BEACON ENVIRONMENTAL

GUIDING SOLUTIONS IN THE NATURAL ENVIRONMENT

Scoped Environmental Impact Study
Massi Property, Dunnville, ON

Prepared For:

1108991 Ontario Inc.

Prepared By:

Beacon Environmental Limited

Date: *Project:*

August 2020 **219562**

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1. Introduction

Beacon Environmental Limited (Beacon) was retained by 1108991 Ontario Inc. to prepare an Environmental Impact Study (EIS) for a 2.7 ha property located at the southeast corner of Cross Street West and George Street in the Community of Dunnville, Haldimand County (**Figure 1**). The EIS was requested by Haldimand County staff to address any potential legislative requirements related to the Ontario *Endangered Species Act* (ESA) and the Federal *Migratory Bird Convention Act*.

To address this request, Beacon has prepared the following EIS which has been scoped to the following:

a) Undertake a background review and field investigations to confirm whether the subject property supports potential habitats of threatened or endangered species; and
b) Provide recommendations for addressing any identified species or habitats to ensure the application is compliant with the provisions and regulations under the ESA.

Terms of Reference for the Scoped EIS were prepared by Beacon and approved by Haldimand County. A copy of the Terms of Reference is included as **Appendix A**.

2. Legislative Framework

The following is a summary of the key provincial and municipal natural heritage policies and legislation that apply to the subject property and future development.

2.1 *Endangered Species Act* (2007)

The Ontario *Endangered Species Act* (2007) provides legal protection to endangered and threatened species and their habitats in Ontario.

When a species is listed as endangered or threatened, its general habitat is automatically protected. General habitat includes areas or features that the species requires to carry out its life processes. A specific habitat regulation may be developed based on an approved Recovery Strategy for a species. The specific habitat regulation replaces the general habitat protection and is then regulated under the *Endangered Species Act*.

A species at risk (SAR) screening is typically completed as part of development applications to assess the property for habitat for threatened or endangered species. This involves identifying potential SAR in the area though a review of existing databases and wildlife atlases and assessing the suitability of the site to support potential SAR through field investigations.

Where threatened or endangered species occur, development or site alteration must comply with the requirements of the *Endangered Species Act* and Ontario Regulation 242/08. If an activity will impact a threatened or endangered species or its habitat, then the activity must be authorized by the Ministry of the Environment, Conservation, and Park (MECP). In some cases, a permit may be required to

undertake an activity, and sometimes a Notice of Activity may be registered with the MECP. The regulation provides exemptions for some species and certain types of activities.

2.2 *Migratory Birds Convention Act* (1994)

The federal *Migratory Birds Convention Act* protects the nests, eggs, and young of most bird species from harassment, harm, or destruction. Generally, this means that clearing of vegetation or removal of other nesting habitats should be avoided during the breeding bird season. Environment Canada considers the 'general nesting period' of breeding birds in southern Ontario to be between late March and the end of August; therefore, vegetation clearing should generally be undertaken between September 1 and March 31.

3. Methodology

3.1 Background Review

As part of the assessment, Beacon conducted a review of available natural heritage information resources including:

- Provincially Tracked Species Layer from Land Information Ontario (LIO);
- Ontario Breeding Bird Atlas;
- Ontario Reptile and Amphibian Atlas;
- Natural Heritage Information Centre (NHIC) Data via the Make-A-Map application;
- Species at risk range maps https://www.ontario.ca/environment-and-energy/species-risk-ontario-list;
- High Resolution aerial photography of the property; and
- Natural and physical feature layers from LIO—these geospatial layers include wetlands (provincially significant and un-evaluated wetlands), and watercourses with thermal regime.

The findings of the background review confirmed records for the following threatened or endangered species in the vicinity of the subject property:

- Bank Swallow;
- Barn Swallow;
- Eastern Meadowlark;
- Bobolink;
- Chimney Swift;
- Butternut;
- Eastern Flowering Dogwood;
- Little Brown Myotis;
- Northern Myotis;
- Eastern Small-footed Myotis;
- Tri-colored Bat;
- Eastern Pond Mussel;

Site Location	Figure 1
Massi Lands Dunnville	
BEACON ENVIRONMENTAL	Project: 219562 Last Revised: July 2020
Client:1108991 Ontario Inc.	Prepared by: BD Checked by:
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- Kidneyshell;
- Round Pigtoe; and
- Blandings Turtle.

Most of these records are for a much larger area and should not be interpreted as necessarily corresponding with the subject property. Additionally, some of the records are historical.

3.2 Field Investigations

Field investigations focussed on confirming the presence or absence of threatened and endangered species, notably those listed above in **Section 3.1.** Field investigations included floristic surveys, breeding bird surveys, and bat surveys.

Surveys for molluscs (i.e. Kidneyshell, Round Pigtoe, Eastern Pond Mussel) and Blanding's Turtle were not undertaken as there is no suitable habitat on the property. Records for these species are likely associated with the Grand River located to the south of the subject property.

3.2.1 Floristic Survey

An inventory of vascular plants on the subject property was completed on May 21 and July 1, 2020. The property was systematically walked to ensure full coverage. Specific emphasises was placed on determining the presence of threatened and endangered species. The locations of any threatened or endangered species was recorded using a GPS.

3.2.2 Breeding Bird Survey

Two early morning breeding bird surveys were undertaken on June 2 and 11, 2020 with start times of 07:00 and 06:15 respectively. Weather conditions were within 5^{o} C of normal with no rain or excessive wind. The breeding bird community was surveyed using a roving type survey, in which all parts of the subject property were walked to within 50 m and all birds heard or observed and showing some inclination toward breeding were recorded as breeding species. All birds heard and seen were recorded in the location observed on an aerial photograph of the site.

3.2.3 Bat Habitat Assessment

Several bat species are listed as endangered in Ontario, including Eastern Small-footed Myotis (*Myotis leibii*), Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*), and Tri-colored Bat (*Perimyotis subflavus*).

The *Survey Protocol for Species at Risk Bats within Treed Habitats Little Brown Myotis, Northern Myotis & Tri-Colored Bat* (MNRF 2017) includes three (3) steps for identifying habitat of endangered bats. These steps are described below:

Step 1: *Complete Ecological Land Classification (ELC) to determine if any coniferous, deciduous or mixed wooded ecosite, including treed swamps, that includes trees at least 10 cm*

diameter-at-breast height (dbh) are present. If suitable habitat is to be impacted by a proposed activity, project proponents should proceed to step 2.

Step 2: *Conduct surveys for suitable bat maternity roost trees within the coniferous, deciduous or mixed wooded ecosites.*

Step 3: *Conduct acoustic surveys within each ELC ecosite determined to be suitable maternity roost habitat in Step 1 to confirm presence/absence of Endangered bat species. The optimal locations of acoustic detectors within the ELC communities are determined based on the data collected in Step 2.*

Step 1 – Ecological Land Classification

A preliminary classification of ecological communities on the subject property was completed on January 20, 2020 using the Ecological Land Classification System for Southern Ontario (Lee *et al.* 1998). A subsequent site visit was completed on July 1, 2020 to confirm classifications during the growing season and adjust the associated ELC mapping. Two deciduous swamp communities were identified on the subject property. These are mapped as units 2a and 2b on **Figure 2** and both correspond with a Poplar Mineral Deciduous Swamp ecosite. Based on the presence of these two treed swamp ecosites, the site is considered to provide potential habitat for endangered bats. Therefore, Beacon proceeded to Step 2 of the assessment.

Step 2 – Snag Surveys

Individual trees within forested ecosites on the subject property were assessed on January 20, 2020 to determine if they exhibited characteristics (e.g. cavities, loose bark) consistent with roost habitat for Myotis species. The following parameters were documented for each snag tree:

- Species;
- Location;
- Approximate tree height;
- Diameter beast height (DBH);
- Number of cavities;
- Approximate height of cavities; and
- Tree condition (decay class).

In addition to Myotis, Tri-colored bats are known to roost in Oak trees and, to a lesser extent, maple trees, Beacon documented these as follows:

- Any oak tree >10cm DBH;
- Any maple tree >10cm DBH if the tree includes dead/dying leaf clusters; and
- Any maple tree >25cm DBH.

The findings on the survey identified a number of snag trees (discussed further in Section 4.3.1); therefore, Beacon proceeded to Step 3 of the assessment.

Existing Conditions

Figure 2

Massi Lands, Dunnville, Ontario

Legend

- Subject Property
- Bat Detectors
- Snag Trees
- Eastern Flowering Dogwood
- Regulated Habitat
- ELC Communities

Unit	ELC Community
1	Scotch Pine Coniferous Plantation (CUP3-3)
2	Poplar Mineral Deciduous Swamp (SWD4-3)
3	Mineral Thicket Swamp (SWT2)
4	Dry-Moist Old Field Meadow (CUM1-1)/Mineral Meadow Marsh (MAM2)
5	Broad-leaved Sedge Mineral Meadow Marsh (MAM2-6)
6	Dry-Moist Old Field Meadow (CUM1-1)
7	Anthropogenic

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Step 3 – Acoustic Monitoring

Acoustic monitoring was completed from June 15 to June 30, 2020 to determine if any Endangered bats species inhabit the property.

Four SM4BAT passive monitors equipped with a SMM-U1 ultrasonic, omni-directional, microphones were installed in proximity to the identified snag trees (**Figure 2**). These devices provided coverage of the majority of potential bat maternity roost trees on the subject property. At each location a microphone was installed at least 2.5 m above the ground and was oriented to optimize echolocation detections. The monitor was programmed to record during triggered events each night for a period of six hours beginning at half an hour before sunset. A 12dB gain setting was used based on the SMM-U1 microphone, the surrounding habitat and proximity to potential roost trees. The unit was programmed to record with a 256 kHz sample rate and the high pass filter was set to 16 kHz to eliminate low frequency noise but to still capture the lowest frequency bat calls (e.g., Hoary Bat for the study area). All files were recorded as full spectrum in .WAV format.

Recordings from the detector were analyzed using Kaleidoscope software. A combination of auto-identification and manual analysis was applied to call files to make species determinations. All files that fell within the approximate 40 KHz Myotis species and Tri-coloured bat echolocation range were manually vetted. If the call did not fall within the approximate 40 kHz range, it was not analyzed further as it did not represent an endangered species of bat.

4. Existing Conditions

4.1 Flora

A total of 70 species of vascular plants were identified on the subject property, of which, one is an endangered species in Ontario. A list is provided in **Appendix B**. A single Eastern Flowering Dogwood (*Cornus florida*) was recorded on the property (see **Figure 2**). Eastern Flowering Dogwood is an endangered species primarily due to the spread of dogwood anthracnose fungus, which has caused significant declines in the populations of this species in Ontario and the United States.

Eastern Flowering Dogwood

An assessment of the Eastern Flowering Dogwood and its immediate environment was completed by Beacon and Adam Kozial of Earthgen Tree Nursey. The Earthgen assessment is included in **Appendix C**. The individual is located along the northern edge of the Scotch Pine plantation. The soil in the vicinity of the Eastern Flowering Dogwood consists of 10-15 cm of humus underlain by loamy sand extending to a depth of approximately 90 cm below grade. The loamy sand is underlain by clay. The tree is overtopped and surrounded by Scotch Pine (*Pinus sylvestris*), Black Cherry (*Prunus serotina*), Black Walnut (*Juglans nigra*), Pussy Willow (*Salix discolor*), and Common Buckthorn (*Rhamnus cathartica*). The tree has two stems measuring approximately 60 mm and 70 mm in diameter. The tree has grown tall and narrow with elongated branches as it is forced to compete for light with surrounding vegetation. Scarring and dieback was observed on the trunk. See **Photograph 1** and **2**. Additional photos are provided in **Appendix C**.

Photograph 1. Eastern Flowering Dogwood (May 23, 2020)

Photograph 2. Eastern Flowering Dogwood (July 1, 2020)

4.2 Breeding Birds

A total of 12 species of breeding birds were recorded on the subject property, with an additional two noted as foraging (**Table 1**)**.** This level of diversity is reflective of the habitat types within the subject property, including open meadow, thicket, and woodland communities.

All of the observations are common species regularly found in rural and urbanizing areas including the three most abundant species in descending order: Red-winged Blackbird (*Agelaius phoeniceus*), Song Sparrow (*Melodia melodpiza*) and American Robin (*Turdus migratorius*). Three or more breeding territories were recorded of each of these species. Other birds encountered with multiple breeding territories included House Wren (*Troglodytes aedon*), Northern Cardinal (*Cardinalis cardinalis*) and Common Grackle (*Quiscalus quiscula*). No species endangered or threatened species were noted on the property and habitat conditions would generally not support such populations.

Table 1. Breeding Bird Species List

Common Name	Scientific Name	S-Rank	Number of Pairs/Territories
Turkey Vulture	*Cathartes aura*	S5	1 - foraging
House Wren	*Troglodytes aedon*	S5	2
American Robin	*Turdus migratorius*	S5	3
Gray Catbird	*Dumetella carolinensis*	S4	1
Cedar Waxwing	*Bombycilla cedrorum*	S5	1
Warbling Vireo	*Vireo gilvus*	S5	1
Common Yellowthroat	*Geothlyphis trichas*	S5	1
Northern Cardinal	*Cardinalis cardinalis*	S5	2
Song Sparrow	*Melospiza melodia*	S5	3
Red-winged Blackbird	*Agelaius phoeniceus*	S4	5
Common Grackle	*Quiscalus quiscula*	S5	2
Baltimore Oriole	*Icterus galbula*	S4	1
American Goldfinch	*Spinus tristis*	S5	1
House Sparrow	*Passer domesticus*	SNA	2 - foraging

4.3 Endangered Bats

4.3.1 Ecological Land Classification

The subject property consists of former agricultural lands that have converted to early successional meadow, thicket, and young woodlands (approximately 15-30 years old) dominated by Scotch Pine (*Pinus sylvestris*), Green Ash (*Fraxinus pensyvlanica*), Trembling Aspen (*Populus tremuloides*), and Freeman's Maple (*Acer x freemanii*). The total wooded area on to the property is approximately 1.5 ha, including 0.5 hectares of coniferous plantation and 1.0 ha of deciduous woodland/swamp. ELC communities is presented in **Figure 2** and briefly described below.

ELC Unit 1. Scotch Pine Coniferous Plantation (CUP3-3)

This community is dominated by young to mid-aged Scotch Pine with an understory of Common Buckthorn (*Rhamnus cathartica*) and Tatarian Honeysuckle (*Lonicera tatarica*). Ground covers are sparse but include Wild Strawberry (Fragaria virginiana), Enchanter's Nightshade (*Circaea lutetiana*), Green Ash seedlings, and White Avens (*Geum canadense*).

ELC Unit 2. Poplar Mineral Deciduous Swamp (SWD4-3)

This community has established in poorly drained former agricultural fields. The canopy consists of young to mid-aged Trembling Aspen in association with Freeman's Maple, Bur Oak (*Quercus macrocarpa*), and Green Ash. Dominant ground covers are Sensitive Fern (*Onoclea sensibilis*), Fowl Manna Grass (*Glyceria striiata*), and sedges (*Carex* spp.). Soils consist of 15-20 cm of humous underlain by approximately 50-60 cm of loamy sand. The loamy sand is underlain by clay.

ELC Unit 3. Mineral Thicket Swamp (SWT2)

This community has established in former agricultural fields. It has spare cover of young dead Green Ash trees with Pussy Willow (*Salix discolor*), White Meadowsweet (*Spiraea alba*), and Gray Dogwood (*Cornus racemosa*). Ground covers include grasses, sedges, and rushes.

ELC Unit 4. Dry-Moist Old Field Meadow/Mineral Meadow Marsh (CUM1-1/MAM2)

This community is moist-wet old field meadow dominated by Pendulous Bulrush (*Scirpus pendulus*), Dudley's Rush (*Juncus dudlyii*), sedges, and Tall Goldenrod. Soils consist of approximately 15 cm of humous underlain by approximately 50 cm of loamy sand. The loamy sand is underlain by clay.

ELC Unit 5. Broad-leaved Sedge Mineral Meadow Marsh

This community is dominated by Lakebank Sedge (*Carex lacustris*), Bebb's Sedge (*Carex bebbii*), Fox Sedge (*Carex vulpinoidea*) and Swamp Aster (*Symphyotrichum puniceum*).

ELC Unit 6: Dry-Moist Old Field Meadow

This meadow community is dominated by grasses, Crown Vetch (*Coronilla varia*), Tall Goldenrod, and Annual Fleabane (*Erigeron annuus*).

4.3.2 Snag Survey Results

A total of ten (10) trees were identified that represented potential habitat for Little Brown and Northern Myotis based on the presence of loose bark, cavities, or cracks. The majority of these trees are dead/dying poplar trees with loose, exfoliating bark. A summary of the assessment is presented in **Table 2**.

In addition, according to the MNRF guidelines (2017), oak trees and, to a lesser extent, maple trees are preferred habitat for Tri-colored Bat and the following trees should be documented:

- Any oak tree >10cm DBH;
- Any maple tree >10cm DBH if the tree includes dead/dying leaf clusters; and
- Any maple tree >25cm DBH.

On the subject property, ten (10) Freeman Maple trees ≥25 cm diameter at breast height (DBH) and two Bur Oak trees ≥10 cm DBH were identified as potential roost habitat for Tri-colored Bat (see **Table 1**). The locations of candidate maternity roost trees are illustrated in **Figure 2**.

Table 2. Candidate Bat Maternity Roost Tree Data

Tree ID #	Species	# of Cavities	DBH (cm)	Approx. Cavity Height (m)	Approx. Tree Height (m)	% Loose Bark	Decay Class[1]
1	*Populus tremuloides*	0	26	n/a	10	30	3/4
2	*Populus tremuloides*	0	30	n/a	10	10	3/4
3	*Ulmus americana*	0	15	n/a	8	50	3/4
4	*Acer x freemanii*	0	28	n/a	10	0	3/4
5	*Populus tremuloides*	0	33	n/a	10	25	1
6	*Acer x freemanii*	0	25	n/a	15	0	3/4
7	*Populus tremuloides*	0	21	n/a	10	25	1
8	*Acer x freemanii*	0	25,25	n/a	15	0	1
9	*Acer x freemanii*	0	40	n/a	15	0	1
10	*Acer x freemanii*	0	27	n/a	15	0	1
11	*Populus tremuloides*	0	20	n/a	8	50	4/5
12	*Populus tremuloides*	0	20	n/a	8	50	4/5
13	*Populus tremuloides*	0	20	n/a	8	50	4/5
14	*Acer x freemanii*	0	30	n/a	15	0	1
15	*Fraxinus pennsylvanica*	0	19	n/a	10	25	3
16	*Acer x freemanii*	0	34,28	n/a	15	0	1
17	*Quercus macrocarpa*	0	20	n/a	10	0	1
18	*Acer x freemanii*	0	38	n/a	15	0	1
19	*Acer x freemanii*	0	41	n/a	15	0	1
20	*Quercus macrocarpa*	0	15	n/a	10	0	1
21	*Fraxinus pennsylanica*	0	29	n/a	15	20	2
22	*Acer x freemanii*	0	25	n/a	12	0	1
23	*Populus tremuloides*	0	25,19	n/a	15	50	4/5

[1]Decay Class
1. Healthy, live tree
2. Declining live tree, part of canopy lost
3. Very recently dead, no canopy, bark intact, branches intact
4. Recently dead, bark peeling, only large branches intact
5. Older dead tree, 90 percent of bark lost, few branch stubs, broken top
6. Very old dead tree, advanced decay, no branches, parts of the stem have rotted away

4.3.3 Acoustic Monitoring Results

A total of 2,286 bat calls were detected during the monitoring period. Based on an analysis of the bat calls, none of the calls were associated with endangered species of bats. Fort this reason, Beacon has confirmed that maternity roosts for endangered bats are not present on the subject property.

4.4 Summary

In summary, based on the background review and field investigations, it was confirmed that there is one threatened/endangered species (Eastern Flowering Dogwood) associated with the subject property. The assessment of habitat for threatened and endangered species for the subject property is summarized in **Appendix D**.

5. Proposed Development

A residential development is proposed for the subject property, which is consistent with the County's Official Plan land use designation for the property. The conceptual development plan is illustrated in **Appendix E**.

6. Impact Assessment and Mitigation

The proposed conceptual development plan requires removing all vegetation from the subject property which impact on the habitat of Eastern Flowering Dogwood. Similarly, this will also result in the removal of the breeding habitat of a small number of common birds.

The potential impacts of development as well as recommendations for mitigating these impacts are outlined below.

6.1 Breeding Birds

The federal Migratory Birds Convention Act (1994) protects the nests, eggs and young of most bird species from harm or destruction. Environment Canada considers the general nesting period of breeding birds in southern Ontario to be between late March and the end of August. This includes times at the beginning and end of the season when only a few species might be nesting. The broad bird nesting season in southern Ontario is April 1 to August 31. Beacon recommends that during the peak period of bird nesting, no vegetation clearing or disturbance to nesting bird habitat occur – i.e., between May 16 and July 15. In the shoulder seasons of April 1 to May 15, and July 16 to August 31, Beacon suggests that vegetation clearing could occur, but only after an Ecologist with appropriate avian knowledge has surveyed the area to confirm lack of nesting. If nesting is found, then vegetation clearing (in an area around the nest) must wait until nesting has concluded. Between September 1 and March 31, vegetation clearing can occur without nest surveys, but the requirement for nest protection under the Act still holds (i.e., if an active nest is known it should be protected).

6.2 Eastern Flowering Dogwood

Eastern Flowering Dogwood and its habitat are protected under the Endangered Species Act. According to Ontario Regulation 242//08 of the Endangered Species Act, the regulated habitat for this species applies to the following areas:

1. A terrestrial area within 20 metres of the stem of an eastern flowering dogwood; and
2. An area populated by a vegetation type referred to in the land classification system for southern Ontario if:
    i. The vegetation type occurs naturally in Ontario; and
    ii. Eastern flowering dogwood also exists in the area.

As discussed above, the Eastern Flowering Dogwood is located at the edge of a Scotch Pine plantation, which is not a vegetation type that occurs naturally in Ontario; therefore, the regulated habitat for this species on the property is an area with 20 m of the tree as illustrated in **Figure 2**.

Due to the location of the tree within the site and the extent of grading that is required to accommodate the proposed development (up to 1 m of fill), impact avoidance is not considered feasible.

To mitigate impacts to this tree, it is proposed that the tree be transplanted to the Carolinian Arboretum at the Thompson Creek Park Eco-Center, located approximately 1 km north of the subject property.

It is proposed that the tree will be transplanted in October or November 2020. The tree will be transplanted utilizing a tree spade (minimum 48”) under professional supervision to a partially shaded location in the arboretum with moist, well drained soil, similar to the soil conditions on the subject property. The growing conditions at the arboretum will be superior to the existing habitat where the tree currently experiences direct competition from Scotch Pine and other adjacent trees and large shrubs, which has affected its growth and limits its chance of survival over the long term (see Section 3.1).

The Thompson Creek Park Eco-Center is open to the public year-round and is utilized by local schools as an outdoor education destination. Transplanting the tree to this setting will allow the public to appreciate the tree and bring attention to the plight of the species. Positioning the tree in a highly visible area of the arboretum and providing educational signage will serve to inform the public about the species and promote its protection and recovery efforts. A letter of support from the Dunnville Horticultural Society, a key partner in developing and promoting the Thompson Creek Park and arboretum, is provided in **Appendix F**.

To ensure transplanting success, a tree maintenance and monitoring is proposed to be implemented. Transplanted trees can suffer from stress due to root loss and adapting to a new environment, a condition known a transplant shock. A general rule is to expect one year of transplant shock for every 2.54 cm in caliper (diameter). The Eastern Flowering Dogwood has an estimated 9 cm diameter (determined by summing the square of the diameter of each stem and calculating the square root of the total (i.e. $\sqrt{6^2+7^2} = \sqrt{85} = 9.2$ cm); therefore, it can be expected to take about 4 years for the tree to become established. To mitigate transplant shock and promote the establishment of the Eastern Flowering Dogwood in its new location at the Thompson Creek Park Eco-Center Arboretum, the following measures will be implemented:

1. An appropriately sized tree spade will be utilized to maintain as much of the root system as possible and by transplanting to a location with optimal growing conditions;

2. The tree will be transplanted in the fall when the tree is dormant (target date October/November 2020);
3. The tree will be transplanted to a location with suitable light, soil, and moisture conditions; and
4. The tree will be actively maintained and monitored for four years following transplanting.

It will be critical that the tree receives adequate water especially during the first year following transplanting. Maintaining a bed of mulch around the tree is recommended to maintain soil moisture and suppress weeds. A slow-release watering bag (e.g. Treegator) is recommended and should be filled up once week from June to September. The tree should be monitored monthly from April to October during the first two years after transplanting and bi-monthly for the following two years. Any problems or deficiencies will be reported to the proponent with recommendations to mitigate or rectify the issues.

In summary, relocating this Eastern Flowering Dogwood from a neglected property with suboptimal growing conditions to a local native tree arboretum and outdoor education centre (located within 1 km of the property) where the tree can be professionally cared for and appreciated by the public is considered to be a net benefit to the tree and the species.

Authorization from MECP is required prior to transplanting the tree or undertaking development/site alteration within 20 m of the tree.

An Information Gathering Form (IGF) will be completed and submitted to the MECP to confirm that the proposed mitigation measures discussed herein will be sufficient to avoid contravention of the Endangered Species Act.

7. Conclusion

This Scoped EIS was prepared in support of a proposed residential development for the Massi property located at the southeast corner of Cross Street West and George Street in the Community of Dunnville, Haldimand County. The EIS was scoped with the County to address the legislative requirements of the Ontario *Endangered Species Act* (ESA) and the Federal *Migratory Bird Convention Act*.

A background review and field investigations were conducted to determine if the subject property supports any habitats that are utilized by threatened or endangered species and to identify whether any special protection measures need to be considered prior to redevelopment of the property to ensure compliance with the Ontario ESA. Surveys for vegetation, breeding birds, and bats were undertaken as part of this assessment.

The subject property supports habitat for a small number of common breeding birds. No threatened or endangered bird species were recorded on the property. The proposed development will require removal of all vegetation from the property. To avoid disturbing or harming actively breeding/nesting birds and comply with the federal *Migratory Birds Convention Act*, clearing of vegetation should be conducted in accordance with the timing windows recommended in this report (Section 6.1).

The subject property supports a single Eastern Flowering Dogwood tree. No other threatened or endangered plant or animal species were found to occur on the property. Due to the location of the tree within the site and the extent of grading that is required to accommodate the proposed development,

impact avoidance is not considered to be practical. The proposed mitigation strategy is to transplant the Eastern Flowering Dogwood to the Carolinian Arboretum at the Thompson Creek Park Eco-Center, located approximately 1 km north of the subject property. Transplanting the Eastern Flowering Dogwood from a neglected property with suboptimal growing conditions to a local native tree arboretum and outdoor education centre where the tree can be professionally cared for and appreciated by the public is considered to be a net benefit to the tree and the species. The necessary approvals will be obtained from MECP prior to transplanting the tree.

Prepared by:
Beacon Environmental

[redacted]

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Reviewed by:
Beacon Environmental

[redacted]

Ken Ursic, B.Sc., M.Sc.
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BEACON ENVIRONMENTAL

Appendix A

EIS Terms of Reference

BEACON ENVIRONMENTAL

GUIDING SOLUTIONS IN THE NATURAL ENVIRONMENT

March 4, 2020 BEL 219562

Alicia West
Planner - Planning & Development
Hagersville Satellite
1 Main St. S.
Hagersville, ON N0A 1H0

Re: Proposed EIS Terms of Reference – Massi Property, George Street and West Cross Street, Dunnville, Haldimand County

Dear Ms. West:

Beacon Environmental Limited (Beacon) has prepared the following Terms of Reference (ToR) for a Scoped Environmental Impact Study (EIS) in support of a proposed residential development for the Massi Property located at the corner of George Street and West Cross Street in Dunnville, Haldimand County (**Figure 1**).

Based on recent email correspondence from the County (Alicia West, February 20, 2020), a scoped EIS was requested to address the legislative requirements of the *Endangered Species Act* and the *Migratory Bird Convention Act*. The following ToR outlines the proposed scope of work to address these key pieces of legislation.

Background Review

Beacon will review background information sources related to the subject property including, but not necessarily limited to the following:

- Haldimand County Official Plan;
- Provincially Tracked Species Layer from Land Information Ontario (LIO);
- Ontario Breeding Bird Atlas;
- Ontario Reptile and Amphibian Atlas;
- Natural Heritage Information Centre (NHIC) Data via the Make-A-Map application; and
- Species at risk range maps.

Field Investigations

Field investigations will be undertaken to document the vegetation and wildlife habitat on the subject property to determine if the property supports habitat for threatened or endangered species to ensure that development is in conformity with the *Endangered Species Act*.

Flora Surveys

Seasonal (spring and summer) surveys for vascular plants will be undertaken on the subject property. The property will be systematically walked to ensure complete coverage of the property. Specific emphasises will be placed on determining the presence of threatened and endangered species. Should they be found to occur, the location of threatened or endangered species will be recorded with a GPS unit.

Breeding Birds

Two early morning breeding bird surveys will be undertaken between May 28 and July 7 to determine what species of birds are nesting on the subject property. The lands represent a small survey area and can be walked such that all singing birds can be heard or observed and recorded. Point count or transit survey methods will not be undertaken, as these survey methods are typically only required for collecting statistically valid data sets for long term studies. Specific emphasises will be placed on determining the presence of species threatened and endangered species.

Mammals

There are currently four species of bats that are listed as Endangered in Ontario. As part of the initial assessment completed by Beacon on January 7, 2020, there are wooded areas on the property that contain trees which potentially support maternity roost habitat for endangered bats. Beacon will consult with the Ministry of the Environment, Conservation, and Park (MECP) to determine if acoustic monitoring (recording bat calls) is required for this site, or if impacts to potential bat roost trees can sufficiently mitigated without the need for additional monitoring. If additional monitoring or assessment is required by MECP, then Beacon will undertake the appropriate actions.

Amphibians and Reptiles

Based on a background review and preliminary habitat assessment completed on January 7, 2020, Beacon did not identify suitable habitat for threatened or endangered amphibians or reptiles on the property; therefore, no surveys for these taxa are proposed at this time.

Analysis and Reporting

Upon completion of the background review and field investigations, Beacon will prepare an EIS report with our findings and recommendations. The report will address impacts to threatened and endangered species and provide recommendations to ensure conformity with the *Endangered Species Act* and *Migratory Birds Convention Act*.

Should have any questions or require clarification, please do not hesitate to contact the undersigned.

Prepared by:
Beacon Environmental

[redacted]

Dan Westerhof, B.Sc., M.E.S.
Terrestrial Ecologist, ISA Certified Arborist (ON-1536A)

Reviewed by:
Beacon Environmental

[redacted]

Ken Ursic, B.Sc., M.Sc.
Principal, Senior Ecologist

Site Location	Figure 1
Massi Lands Dunnville	
BEACON ENVIRONMENTAL	Project: 219562 Last Revised: March 2020
Client: Marigold and Mountainview Homes	Prepared by: BD Checked by:
N 1:3500	Inset Map:1:50000

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BEACON ENVIRONMENTAL

Appendix B

Vascular Plant Species List

Appendix B

Vascular Plant Species List

Scientific Name	Common Name	Family	COSEWIC[1]	COSARO[2]	S-Rank[3]
Acer rubrum	Red Maple	Aceraceae			S5
Acer x freemanii	Freeman's Maple	Aceraceae			SNA
Agrimonia gryposepala	Hooked Agrimony	Rosaceae			S5
Agrostis gigantea	Redtop	Poaceae			SE5
Apocynum cannabinum	Hemp Dogbane	Apocynaceae			S5
Asclepias syriaca	Common Milkweed	Apocynaceae			S5
Carex bebbii	Bebb's Sedge	Cyperaceae			S5
Carex gracillima	Graceful Sedge	Cyperaceae			S5
Carex granularis	Limestone Meadow Sedge	Cyperaceae			S5
Carex lacustris	Lake Sedge	Cyperaceae			S5
Carex stipata	Awl-fruited Sedge	Cyperaceae			S5
Carex vulpinoidea	Fox Sedge	Cyperaceae			S5
Cornus florida	Eastern Flowering Dogwood	Cornaceae	END	END	S2?
Cornus racemosa	Grey Dogwood	Cornaceae			S5
Cornus sericea	Red-osier Dogwood	Cornaceae			S5
Dactylis glomerata	Orchard Grass	Poaceae			SE5
Desmodium canadense	Canada Tick-trefoil	Fabaceae			S4
Erigeron annuus	Annual Fleabane	Asteraceae			S5
Eupatorium perfoliatum	Common Boneset	Asteraceae			S5
Euthamia graminifolia	Grass-leaved Goldenrod	Asteraceae			S5
Fragaria virginiana	Wild Strawberry	Rosaceae			S5
Fraxinus pennsylvanica	Red Ash	Oleaceae			S4
Galium palustre	Common Marsh Bedstraw	Rubiaceae			S5
Geum aleppicum	Yellow Avens	Rosaceae			S5
Geum canadense	Canada Avens	Rosaceae			S5
Glyceria striata	Fowl Mannagrass	Poaceae			S5
Impatiens capensis	Spotted Jewelweed	Balsaminaceae			S5
Juncus dudleyi	Dudley's Rush	Juncaceae			S5
Juncus effusus	Soft Rush	Juncaceae			S5
Juniperus virginiana	Eastern Red Cedar	Cupressaceae			S5
Leersia oryzoides	Rice Cutgrass	Poaceae			S5
Leucanthemum vulgare	Oxeye Daisy	Asteraceae			SE5

Scientific Name	Common Name	Family	COSEWIC[1]	COSARO[2]	S-Rank[3]
Lolium pratense	Meadow Ryegrass	Poaceae			SE5
Lonicera tatarica	Tatarian Honeysuckle	Caprifoliaceae			SE5
Lythrum salicaria	Purple Loosestrife	Lythraceae			SE5
Monarda fistulosa	Wild Bergamot	Lamiaceae			S5
Onoclea sensibilis	Sensitive Fern	Dryopteridaceae			S5
Parthenocissus vitacea	Thicket Creeper	Vitaceae			S5
Penstemon digitalis	Foxglove Beardtongue	Scrophulariaceae			S4
Phalaris arundinacea	Reed Canarygrass	Poaceae			S5
Phleum pratense	Common Timothy	Poaceae			SE5
Phragmites australis	Common Reed	Poaceae			SE
Pinus sylvestris	Scots Pine	Pinaceae			SE5
Plantago lanceolata	English Plantain	Plantaginaceae			SE5
Poa palustris	Fowl Bluegrass	Poaceae			S5
Podophyllum peltatum	May-apple	Berberidaceae			S5
Populus balsamifera	Balsam Poplar	Salicaceae			S5
Populus tremuloides	Trembling Aspen	Salicaceae			S5
Prunus serotina	Black Cherry	Rosaceae			S5
Quercus macrocarpa	Bur Oak	Fagaceae			S5
Rhamnus cathartica	European Buckthorn	Rhamnaceae			SE5
Rubus occidentalis	Black Raspberry	Rosaceae			S5
Rudbeckia hirta	Black-eyed Susan	Asteraceae			S5
Salix discolor	Pussy Willow	Salicaceae			S5
Scirpus atrovirens	Dark-green Bulrush	Cyperaceae			S5
Scirpus cyperinus	Common Woolly Bulrush	Cyperaceae			S5
Scirpus pendulus	Hanging Bulrush	Cyperaceae			S5
Securigera varia	Purple Crown-vetch	Fabaceae			SE5
Sisyrinchium montanum	Strict Blue-eyed-grass	Iridaceae			S5
Solidago altissima	Tall Goldenrod	Asteraceae			S5
Solidago gigantea	Giant Goldenrod	Asteraceae			S5
Spiraea alba	White Meadowsweet	Rosaceae			S5
Symphyotrichum lanceolatum ssp. lanceolatum	Eastern Panicled Aster	Asteraceae			S5
Symphyotrichum puniceum	Purple-stemmed Aster	Asteraceae			S5
Taraxacum officinale	Common Dandelion	Asteraceae			SE5
Toxicodendron radicans var. radicans	Eastern Poison Ivy	Anacardiaceae			S5
Toxicodendron radicans var. rydbergii	Western Poison Ivy	Anacardiaceae			S5
Typha latifolia	Broad-leaved Cattail	Typhaceae			S5
Viburnum opulus ssp. trilobum	Highbush Cranberry	Caprifoliaceae			S5
Vitis riparia	Riverbank Grape	Vitaceae			S5

[1] Committee on the Status of Endangered Wildlife in Canada
[2] Committee on the Status of Species at Risk in Ontario
[3] Provincial Status: S5=Secure, S4=Apparently Secture, S2 = Imperiled, SE=Exotic

BEACON ENVIRONMENTAL

Appendix C

Assessment of Eastern Flowering Dogwood (Earthgen)

Earthgen
Better Trees Faster

Hi Archie,

Thank you for the opportunity to inspect the Eastern Flowering Dogwood on your property.

After psychically inspecting the Eastern Flowering Dogwood at the Cross and George Street location on July 10, 2020, I would like to share my observations and assessment of the condition of this tree. This small tree is trying to survive in a very thick under story setting. The surrounding vegetation of Scots Pine (also called Scotch pine, which is on the invasive species list), Black Walnut and others have forced it to grow tall and narrow just to compete for a little bit of sun light. The tree is about 15 feet tall with about a 3 inch (75mm) caliper, which is about its natural mature height but the caliper is well below its desired size.
Also the branches are very long, which is not a healthy sign, again extending for the sun light, as shown in pictures attached. The seed count on this tree is very low because of the heavy completion from other vegetation. But most concerning is the die back and scarring that is on the main trunk. This is a sign that the tree needs to be exposed to a healthier environment. This is visible on pictures attached. My fear is that this tree only has about 2 years of life in its present situation. Fact is the tree needs help soon or it will not survive in its own.

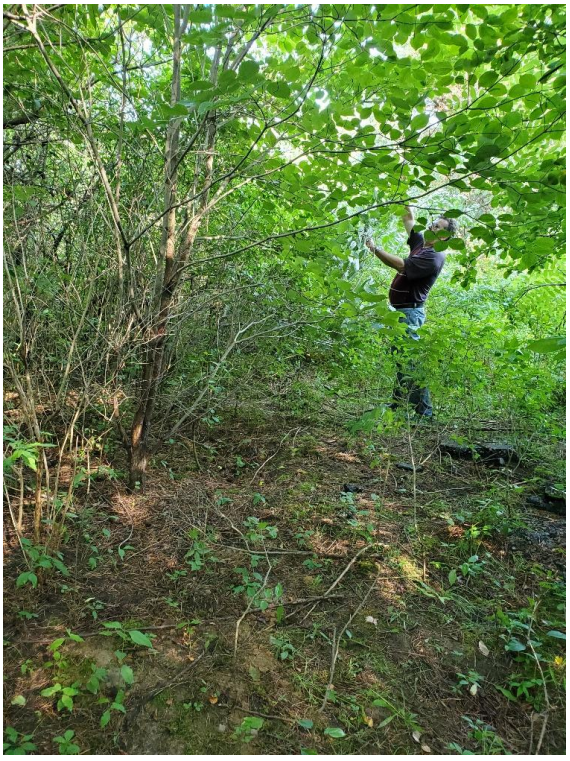
I recommend that the tree be carefully moved to a site that is more accommodating, without the surrounding competition. This can be easily done with a tree spade since the soil is very light and sandy and moved basically a few hundred meters across the street. As an extra benefit for the tree, equal amounts of dirt can be taken and relocated from each site. Which is a site picked by the Dunnville Horticultural Society.

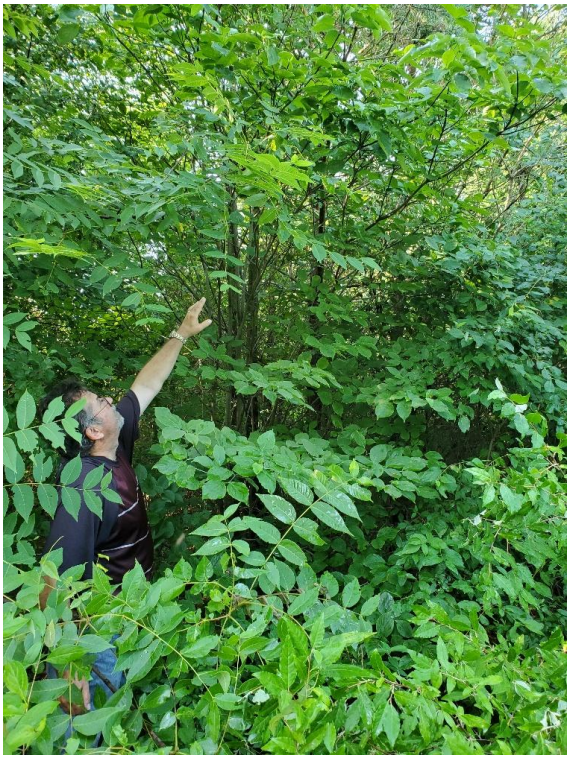
Some preliminary work would help, removing over canopy and removing adjacent interfering trees such as the Scotch Pine Trees first by a skid steer.

The existing damage to the bark can be easily repaired, the die back can be pruned as well as the very long extended branches will have to be pruned back to have a proportional look for the tree after the tree is moved. This should be done this coming Fall, it will be easier to transplant this tree, very late in October or early November, when the tree becomes dormant.

Let me know if you have any questions.
I am glad to help.

Adam Koziol





BEACON ENVIRONMENTAL

Appendix D

Assessment of Habitat for Threatened and Endangered Species

Appendix D

Assessment of Habitat for Threatened and Endangered Species

Taxonomy	Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat	Known Species Range	Assessment of Subject Property
Birds	Bank Swallow *Riparia riparia*	THR	THR Schedule 1	THR	Bank Swallows nest in burrows in natural and human-made settings where there are vertical faces in silt and sand deposits. Many nests are on banks of rivers and lakes, but they are also found in active sand and gravel pits or former ones where the banks remain suitable. The birds breed in colonies ranging from several to a few thousand pairs.	The Bank Swallow is found all across southern Ontario, with sparser populations scattered across northern Ontario. The largest populations are found along the Lake Erie and Lake Ontario shorelines, and the Saugeen River (which flows into Lake Huron).	**No** Potentially suitable habitat is not present on the subject property. Not observed during field investigations.
Birds	Barn Swallow *Hirundo rustica*	THR	THR Schedule 1	THR	Barn Swallows often live in close association with humans, building their cup-shaped mud nests almost exclusively on human-made structures such as open barns, under bridges and in culverts. The species is attracted to open structures that include ledges where they can build their nests, which are often re-used from year to year. They prefer unpainted, rough-cut wood, since the mud does not adhere as well to smooth surfaces.	The Barn Swallow may be found throughout southern Ontario and can range as far north as Hudson Bay, wherever suitable locations for nests exist.	**No** Potentially suitable habitat is not present on the subject property. Not obsereved during field invesigations.
Birds	Bobolink *Dolichonyx oryzivorus*	THR	THR Schedule 1	THR	Historically, Bobolinks lived in North American tallgrass prairie and other open meadows. With the clearing of native prairies, Bobolinks moved to living in hayfields. Bobolinks often build their small nests on the ground in dense grasses. Both parents usually tend to their young, sometimes with a third Bobolink helping.	The Bobolink breeds across North America. In Ontario, it is widely distributed throughout most of the province south of the boreal forest, although it may be found in the north where suitable habitat exists.	**No** The habitat on the site is generally unsuitable. Not observed during field investigations.
Birds	Chimney Swift *Chaetura pelagica*	THR	THR Schedule 1	THR	Before European settlement Chimney Swifts mainly nested on cave walls and in hollow trees or tree cavities in old growth forests. Today, they are more likely to be found in and around urban settlements where they nest and roost (rest or sleep) in chimneys and other manmade structures. They also tend to stay close to water as this is where the flying insects they eat congregate.	The Chimney Swift breeds in eastern North America, possibly as far north as southern Newfoundland. In Ontario, it is most widely distributed in the Carolinian zone in the south and southwest of the province, but has been detected throughout most of the province south of the 49th parallel. It winters in northwestern South America.	**No** Potentially suitable habitat is not present on the subject property. Not observed during field investigations.
Birds	Eastern Meadowlark *Sturnella magna*	THR	THR Schedule 1	THR	Eastern Meadowlarks breed primarily in moderately tall grasslands, such as pastures and hayfields, but are also found in alfalfa fields, weedy borders of croplands, roadsides, orchards, airports, shrubby overgrown fields, or other open areas. Small trees, shrubs or fence posts are used as elevated song perches.	In Ontario, the Eastern Meadowlark is primarily found south of the Canadian Shield but it also inhabits the Lake Nipissing, Timiskaming and Lake of the Woods areas.	**No** The habitat on the site is generally unsuitable. Not observed during field investigations.
Mammals	Eastern Small-footed Myotis (Bat) *Myotis leibii*	END	No Status	No Status	In the spring and summer, eastern small-footed bats will roost in a variety of habitats, including in or under rocks, in rock outcrops, in buildings, under bridges, or in caves, mines, or hollow trees. These bats often change their roosting locations every day. At night, they hunt for insects to eat, including beetles, mosquitos, moths, and flies. In the winter, these bats hibernate, most often in caves and abandoned mines. They seem to choose colder and drier sites than similar bats and will return to the same spot each year. Maternity roost habitat has been further defined by MNRF (2017) as coniferous, deciduous or mixed wooded ecosite, including treed swamps, that include trees at least 10 cm diameter-at-breast height (dbh).	The Eastern Small-footed bat has been found from south of Georgian Bay to Lake Erie and east to the Pembroke area. There are also records from the Bruce Peninsula, the Espanola area, and Lake Superior Provincial Park. Most documented sightings are of bats in their winter hibernation sites.	Potentially suitable woodland habitat was identifed on the the subject property. However, the results of the acoustic monitoring indicated that the species is not present.

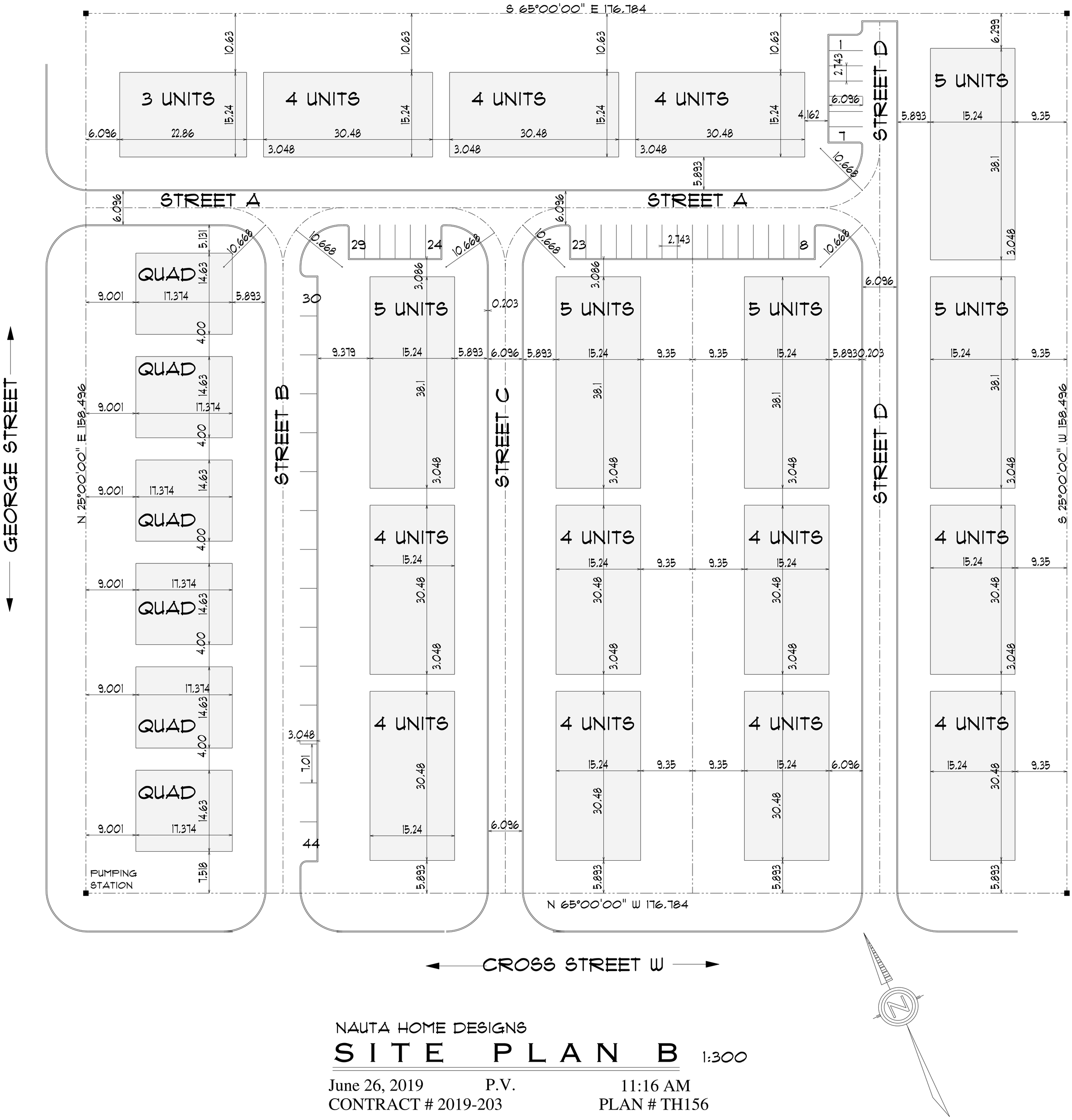
Taxonomy	Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat	Known Species Range	Assessment of Subject Property
Mammals	Little Brown Myotis (Bat) *Myotis lucifugus*	END	END Schedule 1	END	Bats are nocturnal. During the day they roost in trees and buildings. They often select attics, abandoned buildings and barns for summer colonies where they can raise their young. Bats can squeeze through very tiny spaces (as small as six millimetres across) and this is how they access many roosting areas. Little brown bats hibernate from October or November to March or April, most often in caves or abandoned mines that are humid and remain above freezing. This species can typically be associated with any community where suitable roosting (i.e. caviety trees, houses, abandoned buildings, barns, etc.) habitat is available. Maternity roost habitat has been further defined by MNRF (2017) as coniferous, deciduous or mixed wooded ecosite, including treed swamps, that include trees at least 10 cm diameter-at-breast height (dbh).	The Little Brown Myotis is widespread in southern Ontario and found as far north as Moose Factory and Favourable Lake. Outside Ontario, this bat is found across Canada (except in Nunavut) and most of the United States.	Potentially suitable woodland habitat was identifed on the the subject property. However, the results of the acoustic monitoring indicated that the species is not present.
Mammals	Northern Myotis *(Bat) Myotis septentrionalis*	END	END Schedule 1	END	Northern Myotis bats are associated with boreal forests, choosing to roost under loose bark and in the cavities of trees. These bats hibernate from October or November to March or April, most often in caves or abandoned mines. Maternity roost habitat has been further defined by MNRF (2017) as coniferous, deciduous or mixed wooded ecosite, including treed swamps, that include trees at least 10 cm diameter-at-breast height (dbh).	The Northern Myotis is found throughout forested areas in southern Ontario, to the north shore of Lake Superior and occasionally as far north as Moosonee, and west to Lake Nipigon.	Potentially suitable woodland habitat was identifed on the the subject property. However, the results of the acoustic monitoring indicated that the species is not present.
Mammals	Tricoloured Bat *Perimyotis subflavus*	END	END Schedule 1	END	Tricoloured Bat inhabits a variety of forested communities, and will roost older forests and barns (or other structures). Foraging habitats include areas over water and streams. They hibernate in cave where they typically roost independently rather than in groups. Maternity roost habitat has been further defined by MNRF (2017) as coniferous, deciduous or mixed wooded ecosite, including treed swamps, that include trees at least 10 cm diameter-at-breast height (dbh).	Tricoloured Bat is found in southern Ontario, where its northern limit is in proximity to Sudbury. Due to its rarity, their distribution is scattered.	Potentially suitable woodland habitat was identifed on the the subject property. However, the results of the acoustic monitoring indicated that the species is not present.
Molluscs	Eastern Pondmussel *Ligumia nasuta*	SC	SC Schedule 1	SC	The Eastern Pondmussel is typically found in sheltered areas of lakes and in slow-moving areas of rivers and canals with sand or mud bottoms. All mussels filter water to find food, such as bacteria and algae. Mussel larvae must attach to a fish (called a “host”), where they consume nutrients from the fish body until they transform into juvenile mussels and drop off the fish host. It is not known which species of fish act as hosts for the Eastern Pondmussel.	In North America, the Eastern Pondmussel was once one of the most common mussels in the lower Great Lakes. In Canada, there are now only two known populations: one in the delta area of Lake St. Clair and the second in Lyn Creek, a small tributary of the upper St. Lawrence River.	**No** Potentially suitable habitat is not present on the subject property.
Molluscs	Kidneyshell *Ptychobranchus fasciolaris*	END	END Schedule 1	END	The Kidneyshell is typically found in small to medium sized rivers. It prefers shallow, clear, swift-moving water with gravel and sand. It also used to occur on gravel shoals in the Great Lakes. All mussels filter water to find food, such as bacteria and algae. Mussel larvae are parasitic and must attach to a fish host, where they consume nutrients from the fish body until they transform into juvenile mussels that drop off of the fish. The Kidneyshell has three known fish hosts in Canada: Blackside Darter, Fantail Darter, and Johnny Darter. The presence of fish hosts is one of the key features for an area to support a healthy mussel population.	In Canada, the Kidneyshell is currently found in four areas in southwestern Ontario. There are reproducing populations in the East Sydenham River and in the Ausable River. Small populations are also found in St. Clair River delta in Lake St. Clair and a tributary of the Thames River. The species no longer occurs in Lake Erie or the Detroit, Thames, Grand, Welland or Niagara rivers.	**No** Potentially suitable habitat is not present on the subject property.
Molluscs	Round Pigtoe *Pleurobema sintoxia*	END	END Schedule 1	END	The Round Pigtoe is usually found in rivers of various sizes with deep water and sandy, rocky, or mud bottoms. Like all freshwater mussels, this species feeds on algae and bacteria that it filters out of the water. Mussel larvae are parasitic and must attach to a fish host, where they consume nutrients from the fish body until they transform into juvenile mussels and drop off. Known fish hosts of the Round Pigtoe include: Bluegill, Spotfin Shiner, Bluntnose Minnow, and Northern Redbelly Dace. The presence of fish hosts is one of the key features for an area to support a healthy mussel population.	In Canada, Round Pigtoe are found only in southwestern Ontario, mainly in the St. Clair River delta and the Sydenham River but small populations still exist in the Grand and Thames rivers and in shallow areas near the shorelines of Lake Erie and Lake St. Clair.	**No** Potentially suitable habitat is not present on the subject property.

Taxonomy	Species	ESA Status	SARA Status	COSEWIC Status	Preferred Habitat	Known Species Range	Assessment of Subject Property
Plants	Butternut *Juglans cinerea*	END	END Schedule 1	END	In Ontario, Butternut usually grows alone or in small groups in deciduous forests. It prefers moist, well-drained soil and is often found along streams. It is also found on well-drained gravel sites and rarely on dry rocky soil. This species does not do well in the shade, and often grows in sunny openings and near forest edges.	Butternut can be found throughout central and eastern North America. In Canada, Butternut occurs in Ontario, Quebec and New Brunswick. In Ontario, this species is found throughout the southwest, north to the Bruce Peninsula, and south of the Canadian Shield.	**No** The habitat on the preoprty is generally usuitalbe and no Butternut were obserfved during field investigations.
Plants	Eastern Flowering Dogwood *Cornus florida*	END	END Schedule 1	END	Eastern Flowering Dogwood grows under taller trees in mid-age to mature deciduous or mixed forests. It most commonly grows on floodplains, slopes, bluffs and in ravines, and is also sometimes found along roadsides and fencerows.	In Canada, it can only be found in southern Ontario in the Carolinian Zone (the small area of Ontario southwest of Toronto to Sarnia down to the shores of Lake Erie).	**Yes** A single tree was identified on the proeprty.
Reptiles	Blanding's Turtle *Emydoidea blandingii*	THR	THR Schedule 1	END	Blanding's Turtles live in shallow water, usually in large wetlands and shallow lakes with lots of water plants. It is not unusual, though, to find them hundreds of metres from the nearest water body, especially while they are searching for a mate or traveling to a nesting site. Blanding's Turtles hibernate in the mud at the bottom of permanent water bodies from late October until the end of April.	The Blanding's Turtle is found in and around the Great Lakes Basin, with isolated populations elsewhere in the United States and Canada. In Canada, the Blanding's Turtle is separated into the Great Lakes-St. Lawrence population and the Nova Scotia population. Blanding's Turtles can be found throughout southern, central and eastern Ontario.	**No** Potentially suitable habitat is not present on the subject property.

BEACON ENVIRONMENTAL

Appendix E

Conceptual Development Plan



NAUTA HOME DESIGNS

SITE PLAN B 1:300

June 26, 2019 P.V. 11:16 AM

CONTRACT # 2019-203 PLAN # TH156

BEACON ENVIRONMENTAL

Appendix F

Letter of Support to Receive Eastern Flowering Dogwood at the Thompson Creek Eco-Centre

Dunnville Horticultural Society

"Some people look for a beautiful place, others make a place beautiful."- Hazrat Inavat Khan

Est. 1929

www.dunnvillehortandgardenclub.org

P.O. Box 274
Dunnville, Ont.
N1A 2X5

July 20, 2020

To: Archie Merigold

Re: Proposed Transplanting of Eastern Flowering Dogwood to Dunnville's Thompson Creek Eco Centre

Hello Archie,

The Dunnville Horticultural Society (DHS) is pleased to partner with you in the transplanting efforts you have proposed for the important native species of Eastern Flowering Dogwood. The Thompson Creek Eco Centre has endeavoured, since its inception, to create an arboretum which incorporates the many tree species of the quickly disappearing Carolinian forests.

Your proposal to transplant this mature Eastern Flowering Dogwood will be an exciting and welcome addition to this arboretum. It will enhance the variety of species showcased here, and bring much-needed attention to the plight of this endangered tree species. Positioning the tree in a much visited area of the arboretum, and providing a tree identification sign will serve to educate the public on the species and promote its survival.

Once all required approvals and protocols have been met, DHS would be pleased to work with the group and assist where needed. We look forward to an exciting partnership intended to save this tree.

Respectfully yours,

Deb Zynomirski

DHS President

BEACON ENVIRONMENTAL

GUIDING SOLUTIONS IN THE NATURAL ENVIRONMENT

Environmental Impact Study Addendum
Massi Property
West Cross Street and George Street Dunnville, ON

Prepared For:

1108991 Ontario Inc.

Prepared By:

Beacon Environmental Limited

Date: **October 2020**

Project: **219562**

Table of Contents

Figures

Appendices

1. Introduction

Beacon Environmental Limited (Beacon) was retained by 1108991 Ontario Inc. to prepare an Environmental Impact Study (EIS) Addendum for the proposed development of a 2.7 ha property located at the eastern corner of Cross Street West and George Street in the Community of Dunnville, Haldimand County (**Figure 1**). A scoped EIS was originally prepared by Beacon (August 2020) to address the legislative requirements related to the Ontario *Endangered Species Act* (ESA) and the Federal *Migratory Bird Convention Act*.

A residential development is proposed for the subject property, which is consistent with the County's Official Plan land use designation for the property. The conceptual development plan is illustrated in **Appendix A**.

A screening was conducted for potential habitat for threatened or endangered species, which involved delineating and classifying vegetation communities according the Ecological Land Classification (ELC) system for southern Ontario (Lee et al. 1998). Based on this analysis, several vegetation communities were classified as wetlands. The classification was primarily based on the type of vegetation on the subject property.

In their initial comments to Haldimand County (August 13, 2020), the Grand River Conservation Authority (GRCA) indicated that additional assessment of the wetlands is required to determine if removal is feasible and in conformity with their polices. Subsequent correspondence from GRCA (August 28, 2020) requested "additional information and supporting documentation to evaluate the wetland, wetland status, size and should the wetlands be confirmed and if removal is being considered then it would have to meet the GRCA Policies and determine if the Policies 8.4.4 and 8.4.5." To address the GRCA comments, Beacon has undertaken additional work to characterize the wetland features and assess their hydrological functions. An assessment of drainage conditions and anthropogenic impacts related to the subject property was completed by Sco-Terra Consulting Group Limited (**Appendix B**). The purpose of the assessment is to provide a better understanding the history of the subject property and the existing conditions.

Notably, this additional information was gathered to determine if the features on the site meet the definition of a "wetland" according to the Conservation Authorities Act and GRCA policy (2003), which define a wetland as land that:

a) *is seasonally or permanently covered by shallow water or has a water table close to or at its surface,*
b) *directly contributes to the hydrological function of a watershed through connection with a surface watercourse,*
c) *has hydric soils, the formation of which has been caused by the presence of abundant water, and*
d) *has vegetation dominated by hydrophytic plants or water tolerant plants, the dominance of which has been favoured by the presence of abundant water.*

Additionally, GRCA policy also distinguishes between anthropogenic wetlands and natural wetlands.

The findings of these additional assessments are outlined below.

2. Site Assessment

2.1 Hydrology and Soils Assessment

2.1.1 Hydrology

2.1.1.1 Site Drainage

Based on field observations in January 2020, portions of the property are seasonally covered with shallow water, most notably the northern and eastern portions of the property. Standing water tends to be associated with areas of past disturbance including localized excavations, ruts, and furrows. No standing water was observed during subsequent site visits in May, July, or September 2020.

Based on a topographic survey completed in September 2020, Sco-terra identifies four drainage areas within the subject property. A detailed description of the drainage conditions is included in the Sco-terra report (included as **Appendix B**) and briefly summarized herein.

The southwest quadrant of the property drains overland toward the George St. ditch; however, drainage is impeded by a low berm or ridge along the ditch.

The northwest catchment area outlets to the George Street ditch at the northern corner of the subject property; however, drainage has been impeded by grade changes (fill placement) that have occurred both on and adjacent to the subject property as a result of recent redevelopment to the north. Run-off to George Street is also inhibited by a low ridge that runs along the side of the ditch, resulting in trapped drainage on site, which is further exacerbated by surface runoff from the adjacent driveway and direct rooftop discharge via a downspout leader originating from the building on the adjacent land.

The northeast catchment area drains north onto the adjacent property toward and existing stormwater management block. This catchment area appears to receive surface runoff from a portion of the rear yards of the existing residential lots to the east.

The southeast catchment area drains overland to the south and east property limits (i.e. the Cross Street ditch and abutting undeveloped residential parcel to the east).

2.1.1.2 Watercourses

The only surface watercourse in the vicinity of the subject property (aside from roadside ditches is a stormwater management ditch located directly north of the property, which was constructed approximately 10 years ago as part of an approved stormwater management plan for the Northwest Quadrant of Dunnville. This constructed channel originates at George Street and is open for about 180 m before it is enclosed underground beneath the existing development to the east. Only a small portion of the property at the northeast corner drains toward this SWM drain, while the remaining drainage is largely trapped on site.

C:\Dropbox\Dropbox (Beacon)\All GIS Projects\2019\219562 Dunville EIS\MXD\2020-10-02_Figure01_SiteLocation_219562.mxd

Site Location	Figure 1
Massi Lands, Dunnville	
BEACON ENVIRONMENTAL	Project: 219562 Last Revised: October, 2020
Client: 1108991 Ontario Inc.	Prepared by: DU Checked by: DW
N	1:1,400 — Inset Map:1:50,000

Contains information licensed under the Open Government License–Ontario Orthoimagery Baselayer: FBS 2010/Google Satelitte

2.1.2 Soils

Hydric soil is a key attribute of wetlands and one of the criteria for defining wetlands under GRCA policy and the Conservation Authorities Act.

A site visit was conducted by Beacon on September 11, 2020 to verify the existing conditions on the subject property with respect to vegetation and soils. Representative soils samples were taken within the wetland areas previously identified to confirm the soil moisture regime and determine if hydric soils are present. A total of 22 soils samples were taken using a hand-held soil auger. Soil sample locations are illustrated in **Figure 2**. For each sample, soil characteristics were documented including soil texture, depth of soil horizons, and presence/depth of mottles and/or gley, and moisture regime.

Based on the sampling, soil conditions on the subject property are somewhat variable, but generally consist of loamy or silty very fine sand overlying clay. Soil samples are summarized in **Appendix C.**

Hydric soils have a moisture regime of 6 (very moist) or higher (7-9, wet) as per the ELC system (Lee *et al*., 1998). The moisture regime for soils on the subject property range from 5 (moist) to 3 (fresh), although several samples were borderline moist (5)/very moist (6) where mottles were evident in clay/clay loam soils at approximately 30 cm depth. The prevailing moisture regime on the subject property is fresh to moist.

2.2 Vegetation Assessment

The subject property is a former farm that has been idle for about 30 years. The property currently supports coniferous plantation, successional meadow, thicket, and woodlands. A photographic record of the property is presented in **Photographs 1-6** in **Appendix D**, which show aerial snapshots of the property from 1934 to 2015. There are no natural features evident on the site in 1934 or 1954. By 2000, some successional trees and shrubs are evident, but the property is still predominantly an open field. Since 2000, the southern and eastern portions of the property have progressively filled in with trees and shrubs, while the central and western portions of the site remain relatively open.

In the EIS prepared by Beacon (August 2020), several vegetation communities on the property were classified as wetlands based on the ELC system for southern Ontario (Lee et al, 1998). Wetland communities identified in the EIS included Poplar Mineral Deciduous Swamp (SWD4-3), Mineral Thicket Swamp (SWT2), and Broad-leaved Sedge Mineral Meadow Marsh (MAM2-6). The features were classified primarily on the basis of vegetation composition. For the purpose of the EIS, which was primary to address habitat for threatened or endangered species, features supporting a dominance of hydrophytic vegetation were classified as wetland; however, a detailed soil survey was not undertaken.

The poor drainage on the site, which is largely the result of anthropogenic activity, combined with other anthropogenic disturbances (excavation, rutting, furrows) has facilitated the establishment of hydrophytic vegetation; however, there has been little in the way of hydric soils development as discussed in the preceding section.

A Poplar Mineral Deciduous Swamp (SWD4-3) was identified in the EIS along the east side of the property and in the northwest corner. This community supports a canopy of young to mid-aged Trembling Aspen in association with Freeman's Maple (*Acer x freemanii*), Bur Oak (*Quercus macrocarpa*), and Green Ash. Dominant ground covers are Sensitive Fern (*Onoclea sensibilis*), Fowl Manna Grass (*Glyceria striata*), Rough-stemmed Goldenrod (*Solidago rugosa*) and sedges (*Carex*

spp.). Based on the soil moisture regime (fresh-moist) determined through subsequent soil sampling (see Section 2.1.2), this feature has been re-classified as Fresh-Moist Poplar Deciduous Forest (FOD8-1) (**Photographs 10 and 11, Appendix D**).

A Mineral Thicket Swamp (SWT2) was identified at the southeast corner of the property. This community has sparse cover of young dead Green Ash trees with Pussy Willow (*Salix discolor*), White Meadowsweet (*Spiraea alba*), and Gray Dogwood (*Cornus racemosa*). Ground covers include grasses, sedges, and rushes. Based on the soil moisture regime (fresh-moist) determined through subsequent soil sampling (see Section 2.1.2) as well as consideration of the site history and anthropogenic influences, this feature has been re-classified as Mineral Cultural Thicket (CUT1) (**Photograph 12, Appendix D**).

The central portion of the property is a moist old field meadow with an admixture of dry and wet meadow species including Tall Goldenrod, Rough Goldenod (*Solidago rugosa*), Gray-stemmed Goldenrod (*Solidago nemoralis*), Queen Anne's Lace (*Daucus carota*), Pendulous Bulrush (*Scirpus pendulus*), Dudley's Rush (*Juncus dudlyii*), Purple Loosestrife (*Lythrum salicaria*), and Black-eyed Susan (*Rudbeckia hirta*). Occasional trees and shrubs include Pussy Willow, White Meadowsweat, Gray Dogwood (*Cornus racemose*), Scotch Pine (*Pinus sylvestris*), Green Ash (*Fraxinus pennsylvanica*), and Red Cedar (*Juniperus virginiana*). Wet meadow vegetation is primarily associated with old agricultural furrows and vehicle tracks (most evident in **Photograph 5 in Appendix D**). Notably, the property was used as a haul route when the stormwater channel to the north of the property was constructed c. 2008-2009, which resulted in significant soil disturbance and rutting through the central portion of the property. Based on the predominant soil moisture regime (fresh-moist) determined through soil sampling (see Section 2.1.2) and consideration of the site history, the prevailing condition of this area is that of a dry-moist old field meadow (CUM1-1); and, therefore, has been classified as such (**Photographs 7 and 8, Appendix D**).

A Broad-leaved Sedge Mineral Meadow Marsh (MAM2-5) was documented near the northern corner of the subject property (**Photograph 9, Appendix D**). This community is dominated by Lakebank Sedge (*Carex lacustris*), with lesser amounts of Bebb's Sedge (*Carex bebbii*), Fox Sedge (*Carex vulpinoidea*) and Swamp Aster (*Symphyotrichum puniceum*). This feature is dominated by an obligate wetland species (Lakebank Sedge) and soils are borderline hydric; therefore, the classification of this feature has not changed.

3. Conclusion

As discussed in the EIS (August 2020), the proposed development plan requires removing all vegetation from the subject property, including features that support hydrophytic vegetation. Based on the additional assessments presented in this EIS Addendum, several features that were previously documented as wetlands in the EIS (August 2020) do not meet the criteria of "wetland" as defined under the Conservation Authorities Act and GRCA policy. Most of the features do not have hydric soils and/or are not connected to a surface watercourse. The conditions that support hydrophytic vegetation are largely the result of altered drainage and anthropogenic disturbances. Several wetland features have been re-classified based on the soil data that was collected. The original wetland classification was maintained for a small sedge meadow in the northwest portion of the property; however, based on its small size (approx. 640 m^2) and lack of any apparent connection to a surface watercourse, its contribution to the hydrological function of the watershed is limited, and thus would not meet criterion "b" of the wetland definition.

Existing Conditions

Figure 2

Massi Lands, Dunnville

Legend

- Subject Property
- Soil Samples
- ELC Communities

ELC Unit	ELC Community Type
1	Scotch Pine Coniferous Plantation (CUP3-3)
2	Fresh-Moist Poplar Deciduous Forest (FOD8-1)
3	Mineral Cultural Thicket (CUT1)
4	Dry-Moist Old Field Meadow (CUM1-1)
5	Broad-leaved Sedge Mineral Meadow Marsh (MAM2-6)
6	Anthropogenic (ANT)

BEACON ENVIRONMENTAL

Project: 219562
Last Revised: October, 2020

Client: 1108991 Ontario Inc.

Prepared by: DU
Checked by: DW

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Based on the findings of this assessment and the Conservation Authorities Act definition of “wetland” it is Beacon’s understanding that there are no regulated wetlands on the subject property; therefore, the proposed development is in conformity with GRCA polices and Ontario Regulation 150/06.

Should you have any questions regarding this assessment, please do not hesitate to contact the undersigned.

Prepared by:
Beacon Environmental

[redacted]

Dan Westerhof, B.Sc., M.E.S.
Terrestrial Ecologist,
ISA Certified Arborist (ON-1536A)

Reviewed by:
Beacon Environmental

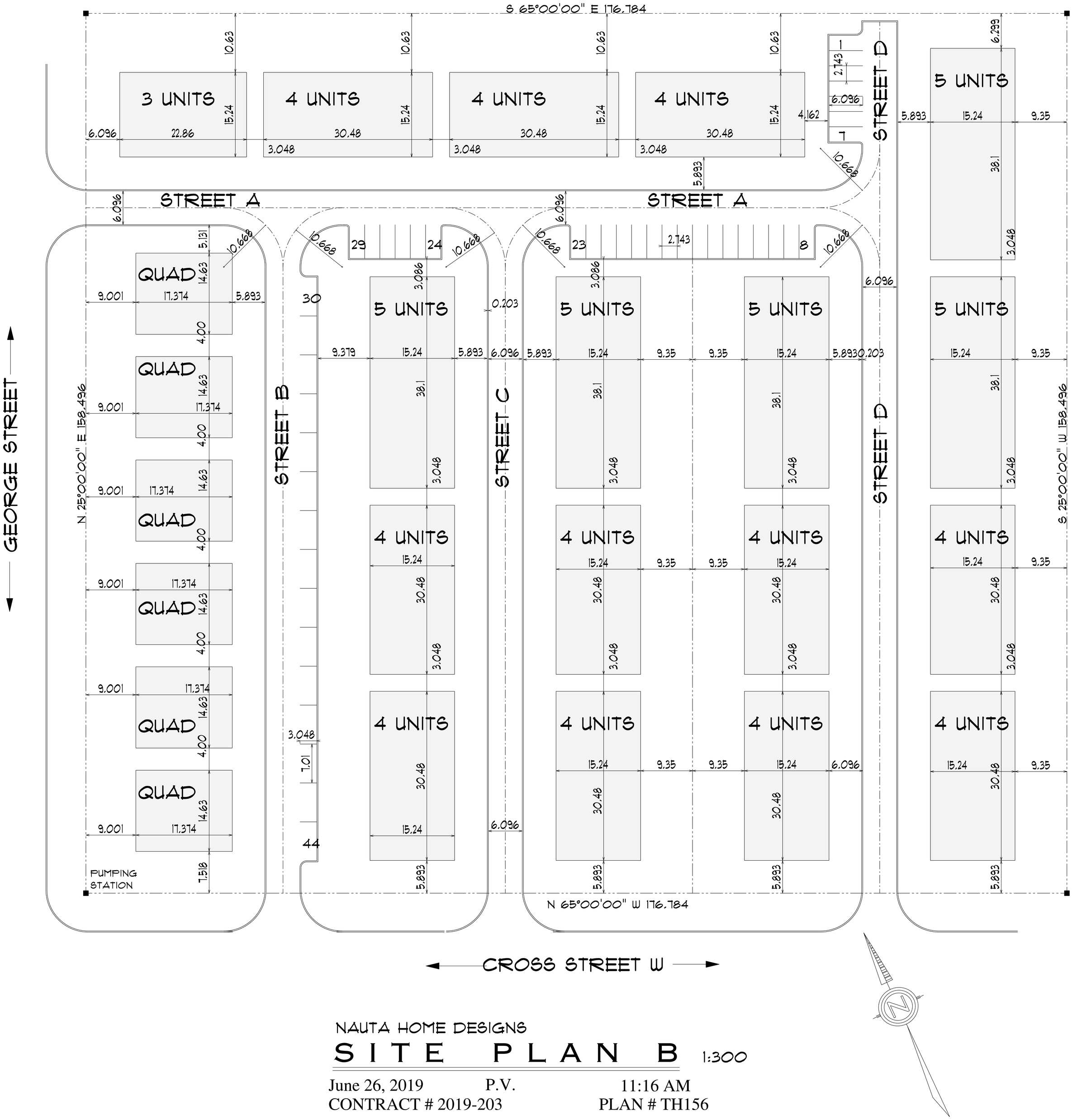
[redacted]

Ken Ursic, B.Sc., M.Sc.
Principal, Senior Ecologist

BEACON ENVIRONMENTAL

Appendix A

Conceptual Development Plan



NAUTA HOME DESIGNS

SITE PLAN B 1:300

June 26, 2019 P.V. 11:16 AM

CONTRACT # 2019-203 PLAN # TH156

BEACON ENVIRONMENTAL

Appendix B

Overview of Existing Drainage Conditions

SCO-TERRA
CONSULTING GROUP LIMITED

5 OCTOBER 2020

Email Distribution

Mr. Nathan Garland, Resource Planner
Grand River Conservation Authority
400 Clyde Road
PO Box 729
Cambridge ON N1R 5W6
e. ngarland@grandriver.ca

Re: Overview of Existing Drainage Conditions and Anthropogenic Impacts
Proposed Residential Development of Massi Lands, Dunnville Urban Area
Lot 3 and Part of Lots 2 and 4, Registered Plan 1407, Haldimand County
Northeast of Cross Street West and George Street, Dunnville
Sco-Terra Consulting Group Limited Ref. E-19528

Dear Mr. Garland:

Our firm is retained by 1108991 Ontario Inc. in connection with the proposed development of the Massi Lands located northeast of the intersection of Cross Street and George Street, within the Northwest Quadrant of Urban Dunnville. In follow-up to a draft EIS prepared by Beacon Environmental dated August 2020, circulated to the Grand River Conservation Authority (GRCA) by Haldimand County Planning and Development Division, the proponent requested that Sco-Terra inspect the site in conjunction with Beacon Environmental, complete a topographical survey and provide an overview of existing drainage conditions and anthropogenic influences observed.

The subject parcel is designated *Residential* in the Haldimand County Official Plan and included within the catchment area of the Haldimand County Northwest Quadrant ('NWQ') regional stormwater management facility located north of the site. The Dunnville Inn Bed & Breakfast located at 809 George Street separates the Massi property and the NWQ regional SWM facility – refer to Drawing 01 - Existing Conditions Drainage Plan. The property is surrounded by development on four sides as follows:

South: Cross Street and Meritage Landing Residential Development south of Cross Street.

West: George Street and suburban residential development west of George Street.

North: Dunnville Inn Bed & Breakfast and NWQ Regional Stormwater Management Facility.

East: Residential development on Brookfield Boulevard and vacant lands designated Residential.

The George Street east ditch which straddles the west limit of the Massi lands is part of a minor-major conveyance system which outlets to the NWQ stormwater management facility, the first stage of which was constructed in or around 2008. An access to the Massi lands from Cross Street at the southwest corner of the property, extending northeast through the site, was utilized as a haul route for the construction of the NWQ SWM facility. The haul route is evident from review of GRCA 2010 (ON) ortho-imagery, which pre-dates development of the Dunnville Inn Bed & Breakfast. Rutting created by heavy equipment accessing the NWQ SWM facility haul route is evident from walking the site.

Sco-Terra attended the site on September 11, 2020 with Beacon Environmental, to complete a topographical survey, examine existing drainage conditions within and adjacent to the subject property and to evaluate the impacts of historic and more recent adjacent development activity, including development extending into the site in two distinct locations. The Massi lands are understood to have been in agricultural use historically. The presence of furrow drains evident from review of historical ortho-imagery and through site investigation is also an indicator of prior agricultural land use.

Notwithstanding the presence of localized depressions, rutting, furrow drains and the historic placement of ditch spoil along the west limit of the Massi lands, no standing water was observed within the site during Sco-Terra's September 11, 2020 site investigation and topographic survey.

1. Anthropogenic Impacts

South: The Cross Street north roadside ditch adjacent to the south limit of the Massi lands is shallow and heavily vegetated, providing limited depth of outlet and drainage function to the Massi lands – refer to photos 001 and 002. This ditch would be deepened and regraded to outlet to the George Street east ditch (minor-major conveyance channel to NWQ SWM Facility) under proposed development conditions.

West: The George Street east roadside ditch (minor-major conveyance channel to NWQ SWM Facility) is flat and heavily vegetated, with standing water observed during the September 11, 2020 site investigation and topographic survey – refer to photos 003 and 004. The historic placement of ditch excavation or spoil material along the interior top of bank within the Massi lands is evident from visual observation, topographic survey and cross-sectioning. The perimeter ridge along the Massi lands west boundary impedes sheet drainage from the Massi lands to the George Street ditch which functions as a minor-major conveyance channel.

North: Relatively recent development of the Dunnville Inn Bed & Breakfast has resulted in site alteration and extensive fill placement encroaching up to 30 metres into the Massi lands – refer to Drawing 01 and photos 005 to 008 inclusive. Site development activities such as fill placement, the piping and discharge of rooftop drainage from the primary building structure into the Massi lands, sheet runoff from an elongated impervious driveway (pavement and concrete) into the Massi lands and the establishment of a maintained lawn area extending up to 30 metres into the Massi property were identified during the September 11, 2020 site investigation. The extent of fill placement within the Dunnville Inn Bed & Breakfast site precludes northerly sheet drainage from the Massi lands to the NWQ SWM Facility.

East: Prior residential development to the east along Brookfield Boulevard has also resulted in site alteration, fill placement and the establishment of localized maintained lawn area encroaching as much as 15 metres into the Massi lands - refer to Drawing 01 and photos 009 to 011 inclusive. Impacts from prior subdivision development activity such as fill placement and sheet drainage from adjoining residential lots contribute external uncontrolled stormwater runoff into the Massi lands. Rear yard encroachments in the form of maintained lawn area were also identified during the September 11, 2020 site investigation and topographic survey.

In summary, drainage of the Massi lands is influenced and impeded by the anthropogenic impacts arising from adjacent site alterations and constraints observed, including:

(i) shallow, heavily vegetated and poorly drained roadside ditch along the north limit of Cross Street;

(ii) placement of ditch excavation or spoil along the George Street ditch internal top of bank resulting in a ridge along the west property limit;

(iii) development of the Dunnville Inn Bed & Breakfast including substantial fill placement extending 30 metres into the Massi lands and the unauthorized discharge of stormwater into the Massi lands;

(iv) established residential development to the east along Brookfield Boulevard;

(v) a temporary haul route extending from the southwest corner of the site northeast, utilized for construction of the NWQ regional SWM facility, with remnant rutting across the site; and

(vi) successional vegetation including the substantial development of invasive scotch pine.

2. Existing Drainage Conditions

As referenced, the Massi lands are bounded to the south by Cross Street West; to the west by George Street and the north flowing minor-major conveyance channel and culverts (east roadside ditch); to the north by the recently developed Dunnville Inn Bed and Breakfast ('DIB&B') property located at MN 809 George Street; and to the east by established residential development identified as municipal numbers 15, 17, 19 and 21 Brookfield Boulevard, flanked by undeveloped residential lands fronting onto Cross Street.

Based on topographic survey of the Massi property on September 11, 2020, the attached Existing Conditions Drainage Plan – Drawing 01 was prepared to identify existing drainage patterns, influenced by adjacent development activity and site alteration as described above under section 1. The property is divided into four distinct catchments, each draining to a respective corner of the parcel. No standing water was observed within the Massi Lands during the September 11, 2020 survey.

1. The **SW Catchment (No. 100 – 0.37 Ha.)** drains overland to the west property limit (i.e. the George Street ditch). A subtle ridge exists along the top-of-bank, likely the result of spoil material placed during ditch excavation or maintenance. Surface runoff is impeded by the subtle ridge paralleling the George Street ditch, with discharge to the ditch through periodic breaks in the ridge.

2. The **NW Catchment (No. 200 – 1.10 Ha.)** drains to a shallow depression which would be expected to sheet drain to the George Street ditch near the northwest corner of the property. The recently developed Dunnville Inn Bed & Breakfast (DIB&B) property to the north has been built up (at least 0.60m) through fill placement relative to the natural topography of the Massi Lands. The fill placement extends into the Massi lands, precluding surface runoff north to the regional stormwater facility. The DIB&B property maintains a lawn area (approx. 2,000m^2) which extends as much as 30m into the Massi property. The shallow depression receiving storm runoff from the NW Catchment also receives significant external runoff contribution from the DIB&B property, including rooftop runoff directed to the depression via downspout leader piped discharge, and through sheet flow from the abutting paved driveway (external). Discharge of stormwater from this shallow depression to the George Street ditch is inhibited by a ridge along the property line, which is believed to originate from ditch excavation and maintenance (i.e. disposal of ditch spoil), altering the natural topography and impeding surface drainage of the Massi Lands in this location.

3. The **NE Catchment (No. 300 – 0.47 Ha.)** drains into the adjacent property to the north through a shallow depression, believed to discharge overland to the NWQ stormwater management facility located on the next parcel. This catchment appears to receive surface runoff from a portion of the rear yards of the 4 developed lots to the east (MN15, 17, 19 and 21 Brookfield Boulevard). Two lots (15 and 17 Brookfield Boulevard) are also maintaining a lawn area (approx. 300m^2) which extends as much as 15m into the Massi Lands.

4. The **SE Catchment (No. 400 – 0.85 Ha.)** drains overland to the south and east property limits (i.e. the Cross Street ditch and abutting undeveloped residential parcel to the east).

   Shallow finger drains extending to the east property limit were observed during the September 11, 2020 site inspection, believed to be furrow drains from historic agricultural land use (refer also to GRCA 2010 (ON) ortho-imagery). These furrow drains outlet to a shallow swale along the undeveloped southerly portion of the east property line. This line swale is impeded by successional vegetation and the limited depth of outlet available, in that the Cross Street north ditch is shallow and poorly drained in this location – refer to photos 001 and 002.

3. Summary

3.1 The Massi lands are designated *Residential* in the Haldimand County Official Plan.

3.2 The Massi lands are allocated in the NWQ Stormwater Management Facility service area.

3.3 The site is generally flat, contains shallow localized depressions and is poorly drained.

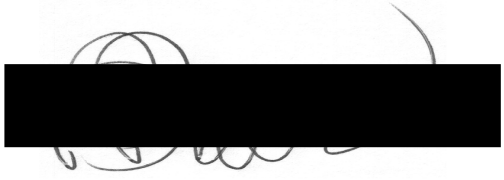
3.4 Drainage is impeded by adjacent site alterations, including:

- 3.4.1 South: shallow, heavily vegetated and poorly drained roadside ditch along the north limit of Cross Street;
- 3.4.2 West: placement of ditch excavation or spoil along the George Street ditch internal top of bank resulting in a ridge along the west property limit;
- 3.4.3 North: development of the Dunnville Inn Bed & Breakfast at 809 George Street including substantial fill placement extending 30 metres into the Massi lands and the unauthorized discharge of rooftop and impervious surface stormwater runoff into the Massi lands;
- 3.4.4 East: established residential development to the east along Brookfield Boulevard;
- 3.4.5 NWQ Stormwater Facility Development: a temporary haul route extending from the southwest corner of the site, northeast through the site, utilized for construction of the NWQ regional SWM facility with remnant rutting across the site; and
- 3.4.6 Scotch Pine Infestation: successional vegetation including substantial development of invasive scotch pine.

3.5 Existing drainage constraints would be corrected under contemplated residential development, through strategic site grading, improvements to and maintenance of existing drainage outlets such as the Cross Street north ditch and the George Street east ditch, to ensure adequate stormwater conveyance to the NWQ regional stormwater management facility in which the subject Massi property is allocated for stormwater servicing.

Should you have any questions or wish to discuss, please contact me at Tel. (519) 434-0278 or by email at rpellerin@scoterra.com.

Respectfully Submitted,



Sco-Terra Consulting Group Limited
Richard J. Pellerin, P.Eng.
Principal

RJP/

cc. Alicia West, Planner, Planning & Development Division, Haldimand County
Archie Merigold, 1108991 Ontario Limited
Dan Westerhof, Beacon Environmental

PHOTO 01

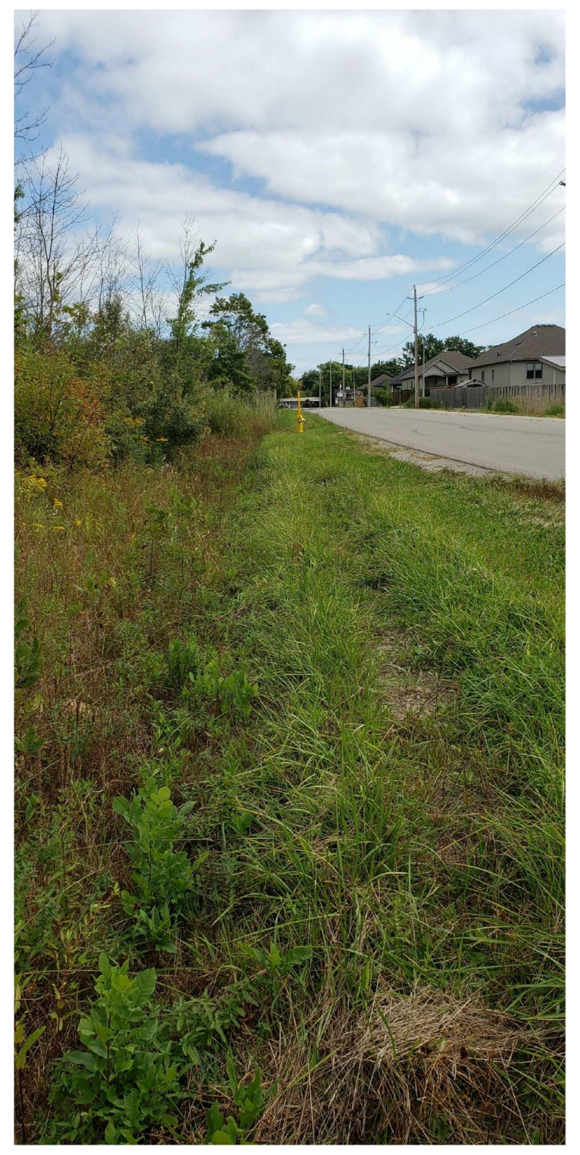


PHOTO 02

PHOTO 03

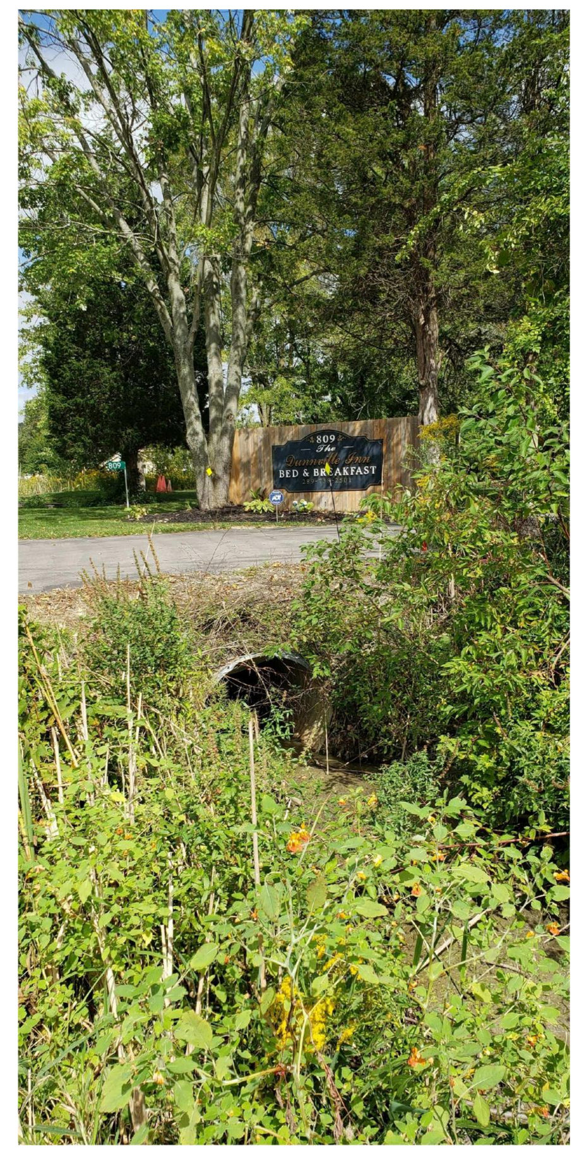


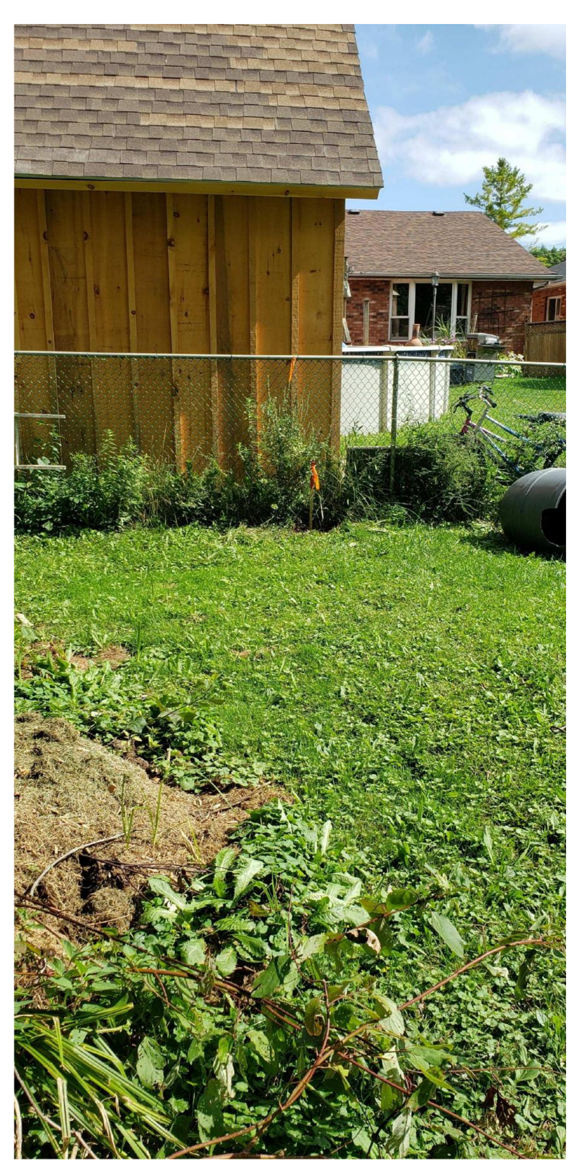
PHOTO 04

PHOTO 05

PHOTO 06

PHOTO 07

PHOTO 08



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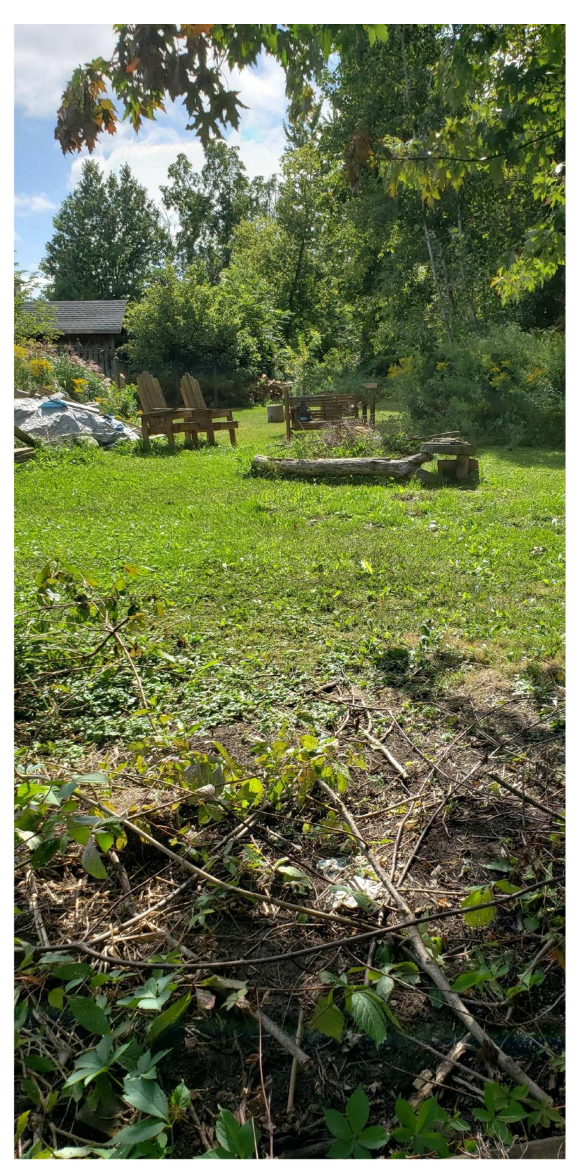

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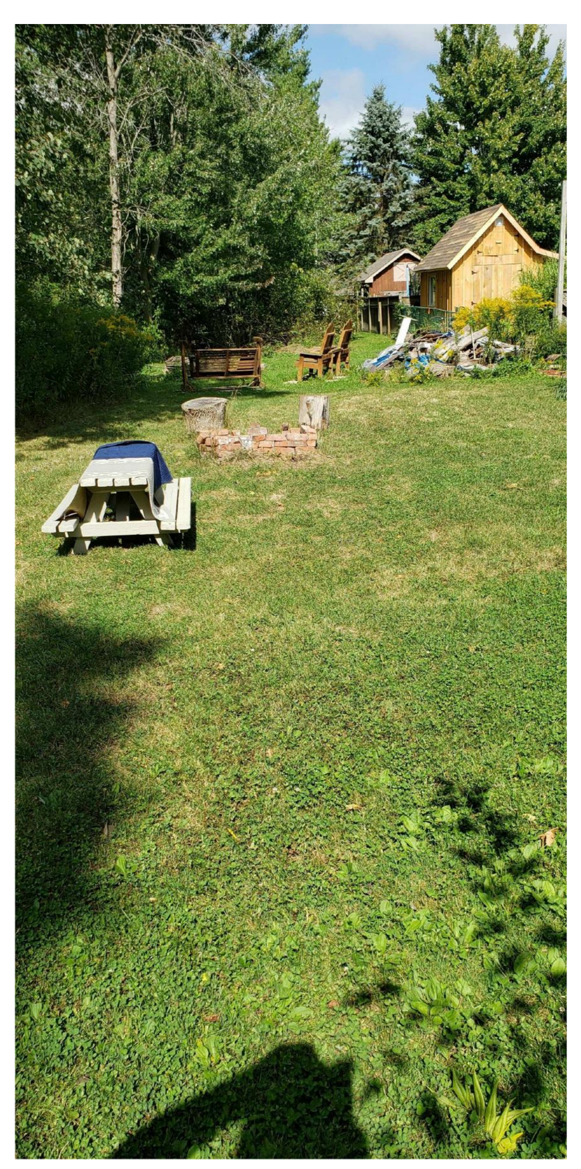
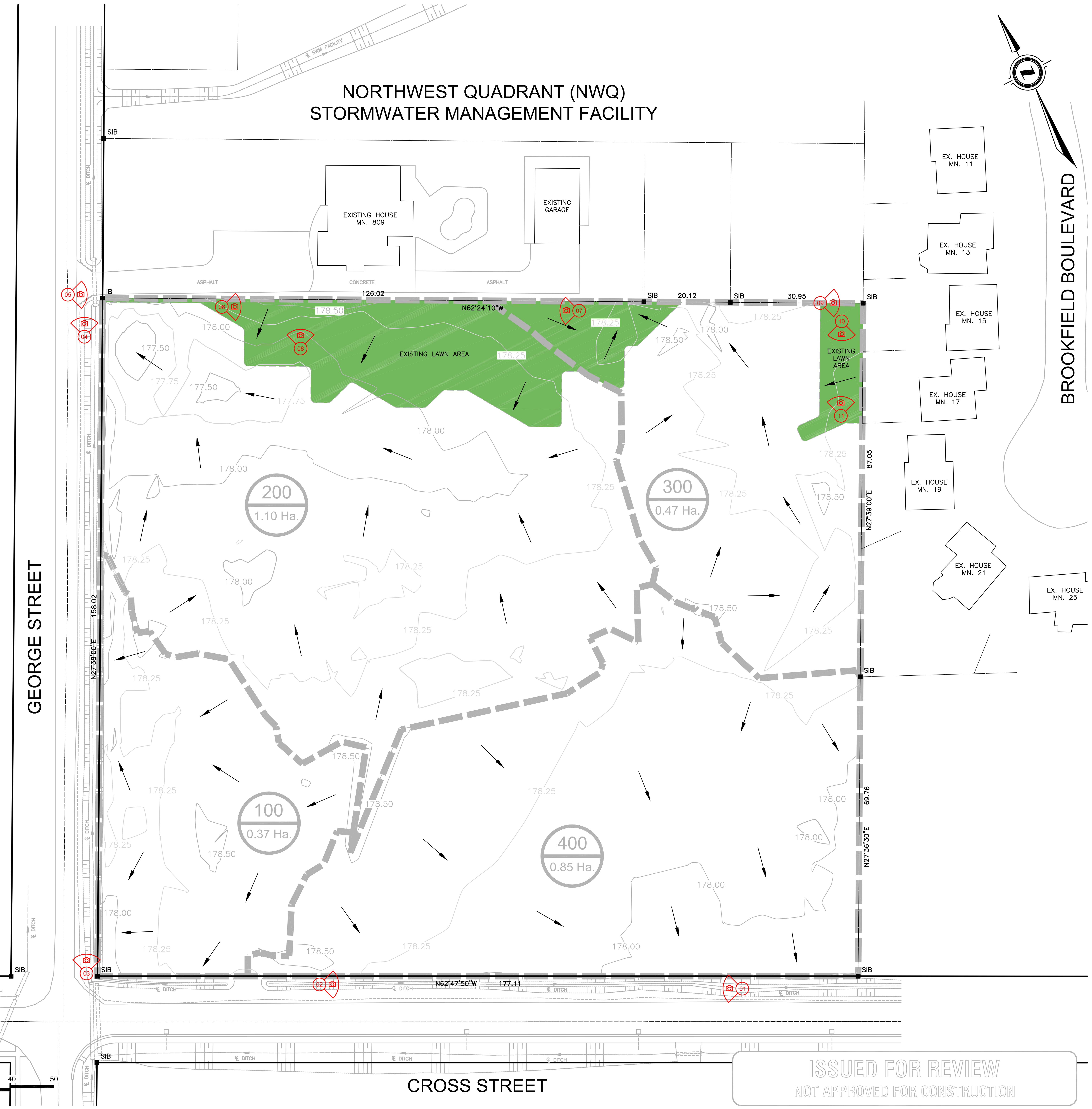


PHOTO 11



0 5 10 20 30 40 50

SCALE: 1:500 m

BENCHMARKS:

No.	REVISIONS TO DRAWING	BY	Y/M/D	APP.

ALL PREVIOUS ISSUES OF THIS DRAWING ARE SUPERSEDED

CLIENT

1108991 ONTARIO LIMITED
O/A MERITAGE LANDING
1333 HIGHWAY # 3 EAST
R.R. #8
DUNNVILLE, ON N1A 2W7

DESIGNED SJP
DRAWN SJP
CHECKED RJP

ENGINEER'S STAMP

ENGINEER'S STAMP

SCO-TERRA
CONSULTING GROUP LIMITED
321 DUFFERIN AVENUE, LONDON, ONTARIO, CANADA N6B 1Z3
Tel: (519) 434-0278 Fax: (519) 434-6820 e-mail: info@scoterra.com

MASSI LANDS DEVELOPMENT
LOT 3, PART OF LOTS 2 and 4, REGISTERED PLAN 1407
GEOGRAPHIC TOWN OF DUNNVILLE, HALDIMAND COUNTY

EXISTING CONDITIONS DRAINAGE PLAN

DATE: 4 OCT. 2020
SCALE: 1:500m
PROJECT No. E-19528
DWG. No. 01

spellerin Oct.04/20-7:33pm E19528 Massi Lands base plan.dwg

BEACON ENVIRONMENTAL

Appendix C

Soil Assessment

Appendix C

Soil Assessment

Photograph 1. Soil Sample 1

Table 1. Soil Sample 1 Details

Substrate Details	Horizon	Soil type	Depth (cm)
	A	Topsoil	0-30
	B	Clay Loam	30+
Depth to mottles	30 cm		
Depth to gley	-		
Effective texture	Clay Loam		
Moisture regime	5 (moist)		

Photograph 2. Soil Sample 2

Table 2. Soil Sample 2 Details

Substrate Details	Horizon	Soil type	Depth (cm)
	A	Topsoil	0-30
	B	Sandy Loam	30+
Depth to mottles	30 cm		
Depth to gley	-		
Effective texture	Sandy Loam		
Moisture regime	5 (moist)		

Photograph 3. Soil Sample 3

Table 3. Soil Sample 3 Details

Substrate Details	Horizon	Soil type	Depth (cm)
	A	Topsoil	0-45
	B	Loamy sand	45+
Depth to mottles	30 cm		
Depth to gley	-		
Effective texture	Loamy Sand		
Moisture regime	5 (moist)		

Photograph 4. Soil Sample 4

Table 4. Soil Sample 4 Details

Substrate Details	**Horizon**	**Soil type**	**Depth (cm)**
	A	Topsoil	0-28
	B	Silty very fine	28+
Depth to mottles	28 cm		
Depth to gley	-		
Effective texture	Silty very fine sand		
Moisture regime	4 (very moist)		

Photograph 5. Soil Sample 5

Table 5. Soil Sample 5 Details

Substrate Details	**Horizon**	**Soil type**	**Depth (cm)**
	A	Topsoil	0-28
	B	Silty very fine sand	28-90
	C	Clay	90+
Depth to mottles	40 cm		
Depth to gley	-		
Effective texture	Silty very fine sand		
Moisture regime	5 (moist)		

Photograph 6. Soil Sample 6

Table 6. Soil Sample 6 Details

	Horizon	Soil type	Depth (cm)
Substrate Details	A	Topsoil	0-25
	B	Silty very fine sand	25-70
	C	Clay	70+
Depth to mottles	40 cm		
Depth to gley	-		
Effective texture	Silty very fine sand		
Moisture regime	5 (moist)		

Photograph 7. Soil Sample 7

Table 7. Soil Sample 7 Details

Substrate Details	**Horizon**	**Soil type**	**Depth (cm)**
	A	Topsoil	0-28
	B	Sandy Loam	28-35
	C	Clay	35+
Depth to mottles	30 cm		
Depth to gley	-		
Effective texture	Sandy Loam		
Moisture regime	5 (moist)		

Photograph 8. Soil Sample 8

Table 8. Soil Sample 8 Details

	Horizon	Soil type	Depth (cm)
Substrate Details	A	Topsoil	0-20
	B	Silty very fine sand	20-60
	C	Clay	60+
Depth to mottles	35 cm		
Depth to gley	-		
Effective texture	Silty very fine sand		
Moisture regime	5 (moist)		

Photograph 9. Soil Sample 9

Table 9. Soil Sample 9 Details

	Horizon	Soil type	Depth (cm)
Substrate Details	A	Topsoil	0-15
	B	Silty very fine sand	26-70
	C	Clay	70+
Depth to mottles	70 cm		
Depth to gley	-		
Effective texture	Silty very fine sand		
Moisture regime	3 (moderately fresh)		

Photograph 10. Soil Sample 10

Table 10. Soil Sample 10 Details

Substrate Details	**Horizon**	**Soil type**	**Depth (cm)**
	A	Topsoil	0-25
	B	Silty very fine sand	25-80
	C	Clay	80+
Depth to mottles	25 cm		
Depth to gley	-		
Effective texture	Silty very fine sand		
Moisture regime	5 (moist)		

Photograph 11. Soil Sample 11

Table 11. Soil Sample 11 Details

	Horizon	Soil type	Depth (cm)
Substrate Details	A	Topsoil	0-30
	B	Clay	30+
Depth to mottles	35 cm		
Depth to gley	-		
Effective texture	Clay		
Moisture regime	5 (moist)		

Photograph 12. Soil Sample 12

Table 12. Soil Sample 12 Details

	Horizon	Soil type	Depth (cm)
Substrate Details	A	Topsoil	0-30
	B	Silty very fine sand	30-69
	C	Clay	60+
Depth to mottles	30 cm		
Depth to gley	-		
Effective texture	Silty very fine sand		
Moisture regime	5 (moist)		

Photograph 13. Soil Sample 13

Table 13. Soil Sample 13 Details

Substrate Details	**Horizon**	**Soil type**	**Depth (cm)**
	A	Topsoil	25
	B	Silty very fine sand	25-50
	C	Clay	50+
Depth to mottles	45 cm		
Depth to gley	-		
Effective texture	Silty very fine sand		
Moisture regime	5 (moist)		

Photograph 14. Soil Sample 14

Table 14. Soil Sample 14 Details

Substrate Details	**Horizon**	**Soil type**	**Depth (cm)**
	A	Topsoil	40
	B	Silty very fine sand	40-90
	C	Clay	90+
Depth to mottles	50 cm		
Depth to gley	-		
Effective texture	Silty very fine sand		
Moisture regime	4 (very fresh)		

Photograph 15. Soil Sample 15

Table 15. Soil Sample 15 Details

Substrate Details	**Horizon**	**Soil type**	**Depth (cm)**
	A	Topsoil	40
	B	Silty very fine sand	40-90
	C	Clay	90+
Depth to mottles	40 cm		
Depth to gley	-		
Effective texture	Silty very fine sand		
Moisture regime	5 (moist)		

Photograph 16. Soil Sample 16

Table 16. Soil Sample 16 Details

Substrate Details	**Horizon**	**Soil type**	**Depth (cm)**
	A	Topsoil	0-40
	B	Silty very fine sand	40-70
	C	Clay	70+
Depth to mottles	45 cm		
Depth to gley	-		
Effective texture	Silty very fine sand		
Moisture regime	5 (moist)		

Photograph 17. Soil Sample 17

Table 17. Soil Sample 17 Details

	Horizon	Soil type	Depth (cm)
Substrate Details	A	Topsoil	0-20
	B	Silty very fine sand	40-70
	C	Clay	70+
Depth to mottles	30 cm		
Depth to gley	-		
Effective texture	Silty very fine sand		
Moisture regime	5 (moist)		

Photograph 18. Soil Sample 18

Table 18. Soil Sample 18 Details

Substrate Details	Horizon	Soil type	Depth (cm)
	A	Topsoil	20
	B	Silty very fine sand	20-80
	C	Clay	80+
Depth to mottles	80 cm		
Depth to gley	-		
Effective texture	Silty very fine sand		
Moisture regime	3 (fresh)		

Photograph 19. Soil Sample 19

Table 19. Soil Sample 19 Details

	Horizon	Soil type	Depth (cm)
Substrate Details	A	Topsoil	40
	B	Sandy Loam	40-85
	C	Clay	85+
Depth to mottles	85 cm		
Depth to gley	-		
Effective texture	Sandy loam		
Moisture regime	3 (fresh)		

Photograph 20. Soil Sample 20

Table 20. Soil Sample 20 Details

Substrate Details	Horizon	Soil type	Depth (cm)
	A	Topsoil	35
	B	Clay	35+
Depth to mottles	35 cm		
Depth to gley	-		
Effective texture	Clay		
Moisture regime	5 (moist)		

Photograph 21. Soil Sample 21

Table 21. Soil Sample 21 Details

Substrate Details	Horizon	Soil type	Depth (cm)
	A	Topsoil	0-50
	B	Clay	50+
Depth to mottles	50 cm		
Depth to gley	-		
Effective texture	Clay		
Moisture regime	4 (moderately moist)		

Photograph 22. Soil Sample 22

Table 22. Soil Sample 22 Details

Substrate Details	Horizon	Soil type	Depth (cm)
	A	Topsoil	0-30
	B	Clay	30+
Depth to mottles	30 cm		
Depth to gley	-		
Effective texture	Clay		
Moisture regime	5 (moist)		

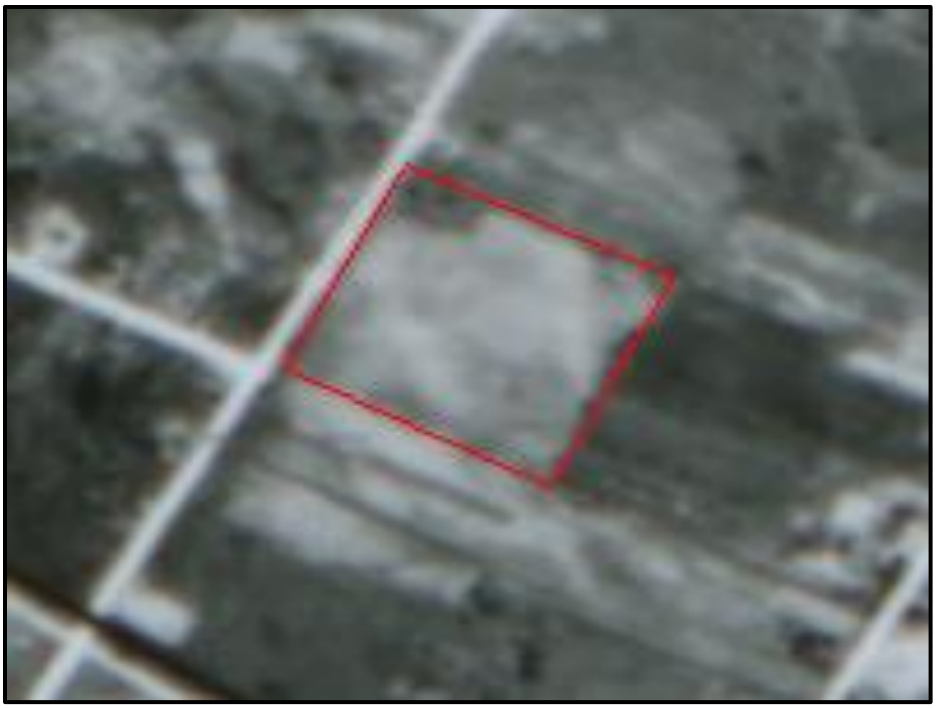
Appendix D

Photograph Log

Appendix D

Photograph Log

Photograph 1. Subject Property 1934 (Google Earth)

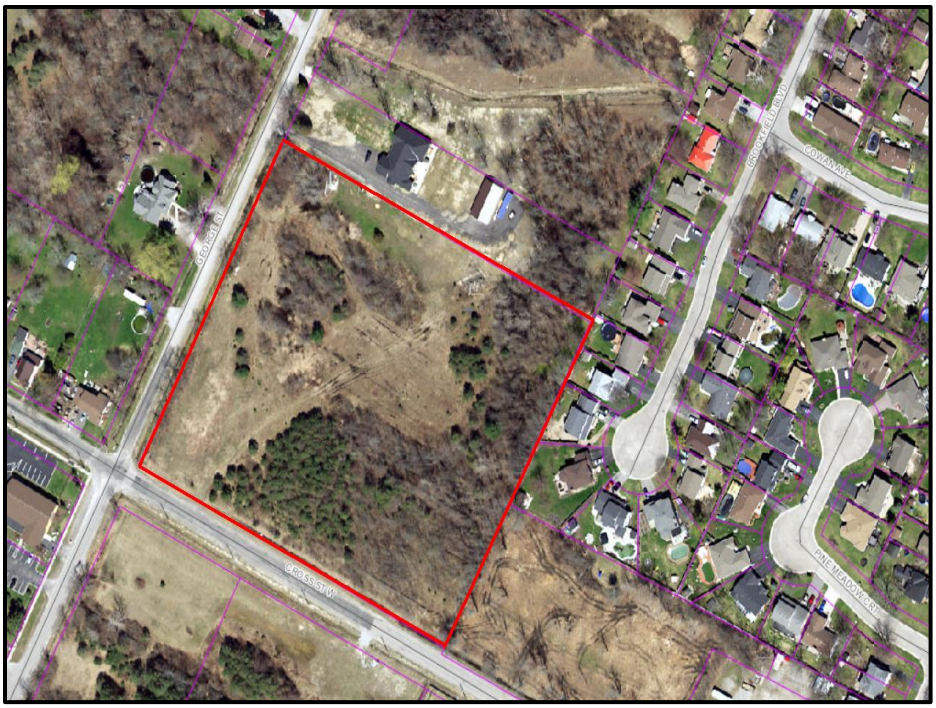


Photograph 2. Subject Property 1954 (University of Toronto Libraries)

Photograph 3. Subject Property 2000 (GRCA on-line mapping)

Photograph 4. Subject Property 2006 (GRCA on-line mapping)

Photograph 5. Subject Property 2007 (Haldimand County on-line mapping)



Photograph 6. Subject Property 2015 (GRCA on-line mapping)

Photograph 7. Dry-Moist Old Field Meadow

Photograph 8. Dry-Moist Old Field Meadow

Photograph 9. Broad-leaved Sedge Mineral Meadow Marsh

Photograph 10. Fresh-Moist Poplar Deciduous Forest

Photograph 11. Fresh-Moist Poplar Deciduous Forest

Photograph 12. Mineral Cultural Thicket