseBark, Crack		21				0	10-15	2	FOD - Deciduous Forest
59	Maple Species	Acer sp	Dead	5	LooseBark, Crack, Cavity	Hollow with many cavities	12				0	03-05	2	FOD - Deciduous Forest
60	Maple Species	Acer sp	Dead	5	Cavity, Interior, LooseBark, Crack	Cavities at top	31				0	15-20	2	FOD - Deciduous Forest
61	Black Cherry	Prunus serotina var. serotina	Dead	4	LooseBark		16				0	15-20	2	FOD - Deciduous Forest
62	Sugar Maple	Acer saccharum	Alive	2	Cavity	Cavity 15m up	26				10	20-25	2	FOD - Deciduous Forest
63	Sugar Maple	Acer saccharum	Dead	3	LooseBark	Top snapped off likely this year	53				0	10-15	2	FOD - Deciduous Forest
64	Sugar Maple	Acer saccharum	Alive	2	LooseBark, Crack, Cavity	Cavity at top	26				5	10-15	2	FOD - Deciduous Forest
65	Sugar Maple	Acer saccharum	Dead	3	ForestEdge, LooseBark	Top sheared off recently some decay present	50				0	05-10	2	FOD - Deciduous Forest
66	Sugar Maple	Acer saccharum	Alive	2	Cavity, Crack	Lg cavity 10m up and 1m long	43				3	15-20	2	FOD - Deciduous Forest
66	Northern Red Oak	Quercus rubra	Alive	1	LooseBark, KnotHole		61				14	20-25	2	FOD - Deciduous Forest
67	Unknown Tree Species	unknown sp.	Dead	6	ForestEdge, Crack, Cavity	No bark present super decayed	37				0	10-15	2	FOD - Deciduous Forest
68	Sugar Maple	Acer saccharum	Alive	2	Cavity, LooseBark, Crack	Cavities at top	31				4	15-20	2	FOD - Deciduous Forest
69	Maple Species	Acer sp	Dead	5	Crack, LooseBark		19				0	10-15	2	FOD - Deciduous Forest
70	Sugar Maple	Acer saccharum	Alive	2	KnotHole, Cavity	Cavities 10 and 15m up	40				10	20-25	2	FOD - Deciduous Forest
71	Maple Species	Acer sp	Dead	5	LooseBark, Cavity, Crack	Cavity at top	20				0	15-20	2	FOD - Deciduous Forest
72	Sugar Maple	Acer saccharum	Dead	3	LooseBark		37				0	15-20	2	FOD - Deciduous Forest
73	Sugar Maple	Acer saccharum	Dead	4	LooseBark, Crack, Cavity	Cavity at top	20				0	15-20	2	FOD - Deciduous Forest
74	Sugar Maple	Acer saccharum	Alive	2	Interior, Crack, Cavity, LooseBark	Cavity at top	24				3	15-20	2	FOD - Deciduous Forest
75	Sugar Maple	Acer saccharum	Dead	4	Cavity, LooseBark, Crack	Likely hollow, many small cavities and some large ones	73				0	20-25	2	FOD - Deciduous Forest
76	White Ash	Fraxinus americana	Dead	3	Cavity, LooseBark, KnotHole	EAB hopes, cavity 15 up	82				0	20-25	2	FOD - Deciduous Forest
77	Sugar Maple	Acer saccharum	Dead	3	LooseBark, KnotHole		52				0	20-25	2	FOD - Deciduous Forest
78	Sugar Maple	Acer saccharum	Dead	4	Cavity, LooseBark	Cavity 15m up	24				0	15-20	2	FOD - Deciduous Forest
79	Sugar Maple	Acer saccharum	Dead	5	LooseBark, Cavity	No top	20				0	10-15	2	FOD - Deciduous Forest
79	Sugar Maple	Acer saccharum	Dead	4	LooseBark		35				0	10-15	2	FOD - Deciduous Forest
80	Sugar Maple	Acer saccharum	Alive	2	LooseBark		29				1	10-15	2	FOD - Deciduous Forest
81	Maple Species	Acer sp	Dead	5	LooseBark, Cavity, Crack	Cavity at top	27				0	10-15	2	FOD - Deciduous Forest
82	Sugar Maple	Acer saccharum	Dead	5	Cavity, LooseBark, Crack	Cavity at top	22				0	10-15	2	FOD - Deciduous Forest
83	Sugar Maple	Acer saccharum	Alive	2	ForestEdge, LooseBark, Crack, KnotHole, Cavity	Cavity 20m up	77				13	20-25	2	FOD - Deciduous Forest
84	Shagbark Hickory	Carya ovata var. ovata	Dead		LooseBark	Top snapped off	45				0	05-10	2	FOD - Deciduous Forest
86	Red Maple	Acer rubrum	Alive	1	Cavity, KnotHole	Cavity large 15m up	100				17	20-25	1	CUW - Cultural Woodland
87	Unknown Tree Species	unknown sp.	Dead	4	Cavity, OtherSnag, LooseBark		50	13	8		0	15-20	1	CUW - Cultural Woodland
88	Elm Species	Ulmus sp.	Dead	5	Cavity, LooseBark	Cavity at top	23				0	10-15	1	CUW - Cultural Woodland
89	Unknown Tree Species	unknown sp.	Dead	4	Cavity, Crack, LooseBark		38				0	10-15	1	CUW - Cultural Woodland
90	American Beech	Fagus grandifolia	Alive	2	KnotHole, LooseBark	48	48				10	10-15	1	CUW - Cultural Woodland
91	Shagbark Hickory	Carya ovata var. ovata	Dead	4	LooseBark	Broken top	59				0	05-10	1	CUW - Cultural Woodland
92	Willow Species	Salix sp.	Alive	1	LooseBark		40	35	18	17	12	15-20	1	CUW - Cultural Woodland
93	Maple Species	Acer sp	Dead	3	Cavity, Crack		82				0	20-25	1	CUW - Cultural Woodland
94	Unknown Tree Species	unknown sp.	Dead	5	LooseBark, Crack		40				0	15-20	1	CUW - Cultural Woodland
95	Willow Species	Salix sp.	Alive	2	LooseBark	Epicotmic	72	45			5	15-20	1	CUW - Cultural Woodland
96	Unknown Tree Species	unknown sp.	Dead	5	Cavity, Crack, KnotHole		40				0	10-15	5	CUW - Cultural Woodland
98	Pine Species	Pinus sp.	Dead	5	Crack, OtherSnag		45				0	15-20	5	CUW - Cultural Woodland
99	Pine Species	Pinus sp.	Dead	4	LooseBark		19				0	05-10	5	CUW - Cultural Woodland
100	Pine Species	Pinus sp.	Dead	4	Cavity, LooseBark, OtherSnag, KnotHole		38				0	20-25	5	CUW - Cultural Woodland
101	Pine Species	Pinus sp.	Dead	5	Cavity, LooseBark, KnotHole		28				0	10-15	5	CUW - Cultural Woodland
102	Pine Species	Pinus sp.	Dead	3	LooseBark		41				0	15-20	5	CUW - Cultural Woodland
103	Pine Species	Pinus sp.	Dead	4	KnotHole, LooseBark		41				0	15-20	5	CUW - Cultural Woodland

Appendix D: Bat Habitat Suitability Assessment Findings

Tree Tag	Common Name	Scientific Name	Tree Status	Decay Class	Snag Attributes	Snag Attributes Comments	DBH1	DBH2	DBH3	DBH4	Crown Reserve	Height	ELC Polygon number	ELC Community
104	Pine Species	Pinus sp.	Dead	4	LooseBark, Cavity		32				0	15-20	5	CUW - Cultural Woodland
105	Pine Species	Pinus sp.	Dead	5	LooseBark, Crack		23				0	10-15	5	CUW - Cultural Woodland
139	White Ash	Fraxinus americana	Dead				100				0	15-20	2	FOD - Deciduous Forest
1742	Northern Red Oak	Quercus rubra	Alive	1	Cavity, KnotHole, OtherSnag		90				15	20-25	6	ANTH - Anthropogenic
1743	Northern Red Oak	Quercus rubra	Alive	1	Cavity, LooseBark, KnotHole		83				10	20-25	6	ANTH - Anthropogenic
1745	Northern Red Oak	Quercus rubra	Alive	2	Cavity, KnotHole, LooseBark, Crack		45				7	15-20	6	ANTH - Anthropogenic
1746	Shagbark Hickory	Carya ovata var. ovata	Alive	1	LooseBark		50				5	20-25	6	ANTH - Anthropogenic
1747	Shagbark Hickory	Carya ovata var. ovata	Alive	1	LooseBark, OtherSnag		60				10	20-25	6	ANTH - Anthropogenic
1751	Bur Oak	Quercus macrocarpa	Alive	2	Crack, LooseBark, Cavity	Cavity 20m up	104				15	20-25	6	ANTH - Anthropogenic
1758	Northern Red Oak	Quercus rubra	Alive	2	OtherSnag, Cavity, Crack	Main leader broken	82				12	20-25	6	ANTH - Anthropogenic
1762	Red Maple	Acer rubrum	Alive	2	LooseBark, KnotHole, OtherSnag		52				4	10-15	6	ANTH - Anthropogenic
1763	Sugar Maple	Acer saccharum	Dead	4	Cavity, LooseBark, Crack, KnotHole, OtherSnag	Likely, several cavities	72				0	10-15	6	ANTH - Anthropogenic
1764	Northern Red Oak	Quercus rubra	Alive	2	Dead, OpenArea, Cavity, LooseBark, Crack, KnotHole, OtherSnag	Main leader broken off large cavity 10m up likely hollow in middle	104				7	20-25	6	ANTH - Anthropogenic

Appendix E: Vascular Plant Species and Status List

Scientific Name	Common Name	G Rank	S Rank	COSEWIC Status	SARO Status	Hamilton Status (2014)	CC	CW	Native Status	Polygon Found In						
										1	2	3	4	5	6	7
Acer negundo	Manitoba Maple	G5	S5				0	-2	N	x			x			
Acer nigrum	Black Maple	G5	S4?				7	3	N	x	x					
Acer platanoides	Norway Maple	GNR	SNA				0	5	I	x	x	x	x	x		x
Acer rubrum	Red Maple	G5	S5				4	0	N	x						
Acer saccharinum	Silver Maple	G5	S5				5	-3	N				x			
Acer saccharum	Sugar Maple	G5	S5				4	3	N	x	x	x				x
Acer x freemanii	(Acer rubrum X Acer saccharinum)	GNA	SNA						I	x		x		x		
Aegopodium podagraria	Goutweed	GNR	SNA				0	0	I		x			x		
Agrimonia gryposepala	Hooked Agrimony	G5	S5				2	2	N	x						
Alliaria petiolata	Garlic Mustard	GNR	SNA				0	0	I	x	x		x	x	x	x
Allium schoenoprasum	Chives	G5	S4						N		x					
Allium sp	Onion Species									x						
Amelanchier arborea	Downy Serviceberry	G5	S5				5	3	N							x
Amelanchier laevis	Smooth Serviceberry	G5	S5				5	5	N	x						
Amelanchier sp	Serviceberry Species										x					
Aquilegia canadensis	Wild Columbine	G5	S5				5	1	N					x		
Arctium lappa	Great Burdock	GNR	SNA						I	x	x	x		x	x	
Arisaema triphyllum	Jack-in-the-pulpit	G5	S5				5	-2	N		x	x	x			
Asclepias syriaca	Common Milkweed	G5	S5				0	5	N	x						
Aster sp	Aster Species										x			x		
Bidens frondosa	Devil's Beggarticks	G5	S5				3	-3	N	x	x	x				
Brassica nigra	Black Mustard	GNR	SNA				0	5	I					x	x	
Bromus inermis	Smooth Brome	G5TNR	SNA				0	5	I	x						
Campsis radicans	Trumpet Creeper	G5	S2?				3	0	N	x						
Cardamine diphylla	Two-leaved Toothwort	G5	S5				7	5	N		x					
Carex blanda	Woodland Sedge	G5	S5				3	0	N	x		x	x			
Carex cristatella	Crested Sedge	G5	S5				3	-4	N				x			
Carex laxiflora	Loose-flowered Sedge	G5	S5				5	0	N		x					
Carex molesta	Troublesome Sedge	G4	S4S5				5	2	N			x				
Carex pensylvanica	Pennsylvania Sedge	G5	S5				5	5	N		x		x			
Carex radiata	Eastern Star Sedge	G5	S5				4	5	N		x	x	x			
Carex sp	Sedge Species									x	x	x	x			
Carex spicata	Spiked Sedge	GNR	SNA				0	5	I	x			x	x		
Carex stipata	Awl-fruited Sedge	G5	S5				3	-5	N	x						
Carex vulpinoidea	Fox Sedge	G5	S5				3	-5	N	x						
Carya cordiformis	Bitternut Hickory	G5	S5				6	0	N							x
Carya ovata	Shagbark Hickory	G5	S5				6	3	N	x	x		x	x		
Cercidiphyllum japonicum	Katsura-tree	GNR	SNA						I					x		
Chelidonium majus	Greater Celadine	GNR	SNA				0	5	I		x			x		
Chenopodium album	White Goosefoot	G5	SNA				0	1	I		x			x		
Cichorium intybus	Chicory	GNR	SNA				0	5	I				x	x		
Circaea canadensis	Broad-leaved Enchanter's Nightshade	G5T5	S5				3	3	N	x	x	x	x		x	
Cirsium arvense	Canada Thistle	GNR	SNA				0	3	I	x		x		x		

Appendix E: Vascular Plant Species and Status List

Cirsium vulgare	Bull Thistle	GNR	SNA				0	4	I	x			x	x	x	
Convallaria majalis	European Lily-of-the-valley	G5	SNA				0	5	I	x	x		x	x		
Convolvulus arvensis	Field Bindweed	GNR	SNA				0	5	I					x		
Cornus racemosa	Gray Dogwood	G5?	S5				2	-2	N	x		x		x		
Cornus rugosa	Round-leaved Dogwood	G5	S5				6	5	N	x						
Cornus sericea	Red-osier Dogwood	G5	S5				2	-3	N	x						
Cornus sp	Dogwood Species													x		
Corylus sp	Hazelnut Species									x						
Crataegus mollis	Downy Hawthorn	G5	S4S5			h	4	-2	N	x						
Crataegus punctata	Dotted Hawthorn	G5	S5				4	5	N			x				
Crataegus sp	Hawthorn Species												x			
Crataegus sp	Hawthorn Species															x
Cynoglossum officinale	Common Hound's-tongue	GNR	SNA				0	5	I		x					
Dactylis glomerata	Orchard Grass	GNR	SNA				0	3	I	x	x			x	x	
Daucus carota	Wild Carrot	GNR	SNA				0	5	I	x	x	x	x	x		
Dianthus arenarius	Sand Pink	GNR	SNA						I			x				
Dianthus armeria	Deptford Pink	GNR	SNA				0	5	I					x		
Doellingeria umbellata	Flat-top White Aster	G5	S5				6	-3	N	x						
Eleutherococcus sieboldianus	Five-leaved Aralia	GNR	SNA						I	x						
Elymus virginicus	Virginia Wildrye	G5	S5				5	-2	N	x	x					
Epilobium coloratum	Purple-veined Willowherb	G5	S5				3	-5	N				x			
Epilobium hirsutum	Hairy Willowherb	GNR	SNA				0	-4	I			x	x	x		
Epipactis helleborine	Eastern Helleborine	GNR	SNA				0	5	I	x						
Erigeron annuus	Annual Fleabane	G5	S5				0	1	N		x	x		x		
Erigeron philadelphicus	Philadelphia Fleabane	G5	S5				1	-3	N	x	x	x				
Erythronium americanum	Yellow Trout-lily	G5	S5				5	5	N	x	x		x			
Euonymus alatus	Winged Euonymus	GNR	SNA				0	5	I					x		
Euonymus fortunei	Climbing Euonymus	GNR	SNA				0	5	I	x						
Euonymus obovatus	Running Strawberry Bush	G5	S4				6	5	N	x	x					
Euonymus sp	Euonymus Species									x				x		
Euthamia graminifolia	Grass-leaved Goldenrod	G5	S5				2	-2	N	x						
Eutrochium maculatum	Spotted Joe Pye Weed	G5	S5				3	-5	N		x					
Fagus grandifolia	American Beech	G5	S4				6	3	N	x						
Festuca rubra	Red Fescue	G5	S5				0	1	N	x	x			x		
Forsythia viridissima	Green-stemmed Forsythia	GNR	SNA						I						x	
Fragaria virginiana	Wild Strawberry	G5	S5				2	1	N	x		x		x		
Fraxinus americana	White Ash	G5	S4				4	3	N	x		x	x			
Fraxinus excelsior	European Ash	GNR	SNA						I		x					
Fraxinus pennsylvanica	Green Ash	G5	S4				3	-3	N	x	x		x	x		
Fraxinus sp	Ash Species										x					
Galium aparine	Cleavers	G5	S5				4	3	N	x	x			x		
Galium mollugo	Smooth Bedstraw	GNR	SNA				0	5	I		x					
Geranium maculatum	Spotted Geranium	G5	S5				6	3	N	x	x		x			
Geranium robertianum	Herb-Robert	G5	S5				0	5	N	x	x	x		x		
Geum aleppicum	Yellow Avens	G5	S5				2	-1	N	x	x			x		
Geum canadense	White Avens	G5	S5				3	0	N	x	x			x		
Geum sp	Avens Species									x	x	x	x		x	

Appendix E: Vascular Plant Species and Status List

Geum urbanum	Wood Avens	G5	SNA				0	5	I	x				x		
Glechoma hederacea	Ground Ivy	GNR	SNA				0	3	I	x	x	x	x	x		
Gleditsia triacanthos	Honey-locust	G5	S2?				3	0	N	x				x		
Hackelia virginiana	Virginia Stickseed	G5	S5				5	1	N	x						
Hemerocallis fulva	Orange Daylily	GNA	SNA				0	5	I	x			x	x		
Hesperis matronalis	Dame's Rocket	G4G5	SNA				0	5	I	x			x			
Hypericum perforatum	Common St. John's-wort	GNR	SNA				0	5	I				x			
Impatiens capensis	Spotted Jewelweed	G5	S5				4	-3	N		x					
Juglans nigra	Black Walnut	G5	S4?				5	3	N	x		x				x
Juncus tenuis	Path Rush	G5	S5				0	0	N	x		x				
Juniperus communis	Common Juniper	G5	S5			H	4	3	N	x						
Juniperus virginiana	Eastern Red Cedar	G5	S5				4	3	N	x						
Lapsana communis	Common Nipplewort	GNR	SNA				0	5	I	x	x	x				
Leersia virginica	Virginia Cutgrass	G5	S4				6	-3	N		x	x	x			
Leersia virginica	Virginia Cutgrass	G5	S4				6	-3	N							
Leonurus cardiaca	Common Motherwort	GNR	SNA				0	5	I	x				x		
Ligustrum vulgare	European Privet	GNR	SNA				0	1	I	x						
Lilium michiganense	Michigan Lily	G5	S4				7	-1	N				x			
Lonicera maackii	Amur Honeysuckle	GNR	SNA				0	5	I		x					
Lonicera morrowii	Morrow's Honeysuckle	GNR	SNA				0	5	I		x					
Lonicera sp	Honeysuckle Species										x					
Lonicera sp	Honeysuckle Species											x				
Lonicera tatarica	Tartarian Honeysuckle	GNR	SNA				0	3	I	x	x		x	x		x
Lysimachia nummularia	Creeping Jennie	GNR	SNA				0	-4	I	x	x		x			
Malus coronaria	Sweet Crabapple	G5	S4				5	5	N					x		
Malus pumila	Common Apple	G5	SNA				0	5	I	x						x
Melilotus officinalis	Yellow Sweet-clover	GNR	SNA				0	3	I		x	x				
Melissa officinalis	Lemon Balm	GNR	SNA				0	5	I	x	x			x		
Menispermum canadense	Canada Moonseed	G5	S4				7	0	N				x			
Mentha aquatica	Water Mint	GNR	SNA						I		x	x		x		
Mentha sp	Mint Species									x						
Mertensia virginica	Virginia Bluebells	G5	S3			H	9	-3	N				x			
Morus alba	White Mulberry	GNR	SNA				0	0	I	x				x		
Narcissus poeticus	Poets' Narcissus	GNR	SNA						I				x			
Narcissus pseudonarcissus	Common Daffodil	GNR	SNA						I							x
Onoclea sensibilis	Sensitive Fern	G5	S5				4	-3	N		x					
Ostrya virginiana	Eastern Hop-hornbeam	G5	S5				4	4	N	x	x	x				x
Oxalis stricta	Upright Yellow Wood-sorrel	G5	S5				0	3	N	x				x		
Parthenocissus quinquefolia	Virginia Creeper	G5	S4?				6	1	N	x	x			x		
Parthenocissus vitacea	Thicket Creeper	G5	S5				3	3	N	c			x			
Persicaria amphibia	Water Smartweed	G5	S5				5	-5	N			x				
Persicaria maculosa	Spotted Lady's-thumb	G3G5	SNA				0	-3	I				x	x		
Phalaris arundinacea	Reed Canary Grass	G5	S5				0	-4	N	x		x				
Picea abies	Norway Spruce	G5	SNA				0	5	I					x		
Picea glauca	White Spruce	G5	S5				6	3	N	x						
Picea pungens	Blue Spruce	G5	SNA						I	x						
Pilea fontana	Springs Clearweed	G5	S4				5	-3	N		x					

Appendix E: Vascular Plant Species and Status List

Pilea pumila	Canada Clearweed	G5	S5				5	-3	N		x	x				
Pinus nigra	Black Pine	GNR	SNA				0	-5	I	x			x	x		
Pinus strobus	Eastern White Pine	G5	S5				4	3	N					x		
Pinus sylvestris	Scots Pine	GNR	SNA				0	5	I		x	x		x		
Plantago lanceolata	English Plantain	G5	SNA				0	0	I					x		
Plantago major	Common Plantain	G5	SNA				0	-1	I	x	x	x		x		
Poa nemoralis	Woods Bluegrass	G5	SNA				0	0	I	x	x	x				x
Poa pratensis	Kentucky Bluegrass	G5	S5				0	1	N						x	
Poa pratensis ssp. irrigata	Spreading Bluegrass	G5TU	SU						N	x						
Podophyllum peltatum	May-apple	G5	S5				5	3	N		x					
Polygonatum sp	Solomon's Seal Species															x
Populus deltoides	Eastern Cottonwood	G5	S5				4	-1	N					x		
Potentilla canadensis	Canada Cinquefoil	G5	S2?				5	4	N		x			x		
Potentilla indica var. indica	Mock-strawberry	GNR	SNA				0	4	I	x						
Prenanthes sp	Rattlesnake-root Species										x					
Prunella vulgaris	Self-heal	G5	S5						N	x		x		x		
Prunus avium	Sweet Cherry	GNR	SNA				0	5	I	x	x			x		x
Prunus serotina	Black Cherry	G5	S5				3	3	N	x	x					
Prunus sp	Cherry Species										x					
Prunus virginiana	Choke Cherry	G5	S5				2	1	N	x	x	x				x
Pyrus communis	Common Pear	G5	SNA				0	5	I							x
Quercus alba	White Oak	G5	S5				6	3	N	x	x		x			
Quercus rubra	Northern Red Oak	G5	S5				6	3	N	x	x	x	x	x	x	x
Ranunculus acris	Tall Buttercup	G5	SNA				0	-2	I	x		x				
Ranunculus sp	Buttercup Species											x		x		
Rhamnus cathartica	Common Buckthorn	GNR	SNA				0	3	I	x	x	x	x	x	x	
Rhus typhina	Staghorn Sumac	G5	S5				1	5	N	x						x
Ribes americanum	Wild Black Currant	G5	S5				4	-3	N		x	x	x			
Robinia pseudoacacia	Black Locust	G5	SNA				0	4	I	x		x	x	x		x
Rosa multiflora	Multiflora Rose	GNR	SNA				0	3	I	x	x	x	x			
Rubus allegheniensis	Allegheny Blackberry	G5	S5				2	2	N		x					
Rubus idaeus	Common Red Raspberry	G5	S5						N	x	x			x		
Rubus occidentalis	Black Raspberry	G5	S5				2	5	N	x	x	x		x		
Rubus odoratus	Purple-flowering Raspberry	G5	S5				3	5	N		x					
Rumex crispus	Curly Dock	GNR	SNA				0	-1	I	x	x	x	x	x	x	
Rumex obtusifolius	Bitter Dock	GNR	SNA				0	-3	I		x					
Salix interior	Sandbar Willow	GNR	S5				3	-5	N	x						
Salix x fragilis	(Salix alba X Salix euxina)	GNA	SNA				0	-4	I	x						
Sambucus racemosa	Red Elderberry	G5	S5				5	2	N							x
Scilla siberica	Siberian Squill	GNR	SNA				0	5	I	x						
Scirpus atrocinctus	Black-girdled Bulrush	G5	S5						N	x						
Solanum dulcamara	Climbing Nightshade	GNR	SNA				0	0	I	x	x	x				
Solanum nigrum	Black Nightshade	GNR	SNA				0	0	I					x		
Solidago altissima	Tall Goldenrod	G5	S5						N	x		x		x		
Solidago bicolor	White Goldenrod	G5	S4?			h	8	5	N		x					
Solidago caesia	Blue-stemmed Goldenrod	G5	S5				5	3	N		x					
Solidago canadensis	Canada Goldenrod	G5	S5				1	3	N	x	x	x	x			

Appendix E: Vascular Plant Species and Status List

Solidago flexicaulis	Zigzag Goldenrod	G5	S5				6	3	N	x	x					x
Solidago sp	Goldenrod Species														x	
Sonchus arvensis	Field Sow-thistle	GNR	SNA					1	I					x		
Sonchus sp	Sowthistle Species											x				
Spiraea prunifolia	Bridal-wreath	G5	SNA						I					x		
Symphoricarpos albus	Common Snowberry	G5	S5				7	4	N	x						
Symphyotrichum cordifolium	Heart-leaved Aster	G5	S5				5	5	N	x						
Symphyotrichum laeve	Smooth Aster	G5	S5				7	5	N	x						
Symphyotrichum lanceolatum	Panicled Aster	G5	S5				3	-3	N	x	x	x		x		
Symphyotrichum lateriflorum	Calico Aster	G5	S5				3	-2	N	x	x					
Symphyotrichum urophyllum	Arrow-leaved Aster	G4G5	S4				6	5	N	x	x	x	x			
Syringa reticulata	Japanese Tree Lilac	GNR	SNA						I					x		
Syringa vulgaris	Common Lilac	GNR	SNA				0	5	I	x	x					
Taraxacum officinale	Common Dandelion	G5	SNA				0	3	I	x	x	x		x	x	x
Taxus canadensis	Canadian Yew	G5	S4				7	3	N	x						
Thuja occidentalis	Eastern White Cedar	G5	S5				4	-3	N					x		
Tilia americana	American Basswood	G5	S5				4	3	N	x	x		x			x
Tilia cordata	Little-leaf Linden	GNR	SNA						I					x		
Toxicodendron radicans	Poison Ivy	G5	S5				5	-1	N	x	x					
Trifolium repens	White Clover	GNR	SNA				0	2	I			x				
Tsuga canadensis	Eastern Hemlock	G5	S5				7	3	N	x	x					
Tussilago farfara	Colt's-foot	GNR	SNA				0	3	I	x		x		x		
Typha angustifolia	Narrow-leaved Cattail	G5	SNA				3	-5	I	x					x	
Typha latifolia	Broad-leaved Cattail	G5	S5				3	-5	N			x				
Ulmus americana	American Elm	G5	S5				3	-2	N	x	x					
Ulmus glabra	Wych Elm	GNR	SNA						I	x	x			x		
Urtica dioica	Stinging Nettle	G5	S5						N	x		x		x		
Verbena urticifolia	White Vervain	G5	S5				4	-1	N			x				
Veronica chamaedrys	Germander Speedwell	GNR	SNA				0	5	I						x	
Veronica officinalis	Common Speedwell	G5	SNA				0	5	I		x					
Veronica sp	Speedwell Species											x				
Viburnum opulus ssp. opulus	Cranberry Viburnum	GNR	SNA				0	0	I	x		x		x		
Vinca minor	Periwinkle	GNR	SNA				0	5	I	x	x	x	x	x		
Viola odorata	English Violet	GNR	SNA				0	5	I		x					
Viola sororia	Woolly Blue Violet	G5	S5				4	1	N	x						
Viola sp	Violet Species													x		
Vitis riparia	Riverbank Grape	G5	S5				0	-2	N	x	x	x		x		

Appendix F: Tree Inventory Data

Tree Tag #	Species Code	Scientific Name	Common Name	DBH1 [1] (cm)	DBH2	DBH3	DBH4	DBH5	Tree Condition	Tree Action	Native Status [7]
1	ACERPLA	*Acer platanoides*	Norway Maple	33					Good	Injure*	I
2	ACERPLA	*Acer platanoides*	Norway Maple	33					Good	Injure*	I
3	ACERPLA	*Acer platanoides*	Norway Maple	31					Good	Injure*	I
4	ACERPLA	*Acer platanoides*	Norway Maple	31					Good	Injure*	I
5	ACERPLA	*Acer platanoides*	Norway Maple	26					Poor	Injure*	I
6	ACERPLA	*Acer platanoides*	Norway Maple	14					Good	Remove	I
7	TILICOR	*Tilia cordata*	Little-leaf Linden	34					Good	Remove	I
8	FRAXAME	*Fraxinus americana*	White Ash	4					Poor	Remove	N
9	MORUALB	*Morus alba*	White Mulberry	72					Poor	Remove	I
10	PICEABI	*Picea abies*	Norway Spruce	54					Good	Remove	I
11	PICEABI	*Picea abies*	Norway Spruce	45					Good	Remove	I
12	ACERRUB	*Acer rubrum*	Red Maple	34	25	14			Good	Remove	N
13	QUERRUB	*Quercus rubra*	Northern Red Oak	54					Good	Remove	N
14	QUERRUB	*Quercus rubra*	Northern Red Oak	58					Good	Remove	N
15	CARYOVA	*Carya ovata*	Shagbark Hickory	39					Good	Remove	N
16	CARYOVA	*Carya ovata*	Shagbark Hickory	37					Good	Remove	N
17	BETUPAP	*Betula papyrifera*	Paper Birch	35					Good	Remove	N
18	BETUPAP	*Betula papyrifera*	Paper Birch	28					Good	Remove	N
19	TILIAME	*Tilia americana*	American Basswood	22	17				Good	Remove	N
20	MORUALB	*Morus alba*	White Mulberry	35					Fair	Remove	I
21	QUERALB	*Quercus alba*	White Oak	12					Good	Remove	N
22	CARYOVA	*Carya ovata*	Shagbark Hickory	58					Good	Remove	N
23	CARYOVA	*Carya ovata*	Shagbark Hickory	5					Good	Remove	N
24	QUERRUB	*Quercus rubra*	Northern Red Oak	89					Good	Remove	N
25	QUERRUB	*Quercus rubra*	Northern Red Oak	82					Good	Remove	N
26	MORUALB	*Morus alba*	White Mulberry	44					Poor	Remove	I
27	MORUALB	*Morus alba*	White Mulberry	45					Good	Remove	I
28	PICEGLA	*Picea glauca*	White Spruce	3					Good	Remove	N
29	JUGLNIG	*Juglans nigra*	Black Walnut	53					Good	Remove	N
30	CARYOVA	*Carya ovata*	Shagbark Hickory	21					Good	Remove	N
31	PICEGLA	*Picea glauca*	White Spruce	37					Good	Remove	N
32	BETUPAP	*Betula papyrifera*	Paper Birch	4					Good	Remove	N
33	ACERSAC	*Acer saccharum*	Sugar Maple	73					Poor	Remove	N
34	QUERALB	*Quercus alba*	White Oak	87					Good	Remove	N
35	QUERRUB	*Quercus rubra*	Northern Red Oak	12					Good	Injure*	N
36	ACERRUB	*Acer rubrum*	Red Maple	51					Poor	Remove	N
37	QUERMAC	*Quercus macrocarpa*	Bur Oak	37					Good	Remove	N
38	QUERMAC	*Quercus macrocarpa*	Bur Oak	35					Poor	Injure*	N
39	QUERRUB	*Quercus rubra*	Northern Red Oak	37					Good	Injure*	N
40	QUERRUB	*Quercus rubra*	Northern Red Oak	81					Good	Injure*	N
41	QUERRUB	*Quercus rubra*	Northern Red Oak	45					Good	Injure*	N
42	QUERRUB	*Quercus rubra*	Northern Red Oak	6					Good	Remove	N
45	ACERSAC	*Acer saccharum*	Sugar Maple	7					Good	Remove	N
48	ACERPLA	*Acer platanoides*	Norway Maple	17					Good	Remove	I
49	ACERPLA	*Acer platanoides*	Norway Maple	13					Good	Remove	I
50	GLEDTRI	*Gleditsia triacanthos*	Honey-locust	15	16	18			Good	Remove	N
53	GLEDTRI	*Gleditsia triacanthos*	Honey-locust	44					Good	Remove	N
57	TILICOR	*Tilia cordata*	Little-leaf Linden	52					Fair	Remove	I
58	TILICOR	*Tilia cordata*	Little-leaf Linden	51					Good	Remove	I
62	ACERSAC	*Acer saccharum*	Sugar Maple	68					Good	Remove	N

Tree Data Table

Tree Tag #	Species Code	Scientific Name	Common Name	DBH1 [1] (cm)	DBH2	DBH3	DBH4	DBH5	Tree Condition	Tree Action	Native Status [7]
63	MALU_SP	*Malus sp*	Apple Species	26					Poor	Remove	G
64	MALU_SP	*Malus sp*	Apple Species	32	3	22			Fair	Remove	G
65	MALU_SP	*Malus sp*	Apple Species	23	23	3			Fair	Remove	G
66	ACERSAC	*Acer saccharum*	Sugar Maple	68					Good	Remove	N
67	CARY_SP	*Carya sp*	Hickory Species	38					Poor	Remove	G
68	FRAXEXC	*Fraxinus excelsior*	European Ash	32					Good	Remove	I
69	PRUN_SP	*Prunus sp*	Cherry Species	32					Poor	Injure*	G
70	ACERPLA	*Acer platanoides*	Norway Maple	33					Good	Injure*	I
71	ACERPLA	*Acer platanoides*	Norway Maple	33					Good	Injure*	I
72	ACERPLA	*Acer platanoides*	Norway Maple	33					Good	Injure*	I
73	JUNIVIR	*Juniperus virginiana*	Eastern Red Cedar	24					Poor	Remove	N
74	ACERPLA	*Acer platanoides*	Norway Maple	37					Good	Injure*	I
75	ACERPLA	*Acer platanoides*	Norway Maple	4					Poor	Injure*	I
76	ELAEANG	*Elaeagnus angustifolia*	Russian Olive	13	13	17			Fair	Remove	I
77	ELAEANG	*Elaeagnus angustifolia*	Russian Olive	13	14	26			Poor	Remove	I
79	FRAXEXC	*Fraxinus excelsior*	European Ash	3					Poor	Remove	I
80	FRAXEXC	*Fraxinus excelsior*	European Ash	31					Poor	Remove	I
83	ACERPLA	*Acer platanoides*	Norway Maple	2					Good	Remove	I
84	MALU_SP	*Malus sp*	Apple Species	21	21				Good	Remove	G
85	MALU_SP	*Malus sp*	Apple Species	25	17	34			Good	Remove	G
86	ACERPLA	*Acer platanoides*	Norway Maple	43					Good	Injure*	I
87	MALU_SP	*Malus sp*	Apple Species	15	15	2	21		Fair	Remove	G
88	MALU_SP	*Malus sp*	Apple Species	15	16	2	27		Good	Remove	G
89	MALU_SP	*Malus sp*	Apple Species	19	19	29			Good	Remove	G
90	MALU_SP	*Malus sp*	Apple Species	3	2				Fair	Remove	G
91	MALU_SP	*Malus sp*	Apple Species	16	21				Poor	Remove	G
92	MALU_SP	*Malus sp*	Apple Species	15	18	24	21		Fair	Remove	G
93	MALU_SP	*Malus sp*	Apple Species	11	18	2	24	2	Fair	Remove	G
94	ACERPLA	*Acer platanoides*	Norway Maple	35					Poor	Injure*	I
95	ACERPLA	*Acer platanoides*	Norway Maple	2					Good	Remove	I
96	ACERPLA	*Acer platanoides*	Norway Maple	39					Good	Injure*	I
97	PICEABI	*Picea abies*	Norway Spruce	26					Fair	Remove	I
98	PICEABI	*Picea abies*	Norway Spruce	33					Good	Remove	I
99	ACERPLA	*Acer platanoides*	Norway Maple	25					Good	Remove	I
100	PICEABI	*Picea abies*	Norway Spruce	18					Fair	Remove	I
101	PICEABI	*Picea abies*	Norway Spruce	33					Fair	Remove	I
102	PICEABI	*Picea abies*	Norway Spruce	34					Poor	Remove	I
103	AESCHIP	*Aesculus hippocastanum*	Horse Chestnut	47	35				Poor	Remove	I
104	PICEABI	*Picea abies*	Norway Spruce	26					Poor	Remove	I
105	PICEABI	*Picea abies*	Norway Spruce	31					Fair	Remove	I
106	PICEABI	*Picea abies*	Norway Spruce	37					Good	Remove	I
107	PICEABI	*Picea abies*	Norway Spruce	38					Good	Remove	I
108	PICEABI	*Picea abies*	Norway Spruce	17					Good	Remove	I
109	PICEABI	*Picea abies*	Norway Spruce	38					Good	Remove	I
110	PICEABI	*Picea abies*	Norway Spruce	32					Good	Remove	I
111	PICEABI	*Picea abies*	Norway Spruce	44					Good	Remove	I
112	MORUALB	*Morus alba*	White Mulberry	29					Good	Remove	I
113	ACERPLA	*Acer platanoides*	Norway Maple	4					Good	Injure*	I
114	ACERPLA	*Acer platanoides*	Norway Maple	44					Good	Injure*	I
115	ACERPLA	*Acer platanoides*	Norway Maple	35					Good	Injure*	I

Tree Data Table

Tree Tag #	Species Code	Scientific Name	Common Name	DBH1 [1] (cm)	DBH2	DBH3	DBH4	DBH5	Tree Condition	Tree Action	Native Status [7]
116	ACERPLA	*Acer platanoides*	Norway Maple	34					Poor	Injure*	I
117	ACERPLA	*Acer platanoides*	Norway Maple	29					Poor	Injure*	I
118	ACERPLA	*Acer platanoides*	Norway Maple	48					Good	Injure*	I
119	ACERPLA	*Acer platanoides*	Norway Maple	58					Good	Injure*	I
120	ACERPLA	*Acer platanoides*	Norway Maple	5					Good	Injure*	I
121	ACERPLA	*Acer platanoides*	Norway Maple	46					Good	Injure*	I
122	ACERPLA	*Acer platanoides*	Norway Maple	5					Good	Injure*	I
123	ACERPLA	*Acer platanoides*	Norway Maple	46					Good	Injure*	I
124	ACERPLA	*Acer platanoides*	Norway Maple	5					Good	Injure*	I
125	ACERPLA	*Acer platanoides*	Norway Maple	41					Good	Injure*	I
126	ACERPLA	*Acer platanoides*	Norway Maple	49					Good	Injure*	I
127	ACERPLA	*Acer platanoides*	Norway Maple	42					Poor	Injure*	I
128	ACERPLA	*Acer platanoides*	Norway Maple	45					Fair	Injure*	I
129	ACERPLA	*Acer platanoides*	Norway Maple	51					Good	Remove	I
130	ACERPLA	*Acer platanoides*	Norway Maple	39					Good	Preserve	I
131	ACERPLA	*Acer platanoides*	Norway Maple	44					Good	Preserve	I
132	ACERPLA	*Acer platanoides*	Norway Maple	6					Good	Preserve	I
133	ACERPLA	*Acer platanoides*	Norway Maple	58					Good	Remove	I
134	ACERPLA	*Acer platanoides*	Norway Maple	64					Poor	Remove	I
135	ACERPLA	*Acer platanoides*	Norway Maple	51					Fair	Remove	I
136	ACERPLA	*Acer platanoides*	Norway Maple	6					Fair	Remove	I
137	ACERPLA	*Acer platanoides*	Norway Maple	48					Fair	Remove	I
138	ACERPLA	*Acer platanoides*	Norway Maple	57					Poor	Remove	I
139	ACERPLA	*Acer platanoides*	Norway Maple	39					Poor	Remove	I
140	ROBIPSE	*Robinia pseudoacacia*	Black Locust	56					Poor	Preserve	I
141	QUERMAC	*Quercus macrocarpa*	Bur Oak	5					Poor	Preserve	N
142	QUERMAC	*Quercus macrocarpa*	Bur Oak	52					Good	Preserve	N
143	PINUSYL	*Pinus sylvestris*	Scots Pine	36					Good	Remove	I
144	PICEABI	*Picea abies*	Norway Spruce	51					Good	Remove	I
145	ACERPLA	*Acer platanoides*	Norway Maple	3					Good	Remove	I
146	ACERPLA	*Acer platanoides*	Norway Maple	29	14				Fair	Preserve	I
147	ACERPLA	*Acer platanoides*	Norway Maple	36					Good	Remove	I
147.1	ACERPLA	*Acer platanoides*	Norway Maple	21					Poor	Preserve	I
148	PINURES	*Pinus resinosa*	Red Pine	38					Fair	Remove	N
149	PINURES	*Pinus resinosa*	Red Pine	28					Fair	Remove	N
149.1	ACERPLA	*Acer platanoides*	Norway Maple	26					Fair	Preserve	I
150	PINURES	*Pinus resinosa*	Red Pine	35					Good	Remove	N
150.1	ACERPLA	*Acer platanoides*	Norway Maple	19					Fair	Preserve	I
151	PINURES	*Pinus resinosa*	Red Pine	35					Fair	Remove	N
152	PINURES	*Pinus resinosa*	Red Pine	43					Fair	Remove	N
153	QUERPAL	*Quercus palustris*	Pin Oak	7					Good	Remove	N
153.1	ACERXFR	*Acer x freemanii*	(Acer rubrum X Acer saccharinum)	44	21				Fair	Preserve	I
154	QUERPAL	*Quercus palustris*	Pin Oak	75					Good	Remove	N
154.1	QUERRUB	*Quercus rubra*	Northern Red Oak	55					Fair	Preserve	N
155	PINURES	*Pinus resinosa*	Red Pine	38					Fair	Remove	N
156	PINURES	*Pinus resinosa*	Red Pine	42					Fair	Remove	N
157	PINURES	*Pinus resinosa*	Red Pine	44					Fair	Remove	N
158	PINURES	*Pinus resinosa*	Red Pine	28					Fair	Remove	N
159	PINURES	*Pinus resinosa*	Red Pine	33					Fair	Remove	N
160	PINURES	*Pinus resinosa*	Red Pine	36					Fair	Remove	N

Tree Data Table

Tree Tag #	Species Code	Scientific Name	Common Name	DBH1 [1] (cm)	DBH2	DBH3	DBH4	DBH5	Tree Condition	Tree Action	Native Status [7]
161	PINURES	*Pinus resinosa*	Red Pine	42					Fair	Remove	N
162	PINURES	*Pinus resinosa*	Red Pine	32					Fair	Remove	N
163	PINURES	*Pinus resinosa*	Red Pine	25					Fair	Remove	N
164	PINURES	*Pinus resinosa*	Red Pine	54					Fair	Remove	N
165	PINUSYL	*Pinus sylvestris*	Scots Pine	41					Good	Remove	I
166	PINUSYL	*Pinus sylvestris*	Scots Pine	46					Good	Remove	I
167	PINUSYL	*Pinus sylvestris*	Scots Pine	32					Good	Remove	I
168	PINURES	*Pinus resinosa*	Red Pine	35					Fair	Remove	N
169	PINURES	*Pinus resinosa*	Red Pine	31					Poor	Remove	N
170	PINURES	*Pinus resinosa*	Red Pine	46					Fair	Remove	N
171	PINURES	*Pinus resinosa*	Red Pine	54					Fair	Remove	N
172	THUJOCC	*Thuja occidentalis*	Eastern White Cedar	21					Good	Remove	N
173	ACERPLA	*Acer platanoides*	Norway Maple	11					Good	Remove	I
174	THUJOCC	*Thuja occidentalis*	Eastern White Cedar	14					Poor	Remove	N
175	THUJOCC	*Thuja occidentalis*	Eastern White Cedar	29					Fair	Remove	N
176	THUJOCC	*Thuja occidentalis*	Eastern White Cedar	24					Fair	Remove	N
177	ACERPLA	*Acer platanoides*	Norway Maple	27					Good	Remove	I
178	THUJOCC	*Thuja occidentalis*	Eastern White Cedar	1	8	5			Poor	Remove	N
179	THUJOCC	*Thuja occidentalis*	Eastern White Cedar	16					Poor	Remove	N
180	THUJOCC	*Thuja occidentalis*	Eastern White Cedar	19					Poor	Remove	N
181	ACERPLA	*Acer platanoides*	Norway Maple	19					Good	Remove	I
182	ACERPLA	*Acer platanoides*	Norway Maple	25					Good	Remove	I
183	PINURES	*Pinus resinosa*	Red Pine	43					Fair	Remove	N
184	PINURES	*Pinus resinosa*	Red Pine	44					Fair	Remove	N
185	PINUSYL	*Pinus sylvestris*	Scots Pine	32					Fair	Remove	I
186	PINUSYL	*Pinus sylvestris*	Scots Pine	26					Fair	Remove	I
187	POPUTRE	*Populus tremuloides*	Trembling Aspen	34	33				Good	Remove	N
188	ACERPLA	*Acer platanoides*	Norway Maple	19					Good	Remove	I
189	ACERPLA	*Acer platanoides*	Norway Maple	2					Good	Remove	I
190	ACERPLA	*Acer platanoides*	Norway Maple	22					Fair	Remove	I
191	PRUN_SP	*Prunus sp*	Cherry Species	13					Fair	Remove	G
192	ACERPLA	*Acer platanoides*	Norway Maple	18					Good	Remove	I
193	PINUSYL	*Pinus sylvestris*	Scots Pine	37					Good	Remove	I
194	PINURES	*Pinus resinosa*	Red Pine	46					Fair	Remove	N
195	PINURES	*Pinus resinosa*	Red Pine	47					Fair	Remove	N
196	PINURES	*Pinus resinosa*	Red Pine	37					Fair	Remove	N
197	PINURES	*Pinus resinosa*	Red Pine	6					Fair	Remove	N
198	PINURES	*Pinus resinosa*	Red Pine	27					Fair	Remove	N
199	PINUSYL	*Pinus sylvestris*	Scots Pine	29					Good	Remove	I
200	PINURES	*Pinus resinosa*	Red Pine	38					Fair	Remove	N
201	PINURES	*Pinus resinosa*	Red Pine	39					Fair	Remove	N
202	PINURES	*Pinus resinosa*	Red Pine	45					Fair	Remove	N
204	PINURES	*Pinus resinosa*	Red Pine	45					Fair	Remove	N
205	GLEDTRI	*Gleditsia triacanthos*	Honey-locust	74					Good	Remove	N
206	TILICOR	*Tilia cordata*	Little-leaf Linden	36					Good	Remove	I
207	PRUN_SP	*Prunus sp*	Cherry Species	23	21				Poor	Remove	G
208	THUJOCC	*Thuja occidentalis*	Eastern White Cedar	25					Good	Remove	N
209	TILICOR	*Tilia cordata*	Little-leaf Linden	42					Good	Remove	I
210	TILICOR	*Tilia cordata*	Little-leaf Linden	4					Good	Remove	I
211	TILICOR	*Tilia cordata*	Little-leaf Linden	41					Good	Remove	I

Tree Data Table

Tree Tag #	Species Code	Scientific Name	Common Name	DBH1 [1] (cm)	DBH2	DBH3	DBH4	DBH5	Tree Condition	Tree Action	Native Status [7]
212	TILICOR	*Tilia cordata*	Little-leaf Linden	61					Good	Remove	I
213	TILICOR	*Tilia cordata*	Little-leaf Linden	56					Good	Remove	I
214	ACERPLA	*Acer platanoides*	Norway Maple	27					Good	Remove	I
215	TILICOR	*Tilia cordata*	Little-leaf Linden	49					Good	Remove	I
216	TILICOR	*Tilia cordata*	Little-leaf Linden	5					Good	Remove	I
217	THUJOCC	*Thuja occidentalis*	Eastern White Cedar	26					Good	Remove	N
218	CERCJAP	*Cercidiphyllum japonicum*	Katsura-tree	22	21	18	8		Good	Remove	I
219	CERCJAP	*Cercidiphyllum japonicum*	Katsura-tree	23	22	19	18	6	Good	Remove	I
220	CERCJAP	*Cercidiphyllum japonicum*	Katsura-tree	22	1	9	6		Good	Remove	I
221	CARYOVA	*Carya ovata*	Shagbark Hickory	57					Good	Remove	N
222	FAGUGRA	*Fagus grandifolia*	American Beech	5					Poor	Remove	N
223	ACERPLA	*Acer platanoides*	Norway Maple	26					Good	Remove	I
224	ACERPLA	*Acer platanoides*	Norway Maple	41					Good	Remove	I
225	MALU_SP	*Malus sp*	Apple Species	19					Good	Remove	G
226	MALU_SP	*Malus sp*	Apple Species	23					Fair	Remove	G
227	QUERRUB	*Quercus rubra*	Northern Red Oak	58					Good	Remove	N
228	ACERXFR	*Acer x freemanii*	(Acer rubrum X Acer saccharinum)	66					Good	Remove	I
501	ACERPLA	*Acer platanoides*	Norway Maple	18					Fair	Remove	I
502	TILIAME	*Tilia americana*	American Basswood	19	12				Fair	Remove	N
503	ACERPLA	*Acer platanoides*	Norway Maple	19					Fair	Remove	I
504	PRUNSER	*Prunus serotina*	Black Cherry	15					Fair	Remove	N
505	ACERPLA	*Acer platanoides*	Norway Maple	3					Fair	Remove	I
506	TILIAME	*Tilia americana*	American Basswood	33					Poor	Remove	N
507	FAGUGRA	*Fagus grandifolia*	American Beech	11					Fair	Remove	N
508	FAGUGRA	*Fagus grandifolia*	American Beech	12					Fair	Remove	N
509	ACERPLA	*Acer platanoides*	Norway Maple	34					Fair	Remove	I
510	FAGUGRA	*Fagus grandifolia*	American Beech	11					Fair	Remove	N
511	FAGUGRA	*Fagus grandifolia*	American Beech	11					Fair	Remove	N
512	FAGUGRA	*Fagus grandifolia*	American Beech	12					Fair	Remove	N
513	FAGUGRA	*Fagus grandifolia*	American Beech	16					Fair	Remove	N
514	FAGUGRA	*Fagus grandifolia*	American Beech	13	7				Fair	Remove	N
515	FRAXAME	*Fraxinus americana*	White Ash	51					Poor	Remove	N
516	ACERPLA	*Acer platanoides*	Norway Maple	14					Fair	Remove	I
517	SALIFRA	*Salix fragilis*	Crack Willow	41					Poor	Remove	I
518	SALIFRA	*Salix fragilis*	Crack Willow	47					Poor	Remove	I
519	FAGUGRA	*Fagus grandifolia*	American Beech						Fair	Remove	N
520	FAGUGRA	*Fagus grandifolia*	American Beech	17					Fair	Remove	N
521	FAGUGRA	*Fagus grandifolia*	American Beech	12	7	7			Fair	Remove	N
522	FAGUGRA	*Fagus grandifolia*	American Beech	17	13				Fair	Remove	N
523	FAGUGRA	*Fagus grandifolia*	American Beech	11					Fair	Remove	N
524	FAGUGRA	*Fagus grandifolia*	American Beech	15	5				Fair	Remove	N
525	FAGUGRA	*Fagus grandifolia*	American Beech	13	12	9			Fair	Remove	N
526	FAGUGRA	*Fagus grandifolia*	American Beech	13	9	9	7		Fair	Remove	N
527	SALIFRA	*Salix fragilis*	Crack Willow	35	34	26			Poor	Remove	I
528	TILIAME	*Tilia americana*	American Basswood	26					Fair	Remove	N
529	ULMUAME	*Ulmus americana*	American Elm	15					Fair	Remove	N
530	FRAXAME	*Fraxinus americana*	White Ash	18	1				Poor	Remove	N
531	TILIAME	*Tilia americana*	American Basswood	14					Fair	Remove	N
532	QUERMAC	*Quercus macrocarpa*	Bur Oak	54					Good	Remove	N
533	FRAXPEN	*Fraxinus pennsylvanica*	Green Ash	13					Fair	Remove	N

Tree Data Table

Tree Tag #	Species Code	Scientific Name	Common Name	DBH1 [1] (cm)	DBH2	DBH3	DBH4	DBH5	Tree Condition	Tree Action	Native Status [7]
534	FRAXPEN	*Fraxinus pennsylvanica*	Green Ash	1					Poor	Remove	N
535	QUERMAC	*Quercus macrocarpa*	Bur Oak	41					Good	Remove	N
536	QUERMAC	*Quercus macrocarpa*	Bur Oak	4					Fair	Remove	N
537	JUNI_SP	*Juniperus sp*	Juniper Species	15					Poor	Remove	G
538	ACERPLA	*Acer platanoides*	Norway Maple	15					Fair	Remove	I
539	ULMUAME	*Ulmus americana*	American Elm	17					Fair	Remove	N
540	QUERMAC	*Quercus macrocarpa*	Bur Oak	42					Poor	Remove	N
541	JUNI_SP	*Juniperus sp*	Juniper Species	15					Poor	Remove	G
542	ULMUGLA	*Ulmus glabra*	Wych Elm	31					Fair	Remove	I
543	MALUPUM	*Malus pumila*	Common Apple	25					Fair	Remove	I
544	ULMUGLA	*Ulmus glabra*	Wych Elm	13					Fair	Remove	I
546	ACERPLA	*Acer platanoides*	Norway Maple	4					Fair	Remove	I
547	GLEDTRI	*Gleditsia triacanthos*	Honey-locust	44					Good	Remove	N
548	JUNI_SP	*Juniperus sp*	Juniper Species	11					Poor	Remove	G
549	QUERMAC	*Quercus macrocarpa*	Bur Oak	68					Good	Remove	N
550	PRUNAVI	*Prunus avium*	Sweet Cherry	23					Poor	Remove	I
551	FRAXPEN	*Fraxinus pennsylvanica*	Green Ash	16					Poor	Remove	N
552	ULMUGLA	*Ulmus glabra*	Wych Elm	12					Fair	Remove	I
553	MALUPUM	*Malus pumila*	Common Apple	26					Poor	Remove	I
554	GLEDTRI	*Gleditsia triacanthos*	Honey-locust	49					Good	Remove	N
555	OSTRVIR	*Ostrya virginiana*	Eastern Hop-hornbeam	2					Good	Remove	N
556	PRUNAVI	*Prunus avium*	Sweet Cherry	3					Fair	Remove	I
557	SALIFRA	*Salix fragilis*	Crack Willow	39					Fair	Remove	I
560	SALIFRA	*Salix fragilis*	Crack Willow	34	28	2			Fair	Remove	I
561	ACERSAC	*Acer saccharum*	Sugar Maple	58					Good	Remove	N
562	ACERPLA	*Acer platanoides*	Norway Maple	33					Fair	Remove	I
563	ACERPLA	*Acer platanoides*	Norway Maple	18					Fair	Remove	I
564	ACERPLA	*Acer platanoides*	Norway Maple	1					Fair	Remove	I
568	PRUNAVI	*Prunus avium*	Sweet Cherry	54					Fair	Remove	I
569	FRAX_SP	*Fraxinus sp*	Ash Species	18					Poor	Remove	G
570	ACERPLA	*Acer platanoides*	Norway Maple	17	13				Fair	Remove	I
571	ACERSAC	*Acer saccharum*	Sugar Maple	17					Fair	Remove	N
572	CARYOVA	*Carya ovata*	Shagbark Hickory	52					Good	Remove	N
573	PICEPUN	*Picea pungens*	Blue Spruce	43					Poor	Remove	I
574	CARYOVA	*Carya ovata*	Shagbark Hickory	46					Good	Remove	N
575	ACERPLA	*Acer platanoides*	Norway Maple	17	13				Fair	Remove	I
576	ACERPLA	*Acer platanoides*	Norway Maple	26	24				Fair	Remove	I
578	ACERPLA	*Acer platanoides*	Norway Maple	16					Fair	Remove	I
579	ACERSAC	*Acer saccharum*	Sugar Maple	17					Fair	Remove	N
580	ACERPLA	*Acer platanoides*	Norway Maple	47					Fair	Remove	I
581	ACERPLA	*Acer platanoides*	Norway Maple	3	28				Fair	Remove	I
582	ACERPLA	*Acer platanoides*	Norway Maple	31					Fair	Remove	I
583	QUERRUB	*Quercus rubra*	Northern Red Oak	57					Good	Remove	N
584	ACERPLA	*Acer platanoides*	Norway Maple	12					Fair	Remove	I
585	ACERPLA	*Acer platanoides*	Norway Maple	29					Fair	Remove	I
586	SALIFRA	*Salix fragilis*	Crack Willow	68	46				Poor	Remove	I
587	ACERPLA	*Acer platanoides*	Norway Maple	37	17				Fair	Remove	I
588	ACERPLA	*Acer platanoides*	Norway Maple	16					Poor	Remove	I
589	ACERSAC	*Acer saccharum*	Sugar Maple	28					Fair	Remove	N
591	ACERPLA	*Acer platanoides*	Norway Maple	16					Fair	Remove	I

Tree Data Table

Tree Tag #	Species Code	Scientific Name	Common Name	DBH1 [1] (cm)	DBH2	DBH3	DBH4	DBH5	Tree Condition	Tree Action	Native Status [7]
592	ACERSAC	*Acer saccharum*	Sugar Maple	36					Good	Remove	N
593	ACERSAC	*Acer saccharum*	Sugar Maple	11					Fair	Remove	N
594	ACERSAC	*Acer saccharum*	Sugar Maple	18	11				Fair	Remove	N
595	ACER_SP	*Fagus sylvatica*	European Beech	42					Fair	Remove	I
596	ACER_SP	*Fagus sylvatica*	European Beech	21	9				Fair	Remove	I
597	ACER_SP	*Fagus sylvatica*	European Beech	29					Fair	Remove	I
701	SALIALB	*Salix alba*	White Willow	41	4	27	28		Fair	Remove	I
702	PICEPUN	*Picea pungens*	Blue Spruce	55					Good	Remove	I
703	TILIAME	*Tilia americana*	American Basswood	43					Fair	Remove	N
704	FAGUSYL	*Fagus sylvatica*	European Beech	49					Good	Remove	I
705	SALIALB	*Salix alba*	White Willow	38	33				Fair	Remove	I
706	SALIALB	*Salix alba*	White Willow	43	19	17			Fair	Remove	I
707	CRAT_SP	*Crataegus sp*	Hawthorn Species	11					Good	Remove	G
708	CRAT_SP	*Crataegus sp*	Hawthorn Species	13	13	7			Good	Remove	G
709	CRAT_SP	*Crataegus sp*	Hawthorn Species	16	12	1	11		Good	Remove	G
710	MAGNACU	*Magnolia acuminata*	Cucumber Tree	27	23	24	14		Good	Remove	N
711	ACERPLA	*Acer platanoides*	Norway Maple	25	19	19	16	1	Fair	Remove	I
712	ACERPLA	*Acer platanoides*	Norway Maple	24					Fair	Remove	I
713	ACERXFR	*Acer x freemanii*	(Acer rubrum X Acer saccharinum)	38					Good	Remove	I
714	ACERPLA	*Acer platanoides*	Norway Maple	26					Fair	Remove	I
715	ACERPLA	*Acer platanoides*	Norway Maple	21	2	1			Fair	Remove	I
716	ACERPLA	*Acer platanoides*	Norway Maple	39					Fair	Remove	I
717	ACERXFR	*Acer x freemanii*	(Acer rubrum X Acer saccharinum)	24	2				Good	Remove	I
718	ACERPLA	*Acer platanoides*	Norway Maple	2					Fair	Remove	I
719	ACERPLA	*Acer platanoides*	Norway Maple	17					Fair	Remove	I
720	FRAXPEN	*Fraxinus pennsylvanica*	Green Ash	16					Poor	Remove	N
721	ACERPLA	*Acer platanoides*	Norway Maple	25					Fair	Remove	I
722	ACERPLA	*Acer platanoides*	Norway Maple	12					Fair	Remove	I
723	ACERPLA	*Acer platanoides*	Norway Maple	29					Fair	Remove	I
724	TSUGCAN	*Tsuga canadensis*	Eastern Hemlock	27	25				Good	Remove	N
725	FAGUSYL	*Fagus sylvatica*		57					Good	Remove	I
726	ACERNEG	*Acer negundo*	Manitoba Maple	11					Poor	Remove	N
727	CRAT_SP	*Crataegus sp*	Hawthorn Species	14					Poor	Remove	G
728	FRAX_SP	*Fraxinus sp*	Ash Species	1					Good	Remove	G
729	PRUNAVI	*Prunus avium*	Sweet Cherry	28					Fair	Remove	I
730	PRUNAVI	*Prunus avium*	Sweet Cherry	1					Fair	Remove	I
731	ACERPLA	*Acer platanoides*	Norway Maple	22					Good	Remove	I
732	ACERPLA	*Acer platanoides*	Norway Maple	11					Good	Remove	I
733	ULMUGLA	*Ulmus glabra*	Wych Elm	95					Good	Remove	I
734	ACERNEG	*Acer negundo*	Manitoba Maple	14					Poor	Remove	N
735	ACERNEG	*Acer negundo*	Manitoba Maple	31					Poor	Remove	N
736	ACERXFR	*Acer x freemanii*	(Acer rubrum X Acer saccharinum)	39					Good	Remove	I
737	ACERPLA	*Acer platanoides*	Norway Maple	12	12	7	5		Fair	Remove	I
738	FRAXPEN	*Fraxinus pennsylvanica*	Green Ash	13					Poor	Remove	N
739	FRAXPEN	*Fraxinus pennsylvanica*	Green Ash	15					Poor	Remove	N
740	ACERXFR	*Acer x freemanii*	(Acer rubrum X Acer saccharinum)	13	13	11	1	6	Good	Remove	I
741	FRAXPEN	*Fraxinus pennsylvanica*	Green Ash	1					Poor	Remove	N
742	ACERPLA	*Acer platanoides*	Norway Maple	16					Poor	Remove	I
743	SALIALB	*Salix alba*	White Willow	48	31				Poor	Remove	I
744	ACERPLA	*Acer platanoides*	Norway Maple	11					Fair	Remove	I

Tree Data Table

Tree Tag #	Species Code	Scientific Name	Common Name	DBH1 [1] (cm)	DBH2	DBH3	DBH4	DBH5	Tree Condition	Tree Action	Native Status [7]
745	PRUNAVI	*Prunus avium*	Sweet Cherry	1					Fair	Remove	I
746	FRAXPEN	*Fraxinus pennsylvanica*	Green Ash	12					Poor	Remove	N
747	MORUALB	*Morus alba*	White Mulberry	24					Fair	Remove	I
748	ACERPLA	*Acer platanoides*	Norway Maple	11					Fair	Remove	I
749	ACERPLA	*Acer platanoides*	Norway Maple	16					Fair	Remove	I
750	ACERPLA	*Acer platanoides*	Norway Maple	12					Fair	Remove	I
751	ACERPLA	*Acer platanoides*	Norway Maple	22					Fair	Remove	I
752	ACERPLA	*Acer platanoides*	Norway Maple	12					Poor	Remove	I
753	ACERPLA	*Acer platanoides*	Norway Maple	12					Fair	Remove	I
754	FRAXPEN	*Fraxinus pennsylvanica*	Green Ash	1					Poor	Remove	N
755	ACERPLA	*Acer platanoides*	Norway Maple	15					Fair	Remove	I
756	SALIALB	*Salix alba*	White Willow	69	28				Poor	Remove	I
757	ACERPLA	*Acer platanoides*	Norway Maple	15					Fair	Remove	I
758	MALU_SP	*Malus sp*	Apple Species	32					Good	Remove	G
759	ACERPLA	*Acer platanoides*	Norway Maple	38					Good	Remove	I
760	ACERXFR	*Acer x freemanii*	(Acer rubrum X Acer saccharinum)	24	18	2	12	11	Good	Remove	I
761	FRAXPEN	*Fraxinus pennsylvanica*	Green Ash	1	7				Good	Remove	N
762	ACERXFR	*Acer x freemanii*	(Acer rubrum X Acer saccharinum)	23	18	23	16	1	Good	Remove	I
763	ACERPLA	*Acer platanoides*	Norway Maple	19					Fair	Remove	I
764	FRAXPEN	*Fraxinus pennsylvanica*	Green Ash	1					Fair	Remove	N
765	FRAXPEN	*Fraxinus pennsylvanica*	Green Ash	1					Fair	Remove	N
766	ACERPEN	*Acer pensylvanicum*	Striped Maple	12	7	6	3	3	Fair	Remove	N
767	FRAXPEN	*Fraxinus pennsylvanica*	Green Ash	1	9	6	4		Fair	Remove	N
768	JUGLNIG	*Juglans nigra*	Black Walnut	13	12				Good	Remove	N
769	CRAT_SP	*Crataegus sp*	Hawthorn Species	19	9	9	6	5	Good	Remove	G
770	ACERPLA	*Acer platanoides*	Norway Maple	12					Fair	Remove	I
771	PRUNAVI	*Prunus avium*	Sweet Cherry	36					Fair	Remove	I
772	ACERPLA	*Acer platanoides*	Norway Maple	16	7				Fair	Remove	I
773	ACERPLA	*Acer platanoides*	Norway Maple	33					Fair	Remove	I
774	OSTRVIR	*Ostrya virginiana*	Eastern Hop-hornbeam	44					Good	Remove	N
775		*Pseudotsuga menziesii*	Douglas Fir	43					Good	Remove	I
776	ACERPLA	*Acer platanoides*	Norway Maple	13					Fair	Remove	I
777	PRUNAVI	*Prunus avium*	Sweet Cherry	19					Fair	Remove	I
778	PRUNAVI	*Prunus avium*	Sweet Cherry	2					Fair	Remove	I
779	PRUNAVI	*Prunus avium*	Sweet Cherry	12	5				Fair	Remove	I
780	PRUNAVI	*Prunus avium*	Sweet Cherry	1	8	5	3		Fair	Remove	I
781	FRAXPEN	*Fraxinus pennsylvanica*	Green Ash	1					Fair	Remove	N
782	ACERPLA	*Acer platanoides*	Norway Maple	24					Fair	Remove	I
783	ACERPLA	*Acer platanoides*	Norway Maple	37					Fair	Remove	I
784	PRUNAVI	*Prunus avium*	Sweet Cherry	27					Fair	Remove	I
785	PRUNAVI	*Prunus avium*	Sweet Cherry	17					Fair	Remove	I
786	ROBIPSE	*Robinia pseudoacacia*	Black Locust	61					Poor	Remove	I
787	ROBIPSE	*Robinia pseudoacacia*	Black Locust	55					Fair	Remove	I
788	ACERNEG	*Acer negundo*	Manitoba Maple	77					Good	Remove	N
789	ACERGIN	*Acer tataricum ssp. ginnala*	Amur Maple	2	7	5	5	4	Poor	Remove	I
790	ACERPLA	*Acer platanoides*	Norway Maple	24					Good	Remove	I
791	ACERPLA	*Acer platanoides*	Norway Maple	1					Poor	Remove	I
792	ACERPLA	*Acer platanoides*	Norway Maple	16					Fair	Remove	I
793	ACERPLA	*Acer platanoides*	Norway Maple	32					Fair	Remove	I
794	ACERPLA	*Acer platanoides*	Norway Maple	27					Fair	Remove	I

Tree Data Table

Tree Tag #	Species Code	Scientific Name	Common Name	DBH1 [1] (cm)	DBH2	DBH3	DBH4	DBH5	Tree Condition	Tree Action	Native Status [7]
795	ACERPLA	*Acer platanoides*	Norway Maple	36					Fair	Remove	I
796	MALU_SP	*Malus sp*	Apple Species	31					Poor	Remove	G
797	ACERPLA	*Acer platanoides*	Norway Maple	18					Good	Remove	I
798	SALIALB	*Salix alba*	White Willow	13	14				Poor	Remove	I
799	PRUNAVI	*Prunus avium*	Sweet Cherry	18					Fair	Remove	I
800	TILIAME	*Tilia americana*	American Basswood	15	15				Fair	Remove	N
801	ACERPLA	*Acer platanoides*	Norway Maple	21					Fair	Remove	I
802	ACERPLA	*Acer platanoides*	Norway Maple	15					Fair	Remove	I
803	ACERPLA	*Acer platanoides*	Norway Maple	14	1				Fair	Remove	I
804	JUGLNIG	*Juglans nigra*	Black Walnut	38					Good	Remove	N
805	ACERPLA	*Acer platanoides*	Norway Maple	15					Fair	Remove	I
806	ULMUGLA	*Ulmus glabra*	Wych Elm	16					Good	Remove	I
807	MORUALB	*Morus alba*	White Mulberry	41					Fair	Remove	I
808	ACERPLA	*Acer platanoides*	Norway Maple	24					Good	Remove	I
809	ACERXFR	*Acer x freemanii*	(Acer rubrum X Acer saccharinum)	12					Good	Remove	I
810	ACERXFR	*Acer x freemanii*	(Acer rubrum X Acer saccharinum)	3					Fair	Remove	I
811	FRAXPEN	*Fraxinus pennsylvanica*	Green Ash	11					Poor	Remove	N
812	ACERPLA	*Acer platanoides*	Norway Maple	13					Fair	Remove	I
813	ACERPLA	*Acer platanoides*	Norway Maple	28					Fair	Remove	I
814	ACERPLA	*Acer platanoides*	Norway Maple	18					Fair	Remove	I
815	FRAXAME	*Fraxinus americana*	White Ash	11					Poor	Remove	N
816	FRAXPEN	*Fraxinus pennsylvanica*	Green Ash	11					Good	Remove	N
817	FRAXPEN	*Fraxinus pennsylvanica*	Green Ash	12					Fair	Remove	N
818	FRAXPEN	*Fraxinus pennsylvanica*	Green Ash	19					Poor	Remove	N
819	FRAXAME	*Fraxinus americana*	White Ash	11					Poor	Remove	N
820	ROBIPSE	*Robinia pseudoacacia*	Black Locust	1					Fair	Remove	I
821	ACERPLA	*Acer platanoides*	Norway Maple	34					Good	Remove	I
822	PRUNAVI	*Prunus avium*	Sweet Cherry	11					Poor	Remove	I
823	FRAXPEN	*Fraxinus pennsylvanica*	Green Ash	11					Fair	Remove	N
824	JUGLNIG	*Juglans nigra*	Black Walnut	47					Good	Remove	N
825	ACERPLA	*Acer platanoides*	Norway Maple	23					Good	Remove	I
826	PINUSYL	*Pinus sylvestris*	Scots Pine	39					Good	Remove	I
827	ACERPLA	*Acer platanoides*	Norway Maple	12					Fair	Remove	I
828	ACERPLA	*Acer platanoides*	Norway Maple	21					Fair	Remove	I
829	ACERPLA	*Acer platanoides*	Norway Maple	14					Fair	Remove	I
830	ACERPLA	*Acer platanoides*	Norway Maple	15	14	12	11	8	Fair	Remove	I
831	FAGUSYL	*Fagus sylvatica*	European Beech	5	34	15			Good	Remove	I
832	JUGLNIG	*Juglans nigra*	Black Walnut	44					Good	Remove	N
833	FRAXAME	*Fraxinus americana*	White Ash	17					Fair	Remove	N
834	MALUPUM	*Malus pumila*	Common Apple	28	25	2	25	21	Good	Remove	I
835	PINUNIG	*Pinus nigra*	Black Pine	46					Good	Remove	I
836	FRAXAME	*Fraxinus americana*	White Ash	15					Poor	Remove	N
837	TILICOR	*Tilia cordata*	Little-leaf Linden	22	12				Good	Remove	I
838	PRUNAVI	*Prunus avium*	Sweet Cherry	22	17				Fair	Remove	I
839	ULMUGLA	*Ulmus glabra*	Wych Elm	21					Fair	Remove	I
840	PRUNSER	*Prunus serotina*	Black Cherry	19					Good	Remove	N
841	TSUGCAN	*Tsuga canadensis*	Eastern Hemlock	26					Good	Remove	N
842	PRUNAVI	*Prunus avium*	Sweet Cherry	21					Fair	Remove	I
843	TSUGCAN	*Tsuga canadensis*	Eastern Hemlock	22					Good	Remove	N
844	TSUGCAN	*Tsuga canadensis*	Eastern Hemlock	19					Good	Remove	N

Tree Data Table

Tree Tag #	Species Code	Scientific Name	Common Name	DBH1 [1] (cm)	DBH2	DBH3	DBH4	DBH5	Tree Condition	Tree Action	Native Status [7]
845	PRUNAVI	*Prunus avium*	Sweet Cherry	11					Fair	Remove	I
846	PRUNSER	*Prunus serotina*	Black Cherry	13					Good	Remove	N
847	MALU_SP	*Malus sp*	Apple Species	22					Fair	Remove	G
848	FRAXPEN	*Fraxinus pennsylvanica*	Green Ash	13					Poor	Remove	N
849	ACERSAC	*Acer saccharum*	Sugar Maple	45					Fair	Remove	N
850	FRAXPEN	*Fraxinus pennsylvanica*	Green Ash	18					Poor	Remove	N
851	MALU_SP	*Malus sp*	Apple Species	1	5				Fair	Remove	G
852	ACERRUB	*Acer rubrum*	Red Maple	58					Good	Remove	N
853	ACERXFR	*Acer x freemanii*	(Acer rubrum X Acer saccharinum)	1					Good	Remove	I
854	FRAXPEN	*Fraxinus pennsylvanica*	Green Ash	17					Fair	Remove	N
855	FRAXPEN	*Fraxinus pennsylvanica*	Green Ash	15					Poor	Remove	N
856	FRAXPEN	*Fraxinus pennsylvanica*	Green Ash	12					Fair	Remove	N
857	ACERPLA	*Acer platanoides*	Norway Maple	15					Poor	Remove	I
858	FRAXPEN	*Fraxinus pennsylvanica*	Green Ash	12					Poor	Remove	N
859	FRAXPEN	*Fraxinus pennsylvanica*	Green Ash	14					Poor	Remove	N
860	TILIAME	*Tilia americana*	American Basswood	7					Good	Remove	N
861	ACERPLA	*Acer platanoides*	Norway Maple	51					Good	Remove	I
862	ULMUGLA	*Ulmus glabra*	Wych Elm	27					Fair	Remove	I
863	FAGUSYL	*Fagus sylvatica*	European Beech	58					Good	Remove	I
864	ACERRUB	*Acer rubrum*	Red Maple	58					Good	Remove	N
865	PICEABI	*Picea abies*	Norway Spruce	51					Good	Remove	I
866	PICEABI	*Picea abies*	Norway Spruce	49					Good	Remove	I
867	PRUNAME	*Prunus americana*	American Plum	21	19				Good	Remove	N
868	PRUNAME	*Prunus americana*	American Plum	12	9				Good	Remove	N
869	PRUNAME	*Prunus americana*	American Plum	13					Good	Remove	N
870	PICEABI	*Picea abies*	Norway Spruce	32					Good	Remove	I
871	FRAXAME	*Fraxinus americana*	White Ash	28					Poor	Remove	N
872	ACERPLA	*Acer platanoides*	Norway Maple	28					Good	Remove	I
873	ACERPLA	*Acer platanoides*	Norway Maple	15					Good	Remove	I
874	ACERXFR	*Acer x freemanii*	(Acer rubrum X Acer saccharinum)	48					Good	Remove	I
875	ACERPLA	*Acer platanoides*	Norway Maple	13	9	6	5		Good	Remove	I
876	TAXUCAN	*Taxus canadensis*	Canadian Yew	12	11	1	1	9	Fair	Remove	N
877	TAXUCAN	*Taxus canadensis*	Canadian Yew	19	17	12	12	1	Fair	Remove	N
878	TAXUCAN	*Taxus canadensis*	Canadian Yew	18	1	9	7	7	Fair	Remove	N
879	TAXUCAN	*Taxus canadensis*	Canadian Yew	11	5	3			Fair	Remove	N
1001	FRAXAME	*Fraxinus americana*	White Ash	13					Poor	Preserve	N
1002	PINUNIG	*Pinus nigra*	Black Pine	19					Fair	Preserve	I
1003	ACERPLA	*Acer platanoides*	Norway Maple	34					Fair	Preserve	I
1004	ACERPLA	*Acer platanoides*	Norway Maple	18					Fair	Preserve	I
1005	ACERSAC	*Acer saccharum*	Sugar Maple	24					Good	Preserve	N
1006	PINUNIG	*Pinus nigra*	Black Pine	4					Fair	Preserve	I
1007	ACERSAC	*Acer saccharum*	Sugar Maple	2					Fair	Preserve	N
1008	TILIAME	*Tilia americana*	American Basswood	15	12				Poor	Preserve	N
1009	ACERPLA	*Acer platanoides*	Norway Maple	3					Poor	Preserve	I
1010	PINUSYL	*Pinus sylvestris*	Scots Pine	3					Fair	Preserve	I
1011	OSTRVIR	*Ostrya virginiana*	Eastern Hop-hornbeam	2	1				Good	Preserve	N
1012	PINUNIG	*Pinus nigra*	Black Pine	38					Fair	Preserve	I
1013	ACERSAC	*Acer saccharum*	Sugar Maple	11					Fair	Preserve	N
1014	CRAT_SP	*Crataegus sp*	Hawthorn Species	11					Fair	Preserve	G
1015	TILIAME	*Tilia americana*	American Basswood	36					Fair	Preserve	N

Tree Data Table

Tree Tag #	Species Code	Scientific Name	Common Name	DBH1 [1] (cm)	DBH2	DBH3	DBH4	DBH5	Tree Condition	Tree Action	Native Status [7]
1016	PINUSYL	*Pinus sylvestris*	Scots Pine	43					Fair	Preserve	I
1017	ACERSAC	*Acer saccharum*	Sugar Maple	13					Fair	Preserve	N
1018	ACERSAC	*Acer saccharum*	Sugar Maple	16					Good	Preserve	N
1019	TILIAME	*Tilia americana*	American Basswood	4					Good	Preserve	N
1020	TILIAME	*Tilia americana*	American Basswood	34					Fair	Preserve	N
1021	TILIAME	*Tilia americana*	American Basswood	24	23				Fair	Preserve	N
1025	TILIAME	*Tilia americana*	American Basswood	36	11				Fair	Preserve	N
1026	ACERSAC	*Acer saccharum*	Sugar Maple	12					Good	Preserve	N
1027	JUGLNIG	*Juglans nigra*	Black Walnut	55					Fair	Preserve	N
1028	ACERPLA	*Acer platanoides*	Norway Maple	3					Fair	Preserve	I
1029	ACERPLA	*Acer platanoides*	Norway Maple	25					Fair	Preserve	I
1030	ACERPLA	*Acer platanoides*	Norway Maple	14					Fair	Preserve	I
1031	ACERPLA	*Acer platanoides*	Norway Maple	18					Fair	Preserve	I
1032	ACERSAC	*Acer saccharum*	Sugar Maple	31					Fair	Preserve	N
1033	ACERPLA	*Acer platanoides*	Norway Maple	17					Poor	Preserve	I
1034	ACERPLA	*Acer platanoides*	Norway Maple	2					Fair	Preserve	I
1035	ACERPLA	*Acer platanoides*	Norway Maple	26					Fair	Preserve	I
1036	ACERPLA	*Acer platanoides*	Norway Maple	25					Fair	Preserve	I
1037	ACERPLA	*Acer platanoides*	Norway Maple	11					Fair	Preserve	I
2022	TILIAME	*Tilia americana*	American Basswood	64					Good	Preserve	N
2023	ACERSAC	*Acer saccharum*	Sugar Maple	29					Good	Preserve	N
2024	ACERSAC	*Acer saccharum*	Sugar Maple	27					Good	Preserve	N

Tree Assessment Criteria

1. DBH (cm): Diameter at breast height, 1.4 m above ground, measured in centimetres.

2. Crown Reserve (m): Crown diameter (tree's canopy) measured at intervals of 1, 3, 5, 7.5, 10, 15 metres

3. Height (m): Height of tree from ground to top of crown.

4. Structural Condition: Related to defects in a tree's structure, (i.e., lean, codominant trunks).
High - No structural defects, well-developed crown.
Medium - Presence of minor structural defects.
Low - Presence of major structural defects including drastic leans and imminent branch and/or trunk failure.

5. Biological Health: Related to presence and extent of disease/disease symptoms and the vigour of the tree.
High - No diseases/disease symptoms present, and moderate to high vigour.
Medium - Presence of minor diseases/disease symptoms, and/or moderate vigour.
Low - Presence of major diseases/disease symptoms, (i.e., extensive crown dieback), and/or severely poor vigour.

6. Preservation Priority: A rating of each tree's projected survival related to existing conditions.
High - High to moderate biological health, and well developed crown. Well suited as a shade tree or screen planting. Will survive existing conditions indefinitely.
Medium - One or more moderate to severe defects in biological health and/or structural condition. Marginally suited as a shade tree or screen planting. Can survive at least 3 - 5 years under existing conditions.
This category also includes stock planted within past 2 years that is not yet established.
Low - Low biological health and/or severely damaged/defective structural condition, and/or unsuitable for urban uses. If biologically defective, survival for more than 1-3 years under existing conditions is unlikely.

7. Native Status:
Native – Native to Ontario
Introduced – Not native to Ontario
Genus - Unable to identify species level due to lack of key characteristics at the time of survey.
Source: NHIC (Natural Heritage Information Centre). 2009. Ontario Vascular Plant Species List. Biodiversity Explorer Online Database. Ontario Ministry of Natural Resources.

8. Tree Action
Preserve - Trees that have a dripline that is substantially outside the limits of disturbance (less than 30% of the crown reserve will be impacted) and having moderate to high Preservation Priority. Protection of the entire root zone of the tree is desirable.
Injure - Trees located near construction activities that may be damaged.
Remove - Any tree for which at least 30% of the dripline is within the limits of disturbance, has low biological health, and/or severe structural defects, and is not likely to survive more than 1-3 years, and/or will not survive proposed development.
N/A - Not applicable. Tree not present. Removed since D&A's 2014 arborist assessment.

9. Tree Action Coordinate Source
Survey - Tree location was identified on the Site and Grading Plan, completed by Greater Toronto Acres Surveying Inc., revised August 8, 2018. All questions regarding the location of this tree should be directed to Greater Toronto Acres Surveying Inc..
high Preservation Priority. Protection of the entire root zone of the tree is desirable. **Trimble Geo7x 10 cm GPS Unit -** Global Positioning System (GPS) device used to locate each tree. This unit is rated for 10 cm accuracy under IDEAL CONDITIONS. Please see GPS Horizontal Accuracy for additional information about the unit accuracy and ideal satellite conditions.
Injure - Trees located near construction activities that may be damaged. For additional information please refer to the unit's datasheet available at: For more information: https://geospatial.trimble.com/products-and-solutions/geo-7x

10. GPS Horizontal Accuracy (m) GPS Horizontal Accuracy (m)
For trees located using Trimble Geo7x (10 cm) GPS Unit, this unit is capable of 10 cm horiztonal accuracy under ideal conditions. Ideal conditions are considered to be in an open area with low ionospheric activity. Tree canopy significantly impacts GPS accuracy.
The GPS Horiztonal Accuracy is the real-time differitial horizontal accuracy for each tree in metres. Corrections are calculated at a base station and transmitted to the Trimble GPS unit receiver via the cellular network & Can-net Virtual Reference Station Network. http://www.can-net.ca/

Appendix G: Species at Risk Screening

SPECIES LIST (For City of Hamilton; MNRF, November 2018)	SAR Designation (if different = federal / provincial)	Status in Ontario	Key Habitats Used By Species	Status at Browlands EIS site and adjacent lands (within 120 metres)
AMPHIBIANS				
Jefferson Salamander (*Ambystoma jeffersonianum*)	Endangered	Southern Ontario, mainly along the Niagara Escarpment	Inhabits deciduous and mixed deciduous forests with suitable breeding areas which generally consist of ephemeral (temporary) bodies of water that are fed by spring runoff, groundwater, or springs.	**Potential habitat in escarpment forest to the north (in adjacent lands); no suitable habitat on site itself. Although this species is found mainly along Niagara Escarpment in the Hamilton region, the NHIC and MECP databases do not have records from this area (most populations in Ontario have been identified). Therefore, it is highly unlikely that this species is present even in adjacent lands.**
Unisexual Ambystoma - Jefferson-dominated (*Ambystoma laterale-jeffersonianum*)	Endangered	Southern Ontario, mainly along the Niagara Escarpment	Inhabits deciduous and mixed deciduous forests with suitable breeding areas which generally consist of ephemeral (temporary) bodies of water that are fed by spring runoff, groundwater, or springs.	**See Jefferson Salamander.**
BIRDS				
Acadian Flycatcher (*Empidonax virescens*)	Endangered	Carolinian Region (as far north as Toronto)	Generally requires large areas of mature, undisturbed forest; avoids the forest edge; often found in well wooded swamps and ravines.	**No suitable habitat found on site or in adjacent lands. None detected during breeding bird surveys.**
Bald Eagle (*Haliaeetus leucocephalus*)	Special Concern (provincial only)	Widespread in southern Ontario	Prefers deciduous and mixed-deciduous forest; and habitat close to water bodies such as lakes and rivers; they roost in super canopy trees such as pine.	**No suitable habitat found on site or in adjacent lands. None detected during breeding bird surveys.**
Bank Swallow (*Riparia riparia*)	Threatened	Widespread in southern Ontario	Low areas along rivers, streams, coasts or reservoirs; nest in natural bluffs and eroding streamside banks, also sand and gravel quarries and road cuts	**No suitable breeding habitat found on site or in adjacent lands. None detected during breeding bird surveys.**
Barn Owl (*Tyto alba*)	Endangered	Extreme southwestern Ontario only	Generally prefers low-elevation, open country; often associated with agricultural lands, especially pasture. Nests are located in buildings, hollow trees and cavities in cliffs.	**No suitable nesting structures found in study area or adjacent lands. No suitable foraging habitat (e.g. open agricultural areas, meadows) found on site or in adjacent lands. This species is very rare in the region and absent most years.**
Barn Swallow (*Hirundo rustica*)	Threatened	Widespread in southern Ontario	Prefers farmland, lake/river shorelines, wooded clearings, urban populated areas, rocky cliffs, and wetlands. They nest inside or outside buildings; under bridges and in road culverts; on rock faces and in caves, etc.	**Potential nesting and foraging habitat found on site and in adjacent lands. None detected during breeding bird surveys; no evidence found of previous nesting activity (e.g. old nests).**
Black Tern (*Childonias niger*)	Special Concern (provincial only)	Scattered in southern Ontario; breed mainly along edges of the Great Lakes	Generally prefers freshwater marshes and wetlands; nests either on floating material in a marsh or on the ground very close to water.	**No suitable habitat found on site or in adjacent lands. None detected during breeding bird surveys.**
Bobolink (*Dolichonyx oryzivorus*)	Threatened	Widespread in southern Ontario	Generally prefers open grasslands and hay fields. In migration and in winter uses freshwater marshes and grasslands.	**No suitable habitat found on site or in adjacent lands. None detected during breeding bird surveys.**
Canada Warbler (*Wilsonia canadensis*)	Threatened / Special Concern	Absent in southwestern Ontario; primarily breeds in Southern Shield	Generally prefers wet coniferous, deciduous and mixed forest types, with a dense shrub layer. Nests on the ground, on logs or hummocks, and uses dense shrub layer to conceal the nest.	**No suitable habitat found on site or in adjacent lands. None detected during breeding bird surveys.**

Appendix G: Species at Risk Screening

SPECIES LIST (For City of Hamilton; MNRF, November 2018)	SAR Designation (if different = federal / provincial)	Status in Ontario	Key Habitats Used By Species	Status at Browlands EIS site and adjacent lands (within 120 metres)
Cerulean Warbler (*Dendroica cerulea*)	Endangered / Threatened	Widespread but local in southern Ontario	Generally found in mature deciduous forests with an open understorey; also nests in older, second-growth deciduous forests.	**Potential breeding habitat found in adjacent lands (escarpment forest). None detected during breeding bird surveys.**
Chimney Swift (*Chaetura pelagica*)	Threatened	Widespread in southern Ontario	Historically found in deciduous and coniferous, usually wet forest types, all with a well developed, dense shrub layer; now most are found in urban areas in large uncapped chimneys.	**Recent records from area (GeoProcess 2017). No suitable large (50+ cm DBH) hollow trees found on site, although some may be found in escarpment forest to north. Chimney on building being retained; however, it was not accessible for use as a nest site (see report for details). Species not detected during breeding bird surveys.**
Common Nighthawk (*Chordeiles minor*)	Threatened / Special Concern	Widespread in southern Ontario	Generally prefers open, vegetation-free habitats, including dunes, beaches, recently harvested forests, burnt-over areas, logged areas, rocky outcrops, rocky barrens, grasslands, pastures, peat bogs, marshes, lakeshores, and river banks. This species also inhabits mixed and coniferous forests. Can also be found in urban areas (nests on flat roof-tops).	**No suitable habitat found on site or in adjacent lands. None detected during breeding bird surveys.**
Eastern Meadowlark (*Sturnella Magna*)	Threatened	Widespread in southern Ontario	Generally prefers grassy pastures, meadows and hay fields. Nests are always on the ground and usually hidden in or under grass clumps.	**No suitable habitat found on site or in adjacent lands. None detected during breeding bird surveys.**
Eastern Whip-poor-will *(Caprimlugus vociferus)*	Threatened	Scattered in southwestern Ontario; primarily north of Toronto	Generally prefers semi-open deciduous forests or patchy forests with clearings; areas with little ground cover are also preferred. In winter they occupy primarily mixed woods near open areas.	**No suitable habitat found on site or in adjacent lands.**
Eastern Wood-Pewee (*Contopus virens*)	Special Concern	Widespread in southern Ontario	Found in deciduous, mixed woods, or pine plantations; also found in mature woodlands, urban shade trees, roadsides, and orchards; usually found in clearings and forest edges.	**One territorial bird was heard singing on both breeding bird surveys in the escarpment forest to the east of the site (in adjacent lands). See report for details.**
Golden-winged Warbler (*Vermivora chrysoptera*)	Threatened / Special Concern	Local; primarily central-eastern Ontario	Generally prefers areas of early successional vegetation, found primarily on field edges, hydro or utility right-of-ways, or recently logged areas.	**No suitable habitat found on site or in adjacent lands. None detected during breeding bird surveys.**
Henslow's Sparrow *(Ammodramus henslowii)*	Endangered	Extremely rare; may be extirpated	Generally found in old fields, pastures and wet meadows. They prefer areas with dense, tall grasses, and thatch, or decaying plant material.	**No suitable habitat found on site or in adjacent lands. This species is locally extirpated and may be extirpated from the entire province. None detected during breeding bird surveys.**
King Rail (*Rallus elegans*)	Endangered	Majority found at Lake St. Clair; remainder at key coastal marshes along lakes Erie and Ontario	Freshwater and brackish marshes and rice fields.	**No suitable habitat found on site or in adjacent lands. None detected during breeding bird surveys.**
Least Bittern *(Ixobrychus exilis)*	Threatened	Widespread in southern Ontario	Generally located near pools of open water in relatively large marshes and swamps that are dominated by cattail and other robust emergent plants.	**No suitable habitat found on site or in adjacent lands. None detected during breeding bird surveys.**
Louisiana Waterthrush *(Seiurus motacilla)*	Special Concern	Widespread but local in southern Ontario	Ggenerally inhabits mature forests along steeply sloped ravines adjacent to running water. Prefers clear, cold streams and densely wooded swamps.	**No suitable habitat found on site or in adjacent lands. None detected during breeding bird surveys.**

Appendix G: Species at Risk Screening

SPECIES LIST (For City of Hamilton; MNRF, November 2018)	SAR Designation (if different = federal / provincial)	Status in Ontario	Key Habitats Used By Species	Status at Browlands EIS site and adjacent lands (within 120 metres)
Peregrine Falcon (*Falco peregrinus*)	Special Concern	Nests in large cities in southern Ontario; primarily found in northwestern Ontario	Mountain ranges, coastlines, river valleys, and increasingly in cities.	**No suitable habitat found on site or in adjacent lands. None detected during breeding bird surveys.**
Prothonotary Warbler (*Protonotaria citrea*)	Endangered	Primarily along north shore of Lake Erie; very local	Generally found in the dead trees of flooded woodlands or deciduous swamp forests; Carolinian Zone	**No suitable habitat found on site or in adjacent lands. None detected during breeding bird surveys.**
Red-headed Woodpecker *(Melanerpes erythrocephalus)*	Threatened / Special Concern	Widespread but rare in southern Ontario	Generally prefers open oak and beech forests, grasslands, forest edges, orchards, pastures, riparian forests, roadsides, urban parks, golf courses, cemeteries, as well as along beaver ponds and brooks.	**No suitable habitat found on site or in adjacent lands. None detected during breeding bird surveys.**
Short-eared Owl *(Asio flammeus)*	Special Concern	Very local in southern Ontario	Generally prefers a wide variety of open habitats, including grasslands, peat bogs, marshes, sand-sage concentrations, old pastures and agricultural fields.	**No suitable habitat found on site or in adjacent lands. None detected during breeding bird surveys.**
Wood Thrush (*Hylocichla mustelina*)	Threatened / Special Concern	Widespread in southern Ontario	Breeds in mature deciduous and mixed forests, most commonly those with American beech, sweet gum, red maple, black gum, eastern hemlock, flowering dogwood, American hornbeam, oaks, or pines; nests less successfully in fragmented forests and suburban parks with enough large trees for a territory; ideal habitat includes trees over 50 feet tall, a moderate understory of saplings/shrubs, an open floor with moist soil and decaying leaf litter, and water nearby.	**Potential habitat found in adjacent lands (escarpment forest). Previous records from lower escarpment forest (GeoProcess 2017). None were detected during 2019 breeding bird surveys.**
Yellow-breasted Chat *(Icteria virens)*	Endangered	Breeds mainly Point Pelee and Pelee Island	Generally prefers dense thickets around wood edges, riparian areas, and in overgrown clearings.	**No suitable breeding habitat found on site or in adjacent lands. Not detected during breeding bird surveys.**
INSECTS				
Monarch *(Danaus plexippus)*	Endangered / Special Concern	Widespread in southern Ontario	Exist primarily wherever milkweed and wildflowers exist, such as abandoned farmland, along roadsides, and other open spaces.	**No suitable habitat (e.g. open meadows) found on site or in adjacent lands. May show up occasionally during migration but not in significant numbers.**
Mottled Duskywing (*Erynnis martialis*)	Endangered (federal only)	Scattered locations throughout southern Ontario	Open woodland, barrens, prairie hills, open brushy fields, chaparral; larvae feed on New Jersey tea (*Ceanothus americanus*) and redroot (*Ceanothus herbaceus*)	**No suitable habitat found on site or in adjacent lands.**
West Virginia White (*Pieris virginiensis*)	Special Concern (provincial only)	50 sites in south and central Ontario; primarily western Lake Ontario region	Generally prefer moist, deciduous woodlands; the larvae feed only on the leaves of the two-leaved toothwort (Cardamine diphylla), which is a small, spring-blooming plant of the forest floor.	**No suitable habitat found on site or in adjacent lands. No NHIC or MECP records from area; most sites in southern Ontario are generally known.**
MAMMALS				
American Badger (*Taxidea taxus*)	Endangered (SW Ontario); Special Concern (provincial only; NW Ontario)	Southwestern Ontario, primarily Norfolk and Middlesex (close to Lake Erie); also northwestern Ontario pop.	Occurs primarily in grasslands and open areas with grasslands, which can include parklands, farms, and treeless areas; also found in forest glades and meadows, marshes, brushy areas, hot deserts, and mountain meadows	**No suitable habitat found on site or in adjacent lands. No records on file with NHIC, MECP, or HCA. No burrows or other evidence of presence found during field investigations.**

Appendix G: Species at Risk Screening

SPECIES LIST (For City of Hamilton; MNRF, November 2018)	SAR Designation (if different = federal / provincial)	Status in Ontario	Key Habitats Used By Species	Status at Browlands EIS site and adjacent lands (within 120 metres)
Eastern Small-footed Myotis (*Myotis leibii*)	Endangered (provincial only)	Widespread in southern Ontario	Overwintering habitat: caves and mines that remain above 0 degrees Celsius; Maternal roosts: primarily under loose rocks on exposed rock outcrops, crevices and cliffs, and occasionally in buildings, under bridges and highway overpasses, and under tree bark.	**Suitable maternity roost habitat occurs in escarpment forest to the north and adjacent forested ELC communities on site. Isolated maure trees could serve as temporary roosts during summer or migration (April and May; August to October). Any removal of mature trees should be done outside of April 1 to October 31. Proposed development will not adversely impact this species or its maternity roost habitat.**
Little Brown Myotis (*Myotis lucifugus*)	Endangered	Widespread in southern Ontario	Overwintering habitat: caves and mines that remain above 0 C; Maternal roosts: Often associated with buildings (attics, barns, etc.). Occasionally found in trees (25-44 cm dbh).	**See Eastern Small-footed Myotis.**
Northern Myotis (*Myotis septentrionalis)*	Endangered	Widespread in southern Ontario	Overwintering habitat: caves and mines that remain above 0 C; Maternal roosts: often asssociated with cavities of large diameter trees (25-44 cm dbh). Occasionally found in structures (attics, barns, etc.)	**See Eastern Small-footed Myotis.**
Tri-colored Bat (*Perimyotis subflavus*)	Endangered	Very rare; widespread but scattered in southern Ontario	Overwintering habitat: caves and mines that remain above 0 degrees Celsius; Maternal roosts: can be in trees or dead clusters of leaves or arboreal lichens on trees. May also use barns or similar structures.	**See Eastern Small-footed Myotis.**
Woodland Vole (*Microtus pinetorum*)	Special Concern	Carolinian Region only	Occurs in deciduous forests, dry fields, and apple orchards, preferring wooded areas with high vertical vegetative stratification, also evergreen shrubs, ground cover, and old fallen logs. Voles are most abundant in deciduous forests with moist, friable soils suitable for burrowing.	**Potential habitat found in escarpment forest to the north, although status in area is unknown. If present, proposed development will not adversely impact this species or its habitat.**
REPTILES				
Blanding's Turtle *(Emydonidea blandingii)*	Threatened	Widespread in south, central, and eastern Ontario	Generally occurs in freshwater lakes, permanent or temporary pools, slow-flowing streams, marshes and swamps. Prefers shallow water that is rich in nutrients, organic soil and dense vegetation. Adults are generally found in open or partially vegetated sites, and juveniles prefer areas that contain thick aquatic vegetation including sphagnum, water lilies and algae. They dig their nest in a variety of loose substrates, including sand, organic soil, gravel and cobblestone. Overwintering occurs in permanent pools that average about one metre in depth, or in slow-flowing streams.	**No suitable habitat found on site or in adjacent lands. No NHIC or MECP records from area.**
Eastern Hog-nosed Snake (*Heterodon platirhinos*)	Threatened	Two populations: East of Georgian Bay and southwestern Ontario (primarily Grand River sand plain)	Generally prefer habitats with sandy, well-drained soil and open vegetative cover, such as open woods, brushland, fields, forest edges and disturbed sites. The species is often found near water.	**No suitable habitat found on site or in adjacent lands. No NHIC or MECP records from area. None detected during spring snake surveys in 2019.**
Eastern Musk Turtle (Stinkpot) (*Sternotherus odoratus*)	Special Concern	Mostly southern edge of Canadian Shield; scattered locations in southwestern Ontario	Occurs in rivers, lakes and ponds with a slow-moving current, soft bottom, and shallow water	**No suitable habitat found on site or in adjacent lands. No NHIC or MECP records from area.**
Eastern Ribbonsnake *(Thamnophis sauritus)*	Special Concern	Widespread in southern and eastern Ontario	Generally occurs along the edges of shallow ponds, streams, marshes, swamps, or bogs bordered by dense vegetation that provides cover. Abundant exposure to sunlight is also required, and adjacent upland areas may be used for nesting.	**No suitable habitat found on site or in adjacent lands. No NHIC or MECP records from area. None detected during spring snake surveys in 2019.**

Appendix G: Species at Risk Screening

SPECIES LIST (For City of Hamilton; MNRF, November 2018)	SAR Designation (if different = federal / provincial)	Status in Ontario	Key Habitats Used By Species	Status at Browlands EIS site and adjacent lands (within 120 metres)
Northern Map Turtle (*Graptemys geographica*)	Special Concern	Widespread along shores of Georgian Bay and lakes Erie, Ontario, and St. Clair	Found in large rivers and lakes with slow-moving currents and soft bottoms	**No suitable habitat found on site or in adjacent lands. No NHIC or MECP records from area.**
Snapping Turtle *(Chelydra serpentina)*	Special Concern	Very widespread and common in southern Ontario	Generally inhabit shallow waters where they can hide under the soft mud and leaf litter. Nesting sites usually occur on gravely or sandy areas along streams. Snapping Turtles often take advantage of man-made structures for nest sites, including roads (especially gravel shoulders), dams and aggregate pits.	**No suitable basking, foraging, or overwintering habitat found on site or in adjacent lands. No NHIC or MECP records from area.**
Spiny Softshell (*Apalone spinifera*)	Threatened	Lakes St. Clair and Erie and western L. Ontario watersheds. Majority are found in the Thames and Sydenham rivers and at two sites in Lake Erie.	Found in rivers with soft bottoms, aquatic vegetation and sandbars or mudflats; occasionally found in lakes or impoundments.	**No suitable habitat found on site or in adjacent lands. No NHIC or MECP records from area.**
FISH				
American Eel (*Anguilla rostrata*)	Endangered	12-mile Creek watershed and Lake Ontario.	All fresh water, estuaries and coastal marine waters that are accessible to the Atlantic Ocean.	**No suitable habitat found on site or in adjacent lands.**
Grass Pickerel (*Esox americanus vermiculatus*)	Special Concern	Occur in the St. Lawrence River, and lakes Ontario, Erie, and Huron	Generally occur in wetlands with warm, shallow water and an abundance of aquatic plants.	**No suitable habitat found on site or in adjacent lands.**
Nothern Sunfish (Great Lakes - upper St. Lawrence pop.) (*Lepomis peltastes*)	Special Concern	Throughout southern Ontario including Great Lakes and rivers and small lakes in eastern Ontario.	Shallow, vegetated and slow flowing waters as well as warm lakes and ponds with sandy banks or rocky bottoms. Preferred habitats have aquatic vegetation to avoid strong currents.	**No suitable habitat found on site or in adjacent lands.**
Redside Dace *(Clinostomus elongatus)*	Endangered	Found in a few tributaries of Lake Huron, in streams flowing into western Lake Ontario, the Holland River (flows into Lake Simcoe), and Irvine Creek of the Grand River system.	Generally found in pools and slow-moving areas of small headwater streams with a moderate to high gradient.	**No suitable habitat found on site or in adjacent lands.**
Silver Shiner (*Notropis photogenis*)	Threatened	Found in the Thames and Grand Rivers, and in Bronte and Sixteen Mile Creeks.	Generally prefer moderate to large, deep, relatively clear streams with swift currents, and moderate to high gradients.	**No suitable habitat found on site or in adjacent lands.**

Appendix G: Species at Risk Screening

SPECIES LIST (For City of Hamilton; MNRF, November 2018)	SAR Designation (if different = federal / provincial)	Status in Ontario	Key Habitats Used By Species	Status at Browlands EIS site and adjacent lands (within 120 metres)
MOLLUSCS (FRESHWATER MUSSELS)				
Eastern Pondmussel (*Ligumia nasuta*)	Special Concern / Endangered	Lake St. Clair River delta; Lyn Creek (small tributary in upper St. Lawrence River); found at 17 new sites	Generally inhabit sheltered areas of lakes or slow streams in substrates of fine sand and mud	**No suitable habitat found on site or in adjacent lands.**
Lilliput (*Taxolasma parvum*)	Threatened (provincial only)	Southwest Ontario	Found in a variety of habitats including small to large rivers, wetlands, shallows of lakes, ponds and reservoirs. They are common in soft substrates with over 50% of the substrate type comprised of sand and a mud/muck/silt combination. Typically occur with or near Green Sunfish, Bluegill, White Crappie, and Johnny Darter	**No suitable habitat found on site or in adjacent lands.**
Rainbow Mussel (*Villosa iris*)	Special Concern	Ausable, Bayfield, Detroit, Grand, Maitland, Moira, Niagara, Salmon, Saugeen, Sydenham, Thames, & Trent Rivers; Lake St. Clair; may no longer be in L. Erie & St. Clair, Detroit & Niagara R.	Most abundant in shallow, well oxygenated reaches of small- to medium-sized rivers and sometimes lakes, on substrates of cobble, gravel,sand and occasionally mud.	**No suitable habitat found on site or in adjacent lands.**
VASCULAR PLANTS				
American Chestnut (*Castanea dentata*)	Endangered	Found in the Carolinian Zone between Lake Erie and Lake Huron.	Found in deciduous forest communities; this tree prefers arid forests with acid and sandy soils.	**Potential habitat in escarpment forest to the north (adjacent lands) but none on site. No records in NHIC, MECP, or HCA databases. Not observed during botanical surveys.**
American Columbo (*Frasera caroliniensis*)	Endangered	Only found in the Carolinian forest region; 22 populations recorded. Based on field surveys in 2004/2005, 13 populations are currently believed to exist.	Most commonly associated with open deciduous forested slopes, thickets and clearings; grows in a variety of relatively stable habitats as well as on a wide variety of soils.	**Potential habitat in escarpment forest to the north (adjacent lands) but none on site. No records in NHIC, MECP, or HCA databases. Not observed during botanical surveys.**
American Ginseng (*Panax quinquefolius*)	Endangered	Southern Ontario	Grows in rich, moist, undisturbed and relatively mature deciduous woods (dominated by Sugar Maple, White Ash, and American Basswood) in areas of neutral soil (such as over limestone or marble bedrock).	**Potential habitat in escarpment forest to the north (adjacent lands) but none on site. No records in NHIC, MECP, or HCA databases. Not observed during botanical surveys.**
Broad Beech Fern (*Phegopteris hexagonoptera*)	Special Concern	Found in forest remnants in southern Muskoka, along Lake Erie, and in the eastern Lake Ontario-St. Lawrence River region.	Generally inhabits shady areas of beech and maple forests where the soil is moist or wet.	**Potential habitat in escarpment forest to the north (adjacent lands) but none on site. No records in NHIC, MECP, or HCA databases. Not observed during botanical surveys.**

Appendix G: Species at Risk Screening

SPECIES LIST (For City of Hamilton; MNRF, November 2018)	SAR Designation (if different = federal / provincial)	Status in Ontario	Key Habitats Used By Species	Status at Browlands EIS site and adjacent lands (within 120 metres)
Butternut (*Juglans cinerea*)	Endangered	Found throughout the southwest, north to the Bruce Peninsula, and south of the Canadian Shield.	Generally grows in rich, moist, and well-drained soils often found along streams. It may also be found on well-drained gravel sites, especially those made up of limestone. It is also found, though seldomly, on dry, rocky and sterile soils. In Ontario, the Butternut generally grows alone or in small groups in deciduous forests as well as in hedgerows.	**Potential habitat in forested portions of site, however no Butternut observed on or adjacent to site during field surveys.**
Cherry Birch (*Betula lenta*)	Endangered	Two sites on the Niagara peninsula. A survey of these sites in 2010 found only 17 trees (of 50 trees identified in 1967).	Found on moist, well-drained clay loam soil over limestone bedrock with White Oak, Red Oak, Eastern Hemlock, Sugar Maple and other deciduous trees.	**Potential habitat in escarpment forest to the north (adjacent lands) but none on site. No records in NHIC, MECP, or HCA databases. Not observed during botanical surveys.**
Eastern Flowering Dogwood (*Cornus florida*)	Endangered	Only in the Carolinian Zone (southwest of Toronto to Sarnia down to the shores of Lake Erie).	Generally grows in deciduous and mixed forests, in the drier areas of its habitat, although it is occasionally found in slightly moist environments; also grows around edges and hedgerows.	**Potential habitat in escarpment forest to the north (adjacent lands) but none on site. No records in NHIC, MECP, or HCA databases. Not observed during botanical surveys.**
Few-flowered Club-rush (*Trichophorum planifolium*)	Endangered	Two sites: Royal Botanical Gardens (Hamilton) and Rouge Park (Toronto).	Generally found on steep slopes of Dry Fresh Oak deciduous forests and Dry Fresh Oak-Maple-Hickory deciduous forests.	**Potential habitat in escarpment forest to the north (adjacent lands) but none on site. No records in NHIC, MECP, or HCA databases. Not observed during botanical surveys. Only known location in Hamilton area is at Royal Botanical Gardens.**
Green Dragon (*Arisaema dracontium*)	Special Concern	Believed to still occur at about 30 to 35 sites in the southwestern Ontario.	Generally grows in damp deciduous forests, particularly maple forest and forest dominated by Red Ash and White Elm trees, and along streams.	**Potential habitat in escarpment forest to the north (adjacent lands) but none on site. No records in NHIC, MECP, or HCA databases. Not observed during botanical surveys.**
Hoary Mountain-mint (*Pycnanthemum incanum*)	Endangered	Only in Hamilton - north shore of harbour	Oak savannas and prairies, dry sites; occurs on steep, warmer-than-normal slopes.	**No suitable habitat found on site or in adjacent lands.**
Red Mulberry (*Morus rubra*)	Endangered	Found in the Carolinian Zone, especially the shores of Lake Erie and the slopes of the Niagara Escarpment.	Generally grows in moist forest habitats. In Ontario, these include slopes and ravines of the Niagara Escarpment, and sand spits and bottom lands; can grow in open areas such as hydro corridors.	**Potential habitat in escarpment forest to the north (adjacent lands) but none on site. No records in NHIC, MECP, or HCA databases. Not observed during botanical surveys.**
White Wood Aster (*Eurybia divaricata*)	Threatened	Restricted to a relatively small number of sites in the Niagara region	Generally grows in open, dry, deciduous forests that are dominated by Sugar Maple and American Beech. May benefit from some disturbance as it often grows along trails. Often found mixed in with other asters.	**No suitable habitat found on site or in adjacent lands. Not detected during botanical surveys.**
LICHENS AND MOSSES				
Spoon-leaved Moss (*Bryoandersonia illecebra*)	Endangered	Restricted to a few sites in southern Ontario – Elgin, Essex and Welland counties, and the Niagara Region.	Generally found in deciduous forests; found on soil that is in or near flat, low-lying, seasonally wet areas.	**Potential habitat in escarpment forest to the north (adjacent lands) but none on site. No records in NHIC, MECP, or HCA databases. Not observed during botanical surveys. If present, escarpment forest is being preserved as part of proposed development and this species will not be adversely impacted.**

Appendix H. Significant Wildlife Habitat Screening

Screening for Known/Candidate SWH at Browlands EIS site and adjacent lands (within 120 metres) – using Ecoregion 7E Criteria Schedule (Final version: OMNRF, January 2015)

Significant Wildlife Habitat (SWH) Type	Qualifying ELC communities/species and/or other recommended criteria for SWH identification	SWH on site or within 120 m?	Assessment Rationale (Habitat Presence or Absence)	Additional field studies required?
Seasonal Concentration Areas of Animals				
Waterfowl Stopover and Staging Areas (Terrestrial)	CUM1; CUT1; plus evidence of spring flooding (mid-Mar – May); does not include agricultural fields unless sheet water present. Eight indicator species; any mixed species groups of 100+ birds.	No	No suitable habitat present.	No
Waterfowl Stopover and Staging Areas (Aquatic)	MAS1 – 3; SAS1; SAM1; SAF1; SWD1 – 7. 26 indicator species; 100+ of listed species for 7 days; areas with annual staging of Canvasback, Redhead, and Ruddy Duck.	No	No suitable habitat present.	No
Shorebird Migratory Stopover Area	BB01 – 2; BBS1 – 2; BBT1 – 2; SDO1; SDS2; SDT1; MAM1 – 5. Shorelines of lakes, rivers & wetlands. SWM ponds not included. 22 indicator species; 3+ species & 1000+ shorebird use days in spring or fall, or 100+ Whimbrel for 3+ years. Habitat extremely rare, long history of use.	No	No suitable habitat present.	No
Raptor Wintering Area	One of FOD, FOM, FOC & one of CUM, CUT, CUS, CUW (20+ ha); least disturbed sites: 15+ ha with adjacent woodlands; Bald Eagle: FOD, FOM, FOC, SWD or SWC on shoreline areas adjacent to large rivers or adjacent to lakes with open water. 7 indicator species. Confirmed SWH: 1+ Short-eared Owl or Bald Eagle; 10+ of 2+ indicator species for at least 20 days. Note: site must be used regularly (3 in 5 years).	No	Suitable forested habitat present along escarpment but no large (20+ ha) areas of adjacent open habitats; open habitats available are disturbed in nature.	No
Bat Hibernacula	Big Brown Bat/Tri-colored Bat only; CCR1; CCR2; CCA1; CCA2; does not include buildings.	No	No suitable habitat present.	No
Bat Maternity Colonies	Big Brown Bat/Silver-Haired Bat only; all FOD, FOM, SWD, SWM; does not include buildings. 10+ large diameter (25+ cm dbh) snag trees per hectare. 10+ BBBA or 5+ SHBA	Candidate	Escarpment forest to the north (in adjacent lands) likely contain snag trees that meet the size and density thresholds for significance. No suitable maternity roost habitat is found on site, however. Proposed development will not adversely impact this habitat.	No
Bat Migratory Stopover Area	No specific ELC types. Eastern Red, Hoary, and Silver-haired Bats only. For 7E-2 only.	No	Location of site not in 7E-2.	No

Significant Wildlife Habitat (SWH) Type	Qualifying ELC communities/species and/or other recommended criteria for SWH identification	SWH on site or within 120 m?	Assessment Rationale (Habitat Presence or Absence)	Additional field studies required?
	Long Point is only area with this habitat identified to date; check with MNRF.			
Turtle Wintering Areas	Snapping/Midland Painted Turtles: SW, MA, OA, SA; FEO and BOO; Northern Map Turtle: open water areas (e.g. deeper rivers, streams) and lakes with current can be used. Must be permanent water. Does not include man-made ponds.	No	No suitable habitat present.	No
Reptile Hibernaculum	Snakes: any ecosite except very wet ones; talus, rock barren, crevice, cave, and alvar site may be directly related. 8 indicator species. 5+ individuals or 2+ species, or 1+ Eastern Ribbonsnake.	No	Potential hibernacula may be present on site and along escarpment to the north. None were observed on the site during field investigations.	No
Colonially - Nesting Bird Breeding Habitat (Bank and Cliff)	CUM1, CUS1, BLS1, CLO1, CLT1; CUT1; BLO1; BLT1; CLS1. Cliff and Northern Rough-winged Swallows. Does not include bridges, berms, soil piles, aggregate pits, etc. 8+ pairs (combined).	No	No suitable habitat present. No indicator species seen during 2019 breeding bird surveys.	No
Colonially - Nesting Bird Breeding Habitat (Tree/Shrubs)	SWM2; SWM3; SWM5; SWM6; SWD1; SWD2; SWD3; SWD4; SWD5; SWD6; SWD7; FET1. Great Blue, Green, and Black-crowned Night-Herons, Great Egret. 2+ active nests of listed species.	No	No suitable habitat present. No indicator species seen during 2019 breeding bird surveys.	No
Colonially - Nesting Bird Breeding Habitat (Ground)	MAM1 – 6; MAS1 – 3; CUM; CUS; CUT. 7 indicator species (4 gulls, 2 terns, Brewer's Blackbird). Nests: 25+ Herring and Ring-billed gulls; 1+ Great Black-backed and Little gulls; 5+ Common Tern; 2+ Caspian Tern; 5+ Brewer's Blackbird.	No	No suitable habitat present. No indicator species seen during 2019 breeding bird surveys.	No
Migratory Butterfly Stopover Areas	Field: CUM, CUS, CUT; Forest: FOC, FOD, FOM, CUT; Candidate sites 10+ ha, within 5 km of Lake Ontario/Erie. 3 indicator species. 5000+ "Monarch Use Days" or 3000 with Painted Lady/Red Admiral.	No	No suitable field habitat on site or in adjacent lands. Site not within 5 km of Lake Ontario.	No
Landbird Migratory Stopover Areas	FOC, FOM, FOD, SWC, SWM, SWD; 5+ ha, within 5 km of Lake Ontario. If woodlots are rare in an area of shoreline, then woodlots 2 – 5 ha can be considered SWH.	No	Suitable habitat occurs in escarpment forest to the north. Site not within 5 km of Lake Ontario (11.3 km to the east; Hamilton Harbour is 3.9 km to the east but it does not concentrate migrants to the degree that the lake does).	No
Deer Winter Congregation Areas	FOC; FOM; FOD; SWC; SWM; SWD; typically 100+ ha or 50+ if woodlots rare; conifer plantations less than 50 ha may be used. Identified by MNRF.	No	Suitable forest found immediately to the north along the escarpment. However, site is not identified by MNRF as Stratum I or II wintering areas.	No
Rare Vegetation Communities				

Significant Wildlife Habitat (SWH) Type	Qualifying ELC communities/species and/or other recommended criteria for SWH identification	SWH on site or within 120 m?	Assessment Rationale (Habitat Presence or Absence)	Additional field studies required?
Cliffs and Talus Slopes	TAO; TAS; TAT; CLO; CLS; CLT. Vertical cliff 3+ metres. Most occur along the Niagara Escarpment.	No	No indicator ELC communities detected during field investigations.	No
Sand Barren	SBO1; SBS1; SBT1. Tree cover ≤ 60%; 0.5+ ha.	No	No indicator ELC communities detected during field investigations.	No
Alvar	ALO1; ALS1; ALT1; FOC1; FOC2; CUM2; CUS2; CUT2-1; CUW2; 0.5+ ha. Site support 4 of 5 indicator species, and not dominated (< 50%) by exotic or introduced species.	No	No indicator ELC communities detected during field investigations.	No
Old Growth Forest	FOD; FOC; FOM; SWC; SWD; SWM; 0.5+ ha. Rare in 7E.	No	No indicator ELC communities detected during field investigations.	No
Savannah	TPS1; TPS2; TPW1; TPW2; CUS2. Tree cover 25 – 60%. No min. size; does not include remnant sites. 1+ indicator sp.	No	No indicator ELC communities detected during field investigations.	No
Tallgrass Prairie	TPO1 or TPO2. Tree cover < 25%. No min. size; does not include remnant sites. 1+ indicator sp.	No	No indicator ELC communities detected during field investigations.	No
Other Rare Vegetation Communities	S1, S2, or S3 vegetation communities. May include beaches, fens, forest, marsh, barrens, dunes and swamps.	No	No S1 to S3 vegetation communities detected during field investigations.	No
Specialized Habitat for Wildlife				
Waterfowl Nesting Area	MAS1 – 3; SAS1; SAM1; SAF1; MAM1 – 6; SWT1 – 2; SWD1 – 4. Nine indicator species. Wetland size and numbers/diversity thresholds.	No	No suitable habitat present.	No
Bald Eagle and Osprey Nesting, Foraging, and Perching Habitat	FOD; FOM; FOC; SWD; SWM; SWC; adjacent to riparian areas (rivers, lakes, ponds and wetlands). 1+ nests; includes 300 m radius for OSPR, 400 – 800 m for BAEA.	No	No suitable habitat adjacent to riparian habitat present. Neither species was detected during 2019 breeding bird surveys.	No
Woodland Raptor Nesting Habitat	All forested ELC ecosites; also SWC, SWM, SWD, CUP3; 30+ ha with 4+ ha IF (200m buffer). Six indicator species. 1+ nests; specific radius around nest for each species.	No	Escarpment forest to the north does not have sufficient interior forest (based on 200 m buffer) due to linear shape. No suitable habitat on site. No indicator species were detected during 2019 breeding bird surveys.	No
Turtle Nesting Areas	MAS1; MAS2; MAS3; SAS1; SAM1; SAF1; BOO1; FEO1. Midland Painted, Snapping, and N. Map Turtles only. 5+ Painted, 1+ Snapping/N. Map.	No	Suitable nesting substrate may be found in areas on site but not adjacent lands (anthropogenic or forested). However, no other turtle habitat is present so not likely nesting. None seen during field investigations.	No

Significant Wildlife Habitat (SWH) Type	Qualifying ELC communities/species and/or other recommended criteria for SWH identification	SWH on site or within 120 m?	Assessment Rationale (Habitat Presence or Absence)	Additional field studies required?
Seeps and Springs	Any forested ecosite (with < 25% meadow/field/pasture). Often found within headwater areas. Confirmed site: 2+ seeps/springs.	No	None were detected during field investigations. No indicator species were observed.	No
Amphibian Breeding Habitat (Woodland)	FOC; FOM; FOD; SWC; SWM; SWD. 500+ m^2 wetland, pond or woodland (incl. vernal) pool within or adjacent (within 120 m) to woodland (any size). 7 indicator sp. Combination of observational study and call count surveys required.	No	Small amounts of low quality habitat present on site. No indicator species found during 2019 nocturnal amphibian call surveys.	No
Amphibian Breeding Habitat (Wetlands)	SW, MA, FE, BO, OA, SA; typically 120+ m from woodlands 500+ m^2. 12 indicator species. Combination of observational study and call count surveys required.	No	No suitable habitat present on site or in adjacent lands.	No
Woodland Area-Sensitive Bird Breeding Habitat	All FOC, FOM, FOD, SWC, SWM, SWD ecosites; Habitats where interior forest birds are breeding; typically mature (60+ years), or 30+ ha; Interior habitat 200+ m from forest edge. Note: gaps < 20 m in width not typically considered breaks in the forest. 14 indicator sp.	No	Escarpment forest to north does not contain sufficient interior forest (due to linear shape). No indicator species were detected during 2019 breeding bird surveys.	No
Habitats for Species of Conservation Concern (not including END or THR species)				
Marsh Breeding Bird Habitat	MAM1 – 6; SAS1; SAM1; SAF1; FEO1; BOO1; Green Heron: all SW, MA, CUM1 sites. 13 indicator sp.	No	No suitable habitat present on site or in adjacent lands. No indicator species were detected during 2019 breeding bird surveys.	No
Open Country Bird Breeding Habitat	CUM1; CUM2; 30+ ha; not Class 1 or 2 agricultural lands and not actively used for farming in last 5 years. 6 indicator sp.	No	No suitable habitat present on site or in adjacent lands. No indicator species were detected during 2019 breeding bird surveys.	No
Shrub/Early Successional Bird Breeding Habitat	CUT1; CUT2; CUS1; CUS2; CUW1; CUW2; 10+ ha; not Class 1 or 2 agricultural lands and not actively farmed in last 5 years. 2 "Indicator: sp., 4 "Common" sp., and 2 SC sp. listed.	No	No suitable habitat present on site or in adjacent lands. No indicator species were detected during 2019 breeding bird surveys.	No
Terrestrial Crayfish	MAM1 – 6; MAS1 – 3; SWT; SWD; SWM; CUM1 with inclusions of above MAM ecosites. 2 indicator species: Chimney (Digger) Crayfish (*Fallicambrarus fodiens*) and Devil (Meadow) Crayfish (*Cambarus diogenes*). No minimum size. Habitats very rare.	No	No suitable habitat present. No chimney burrows observed during field investigations.	No

Significant Wildlife Habitat (SWH) Type	Qualifying ELC communities/species and/or other recommended criteria for SWH identification	SWH on site or within 120 m?	Assessment Rationale (Habitat Presence or Absence)	Additional field studies required?
Special Concern and Rare Wildlife Species	All SC, S1, S2, S3, and SH species. Includes all plant and animal species.	Candidate	Eastern Wood-Pewee detected in escarpment forest; Monarch may be present but in non-significant numbers and unlikely to breed; Snapping Turtle (SC) may be present along watercourse; Wood Thrush (SC) may nest along escarpment forest. Virginia Bluebells (S3) found in area in 2019. No other S1 to S3 and SC species detected during 2019 field investigations. See report for details.	No
Animal Movement Corridors				
Amphibian Movement Corridors	All ecosites associated with water. 12 indicator sp. No thresholds for numbers/diversity have been determined by MNRF. Check if relevant Region has developed thresholds.	No	No suitable corridors on site or in adjacent lands. Watercourse on site is small with little native vegetation, narrow (< 15 m) riparian zones, and broken up by roadways. No wetlands within 500 metres of site in any direction for amphibians to be moving to or from.	No

Appendix I: Watercourse Characterization

August 23, 2019

MEMORANDUM

Project No.: TPB188083

To: Mary Anne Young, BLA, OALA, ISA
Landscape Architect, Ecologist
Dougan & Associates
77 Wyndham Street South,
Guelph ON N1E 5R3

On Behalf of:

Anthony Valeri
Principal
Valery (Chedoke Browlands)
Development Inc.

Cc: Melissa Torchia, Wood
Senior Environmental Specialist
T: (905) 335-2353 ext. 3196

From: Roxanne Dibbley, Wood
Aquatic Biologist
T: (519) 650-7100

RE: Watercourse Characterization: Chedoke Browlands (Scenic Drive), Hamilton ON

1.0 INTRODUCTION

On behalf of Valery (Chedoke Browlands) Developments Inc. (Browlands), Wood Environment & Infrastructure (a division of Wood Canada Ltd.), (Wood) completed a field investigation including a fish survey and aquatic habitat assessment of Chedoke Creek between Scenic Drive and Sanatorium Drive (~200 m length) in Hamilton, Ontario (Study Area). This fisheries assessment was completed to characterize the watercourse within the Study Area, and to ultimately support an Environmental Impact Study (EIS) to be completed by Dougan & Associates.

The field investigation was conducted by qualified biologists R. Dibbley and T. Hagedorn on August 1, 2019. The results of the fish survey and habitat assessment are detailed herein. Representative photographs are provided in Attachment 1 and field sheets are provided in Attachment 2.

2.0 FISH SURVEY

The fish survey and aquatic habitat assessment was conducted using a backpack electrofisher set to 60 Hz and 180 V, with shocking occurring for 669 seconds. The site conditions were suitable to access the entire Study Area during the fish survey. The air temperature was 20˚C, with a mainly clear sky. No fish were observed within the watercourse or collected during the survey.

3.0 MNRF REPORTING

As per conditions of the Licence to Collect Fish for Scientific Purposes (LCFSP) issued on July 25, 2019, by the Ontario Ministry of Natural Resources and Forestry (MNRF) (#1093893), electronic reporting of the fish survey results was submitted to MNRF on August 6, 2019. A copy of the report is provided in Attachment 3.

4.0 AQUATIC HABITAT ASSESSMENT

Based on a review of aerial imagery, the watercourse originates from above ground runoff approximately 1.1 km upstream of the Study Area and flows underground for much of the distance between the origin of the creek up to Scenic Drive and the start of the Study Area.

The watercourse flows northeast from Scenic Drive for approximately 150 m then continues north for an additional 50 m before entering a culvert underneath Sanatorium Road. At the time of the field investigation, there was a small amount of water/flow passing underneath Sanatorium Road. On the downstream side of Sanatorium Road, the watercourse drops out of the culvert into the Escarpment Valley, which would prevent fish from entering the Study Area from downstream end. Along the upstream end of the Study Area, vegetation is dense which provided limited ability to observe the watercourse features, however, the flow/water level observed was low. Within the Study Area, the mean wetted width and depth are 0.9 m 0.05 m, respectively. The creek is mainly run/flat morphology (95%), with small pools (5%) present. Little flow was observed during the field investigation. The water was clear with predominantly sand and silt substrate, and minor amounts of gravel. There was observations of small woody debris and detritus present within the watercourse, with some woody debris creating a barrier that would prevent fish movement.

A section of the watercourse contained exposed bedrock substrate, approximately 145 m upstream of the Scenic Drive culvert. Little to no instream vegetation or instream cover is present, however dense riparian vegetation comprised of deciduous trees and herbaceous vegetation is present on both sides of the watercourse, providing >80% riparian cover. Minor undercutting of the banks is present, however the banks are stable. A footbridge is present over the watercourse midway between Sanatorium Road and Scenic Drive, a CSP culvert is present under the footbridge to facilitate flow.

Based on the low water depth, (depths as low as 0.01 m), the lack of observable flow, the fish barriers present, and the Escarpment Valley downstream of Sanatorium Road, and the intermittent water observed upstream of the Scenic Drive, the watercourse did not seem suitable to support fish.

Please refer to Attachment 4 for a watercourse characterization map and photograph key.

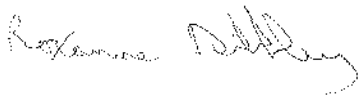
5.0 CLOSURE

This memorandum has been prepared by Wood, on behalf of Valery (Chedoke Browlands) Development Inc. This memorandum is provided in support of the EIS for the subject lands (Browlands) prepared under a separate cover by Dougan and Associates. Information collections is based on observations made at the time of the field investigation. If you have any questions, please do not hesitate to contact the undersigned.

Sincerely,

Wood Environment & Infrastructure Solutions,
a division of Wood Canada Limited

Prepared by:



Roxanne Dibbley, B.Sc., CAN-CISEC-IT
Biologist
Tel (519) 650-7100
Fax (519) 653-6554
roxanne.dibbley@woodplc.com

Reviewed by:

Melissa Torchia, M.A.Sc., CAN-CISEC
Senior Environmental Specialist
Tel (905) 335-2353
Fax (905) 335-1414
melissa.torchia@woodplc.com

Attachment #1

Photographic Record

Photo 1: Downstream of Sanitorium Road, water drops down into Escarpment Valley.

Photo 2: Upstream of Scenic Drive, shallow water with abundant woody debris in the channel.

Photo 3: Culvert at downstream end of Study Area. No obvious flow continuing downstream of the Study Area.

Photo 4: Chedoke Creek, low water depth and elevation drop create potential fish barrier. Within 0 – 50 m upstream of the Sanatorium Road culvert.

Photo 5: Narrow section of channel with dense riparian herbaceous vegetation.

Photo 6: Footbridge over the watercourse.

Photo 7: Woody debris in Chedoke Creek creating a potential fish barrier.

Photo 8: Facing upstream of Scenic Drive culvert.

Attachment #2

Field Sheets

GENERAL INFORMATION

PROJECT #:	PROJECT DESCRIPTION:	DAY:	MONTH:	YEAR:
TPB1880 83		01	August	2019

Is STREAM REALIGNMENT required for this section:
O Yes O No ⊗ Unknown

COLLECTORS:	WEATHER CONDITIONS:	TIME STARTED:	TIME FINISHED:
R. DINSLEY	sunny, few clouds	20:00	—

AIR TEMP:	WATER TEMP:	CONDUCTIVITY (µS/cm):
20 °C	—	—

PHOTO NUMBERS AND DESCRIPTIONS:

LOCATION

NAME OF WATERBODY:	DRAINAGE SYSTEM:	CROSSING #:	STATION #:
Chedoke Ck	—	—	—

LOCATION OF CROSSING: between Scenic Dr and Sanitorium Rd

GPS COORDINATES: 583092 4788532 (DS) 583768 4788395 (US)	MTO CHAINAGE: —
TOWNSHIP: HAMILTON	MNR DISTRICT: GUELPH

LAND USE AND POLLUTION

SURROUNDING LAND USE:	SOURCES OF POLLUTION:
Natural riparian area, residential/commercial outside natural riparian area	roads, residential

EXISTING STRUCTURE TYPE

Bridge O	Box Culvert O	Open Foot Culvert O	CSP ⊗	N/A O

Other O Describe: | Size (w x h) m^2

SECTION TYPE AND MORPHOLOGY

SECTION IDENTIFIER:	SECTION LOCATION: (include on habitat map)

TYPE:	Stream / river	Channelized	Permanent	Intermittent	Ephemeral	ASSOCIATED WETLAND:
	⊗	O	O	O	O	

TOTAL SECTION LENGTH (m):	CURRENT VELOCITY (m/s):

SUB-SECTION(S)	Run O	Pool ⊗	Riffle O	Flats ⊗	Inside culvert O	Other
Percentage of area		5		95		
Mean depth wetted (m)		0.08		0.05		
Mean width wetted (m)		0.8		0.8		
Mean bankfull width (m)		1.0		1.0		
Mean bankfull depth(m)		0.5		0.5		
Substrate		Sa, Si, Gr		Sa, Si, Gr, Co-Sole Bedrock		

Bedrock Br	Boulder Bo	Cobble Co	Gravel Gr	Sand Sa	Silt Si	Clay Cl	Muck Mu	Detritus D

BANK STABILITY

	Stable	Slightly Unstable	Moderately Unstable	Unstable
Left Upstream Bank	~~0~~	0	0	0
Right Upstream Bank	~~0~~	0	0	0

HABITAT

IN-STREAM COVER (% surface area):	Undercut banks	Boulders	Cobble	Woody Debris	Organic debris	Vascular Macrophytes	None
		—	5%	Instream 5%	—	Instream —	
				Overhanging —		Overhanging —	

SHORE COVER (% stream shaded):	100 – 90 %	90 – 60%	60- 30%	30 – 1%	None
	~~0~~	0	0	0	0

VEGETATION TYPE (%):	Submergent	Floating	Emergent	None
Predominant Species	—	—	—	

MIGRATORY OBSTRUCTIONS:	None	Seasonal Woody debris	Permanent
POTENTIAL CRITICAL HABITAT LIMITING:	Spawning —	Evidence of Groundwater —	Other

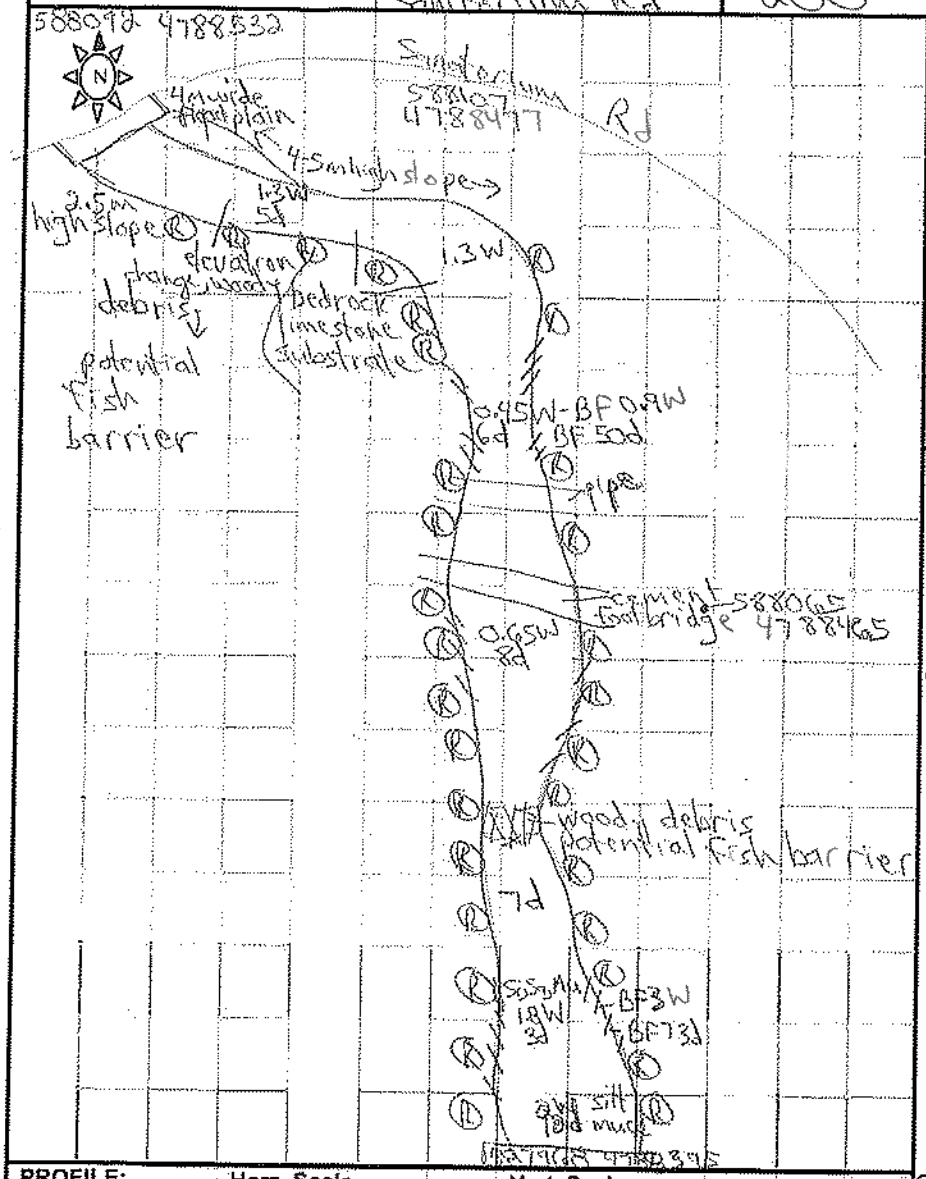
POTENTIAL ENHANCEMENT OPPORTUNITIES:

COMMENTS:

water level low → 0.01 m to 0.12 m deep
Dense riparian vegetation
Flow not obvious
Woody debris in a couple spots, may impede fish movement
No obvious flow coming out of culvert downstream
Also electrofished site; no fish observed or collected
upstream → no obvious flow coming into study area very shallow

Additional Notes Appended? O No O Yes **number of pages** _____

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):
—	Between Centerline Rd & Centerline Rd	200	—



PROFILE: Horz. Scale: ——— Vert. Scale: ———

PROJECT #:	TPBRR2019-3
MAPPER:	R. DI BELLA
NAME OF WATERBODY:	CHANGE CREEK
CROSSING #:	—
STATION #:	—
DATE: DD-MMM-YY	01-AUG-2019

LEGEND

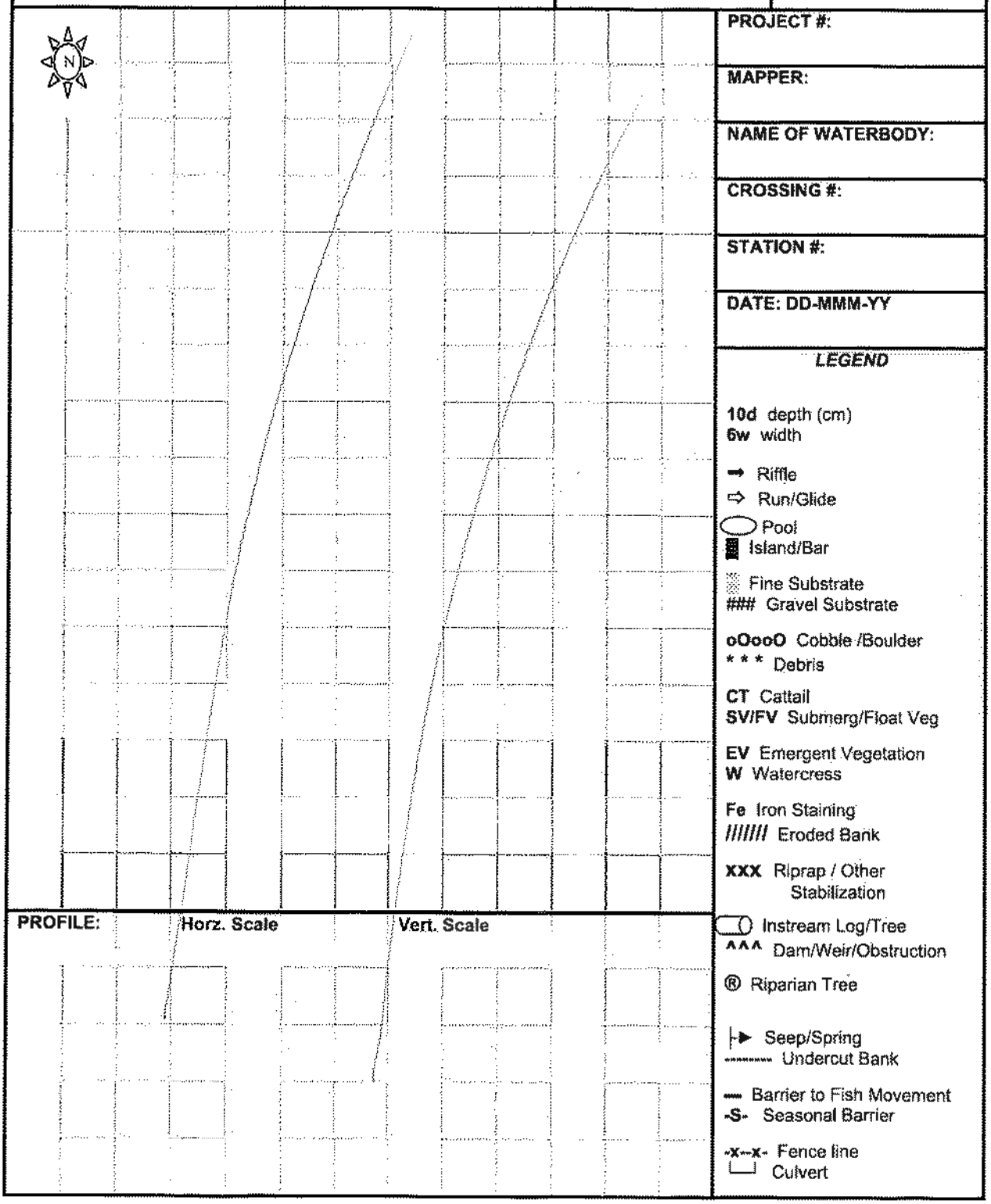
10d depth (cm)
6w width (m)

➡ Riffle
⇨ Run/Glide
⬭ Pool
▩ Island/Bar

▒ Fine Substrate
Gravel Substrate
oOooO Cobble /Boulder
*** * *** Debris
CT Cattail
SV/FV Submerg/Float Veg
EV Emergent Vegetation
W Watercress
Fe Iron Staining
//////// Eroded Bank
XXX Riprap / Other Stabilization
⬭ Instream Log/Tree
^^^ Dam/Weir/Obstruction
® Riparian Tree
⊢► Seep/Spring
-------- Undercut Bank
— Barrier to Fish Movement
-S- Seasonal Barrier
-x--x- Fence line
⊔ Culvert
BF = bankfull

Pg 3 of 3

SECTION IDENTIFIER:	SECTION LOCATION:	SECTION LENGTH (m):	SCALE (cm / m):



PROJECT #:

MAPPER:

NAME OF WATERBODY:

CROSSING #:

STATION #:

DATE: DD-MMM-YY

LEGEND

10d depth (cm)
6w width

➡ Riffle
⇨ Run/Glide
Pool
Island/Bar

Fine Substrate
Gravel Substrate

oOooO Cobble /Boulder
*** * *** Debris

CT Cattail
SV/FV Submerg/Float Veg

EV Emergent Vegetation
W Watercress

Fe Iron Staining
////// Eroded Bank

XXX Riprap / Other Stabilization

Instream Log/Tree
^^^ Dam/Weir/Obstruction

® Riparian Tree

Seep/Spring
Undercut Bank

Barrier to Fish Movement
-S- Seasonal Barrier

-x--x- Fence line
Culvert

ELECTROFISHING FORM

Project Name / Number: TPB188083

wood.

Waterbody: Chedoke creek	Date: (DD/MMM/YYYY) 01/AUG/2019	Water Temp: —	Shocking Method: backpack R. Dibley operator	Pg: 1 of 1 Run: 1 of —
UTM Start: 588092 4788532 UTM End: 587968 4788395 Zone / Acc.: 17T	Start Time / Stop Time (24 hrs): 19:15		Netters: T. Hagedorn	Site Area (Length X Width): 200 m long
Sample ID: CH-CR-01	Elapsed Time (hours): —	Effort (seconds): Colo9	Voltage: 180	Frequency: 60
				Pulse: —

Sample ID	Fish #	Species	Species Code	Length (mm) Fork	Length (mm) Total	Round Weight (g / kg)	Aging Structures (Sc, Pr, Dr, Oto)	Retained (Y/N)	Comments (Hg / Released / etc.)
									No Fish observed or collected

Species Box Tally Area / Site Comments:

Aging Structures Legend:
Sc - Scales
Pr - Pectoral Ray
Oto - Otoliths
Dr - Dorsal Ray
yoy - Young Of the Year

QA/QC By: L. D.
Date: 6 Aug 2019

Attachment #3

MNRF License to Collect Fish for Scientific Purposes Report

Ontario Ministry of Natural Resources and Forestry

Licence to Collect Fish for Scientific Purposes – Mandatory Collection Report

Notice of Collection of Personal Information

Information contained on Part 1 and Part 2 of the Mandatory Collection Report for a Licence to Collect Fish for Scientific Purposes is collected under the authority of the *Fish and Wildlife Conservation Act, 1997* and will be used for the purpose of licensing, identification, enforcement, resource management and customer service surveys. Please direct further enquiries to the District Manager of the Ministry of Natural Resources and Forestry (MNRF) issuing office.

Licence Number *
1093893
Date of Issue (yyyy/mm/dd) *
2019/07/25

Fields marked with an asterisk (*) are mandatory.

Part 1: Administrative Information (complete once for each licence)

Licensee Information

Licensee Name

Last Name *	First Name *
Dibbley	Roxanne

Organization / Affiliation Type *	Organization / Affiliation Name
Consulting Company	

Organization / Affiliation Mailing Address *

Unit Number	Street Number *	Street Name *	PO Box
10	900	Maple Grove Road	

City / Town *	Province / State *	Postal Code / Zip Code*
Cambridge	Ontario	N3H4R7

Business Contact Information

Contact Name

Last Name *	First Name *
Dibbley	Roxanne

Telephone Number *	Email
226-387-0623 ext.	roxanne.dibbley@woodplc.com

Survey Information

Was a survey conducted under the authority of this licence? *

☑ Yes ☐ No

Purpose of Survey (why were you collecting fish) *

part of EIS to support potential future development

Additional reports / data associated with fish collection *

☐ Yes ☑ No

Number of Part 2 Site Collection Reports Submitted (Collection reports for each site and each day of sampling are required, even if no fish were caught) *

1

General Comments

Signature

Signature *	Collection Report Completion Date (yyyy/mm/dd) *
Roxanne Dibbley	2019/08/06

Ontario Ministry of Natural Resources and Forestry

Licence to Collect Fish for Scientific Purposes – Mandatory Collection Report

Site Collection Report 1

For internal office use only
Fisheries Management Zone
ARA Identifier

Licence Number: 1093893

Part 2: Site Collection Reports – Complete Part 2 for each site surveyed and for each day sampling occurred at a site even if no species were caught at a particular site.

Section A – Site Location Information

Survey Site Number / Code *: CH-CR-01

Is this an OSAP Site Code? * ☐ Yes ☑ No

Waterbody Name *: Chedoke Creek

Waterbody Type (check one only): ☐ Lake or Pond ☐ Stream or River ☐ Wetland ☐ Municipal Drain ☐ Other

Stream Permanency (check one only): ☐ Permanent ☐ Intermittent ☐ Ephemeral

Watercress Present: ☐ Yes ☐ No

Township / Municipality / Territorial District Name *: Hamilton

Site Location * (fill in coordinates for either UTM, decimal degrees, or degrees minutes seconds). Ensure that at least one site map is provided for each site sampled.

☑ UTM (NAD 83) * ▶

Zone	Easting	Northing
17	587968	4788395

☐ Decimal Degrees

☐ Degrees / Minutes / Seconds

Site Location / Access Description: between Scenic Drive and Sanatorium Road

Site Location Comments:

Section B – Sampling Information

Sampling Date (yyyy/mm/dd)	Sampling Start Time (24 hour clock)	Sampling End Time (24 hour clock)
2019/08/01		

Water Temperature (°C)	Time Taken (24 hour clock)	Air Temperature (°C)	Time Taken (24 hour clock)

Secchi Depth (m)	Survey Type *

Gear Types (select all that apply)

☐ Angling Equipment	☐ Broadcast Nets	☑ Dipnets	☐ Eel Pots	☑ Electrofishing Gear
☐ Fish Ladder	☐ Fyke Nets	☐ Gillnets	☐ Minnow Traps	☐ Piscicide
☐ Seine net	☐ Trapnets	☐ Trawls	☐ Other	

Survey Type / Gear Type Other Description
1 backpack electrofisher with 1 dipnet

Section C – Electrofishing (if there was no electrofishing at this site, continue to Section D)

Number of Electrofisher Seconds Fished (seconds)	Voltage (V)	Amperage (A)	Frequency (Hz)
669	180.0		60.0

Length of Site Electrofished (m)	Mean Width of Site Surveyed (m)
200.0	0.8

Sampling / Electrofishing Comments
shallow water throughout

Section D – Fish, Mussels, Crayfish or Snails Captured (complete one for each site)

Were fish, mussels, crayfish or snails captured at this site? *

☐ Yes ☑ No

Site Map: Insert site map below. (Select/click on blank space below to add map) *

1.

Attachment #4

Watercourse Characterization Map

588000

SANATORIUM RD

Bedrock / Limestone Substrate

Chedoke Creek

ANGELA AVE

W 35TH ST

SAN PEDRO DR

SCENIC DR

P:\2018\Projects_Other\TPB188083_ChedokeBrowlandsScenicDrive\11_GIS\MXD\Watercourse_Characterization_1.mxd Last saved by: romer.abales

LEGEND

- Photo Location
- Watercourse
- Wood Debris, Potential Fish Barrier
- Pool
- Cement Footbridge

0 25 50 100 150 200 Metres

NOTES:
- Basedata from MNRF LIO, 2019
- Aerial imagery extracted from Google Earth, 2018.

Datum: NAD83
Projection: UTM Zone 17N

N W E S

wood.

CHEDOKE BROWLANDS
SITE WATERCOURSE CHARACTERIZATION

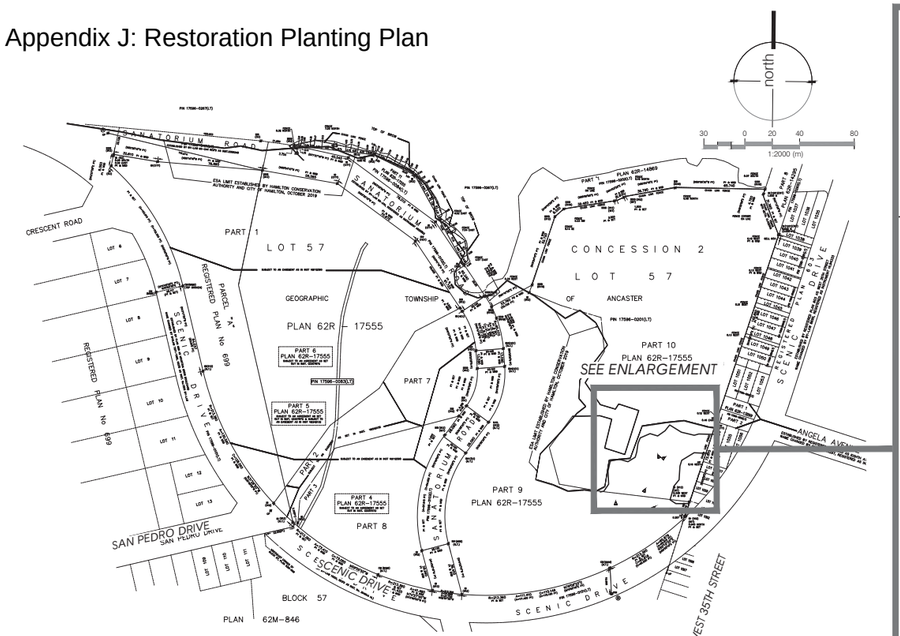
Watercourse Characterization

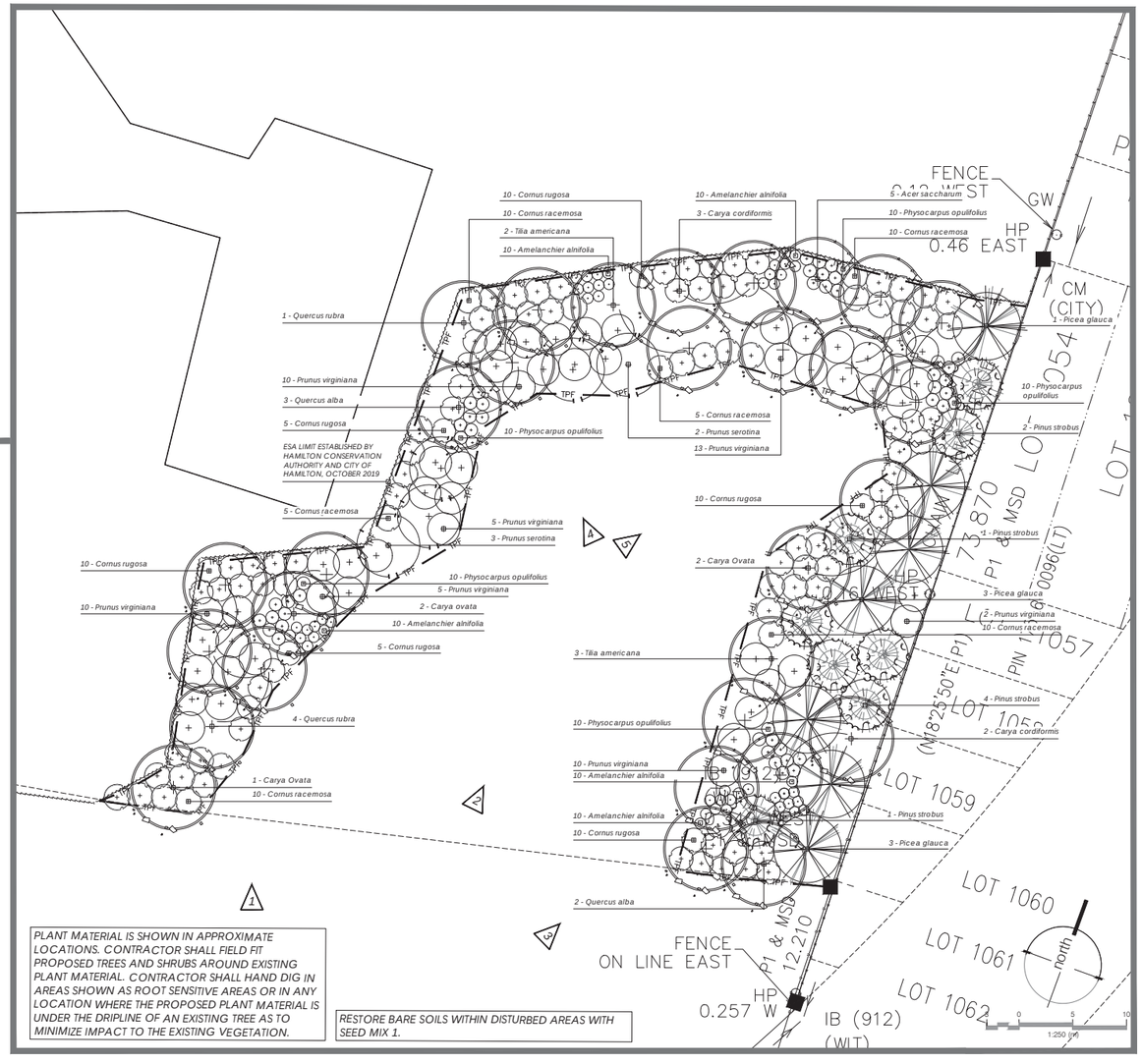
PROJECT N^{o}: TPB188083 | **FIGURE: 1**

SCALE: 1:1,200 | DATE: August 2019

project #: 18-068

Appendix J: Restoration Planting Plan





PLANT MATERIAL IS SHOWN IN APPROXIMATE LOCATIONS. CONTRACTOR SHALL FIELD FIT PROPOSED TREES AND SHRUBS AROUND EXISTING PLANT MATERIAL. CONTRACTOR SHALL HAND DIG IN AREAS SHOWN AS ROOT SENSITIVE AREAS OR IN ANY LOCATION WHERE THE PROPOSED PLANT MATERIAL IS UNDER THE DRIPLINE OF AN EXISTING TREE AS TO MINIMIZE IMPACT TO THE EXISTING VEGETATION.

RESTORE BARE SOILS WITHIN DISTURBED AREAS WITH SEED MIX 1.

ENLARGEMENT 'A' - Restoration Planting

SCALE 1:250

LANDSCAPE NOTES:

1. All work to be carried out in accordance with by-laws and codes having jurisdiction over site location.
2. Complete all work to the satisfaction of the Landscape Architect.
3. Report any changes, discrepancies or substitutions to the Landscape Architect for review. Obtain approval from the Landscape Architect before proceeding.
4. It is the contractor's responsibility to determine existing service locations.
5. Exact locations of plant material will be determined by placement of site services such as hydro vaults, meters, utilities roof rain water leaders, driveways, light standards, etc.
6. All plant material locations to be staked or marked out and approved by Landscape Architect prior to installation.
7. Supply all plant material in accordance with the Canadian Standards for Nursery Stock (8th ed.).
8. Install plant material according to details shown.
9. Supply and place mulch in accordance with Canadian Landscape Standard (Section 10, Mulching). Disturbed soil areas around trees and shrubs are to be covered with shredded conifer bark mulch such as 'Canada Red' or 'Gro-Bark' mulch, or approved equivalent. Alternative mulches must be approved by the Landscape Architect.
10. Contractor to utilize layout dimensions where provided.
11. Provide planting bed area as noted on the drawing or to accommodate mature size of plant material.
12. All support systems must be removed by the contractor at time of final acceptance. No extras will be paid to complete this work
13. Supply and place topsoil in accordance with Canadian Landscape Standard (Section 4, Grading & Drainage and Section 6, Growing Medium) to a minimum depth of 150mm unless otherwise specified
14. Supply and place sod in accordance with Canadian Landscape Standard (Section 7, Lawns & Grass and Section 8, Turfgrass Sod)unless otherwise specified.
15. Supply and place seed in accordance with Canadian Landscape Standard (Section 4, Grading & Drainage and Section 6, Growing Medium) unless otherwise specified. All 5:1 or greater slopes to be seeded with tacifier. Contractor to provide necessary erosion control protection as required to ensure soil stabilization and proper seed germination.
16. All dimensions in meters unless otherwise noted.
17. If discrepancies arise between plant material count shown on drawing and plant list, the drawing shall be considered correct.
18. Contractor to provide minimum one (3) year warranty (including trees on municipal property) from date accepted on all work unless otherwise specified.
19. Any site plan or grading and servicing shown is for information only. Refer to approved drawings.
20. Not for construction unless stamped, signed and dated by Landscape Architect.
21. Drawings not to be reproduced without written consent from Landscape Architect.
22. Approval of landscape plan to be obtained from municipality.
23. All plant material to be planted a minimum of 1.0m from any swales or ditches.
24. For grading and servicing information refer to the consulting Engineer's drawings.
25. For lighting information and power distribution refer to the electrical consultant's drawings.

CITY OF HAMILTON LANDSCAPE NOTES:

1. Any plant material substitutions require the approval of the City of Hamilton.
2. Plant material and fencing shall be minimum to be provided by the owner. Any additions must comply to the zoning by-law.
3. Any sodding, planting or work on lands abutting the property from the lot lines to sidewalk and curbing, shall be to the satisfaction of the City of Hamilton.
4. All landscaping shall be installed prior to the end of the first growing season following the occupancy of the development.
5. Unless otherwise specified all landscaped areas are to be sodded.
6. Unless otherwise specified all undeveloped areas shall be undisturbed and kept free and clear of debris and maintained.

REMOVAL OF INVASIVE SPECIES:

1. One species identified as 'invasive' by the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) have been found onsite:

   Common Buckthorn, Rhamnus cathartica

   OMAFRA recommends the removal of these species in their entirety when found in Southern Ontario.
2. Common Buckthorn to be mechanically removed, when existing site conditions allow. Stumps and roots are to be removed. In areas where mechanical removal is not feasible, Common Buckthorn can be hand dug or pulled using a weed wrench or other suitable tool.
3. Dispose of all parts (woody, herbaceous, roots, etc) of the invasive species offsite.
4. The site will be monitored for 5 years post-construction to ensure invasive species do not re-colonize.
5. No access by heavy equipment into tree protection zone is permitted. Removal of invasive plant material is to be carried out using light equipment and/or by hand.

TREE PRESERVATION NOTES:

1. All arboricultural work performed on trees (exclusive of Common Buckthorn, Rhamnus cathartica) such as pruning of branches and roots shall be conducted by an ISA Certified Arborist.
2. Prune and mitigate limbs and roots damage by construction works in accordance with ANSI A300 (Part 1) -2017 Pruning and associated Best Management Practices.
3. Tree Protection Fence to be erected prior to commencement of any construction, grade, and/or site preparation and maintained throughout the duration of the work.
4. Tree Protection Zones are delineated by Tree Protection Fence(TPF) and Tree Protection Barrier (TPB) as shown on drawing.
5. No construction activities shall occur within the Tree Protection Zone including but not limited to; excavation, equipment parking, refueling or access, storage of materials or supplies, topsoil or fill.
6. Tree removal (if required) will be in accordance with the Migratory Birds Convention Act. Vegetation shall be removed outside the General Nesting period (April 1 - Aug 31) when possible for Regions C1 and C2 of Ontario. If removal is deemed neccessary within these periods, a qualified avian biologist is to review the site prior to removal to ensure compliance with the Migratory Birds Convention Act.
7. Any soils and vegetation within the tree protection zone damaged by the Contractor shall be restored to the satisfaction of the Municipality by the Cntractor at no additional cost to the owner.

TERRASEED NOTES:

1. Areas to be seeded with naturalization mix shall receive an application of naturalization seed at the rate specified below:

OCS Woodland Native Seed Mix 8275	
Canada Anemone (Anemone canadensis)	1%
Bebb's Sedge (Carex bebbi)	1%
Nodding/Fringed Sedge (Carex crinata)	1%
Showy Tick Trefoil (Desmodium canadensis)	30%
Spotted Joe Pye Weed (Eupatorium maculatum)	2%
White Avens (Geum canadense)	4%
Fowl Mannagrass (Glyceria striata)	1%
Foxglove Beardtongue (Penstemon digitalis)	10%
Fowl Bluegrass (Poa palustris)	50%

*to be applied at a seeding rate of 25kg/Hectare or 2 kg/100m² for spot applications, in the following mixture

Nurse Crop (If seeding in Spring/early Summer	
Annual Ryegrass (Lolium multiflorum)	50%
Oats (Avena sativa)	25%
Buckwheat (Fagopyrum esculentum)	25%

*to be applied at a seeding rate of 22kg/Hectare or 2 kg/100m² for spot applications, in the following mixture

Nurse Crop (If seeding in late Summer/Fall	
Annual Ryegrass (Lolium multiflorum)	50%
Winter Wheat (Triticum aestivum)	50%

*to be applied at a seeding rate of 22kg/Hectare or 2 kg/100m² for spot applications, in the following mixture

Supplied by:
*Seed mix to be supplied by local seed source and not just a local nursery.

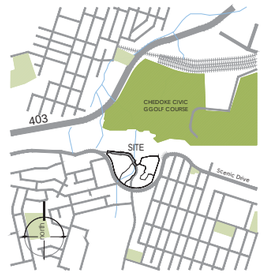
2. Contractor responsible for soil test to determine fertilizer rates. Results of soil test shall be provided to the Landscape Architect for review and approval.
3. Hydraulic mulch to be approved by the Landscape Architect shall be applied at the rate of 2100kg per hectare.
4. The contractor shall not carry out the work under adverse weather conditions such as high wind, frozen ground or ground covered with snow, ice or standing water.
5. Grade sub-grade, eliminate uneven areas and low spots, ensure positive drainage. Remove debris, roots, branches, stones in excess of 50mm diameter and other deleterious materials. Remove subsoil that has been contaminated with oil, gasoline or calcium chloride, dispose of removed material as directed by Landscape Architect.
6. Grade seed bed for terraseeding to a uniform surface and remove vegetation which may interfere with seeding operations. Loosen soil to depth of 25mm minimum and remove stones and foreign material which protrude more than 75mm above the surface.
7. All areas to be terraseeded to receive 150mm of topsoil.
8. Seeded areas to be maintained by contractor ensuring adequate water, fertilizer, maintenance and repair until seeded areas are properly established. Areas seeded in fall must use the above appropriate seed mix as specified. Areas seeded in the early Spring/Summer must use appropriate seed mix as specified above.

PLANT LIST

QNTY.	BOTANICAL NAME	COMMON NAME	CAL.	SIZE	COND.	MATURE HEIGHT (m)	MATURE SPREAD (m)	O.C. SPACING (m)	COMMENTS
	TREES								
5	Acer saccharum	Sugar Maple	50mm		W.B.	30.0	18.0	as shown	-
5	Carya cordiformis	Bitternut Hickory	50mm		W.B.	20.0	15.0	as shown	*May be substituted with Acer rubrum if caliper stock is not available
5	Carya ovata	Shagbark Hickory	50mm		W.B.	25.0	17.0	as shown	*May be substituted with Ostrya virginiana if caliper stock is not available
7	Picea glauca	White Spruce		225cm	W.B.	20.0	15.0	as shown	-
8	Pinus strobus	Eastern White Pine		400cm	W.B.	24.0	10.0	as shown	-
5	Prunus serotina	Black Cherry	50mm		W.B.	24.0	10.0	as shown	*May be substituted with Fagus grandifolia if caliper stock is not available
5	Quercus alba	White Oak	50mm		W.B.	22.0	22.0	as shown	-
5	Quercus rubra	Red Oak	50mm		W.B.	22.0	20.0	as shown	-
5	Tilia americana	Basswood	50mm		W.B.	25.0	15.0	as shown	-
50	***Total Trees***								
	SHRUBS								
50	Amelanchier alnifolia	Saskatoon Berry			#1 cont.	3.0	2.0	2.0	* To be provided by a local seed source and not a local nursery
50	Cornus racemosa	Gray Dogwood			#1 cont.	4.0	4.0	4.0	-
50	Cornus rugosa	Round-Leaved Dogwood			#1 cont.	3.0	4.0	4.0	-
50	Physocarpus opulifolius	Common Ninebark			#1 cont.	2.0	2.0	2.0	-
50	Prunus virginiana	Chokecherry			#1 cont.	7.0	6.0	6.0	-
250	***Total Shrubs***								

*All species to be native. Cultivars will not be accepted. To be planted in fall (mid-October to late November) of 2019 or Spring (April to early May) 2020.

KEY MAP - N.T.S.



LEGEND

- proposed deciduous tree
- proposed coniferous tree
- proposed shrub
- TPF — Tree Protection Fence [To be erected after installation of plant material]
- ESA limit established by hamilton conservation authority and city of hamilton, october 2019
- Proposed Photo Stations for Monitoring Report

NOT FOR CONSTRUCTION
ISSUED FOR REVIEW & COMMENTS ONLY

REVISIONS/ SUBMISSIONS

#	DATE	DESCRIPTION
1	2018-11-14	Issued for review
2	2019-08-26	Issued for review & coordination
3	2019-11-27	Issued for review
4	2020-08-17	Issued for review

STAMP

CLIENT
Valery (Chedoke Browlands) Development Inc.

MUNICIPALITY
City of Hamilton

PROJECT
The Chedoke Browlands
801 Sanitorium Road

MUNICIPAL FILE NUMBER

SHEET
Restoration Planting Plan

L-1

adesso design inc.
landscape architecture

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