

Appendix A

Natural Heritage Assessment Technical Memos



Technical Memorandum

Date: January 30, 2017

Project: 160321 PEEG

To: Mike Tataryn, Prenix Associated International Limited

From: Dirk Janas and Nicole Charlton, Palmer Environmental

cc Wayne Pinkney, Township of King
Youssef Haroon, Prenix Associated International Limited

Subject: **Existing Environmental Conditions and Wetland Impact and Compensation
Assessment for 15th Sideroad Environmental Assessment, Township of King**

1 Introduction and Background

Prenix Associates International Limited has retained Palmer Environmental Consulting Group (PEEG) to undertake natural environment studies relating to the proposed reconstruction of 15th Sideroad in the Township of King. Specifically, PEEG has completed the characterization of the natural environmental conditions and assessment of impacts to the Nobleton Provincially Significant Wetland (PSW) Complex. The road is 1.3 km in length and extends from 100 m east of the intersection of 10th Concession to Hwy 27 to the east (**Figure 1**). The study area is dominated by agricultural and rural land uses. Natural features adjacent to the road include the PSW swamp, bisected by the existing road, and an ephemeral drainage feature, near Highway 27. Some planted trees, primarily ash (*Fraxinus*)¹ and Norway Maple (*Acer platanoides*) are present along the length of the road.

Proposed works include re-alignment of the road to its centre-line, paving, and replacement of existing culverts. No ditching works are proposed within the PSW. The road footprint will be widened by 3 m on each side to accommodate these upgrades, which will result in some encroachment into the adjacent PSW on both sides of the road. Ongoing discussions with the Toronto Region Conservation Authority (TRCA) have indicated the need for wetland compensation and an Edge Management Plan for the areas of wetland impact.

The purpose of the report is to document and describe existing natural environment conditions along the study area and identify the impacts of the proposed works. The report provides a focused assessment of

¹ Several roadside ash trees observed during June surveys had been removed (cut) by the time of subsequent surveys.

the Nobleton PSW Complex impacts in order to address concerns regarding encroachment into the PSW and inform compensation requirements.

As part of this Technical Memo the following supporting Figures and Attachments have been provided:

- **Figure 1** – Site Location
- **Figure 2.1 to 2.3** – Existing Environmental Conditions
- **Figure 3** – Wetland Impact Assessment and Mapping
- **Map A** – 15th Sideroad Environmental Features (NHIC 2016)
- **Map B** – Nobleton Wetland Complex (NHIC 2016)
- **Map C** – Drainage Feature west of Hwy 27 (Google Maps 2016)
- **Attachment A** – Vascular Plant Species recorded from the Study Area

2 Methods and Approach

2.1 Background Information

Data from various sources was reviewed to assess the general character of the area, identify potential constraints and sensitivities and assess the general connectivity of natural features in the vicinity of the proposed project and within the surrounding landscape.

Background information pertaining to the natural and physical setting of the subject property was gathered and reviewed at the outset of the project. These information sources included:

- Natural Heritage Information Centre (NHIC) and MNRF Biodiversity mapping;
- Nobleton Provincially Significant Wetland Complex Data Summary (NHIC 2016);
- Background agency data request;
- 15th Sideroad Reconstruction design drawings (Prenix Associates International Limited 2016); and,
- Ortho-aerial Photography.

2.2 Field Surveys

Field surveys were conducted along the project limits by PEGG ecologists on June 27, July 14, and November 3, 2016. Data collection focused on assessing vegetation, wildlife and aquatic habitat characteristics and to assess physical terrain characteristics and the ecological features and functions within the study area. All surveys were completed from within the municipal ROW.

The assessment involved:

- Describing the vegetation communities/assemblages based on dominant canopy species, understory, general ground layer composition, relative age and drainage conditions;
- Assessing the sensitivity and significance of vegetation communities to identify any potentially sensitive habitats or species assemblages;

- Noting any specific features or functions, and assessing anticipated wildlife usage and potential habitat functions associated with the vegetation communities;
- Recording all observations and signs of wildlife and habitat opportunities; and
- A headwaters drainage features assessment was conducted on the drainage feature near the east end of the study area.

The vegetation assessment was conducted according to the Ecological Land Classification (ELC) system for Southern Ontario (Lee et al. 1998). All natural and cultural vegetation communities within and adjacent to the study area were classified and mapped. Communities were assessed from the edge of the road right-of-way (ROW). A botanical inventory (including a search for rare plant species) was completed for all areas within the existing ROW and in immediately adjacent areas. Vegetation community micro-mapping was also conducted for areas of the PSW along the road to inform compensation. A vascular plant list for the study area is appended.

The drainage feature was surveyed from 15th Sideroad at the upstream end of the property, to the downstream end along Highway 27. Stream characteristics were documented at two representative sites along the study site. The stream appeared to be dry with no flow. The surveys were completed from within the ROW.

2.3 Agency Consultation

Aurora District Ministry of Natural Resources (MNRF) and the TRCA were contacted to obtain existing terrestrial and aquatic information in the vicinity of the study area. The MNRF Natural Heritage Information Centre database was also queried to gather information on designated natural features, habitats and species of conservation concern in or near the study area (see **Map A**). This included data evaluation information for the Nobleton PSW Complex.

An agency meeting for the 15th Sideroad Reconstruction was held on site on July 14, 2016 to review the roadway and proposed works. The objectives of the meeting included reviewing the potential reconstruction limits along the road in the vicinity of the Provincially Significant Wetland (PSW), discussing the field work program being undertaken by PEEG, review any additional data sources, discuss permitting approvals and project timing.

An agency meeting for the 15th Sideroad Reconstruction was held at the TRCA office on October 24, 2016 to review the natural environment existing conditions along the roadway, and the proposed design and reconstruction. One of the key objectives of the meeting was to review the scope of work for the characterization and assessment of the natural environment specific to the PSW, drainage features and trees. Further discussion related to the design, construction methods, best management practices, submission and permitting process and project timing.

3 Existing Conditions

3.1 Vegetation and Flora

Vegetation Communities

The lands within the study area are primarily agricultural and rural residential. One large wetland and a drainage feature are bisected by the existing road. Field investigations identified five vegetation communities along the study area, consisting of deciduous swamp, thick swamp, shallow marsh meadow marsh and cultural meadow. Vegetation community boundaries are illustrated on **Figure 2.1, 2.2, and 2.3** with detailed descriptions provided below.

Swamp Maple Organic Deciduous Swamp (SWD6-3)

This mid-age swamp community occupies both sides of the road and is dominated by Freeman's Maple (*Acer x freemanii*), with infrequent and unevenly distributed associates of Yellow Birch (*Betula alleghaniensis*), Trembling Aspen (*Populus tremuloides*), and White Cedar (*Thuja occidentalis*). The understory is patchy but generally sparse overall and consists mainly of American Elm (*Ulmus americana*), White Cedar, Yellow Birch, Winterberry (*Ilex verticillata*), willow species (*Salix* spp.), and Red-osier Dogwood (*Cornus sericea* ssp. *sericea*). The ground layer is dense and diverse and dominated by a variety of ferns and sedges. The most abundant species consist of Sensitive Fern (*Onoclea sensibilis*), Bulblet Fern (*Cystopteris bulbifera*), Marsh Fern (*Thelypteris palustris*), Porcupine Sedge (*Carex hystericina*), Cyperus-like Sedge (*Carex pseudocyperus*), Hop Sedge (*Carex lupulina*), Bladder Sedge (*Carex intumescens*), Fowl Mannagrass (*Glyceria striata*), Water Parsnip (*Sium suave*), Mad-dog Skullcap (*Scutellaria lateriflora*) and Marsh Skullcap (*Scutellaria galericulata*), Dwarf Raspberry (*Rubus pubescens*), and Bedstraw species (*Galium* spp). Portions of the swamp north of the road have canopy openings associated with small seasonally pooled organic areas containing marsh herbs such as Beggarticks (*Bidens* sp) and duckweed. South of the road, the character of the swamp appears slightly younger and more disturbed, with a higher proportion of Trembling Aspen observed.

Willow Mineral Thicket Swamp (SWT2-2)

This very small thicket swamp occurs adjacent to a hydro station on the north side of the road near the central PSW. Visibility to the interior was limited, but willow shrubs comprise the dense canopy and Reed Canary Grass (*Phalaris arundinacea*) and Narrow-leaved Cattail dominate the ground layer.

Cattail Mineral Shallow Marsh (MAS2-1)

This community type occurs in isolated patches within the limits of the PSW along the north side of the road and in a more continuous strip along the immediate south edge of the road (**Figure 2**). The dominant species is Narrow-leaved Cattail (*Typha angustifolia*), typically occurring in a tall, dense herbaceous layer with scattered herbs and forbs beneath. The community along the south side of the road is relatively diverse, containing species such as ferns (e.g. Sensitive Fern), Marsh Fern, Porcupine

Sedge, Cyperus-like Sedge, Hop Sedge, Fowl Mannagrass, Orange Jewelweed (*Impatiens capensis*), Blue Flag (*Iris versicolor*), Water Parsnip, Mad-dog Skullcap, and Lesser Duckweed (*Lemna minor*).

Reed-canary Grass Mineral Meadow Marsh (MAM2-2)

This community type occurs in a few locations through the study area (**Figure 2**), as narrow linear communities in association with drainage channels. Detailed characterization and species lists could not be collected due to lack of property access; however, each is comprised of an open herbaceous layer dominated by Reed Canary Grass.

Dry-Moist Old Field Meadow (CUM1-1)

This community type occupies the existing ROW along the length of the road, and occupies a small portion of the embankment adjacent to the PSW. Typical species include Wild Carrot (*Daucus carota*), Tall Goldenrod (*Solidago altissima*), grasses such as Orchard Grass (*Dactylis glomerata*) and Awnless Brome (*Bromus inermis ssp. inermis*), and Panicked Aster (*Symphyotrichum lanceolatum*).

Flora Summary

Floral inventories along were undertaken during each of the site visits and included summer and late fall season documentation. A total of 64 species of vascular plants were recorded, consisting of 49 native species, six non-native species, and nine species identified to genus level. A summary of the documented species is provided in **Attachment A**.

There were nine species identified from within the wetland that have an L3 Ranking under the TRCA species rank for flora of conservation concern within the TRCA region (see **Table 1**). L3 status is identified as “of regional concern; restricted in occurrence and/or requires specific site conditions; generally occurs in naturel rather than cultural areas”.

There are five species list as locally or regionally uncommon or rare within York Region (see **Table 2**). The approximate abundance and distribution of each species is also provided in the summary tables.

Table 1: 15th Sideroad TRCA L-Rank Plant Species

Common Name	Scientific Name	L Rank	Abundance and Distribution
Spikenard	<i>Aralia racemosa ssp. racemosa</i>	L3	Isolated occurrence observed in swamp on south side of road outside impact area.
Hoary Sedge	<i>Carex canescens ssp. canescens</i>	L3	Observed in a few locations in swamp on north side of road beyond the impact area.
Bluebead Lily	<i>Clintonia borealis</i>	L3	Observed in a few locations in swamp on north and south side of road beyond the impact area.

Common Name	Scientific Name	L Rank	Abundance and Distribution
Stiff Marsh Bedstraw	<i>Galium tinctorium</i>	L3	Observed occasionally throughout swamp.
Eastern Manna Grass	<i>Glyceria septentrionalis</i>	L3	Isolated occurrence within ROW.
Oak Fern	<i>Gymnocarpium dryopteris</i>	L3	Throughout swamp on north side of road.
Winterberry	<i>Ilex verticillata</i>	L3	Observed throughout the swamp on north side of road.
Blue Flag	<i>Iris versicolor</i>	L3	Observed within marsh on south side of road.
Cinnamon Fern	<i>Osmunda cinnamomeum</i>	L3	Observed infrequently in swamp on north side of road.

Table 2: 15th Sideroad Rare / Uncommon Plant Species in York Region

Common Name	Scientific Name	Rank	Abundance and Distribution
Spikenard	<i>Aralia racemosa ssp. racemosa</i>	U	Isolated occurrence observed in swamp on south side of road outside impact area.
Hoary Sedge	<i>Carex canescens ssp. canescens</i>	R11	Observed in a few locations in swamp on north side of road beyond the impact area.
Stiff Marsh Bedstraw	<i>Galium tinctorium</i>	R9	Observed occasionally throughout swamp.
Eastern Manna Grass	<i>Glyceria septentrionalis</i>	U	Isolated occurrence within ROW.
Slender Wedge Grass	<i>Sphenopholis intermedia</i>	U	Isolated occurrence at marsh-swamp interface on north side of road.

3.2 Wildlife

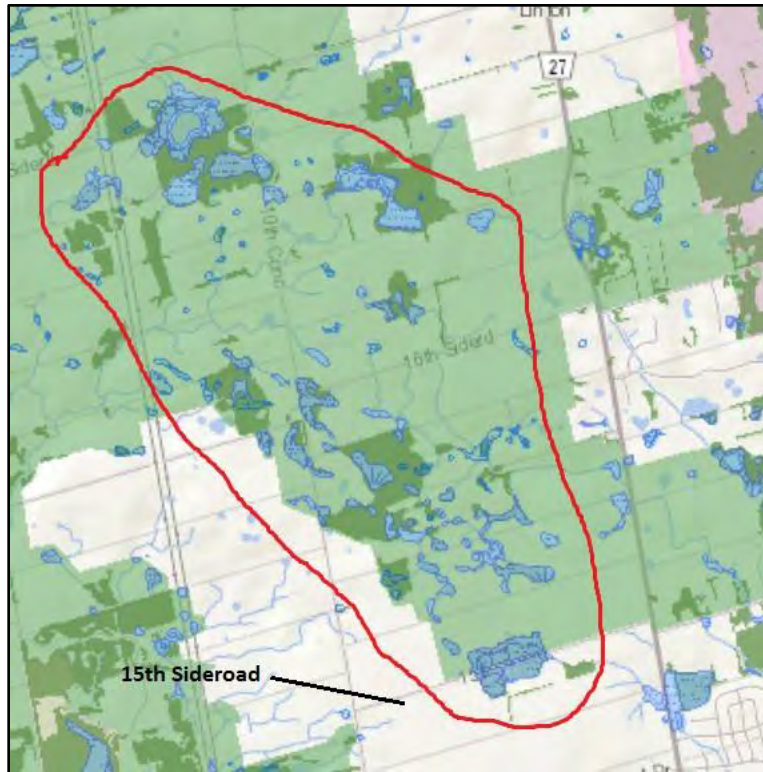
Birds recorded during the field surveys were incidental and included: American Crow (*Corvus brachyrhynchos*), Blue Jay (*Cyanocitta cristata*), American Goldfinch (*Carduelis tristis*), Yellow Warbler (*Dendroica petechia*), Black-capped Chickadee (*Poecile atricapillus*), American Robin (*Turdus migratorius*), Northern Cardinal (*Cardinalis cardinalis*), Common Grackle (*Quiscalus quiscula*), Mourning Dove (*Zenaida macroura*), and Downy Woodpecker (*Picoides pubescens*). Given the agricultural setting of the study area, wildlife habitat opportunities are generally limited along the length of the road for areas outside of the PSW. Wildlife that are adapted to such settings, such as White-tailed Deer and Coyote, may be present in the general area. The remaining natural features in the local landscape are generally

small and isolated within agricultural fields. The PSW likely provides amphibian breeding habitat, and there may be some movement of amphibians and mammals within the PSW adjacent to 15th Sideroad.

3.3 Nobleton Wetland Complex PSW

The Nobleton Wetland Complex is 83 ha in size and made up of three wetland types, swamp, marsh, and fen. The swamp type is the largest proportionally, representing 82.2% of the area of the complex, while marsh represents 16.6% and fen is 1.2%. Soils are 100% organic and there is good winter cover for wildlife (NHIC 2016). The spatial extent of the wetland complex is illustrated on **Map B**. 15th Sideroad bisects the most southerly wetland in the complex, while the remaining wetlands are interspersed within agricultural fields to the northwest and sometimes occur in association with larger woodlands well outside of the study area.

Within the study area, adjacent to 15th Sideroad, marsh (MAS2-1) and swamp (SWD6-3) types are present. The marsh along the south edge of the road occurs under a hydro easement and is subject to repeated maintenance activities such as tree and shrub cutting. Soil samples were taken in 4 locations in the swamp on both sides of the road and organic depths were found to be greater than 120 m. No surface pooling was evident within the swamp on the north side of the road by the late June survey, but the shallow marsh along the south edge of the road had water depths ranging from 5 cm to 50 cm.



Map B – Nobleton Wetland Complex (NHIC2016)

3.4 Drainage Feature

There is a drainage feature located between the wetland complex and Hwy 27 that was assessed at the request of the TRCA using the *Evaluation, Classification and Management of Headwater Drainage Features Guidelines* (TRCA and CVC, 2014). In completing the drainage feature assessment an upstream survey site and downstream survey site was established. Due to limited property access, surveys were completed from the roadway and supplemented by background information and aerial photo interpretation.

Upstream Site

The upstream site was located along 15th Sideroad (see **Photos 1** and **2**). There was no stream bed material present and there was no source of woody material or leaf litter. North of 15th Sideroad, the drainage flow and culvert were dry with no evidence of a channel and the area supported a cornfield. South of 15th Sideroad at the upstream site (see **Photos 3** and **4**) the culvert was located in front of a residential property with mowed grass. The culvert and channel were dry but it is evident the drainage feature could have ephemeral flow south of the road into the farm field adjacent to the house. The



Photo 1. Downstream from north of 15th Sideroad (November 3, 2016).



Photo 2. Downstream from north of 15th Sideroad (November 3, 2016).

channel was also dry during an alternate field visit on June 27, 2016. The drainage feature became evident south of 15th Sideroad in the farm field and was characterized by riparian vegetation consisting of Reed Canary Grass (*Phalaris arundinacea*), Aster sp. (*Aster sp.*), Golden Rod sp. (*Solidago sp.*), and Queen Anne's Lace (*Daucus carota*). A strip of unplowed vegetation on either side of the drainage flow was observed on the farmer's field (Photo 4). The riparian vegetation beside the house consists of Golden Rod sp. (*Solidago sp.*), Reed Canary Grass (*Phalaris arundinacea*), and Aster sp. (*Aster sp.*).



Photo 3. Upstream view from south side 15th Sideroad (November 3, 2016)

Downstream Site

The downstream site was located adjacent to the York Region Water tower on Hwy. 27 on the west side of the road. There is a culvert located along Highway 27 by the York Region Water tower access road (see **Photo 5**). There was no stream bed material present downstream and there was no source of woody material or leaf litter. At the downstream site, the drainage feature flow and the culvert were dry. The riparian vegetation at the north end of the roadside culvert consisted of Reed Canary Grass (*Phalaris arundinacea*), Grass sp. Cattails (*Typha sp.*), Golden Rod sp. (*Solidago sp.*), and European Common Reed (*Phragmites australis*). The riparian vegetation at the south end of the culvert consisted of the same plant species.



Photo 4. Downstream view, south of 15th Sideroad.



Photo 5. Highway 27, along York Region Water Tower access road, north end of the culvert.



Map C. A Google Earth map of the site illustrating the drainage feature at 15th Sideroad. The culverts are represented by the blue arrows and the red arrow represents drainage flow direction through the field.

Connectivity to Downstream Habitat:

The drainage feature is mapped as a watercourse by the Ministry of Natural Resources, however the aquatic assessment indicated that this is a drainage feature. The drainage feature terminated at a roadside ditch along highway 27 adjacent to the water tower. At this location, if there were a flow it would disperse through the culvert and drain into the ditch along the road. There was no stream channel habitat containing stream alluvium, stream bank formation, or evidence of scouring noted. There was no surficial connectivity to downstream aquatic habitat to the Black Duck Wetland Complex.

Summary

The drainage feature does not provide fish habitat at this site, and does not directly connect to any fish-bearing water features immediately downstream. At the upstream site, there is no connection as the flow drains from agricultural lands that are plowed through. At the downstream site, any ephemeral flow would drain into the roadside ditch, although it is unlikely to function as fish habitat event during these periods.

Due to the lack of connectivity to a watercourse downstream and the low potential for supporting fish year-round in this isolated system, it is unlikely this site provides fish habitat.

4 Wetland Impact and Compensation

As shown on **Figure 3**, the road reconstruction requires widening of the current road and ROW to 3 m on each side, resulting in removal of the existing wetland vegetation located within these areas. An existing CSP cross culvert will also be replaced with a larger concrete box culvert. Wetland micro-mapping of vegetation types was conducted along this area in order to inform compensation requirements due to the wetland removals.

Vegetation community descriptions and area calculations of removals per ELC community type as shown on **Figure 3** is provided in **Table 3**.

Table 3. Wetland Impact Summary

ELC community	Description	Removal (ha)
<p>MAS2-1</p> <p><u>Chainage:</u></p> <p>North ROW 0+835 – 0+875 1+030 – 1+055 1+160 – 1+185</p> <p>South ROW 0+840 – 1+010 1+050 – 1+320</p>	<p>Along the northern edge of the road, these marsh communities are small and edged by swamp habitat. No water was present during any field visits. To the south, the marsh is represented by a wide strip running the length of the road, with water depths ranging from 5 to 50 cm. Some shrubs and woody species including Winterberry and willows are present, along with Freeman’s Maple and Trembling Aspen regeneration; however, these species have frequently been cut down by hydro-line maintenance activities. All of the marsh communities are dominated by a tall layer of Narrow-leaved Cattail, with other frequently occurring species including Sensitive Fern, Marsh Fern, Porcupine Sedge, Cyperus-like Sedge, Hop Sedge, Fowl Mannagrass, Orange Jewelweed and Blue Flag.</p> <p>A large patch of Japanese Knotweed (<i>Polygonatum cuspidatum</i>) is present within the ROW at the eastern end of the PSW within the south ROW and will be removed as part of the construction.</p>	<p>Approximately 0.16 ha (1600 m²)</p>
<p>SWD6-3</p> <p><u>Chainage:</u></p> <p>North ROW 0+810 - 0+835 0+875 - 1+030 1+055 -1+160</p>	<p>Mid-age swamp on organic soils on more or less even terrain with relatively infrequent hummocks. Swamp type extends up to the existing road embankment with no intervening ditch.</p> <p>Canopy dominated by Freeman’s Maple, with infrequent associates of Yellow Birch, Trembling Aspen, and White Cedar.</p>	<p>Approximately 0.13 ha (1300 m²)</p>

ELC community	Description	Removal (ha)
1+185 -1+310 South ROW 0+820 – 0+840	Shrub and herb layers consist of willow species, Winterberry, White Cedar, and a variety of ferns and sedges. Trees to be removed are generally within the 10 cm to 30 cm size class range and no cavities suitable for wildlife such as SAR bats were observed.	
Total Wetland Removal Approximately		0.29 ha (2900 m²)

A total of approximately 0.29 ha of the wetland will be removed for the road construction. This represents approximately 2 % of the total wetland size within the immediate study area. The areas to be removed are narrow strips of existing edge habitats, which are already subject to road use effects such as traffic (noise, pollution) and light penetration.

The Edge Management Plan and associated tables provide detailed specifications on restoration works to help mitigate the effects of the road reconstruction and widening. These restoration activities will help the revegetated area returns to original wetland community conditions. The remaining wetland habitat adjacent to the new road will also be protected from the widened road use by the suitable wetland edge restoration. Additionally, improved wildlife passage opportunities will be achieved by installation of a concrete box culvert as replacement for the existing CSP culvert. Depending on the type of culvert installation pea stone gravel or river stone could be added to the culvert to provide natural substrate for use as wildlife passage.

5 Edge Management Plan

The Edge Management Plan (EMP) has been developed based on the assessment and characterization of the areas of wetland to be removed. These consist of a Swamp Maple Organic Deciduous Swamp (SWD6-3) and Cattail Mineral Shallow Marsh (MAS2-1).

The goal of the Edge Management Plan is to mitigate potential negative effects (i.e., edge effects) from the proposed road widening and encroachment into the wetland communities. Potential impact may include loss of plant and wildlife habitat, negative effects to newly exposed trees along the edge (e.g., wind throw, sun scaling), tree root damage, soil compaction and invasive species introduction.

The potential impacts can be reduced through standard BMP during construction such as appropriate timing for vegetation removal, vegetation protection fencing, erosion and sediment control, and environmental inspection. As part of the post-construction mitigation, restoration plantings will be installed through the Edge Management Plan.

Based on the vegetation inventory and characterization of existing wetland communities along the road alignment, planting plans with appropriate native species have been developed that are specific to each of the wetland communities (deciduous swamp and shallow marsh).

Tables A1 to A3 provided the edge management planting details for areas adjacent to deciduous swamp and **Tables B1 to B3** provided the details for areas adjacent to the shallow marsh.

Edge Management Plan Tables for Deciduous Swamp (SWD)

Table A1 - Planting densities

Type	Density / # and size
Tree	3 – 5 m on centre (bare root). A total of 85 to 90 trees to be planted to achieve spacing target. 0.6 m minimum size.
Shrub (S)	0.5 m on centre (live stake and bare root, refer to Table A2), 0.3 – 0.6 m live stake size.
Native Seed Mix	Applied throughout 1.0 m zone – application rate of 8-10 kg/ha. Total seed mix application rate of 16 to 20 kg/ha at 2 inches in depth.
Nursery Seed Mix	Applied throughout 1.0 m zone – application rate of 8-10 kg/ha. Total seed mix application rate of 16 to 20 kg/ha at 2 inches in depth.

Table A2 - Species Recommendations (based on availability)

Trees	Freeman's Maple (<i>Acer x freemanii</i>), Yellow Birch (<i>Betula alleghaniensis</i>)
Shrubs LS = Live Stake BR = Bare Root	Red-osier Dogwood (<i>Cornus sericea</i>) - LS, Cottony Willow (<i>Salix eriocephala</i>) - LS, Winterberry (<i>Ilex verticillata</i>) - BR, Narrow-leaved Meadowsweet (<i>Spiraea alba</i>) - BR
Seed Mix	Swamp Milkweed (<i>Asclepias incarnata</i>), 2% Fowl Bluegrass (<i>Poa palustris</i>), 5% Nodding Beggarticks (<i>Bidens cernua</i>), 2% Orange Jewelweed (<i>Impatiens capensis</i>), 5% Rice Cut-grass (<i>Leersia oryzoides</i>), 5% Blue Flag (<i>Iris versicolor</i>), 5% Marsh Skullcap (<i>Scutellaria galericulata</i>), 2% Spotted Joe-pye Weed (<i>Eupatorium maculatum</i>), 2% Common Boneset (<i>Eupatorium perfoliatum</i>), 5% Common Marsh Bedstraw (<i>Galium palustre</i>), 10% Three-flowered Bedstraw (<i>Galium triflorum</i>), 5% Fowl Mannagrass (<i>Glyceria striata</i>), 15% Field Horsetail (<i>Equisetum arvense</i>), 5% Swamp Aster (<i>Symphotrichum puniceum</i>), 2% Sedge (<i>Carex</i>) species as above, 30%

Table A3– Nursery Species Recommendations

Nursery Cover Seed Mix	Annual Rye Grass (<i>Lolium multiflorum</i>), 50% Oats (<i>Avena sativa</i>), 50%
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Edge Management Plan Tables for Shallow Marsh (MAS2-1)

Table B1 - Planting densities

Type	Density
Native Seed Mix	Applied throughout 2.0 m zone – application rate of 8-10 kg/ha. Total seed mix application rate of 16 to 20 kg/ha at 2 inches in depth.
Nursery Seed Mix	Applied throughout 2.0 m zone – application rate of 8-10 kg/ha. Total seed mix application rate of 16 to 20 kg/ha at 2 inches in depth.

Table B2 – Native Species Recommendations (based on availability)

Native Seed Mix	Swamp Milkweed (<i>Asclepias incarnata</i>), 5% Fowl Bluegrass (<i>Poa palustris</i>), 10% Nodding Beggarticks (<i>Bidens cernua</i>), 15% Orange Jewelweed (<i>Impatiens capensis</i>), 5% Rice Cut-grass (<i>Leersia oryzoides</i>), 10% Blue Flag (<i>Iris versicolor</i>), 5% Marsh Skullcap (<i>Scutellaria galericulata</i>), 5% Spotted Joe-pye Weed (<i>Eupatorium maculatum</i>), 5% Fowl Mannagrass (<i>Glyceria striata</i>), 10% Porcupine Sedge (<i>Carex hystericina</i>), 15% Bearded Sedge (<i>Carex comosa</i>), 15%
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Table B3– Nursery Species Recommendations

Nursery Cover Seed Mix	Annual Rye Grass (<i>Lolium multiflorum</i>), 50% Oats (<i>Avena sativa</i>), 50%
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The preceding details are provided as part of an Edge Management Plan Detail completed by Prenix International in the drawing submission.

6 Mitigation

In order to mitigate the potential short and long-term impacts to the wetland complex the following key mitigation and protection measures are proposed for implementation:

- Install environmental protection and erosion control fencing along the limits of the reconstruction area prior to the commencement of construction (includes prior to vegetation removal).
- Vegetation clearing should occur outside of the breeding bird season (April 15 to July 30) to prevent nest destruction to comply with the *Migratory Birds Convention Act*. Winter season during frozen ground conditions is the ideal period for tree and vegetation removal. In the event that tree removal must occur within the breeding bird window a qualified biologist must screen the area. Clearing in identified nesting areas would be prohibited until such time that it has been confirmed that the young have fledged.
- Prior to removal of the cattail shallow marsh (MAS2), if construction activities occur within the period of April to July, areas with standing water that may support amphibians are to be surveyed by a qualified biologist for the presence of amphibians. If present these are to be relocated to outside of the construction area.
- Prior to construction works, a qualified ecologist will inspect the work area for the presence of regionally rare plant species (specifically Stiff Marsh Bedstraw and Hoary Sedge) that if present will be transplanted to a suitable location outside the impact zone.
- The Edge Management Plan is to be implemented and the plantings installed as outlined on the EMP drawings and details.

7 Conclusions

The findings of our study are the result of a background review, field investigation, agency consultation and an analysis of data using the current scientific understanding of the ecology of the area, as well as the current natural heritage policy requirements. Based on the work completed, we have identified the environmental sensitivities and constraints within the study area, which are described in this Technical Memo and illustrated on **Figures 2a to 2c** and **Figure 3**. Palmer Environmental has identified and mapped the limits of the wetland along the road alignment and has completed a wetland impact assessment to identify the area requirements for compensation that is to be negotiated between the TRCA and Township of King.

Recommendations for mitigation and enhancement have been identified to offset short and long-term impacts. This includes the implementation of an Edge Management Plan. No net negative impacts to the functions of the wetland are expected with implementation of the Edge Management Plan, recommended mitigation measures and compensation requirements.

8 Reference

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Toronto Region Conservation Authority. 2014. TRCA Native Flora and L-Ranks.

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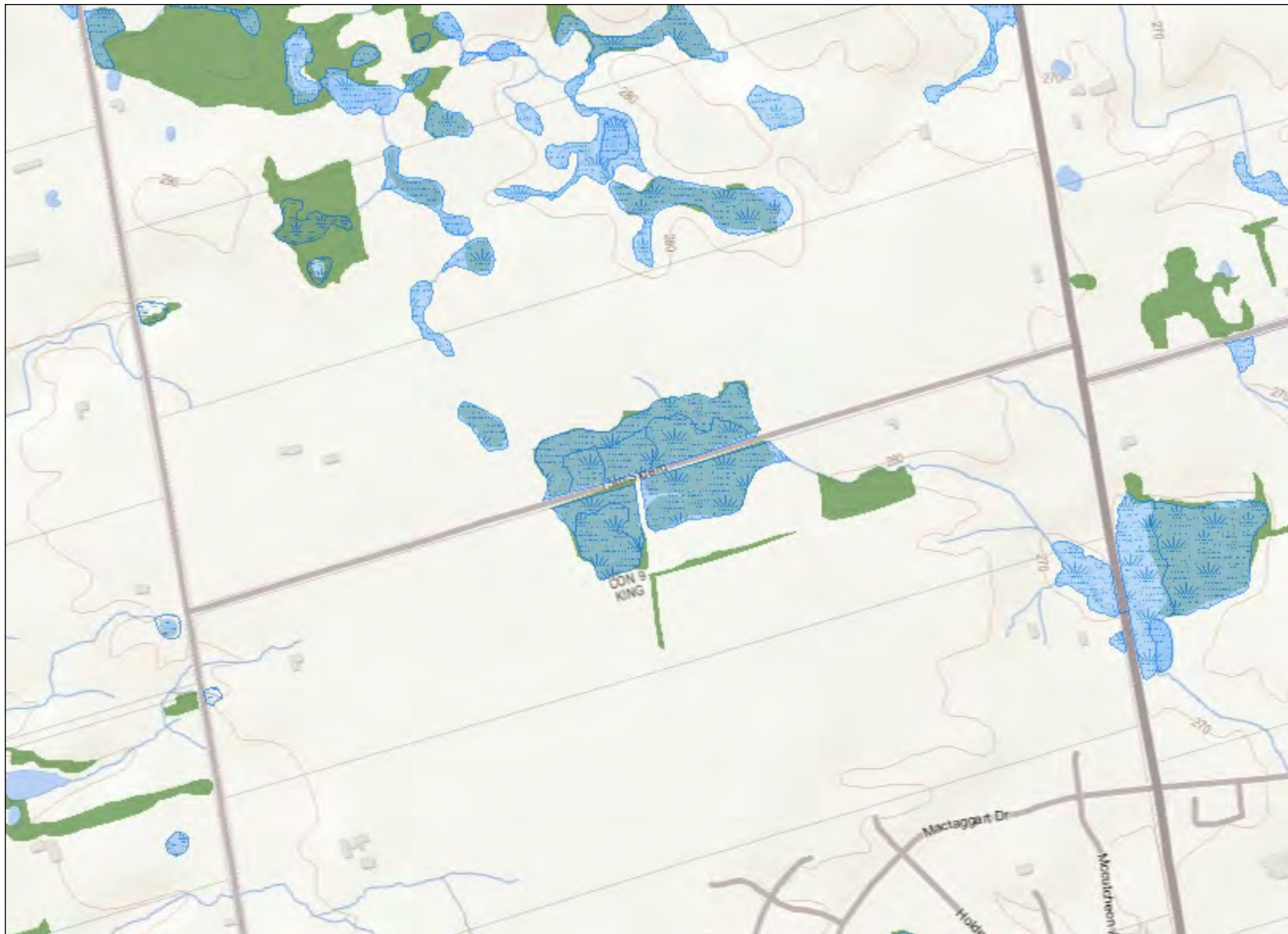
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15th Sideroad Environmental Features

Notes:
TRCA Jurisdiction



Legend

- Assessment Parcel
- Woodland
- Conservation Reserve
- Provincial Park
- Natural Heritage System
- Ecoregion
- Wetland**
 - Provincially Significant Wetland Evaluated
 - Non - Provincially Significant Wetland Evaluated
 - Unevaluated Wetland
- Area of Natural Heritage & Scientific Interest (ANSI)**
 - Provincially Significant Life Science ANSI
 - Provincially Significant Earth Science ANSI
- Greenbelt Plan**
 - Boundary
 - River Valley Connections
- Land Use Designations**
 - Protected Countryside
 - Towns and Villages
 - Hamlets
 - Urban River Valley
 - Specialty Crop Area
- Niagara Escarpment Plan (NEP)**
 - Boundary
 - Parks and Open Space System
 - Land Use Designations**
 - Escarpment Natural Area
 - Escarpment Protection Area
 - Escarpment Rural Area
 - Mineral Resource Extraction Area
 - Escarpment Recreation Area
 - Urban Area
 - Minor Urban Centre
- Oak Ridges Moraine Conservation Plan (ORM)**
 - Boundary
 - Land Use Designations**
 - Natural Core Area
 - Natural Linkage Area
 - Countryside Area
 - Rural Settlement
 - Palgrave Estates Residential Community
 - Settlement Area

0 0.7 km

Projection: Web Mercator



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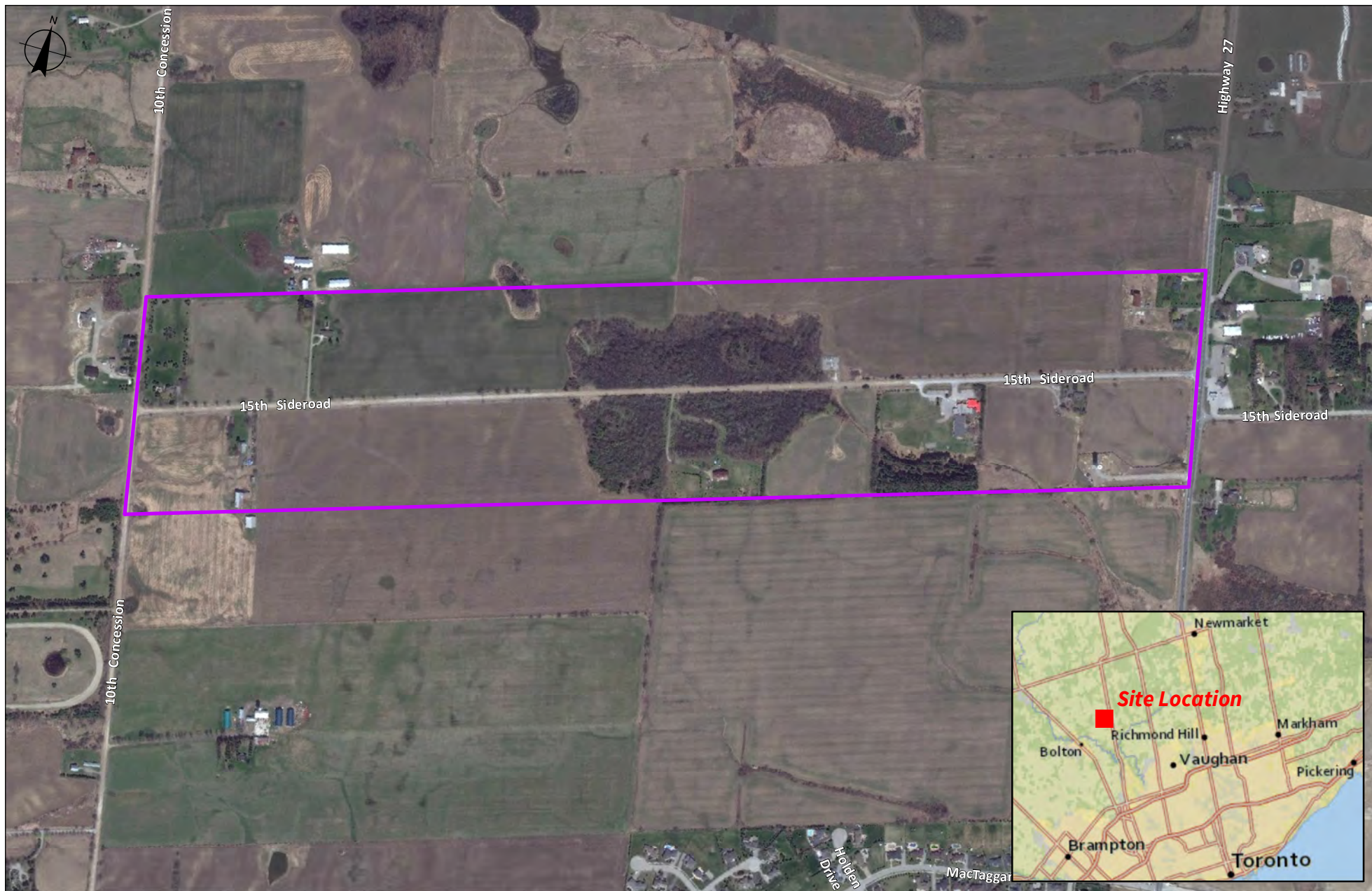


FIGURE 1. Site Location

Project: 15th Sideroad EA	Client: Prenix Associates International
Scale: 1: 10,000	NAD 83 UTM 17 N

LEGEND

Study Area

SOURCE NOTES

1. Base data provided under the Open Government Licence – Ontario.
 2. Imagery Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
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DRAWN: B. Elder	Project: 160321
CHECKED: N. Charlton	2017-01-31





FIGURE 2.1 Existing Conditions

Project: 15th Sideroad EA	Client: Prenix Associates International
Scale: 1: 3,000	NAD 83 UTM 17 N

LEGEND

ELC Community

Vegetation Communities

- MAS2-1** Cattail Mineral Shallow Marsh
- SWD6-3** Swamp Maple Organic Deciduous Swamp
- CUM1-1** Dry-Moist Old Field Meadow
- SWT2-2** Willow Mineral Thicket Swamp
- MAM2-2** Reed-canary Grass Mineral Meadow Marsh

SOURCE NOTES

1. Base data provided under the Open Government Licence – Ontario.
2. Imagery Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

DRAWN: B. Elder	Project: 160321
CHECKED: N. Charlton	2017-01-31



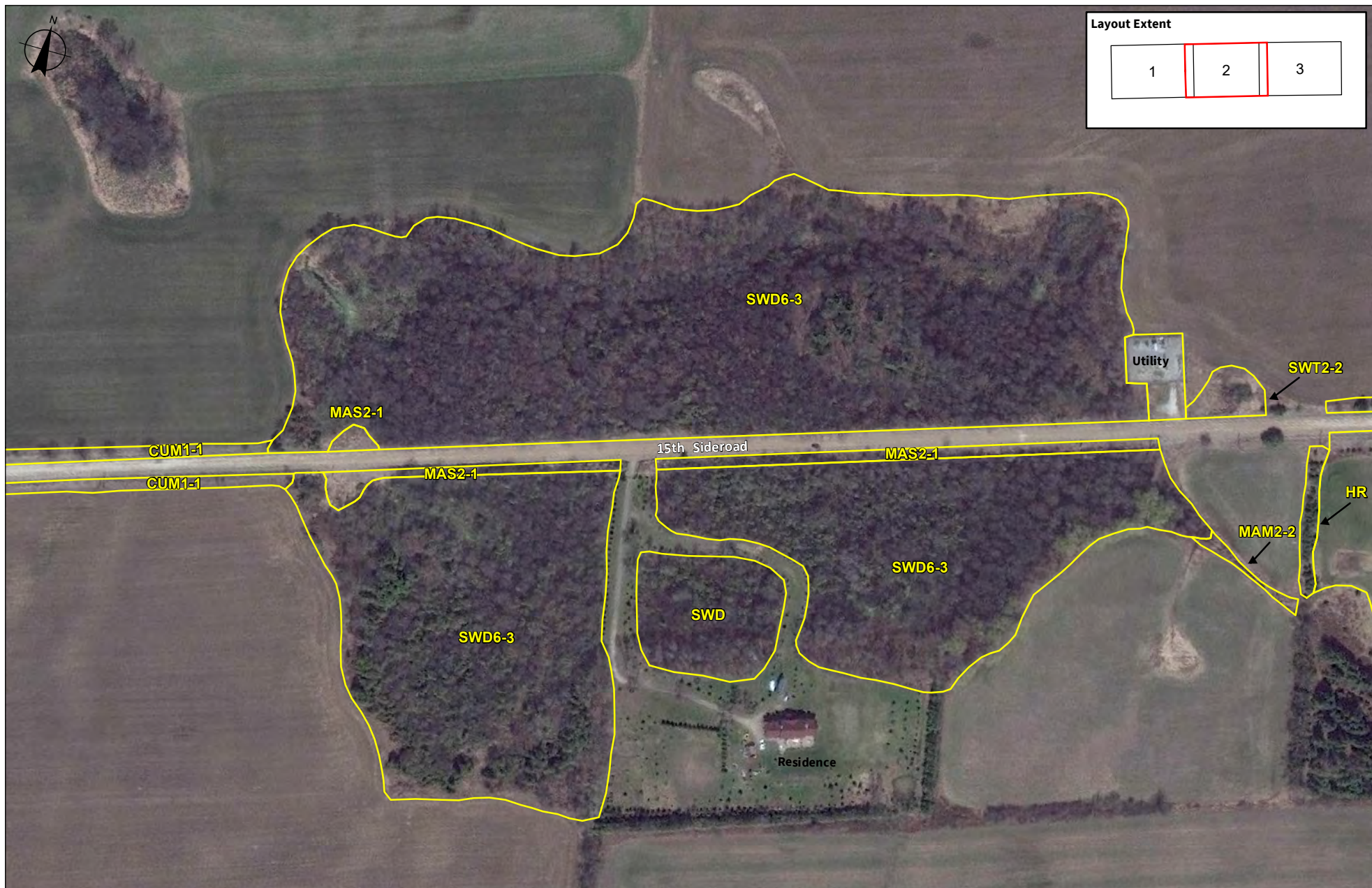


FIGURE 2.2 Existing Conditions

Project: 15th Sideroad EA	Client: Prenix Associates International
Scale: 1: 3,000	NAD 83 UTM 17 N

LEGEND

ELC Community

Vegetation Communities

- MAS2-1** Cattail Mineral Shallow Marsh
- SWD6-3** Swamp Maple Organic Deciduous Swamp
- CUM1-1** Dry-Moist Old Field Meadow
- SWT2-2** Willow Mineral Thicket Swamp
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SOURCE NOTES

1. Base data provided under the Open Government Licence – Ontario.
2. Imagery Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

DRAWN: B. Elder	Project: 160321
CHECKED: N. Charlton	2017-01-31



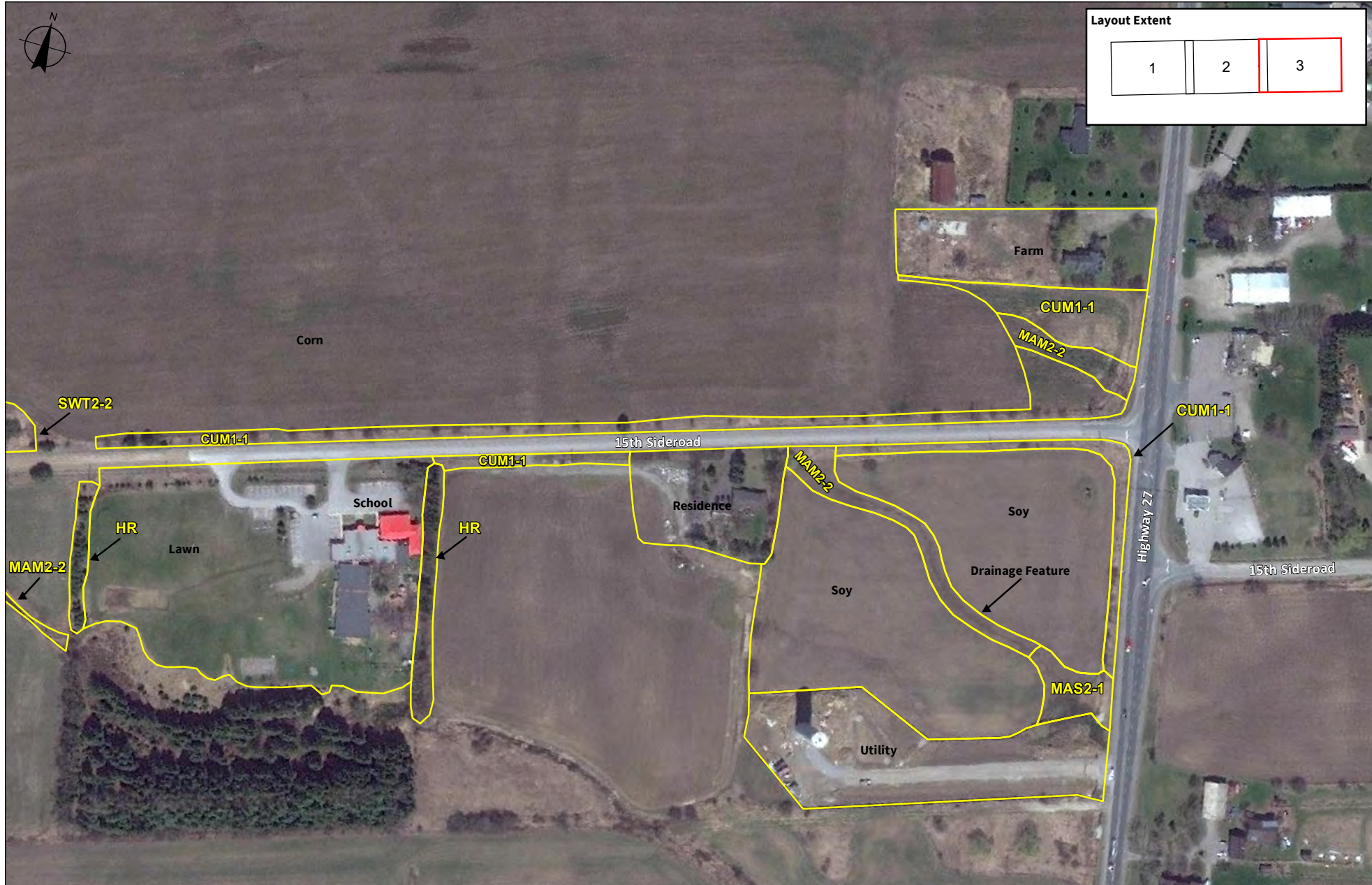


FIGURE 2.3 Existing Conditions

Project: 15th Sideroad EA	Client: Prenix Associates International
Scale: 1: 3,000	NAD 83 UTM 17 N

LEGEND

ELC Community

Vegetation Communities

- MAS2-1** Cattail Mineral Shallow Marsh
- SWD6-3** Swamp Maple Organic Deciduous Swamp
- CUM1-1** Dry-Moist Old Field Meadow
- SWT2-2** Willow Mineral Thicket Swamp
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SOURCE NOTES

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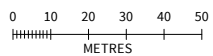
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FIGURE 3. Wetland Impact Micromapping

Project: 15th Sideroad EA Client: Prenix Associates International



Scale: 1: 2,000 NAD 83 UTM 17 N

LEGEND

- ELC Community
- Road Buffer (3 m)

Area Calculations (Within 3 m of Road)

North Side
 SWD6-3: 0.127 Ha
 MAS2-1: 0.024 Ha
South Side
 SWD6-3: 0.005 Ha
 MAS2-1: 0.136 Ha

NOTES

1. Base data provided under the Open Government Licence - Ontario, 2016.
2. Imagery © 2016 Google (Digital Globe, First Base Solutions) - Georeferenced.

DRAWN: B. Elder	Project: 160321
CHECKED: N. Charlton	2017-01-31



ScientificName	CommonName	SRANK	Y	TRCARANKS
Acer X freemanii	Freeman's Maple	S5		L3
Aralia nudicaulis	Wild Sarsaparilla	S5		L5
Aralia racemosa ssp. racemosa	American Spikenard	S5	U	L3
Asclepias incarnata ssp. incarnata	Swamp Milkweed	S5		L4
Symphotrichum lanceolatum var. hesperium	Panicled Aster	S5		
Athyrium filix-femina var. angustum	Lady-fern	S5		L5
Betula alleghaniensis	Yellow Birch	S5		L4
Bidens sp	Beggar's Ticks Species			
Bromus inermis ssp. inermis	Smooth Brome	SE5		L+
Carex sp	Sedge Species			
Carex canescens ssp. canescens	Hoary Sedge	S5	R11	L3
Carex cristatella	Crested Sedge	S5		L5
Carex intumescens	Bladder Sedge	S5		L4
Carex lupulina	Hop Sedge	S5		L3
Carex pseudo-cyperus	Cyperus-like Sedge	S5		L4
Carex stipata	Stalk-grain Sedge	S5		L5
Carex vulpinoidea	Fox Sedge	S5		L5
Cicuta bulbifera	Bulb-bearing Water-hemlock	S5		L3
Clintonia borealis	Blue Bead Lily	S5		L3
Cornus rugosa	Round-leaved Dogwood	S5		L4
Cornus sericea ssp. sericea	Red-osier Dogwood	S5		L5
Dactylis glomerata	Orchard Grass	SE5		L+
Daucus carota	Queen Anne's Lace	SE5		L+
Dryopteris carthusiana	Spinulose Wood Fern	S5		L5
Echinocystis lobata	Wild Mock-cucumber	S5		L5
Epilobium sp	Willow-herb Species			
Equisetum arvense	Field Horsetail	S5		L5
Eupatorium maculatum var. maculatum	Spotted Joe-pye Weed	S5		L5
Eupatorium perfoliatum	Common Boneset	S5		L4
Fraxinus nigra	Black Ash	S5		L4
Galium palustre	Marsh Bedstraw	S5		L5
Galium tinctorium	Stiff Marsh Bedstraw	S5	R9	L3
Galium triflorum	Sweet-scent Bedstraw	S5		L5
Geum sp	Avens Species			
Glyceria septentrionalis	Floating Manna Grass	S4	U	L3
Glyceria striata	Fowl Manna Grass	S5		L5
Gymnocarpium dryopteris	Oak Fern	S5		L3

<i>Ilex aquifolium</i>	English Holly	SR		
<i>Ilex verticillata</i>	Winterberry	S5		L3
<i>Impatiens</i> sp	Jewel-weed Species			
<i>Iris versicolor</i>	Blueflag	S5		L3
<i>Leersia oryzoides</i>	Rice Cutgrass	S5		L5
<i>Lycopus</i> sp	Bugleweed Species			
<i>Lysimachia thyrsiflora</i>	Water Loosestrife	S5		L3
<i>Maianthemum canadense</i>	Wild-lily-of-the-valley	S5		L4
<i>Onoclea sensibilis</i>	Sensitive Fern	S5		L5
<i>Osmunda cinnamomea</i>	Cinnamon Fern	S5		L3
<i>Phalaris arundinacea</i>	Reed Canary Grass	S5		L+?
<i>Poa</i> sp	Bluegrass Species			
<i>Populus tremuloides</i>	Quaking Aspen	S5		L5
<i>Rhamnus cathartica</i>	Buckthorn	SE5		L+
<i>Rubus pubescens</i>	Dwarf Raspberry	S5		L4
<i>Salix</i> sp	Willow Species			
<i>Scutellaria</i> sp	Skullcap Species			
<i>Sium suave</i>	Hemlock Water-parsnip	S5		L4
<i>Solidago canadensis</i> var. <i>scabra</i>	Tall Goldenrod	S5		L5
<i>Solanum dulcamara</i>	Climbing Nightshade	SE5		L+
<i>Sphenopholis intermedia</i>	Slender Wedge Grass	S4S5	U	L3
<i>Spiraea alba</i>	Narrow-leaved Meadow-sweet	S5		L4
<i>Thelypteris palustris</i> var. <i>pubescens</i>	Marsh Fern	S5		L4
<i>Thuja occidentalis</i>	Northern White Cedar	S5		L4
<i>Tussilago farfara</i>	Colt's Foot	SE5		L+
<i>Typha latifolia</i>	Broad-leaf Cattail	S5		L4
<i>Ulmus americana</i>	American Elm	S5		L5

Memorandum

Date: January 13, 2021

Project #: 1705608

To: Steve Fournier and Jody Marks, Ainley Group

From: Jen Paterson and Dirk Janas, Palmer

cc:

Re: **King Township Road Reconstruction Environmental Assessments
10th Concession – Natural Environmental Conditions**

1. Introduction

Palmer was retained by the Ainley Group to assess the natural heritage environmental conditions in support the Class Environmental Assessment for the reconstruction of 8th Concession, 10th Concession and 15th Sideroad, in the Township of King. The 8th and 10th Concession from King Road to 15th Sideroad along with the 15th Sideroad from 10th Concession to Highway 27 will undergo various reconstructions including additional right-of-ways, culvert replacements, road realignment, and road resurfacing.

This Technical Memo will address the proposed reconstruction works for 10th Concession, between King Road and 15th Sideroad, in the Community of Nobleton, Township of King (the project area - **Figure 1**). Separate technical memos have been prepared for 8th Concession and for 15th Sideroad.

This Technical Memo is prepared as part of the road reconstruction design prepared by Ainley and is submitted to support both the Environmental Assessment (EA) process and the Toronto and Region Conservation Authority (TRCA) approval and permitting process. This Technical Memo describes the background review, agency consultation and field investigations undertaken to support the characterization of existing natural environmental conditions through the project area and the identification of potential impacts. As part of this collaborative process, input has been provided to Ainley regarding ecological features and recommended general and site-specific mitigation measures to be advanced as part of the EA and preliminary/detailed design.

The objectives of this study are to inventory and evaluate the existing natural heritage features and ecological functions within the project area, including Ecological Land Classification (ELC) mapping, Species at Risk (SAR) habitat screening and assessment, evaluation of sensitive natural features, and assessment of wildlife habitat. This information has been used as part of the development of the proposed reconstruction design and to provide guidance on the design and mitigation recommendations and implementation.

As part of this Technical Memo, the following supporting Figures and Appendices have been provided:

- **Figure 1** – Project Area Location
- **Figure 2** – Existing Environmental Conditions
- **Figure 3** – Proposed Alignment
- **Figure 4** – Tree Inventory
- **Figure 5** – Tree Removals
- **Appendix A** – Tree Inventory

2. Environmental Policy

2.1 Migratory Birds Convention Act

The *Migratory Birds Convention Act* (MBCA) and Migratory Birds Regulations (MBR) (2014) protect most species of migratory birds and their nests and eggs anywhere they are found in Canada. General prohibitions under the MBCA and MBR protect migratory birds, their nests and eggs and prohibit the deposition of harmful substances in waters / areas frequented by them. The MBR includes an additional prohibition against incidental take, which is the inadvertent harming or destruction of birds, nests or eggs.

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

2.2 Endangered Species Act

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

The protection provisions for species and their habitat within the ESA apply only to those species listed as endangered or threatened on the SARO list. Special Concern species may be afforded protection through policy instruments respecting significant wildlife habitat as defined by the Province or other relevant authority, or other protections contained in Official Plan (OP) policies.

2.3 Provincial Policy Statement

The Provincial Policy Statement (PPS) provides direction to regional and local municipalities regarding planning policies for the protection and management of natural heritage features and resources (OMMAH, 2014). Section 2.1 of the PPS defines eight natural heritage feature (NHF) types and adjacent lands, and provides planning policies for each. Of these NHF, development is not permitted in:

- Significant Coastal Wetlands;
- Significant Wetlands in Ecoregions 5E, 6E and 7E;

- Fish Habitat, except in accordance with provincial and federal requirements; or
- Habitat of species designated as Endangered and Threatened, except in accordance with provincial and federal requirements.

Additionally, unless it can be demonstrated through an EIS that there will be no negative impacts on the natural features or their ecological functions, development and site alteration are also not permitted in:

- Significant Wetlands in the Canadian Shield north of Ecoregions 5E, 6E and 7E;
- Significant Woodlands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Mary's River);
- Significant Valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Mary's River);
- Significant Wildlife Habitat;
- Significant Areas of Natural and Scientific Interest;
- Other Coastal Wetlands in Ecoregions 5E, 6E and 7E; and
- Lands defined as *Adjacent Lands* to all the above natural heritage features.

Each of these natural heritage features is afforded varying levels of protection subject to guidelines, and in some cases, regulations. The project area is located in Ecoregion 6E (Crins, Gray, Uhlig, & Wester, 2009). The NHF definitions are used in this report to guide the identification and protection of ecological elements in the project area.

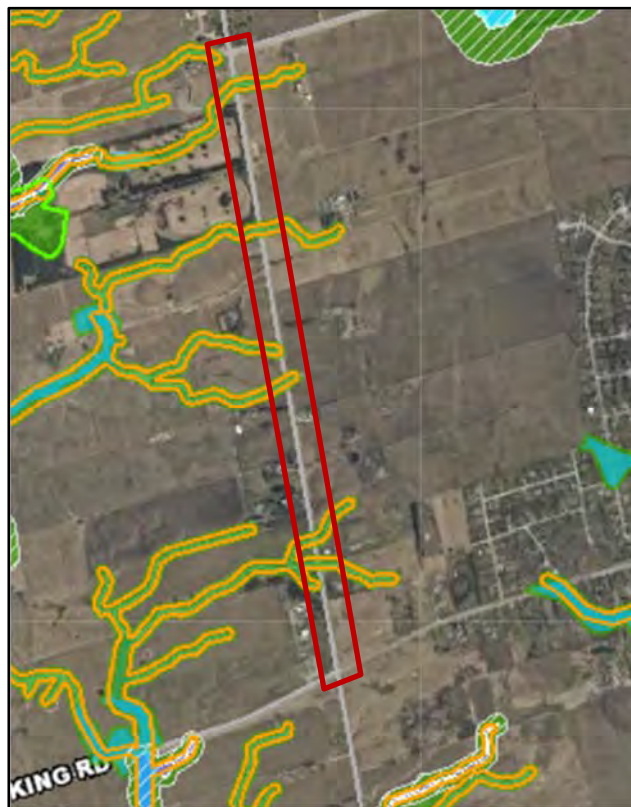
The identification and provisions for the protection of natural features identified in the PPS are for projects such as land development that are subject to approvals under the *Planning Act*. While road reconstruction is subject to the *Environmental Assessment Act*, NHF defined and identified under the PPS are taken into consideration as part of the natural environment assessment.

2.4 TRCA Regulations and Policies

Relevant TRCA regulations and policies include the following:

- Ontario Regulation 166/06 - *Development, Interference with Wetlands and Alterations to Shorelines and Watercourses*. Through this regulation, TRCA regulates activities in natural and hazardous areas (e.g. areas in and near rivers, streams, floodplains, wetlands, and slopes, and shorelines).
- *The Living City Policies* (TRCA, 2014) and associated *Planning and Development Procedural Manual* (TRCA, 2008). These documents present TRCA's planning and permit review practices and technical guidelines. Relevant policies will be discussed in applicable sections of this report.

The project area falls within regulated lands (orange zones on **Map A**). The associated TRCA policies, regulations and permitting will therefore apply and approvals will be required from the agency.



Map A. TRCA Regulation Limits (shown in orange) within the project area – 10th Concession

3. Study Approach

3.1 Background Review

Palmer has reviewed relevant background material to provide a focus to field investigations and ensure compliance with applicable regulations and policy. Background information collection is guided by the *Natural Heritage Information Request Guide* (Ministry of Natural Resources and Forestry, 2018). Current direction from the Ministry of Natural Resources and Forestry (MNRF) and Ministry of Environment, Conservation and Parks (MECP) is to gather natural heritage information and species occurrence records from available sources; the Natural Heritage Information Centre (NHIC) Make-a-Map application being the main course of information and records from the Ministry itself (Ministry of Natural Resources and Forestry, 2019). The information gathered is recommended to be balanced and supplemented by professional ecological review of potential habitats and characteristics of a project site.

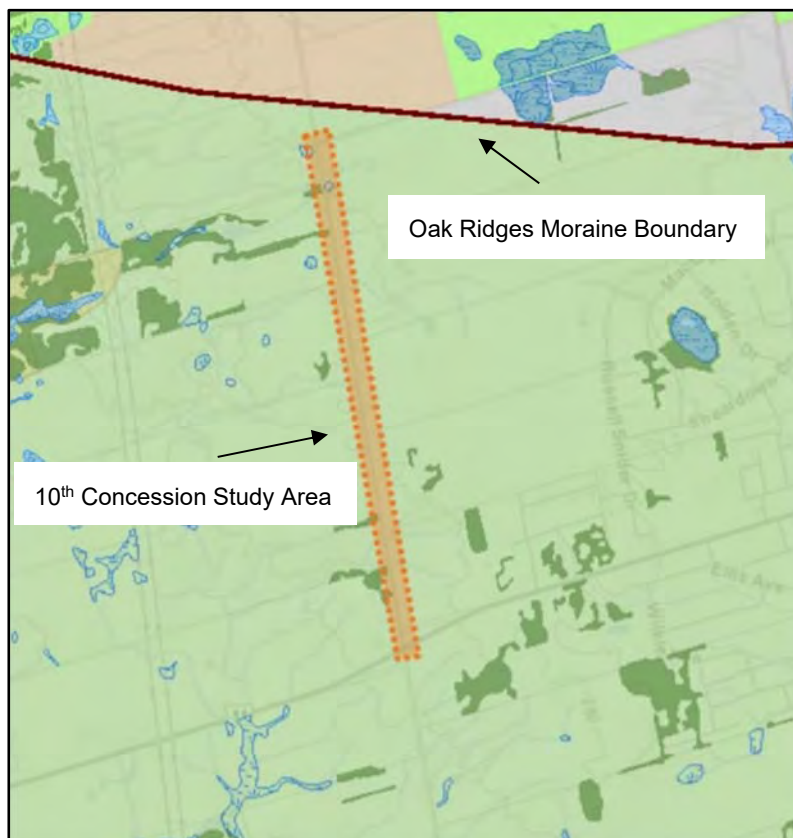
The background review included the collection and review of relevant mapping and reports, including regulations and policies, OPs, and zoning by-laws; and, the NHIC Make-a-Map application for species occurrences and designated area mapping. In addition to these, the following data sources were reviewed for the project:

- **Land Information Ontario (LIO):** certain data types including aquatic resource area (ARA) information is available through these publicly available data layers (Government of Ontario, 2019).
- **Conservation Authorities:** TRCA collects and maintains natural heritage mapping and data, and publish reports, that all provide regional and often site-specific ecological context (TRCA Open Data website).
- **Fisheries and Oceans Canada (DFO):** The DFO maintains mapping of aquatic species at risk (SAR) habitats, including the critical habitat, occupied and contributing habitat ranges of SAR and Special Concern species (Fisheries and Oceans Canada, 2019).
- **Aerial Photography, including historical photos:** Available on-line mapping sources were reviewed to identify current potential habitat types, biogeography and terrain. Historical photos were reviewed to identify past land uses (University of Toronto, 2019).

Following the *Information Request Guide*, MECP advice and direction should be solicited once potential Species at Risk (SAR) requirements associated with the *ESA* are identified via field investigation and analysis.

The Village of Nobleton is situated within the Humber River watershed and specifically within the East Humber River subwatershed. The boundary for the Oak Ridges Moraine (ORM) Conservation Plan occurs immediately to the north of the 10th Concession Study Area. The entire Study Area occurs within the Greenbelt Plan Area (**Map B**).

According to the MNRF NHIC mapping, there are several drainage features along 10th Concession as well as two small unevaluated wetlands and small forested areas (**Map B**). Three provincially Threatened bird species have previously been found in the general area: Eastern Meadowlark (*Sturnella magna*), Bobolink (*Dolichonyx oryzivorus*), and Cerulean Warbler (*Setophaga cerulea*). According to the DFO Aquatic Species at Risk online mapping, there are no critical habitat or distribution data for aquatic species listed under the Species at Risk Act (SARA), within the vicinity of the 10th Concession project area.



Map B. MNRF NHIC Mapping for 10th Concession Study Area (Greenbelt Plan Area shown in light green)

3.2 Agency Consultation

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

- **Pre-consultation Meeting:** A Pre-consultation meeting was attended by Ainley, Palmer and TRCA on July 29, 2019.

3.3 Ecological Surveys

Palmer ecologists undertook field investigations to completed Ecological Land Classification, inventory the flora along the road alignment, conduct a tree inventory, characterize headwater drainage features, assess physical terrain characteristics, and to provide an assessment of the ecological features and functions within the project area. Survey methods are described below.

3.3.1 Vegetation

On June 19 and 21, 2019 vegetation communities were mapped and described following the Ecological Land Classification (ELC) System for Southern Ontario (Lee *et al.* 1998), and the 2008 update tables for anthropogenic cover descriptions. Vegetation community boundaries were delineated on field maps

through the interpretation of recent aerial photographs and TRCA data and refined in the field. Information collected during ELC surveys includes dominant species cover, community structure, as well as level of disturbance, presence of indicator species, and other notable features.

3.3.2 *Tree Inventory*

A tree inventory was completed within and directly adjacent to the area of proposed disturbance along the project area by a Certified Arborist on August 27 and August 28, 2019. The tree inventory was completed for all trees ≥ 10 centimetre (cm) diameter at breast height (DBH). Information collected during the inventory includes species name, tree tag number, DBH, location, a general health assessment and notes on tree trunk and canopy conditions. The attributes of trees located on private properties were estimated whereas trees in the right-of-way were measured. Searches for Butternut (*Juglans cinerea*), an *Endangered* SAR tree, were completed during the tree inventory.

3.3.3 *Wildlife*

Birds

Nest searches were conducted within the wetland areas of the project area on April 3, 2020. Incidental bird observations were also recorded on this day throughout project area limits. Both surveys were completed by scanning through the field with binoculars and documenting any bird calls and songs heard.

Amphibians

Breeding amphibian surveys were conducted on April 30 and May 26, 2020. Surveys were completed in accordance with the *Marsh Monitoring Protocol* (BSC, 2009) to record evidence of breeding amphibians during suitable breeding timing windows and weather conditions. Surveys were completed in the evenings between 20:19 and 21:20 h. Weather conditions were between 11°C and 25°C with few clouds, no precipitation, and light wind.

Species were identified by call, and an abundance code for each species heard calling was assessed by the following the Amphibian Monitoring protocol:

- Code 0: No calls heard.
- Code 1: Calls not overlapping or simultaneous, number of individual frogs can be counted
- Code 2: Calls overlapping or simultaneous, number of individuals can still be distinguished, number of individual frogs cannot be counted, but a reliable estimate of numbers can be made based on location and call voices
- Code 3: Full chorus, calls simultaneous and overlapping, numbers of calling males cannot be reasonably counted or estimated

Incidental Wildlife Observations

Incidental observations of wildlife were recorded during field investigations. Incidental observations included direct sightings and indirect evidence such as nests, tracks, scat, and browse.

3.3.4 Headwater Drainage Features

HDF Assessments were conducted on June 7 and July 23, 2019 and April 3, 2020. Surveys were completed in accordance with the *Evaluation, Classification and Management of Headwater Drainage Features Guideline* (TRCA and CVC, 2014) in order to classify the various characteristics of the features and to identify the functions they provide.

3.3.5 Species at Risk

For the purposes of this memo, SAR include species listed as Endangered, Threatened or Special Concern under Ontario’s ESA. The protection provisions for species and their habitat within the ESA apply only to those species listed as Endangered or Threatened on the SARO list. Special Concern species may be afforded protection through policy instruments respecting significant wildlife habitat as defined by the Province or other relevant authority, or other protections contained in OP policies.

Prior to field work, existing SAR records were queried through correspondence with the MNRF Aurora District and the Natural Heritage Information Centre (NHIC) database.

Habitats within the project area were characterized and screened for evidence of or potential use by these species. A brief discussion of the status, habitat requirements, and assessment of likely presence of SAR species on the subject property is provided in **Section 4.4**.

4. Existing Conditions

4.1 Vegetation Communities

The overall project area is characterized by past disturbance and is dominated by cultural and agricultural influenced vegetation with regenerating shrub and woodland areas, as well as small wetland pockets. In general, the vegetation present is in a relatively disturbed or early successional state, which is reflective of the recent cultural history (e.g., agricultural uses, rural residences) of the project area and the existing uses.

Field investigations and background data review identified six (6) different vegetation communities immediately adjacent to the 10th Concession project area (**Figure 2**). The ELC descriptions of these vegetation communities are provided in **Table 1**.

Table 1. Vegetation Communities identified in the 8th Concession Study Area

Vegetation ELC Community	Vegetation Community Description
MAS2-1 – Cattail Mineral Shallow Marsh Type	Four MAS2-1 vegetation communities were delineated along 10 th Concession: The community (MAS2-1 a), located just north of the intersection of 10 th Concession and King Road is dominated by cattails (<i>Typha</i> sp.), providing greater than 60% cover. MAS2-1 (b) is located along the edge of the agricultural field. This community is dominated by cattails providing 80% cover at a height of 1 to 2 m. The ground layer is dominated by Reed Canary Grass (<i>Phalaris arundinacea</i>), providing 25% cover at a

Vegetation ELC Community	Vegetation Community Description
	<p>height of 0.2 to 0.5 m. This small marsh community is adjacent to an area of tilled grassy hummocks that are subject to mowing. MAS2-1 (c) is located along the edge of the agricultural field in a low depression. The canopy cover on the east side of the community is comprised of scattered Manitoba Maple (<i>Acer negundo</i>) providing 20% cover. This community is dominated by cattails providing 80% cover at a height of 1 to 2 m. A fourth MAS2-1 community occurs on the west side of 10th Concession at 15th Sideroad and contains an area of open water. This community is associated with Headwater Drainage Feature I.</p>
<p>MAS2 – Mineral Shallow Marsh</p>	<p>This narrow, linear community is located in an agricultural field adjacent to a cultural meadow. The canopy is dominated by cattails and Reed Canary Grass, providing greater than 60% cover at a height of 1 to 2 m. The ground layer is dominated by Reed Canary Grass, providing greater than 60% cover at a height of 0.2 to 0.5 m. There is a culvert present along the road in front of this marsh community, associated with Headwater Drainage Feature F.</p>
<p>MAM2-2 – Reed-canary Grass Mineral Meadow Marsh</p>	<p>Four MAM2-2 communities were identified: Two of the MAM2-2 communities are located on the east and west side of 10th Concession, north of King Road and is composed of a patch of Reed Canary Grass, providing 100% cover. These communities are associated with Headwater Drainage Feature A. Another set of narrow linear communities was identified on the east and west side of 10th Concession, associated with Headwater Drainage Feature G. On the east side, this community is composed of a patch of Reed Canary Grass, providing 100% cover. There are also scattered patches of cattails present. The slope decreases on either side of this community to create a low depression with very shallow water in the centre of the community. This community does not extend to the road. On the west side of 10th Concession, a narrow MAM2-2 community was observed within the deciduous forest, surrounding HDF G. This community receives canopy cover from the surrounding deciduous forest, however, only contains herbaceous ground vegetation such as Reed Canary Grass, goldenrod (<i>Solidago</i> sp.) itself.</p>
<p>MAM – Meadow Marsh</p>	<p>This community is located on the east side of 10th Concession, just south of 15th sideroad, associated with Headwater Drainage Feature H. This community is located along the edge of the agricultural field and a drainage area extending to the east that is not plowed. The community is dominated by a patch of Common Reed (<i>Phragmites australis</i>), providing 100% cover and is located adjacent to scattered Reed Canary Grass and old field meadow species, providing 100% cover along the unplowed drainage feature.</p>
<p>SWD2-2: Green Ash Mineral Deciduous Swamp</p>	<p>This small community is located on the east side of 10th Concession and is associated with Headwater Drainage Feature B. The canopy and subcanopy contain Green Ash (<i>Fraxinus pennsylvanica</i>), providing cover of greater than 60%. Understory and ground vegetation comprised of common herbaceous species including sedges (<i>Carex</i> sp.) and Reed Canary Grass.</p>

Vegetation ELC Community	Vegetation Community Description
FOD – Deciduous Forest	<p>This community, located on the east side of 10th Concession, has a canopy cover dominated by Ash (<i>Fraxinus</i> sp.), providing greater than 60%. This community is associated with Headwater Drainage Feature B.</p> <p>A second FOD community, located on the west side of 10th Concession is associated with Headwater Drainage Feature G. This community has a canopy cover dominated by Willow (<i>Salix</i> sp.), providing greater than 60% cover. The subcanopy is dominated by Willow and Sugar Maple (<i>Acer saccharum</i>), providing greater than 60% cover at a height of 2 to 10 m. The understory is composed of Tartarian Honeysuckle (<i>Lonicera tatarica</i>) and Manitoba Maple, providing 25 to 60% cover at a height of 1 to 2 m. The ground layer is composed of Reed Canary Grass, providing 25 to 60% cover at a height of 0.2 to 0.5 m.</p>
FOM –Mixed Forest	<p>Two FOM communities were identified within the study area. One community is located on the west side of 10th Concession and is associated with Headwater Drainage Feature A. This community has a canopy cover dominated by planted Norway Spruce (<i>Picea abies</i>), Eastern White Cedar (<i>Thuja occidentalis</i>) and Black Walnut (<i>Juglans nigra</i>), providing greater than 60% cover. The subcanopy is composed of Eastern White Cedar and Scots Pine (<i>Pinus sylvestris</i>), providing 25 to 60%. The understory is comprised of Eastern White Cedar, Black Walnut and Common Buckthorn (<i>Rhamnus cathartica</i>), providing 25 to 60% cover. The ground layer is composed of Coltsfoot (<i>Tussilago farfara</i>), providing 20 to 25% cover at a height less than 0.2 m.</p> <p>The other FOM community is located on the west side of 10th Concession towards the northern half of the study area. It is comprised of a combination of Norway Maple, Ash, White Pine, English Oak (<i>Quercus robur</i>), Norway Spruce, Silver Maple (<i>Acer saccharinum</i>), and White Oak (<i>Quercus alba</i>) in the canopy and subcanopy, providing over 60% cover at a height of 6 to 20 m.</p>
CUM1 – Mineral Cultural Meadow	<p>This community type is found in various areas of the study area. The community located at the intersection of King Road and 10th Concession contains young Black Locust (<i>Robinia pseudoacacia</i>) and Common Lilac (<i>Syringa vulgaris</i>) along the road edge of 10th Concession.</p>
CUP3-1 – Red Pine Coniferous Plantation	<p>This coniferous plantation community is located on the west side of 10th Concession, south of 15th Sideroad. This community is comprised of Red Pine (<i>Pinus resinosa</i>) and White Pine (<i>Pinus strobus</i>) providing greater than 60% canopy and subcanopy cover. Ground vegetation includes Goldenrod (<i>Solidago</i> sp.), Aster (<i>Symphotrichum</i> sp.), and Smooth Brome (<i>Bromus inermis</i>), providing 10% cover near the plantation edge.</p>
CUP3-2 – White Pine Coniferous Plantation	<p>This community is located on the west side of 10th Concession, north of Headwater Drainage Feature G. The canopy is dominated by White Pine with occasional Norway Maple (<i>Acer platanoides</i>) and Common Apple (<i>Malus pumila</i>) along the plantation edges providing greater than 60% cover at a height of 6 to 15 m.</p>
TAGM5 – Fencerow	<p>A few TAGM5 communities exist throughout the project area on both sides of 10th Concession. Running east-west and located on the east side of 10th Concession in the</p>

Vegetation ELC Community	Vegetation Community Description
	northern half of the study area are two parallel fencerows. The southern one is comprised of Manitoba Maple and Sugar Maple, while the northern one is comprised of Norway Spruce. North of these, another fencerow exists along the driveway adjacent to Headwater Drainage Feature G comprised of Sugar Maple. Further north, on the west side of 10 th Concession, a fencerow containing large Norway Spruce and smaller Red Pine runs east-west.
AG: Agricultural	Located in various areas of the project area, this community type supports agricultural crops and lacks natural woody or herbaceous vegetation and cover.
CVC_1 – Business Sector	Located in the southwest corner of the study area, at the intersection of King Road and 10 th Concession, a tractor company exists within this feature.
CVR_3 – Single Family Residential	This community type exists throughout the project area, on both sides of 10 th Concession. These communities contain single family dwellings and associated driveways, garages, lawns, etc.

4.2 Tree Inventory

The tree inventory comprised 190 individual trees, including 151 (79%) native and 32 (17%) non-native species, as well as 7 (4%) trees identified to the genus level or lower (**Table 2**). There were no Species at Risk (SAR) trees observed, such as Butternut. The full tree inventory is provided in **Appendix A**. The locations of inventoried trees are shown on **Figures 3**.

Table 2. Summary of Tree Inventory Results

Scientific Name	Common Name	Total Count
<i>Malus</i> sp.	Apple	1
<i>Tilia americana</i> *	Basswood	16
<i>Robinia pseudoacacia</i>	Black Locust	1
<i>Juglans nigra</i> *	Black Walnut	2
<i>Picea pungens</i>	Blue Spruce	11
<i>Prunus virginiana</i> *	Chokecherry	1
<i>Juniperus virginiana</i> *	Eastern Red Cedar	1
<i>Thuja occidentalis</i> *	Eastern White Cedar	11
<i>Fraxinus pennsylvanica</i> *	Green Ash	11
<i>Acer</i> sp.	Maple	1
<i>Acer negundo</i> *	Manitoba Maple	9
<i>Acer platanoides</i>	Norway Maple	12
<i>Picea abies</i>	Norway Spruce	4
<i>Betula papyrifera</i> *	Paper Birch	1
<i>Pinus resinosa</i> *	Red Pine	1
<i>Pinus sylvestris</i>	Scots Pine	4

Scientific Name	Common Name	Total Count
<i>Acer saccharinum</i> *	Silver Maple	13
<i>Acer saccharum</i> *	Sugar Maple	35
<i>Populus tremuloides</i> *	Trembling Aspen	2
<i>Fraxinus americana</i> *	White Ash	1
<i>Quercus alba</i> *	White Oak	6
<i>Pinus strobus</i> *	White Pine	23
<i>Picea glauca</i> *	White Spruce	18
<i>Salix</i> sp.	Willow	4
Unknown	Unknown	1
Total		190

* Native Species

4.3 Wildlife

4.3.1 Birds

During the HDF surveys on April 3, 2020, two (2) small bird nests were observed near HDF A in the same shrub near the road (**Figure 2**). Another small nest was observed at the edge of the deciduous forest (FOD) on the western edge of HDF G. A nest was observed within the shallow marsh (MAS2) on the west side of Concession 10 across from HDF F. Several Red-winged Blackbird (*Agelaius phoeniceus*) were observed calling and displaying territorial behaviour near HDF I, suggesting potential nests within the wetland feature (MAS2-1).

4.3.2 Breeding Amphibians

During the HDF surveys on April 3, 2020, multiple Western Chorus Frog (*Pseudacris triseriata*) were heard calling from the pond on the west side of Concession 10 between HDF G and HDF H, approximately 70 m from the outer limit of disturbance (**Figure 2**).

Amphibian breeding surveys were conducted and targeted at potentially suitable wetland areas in the Study Area at eight locations. Six species of amphibians were recorded during the surveys: Spring Peeper (*Pseudacris crucifer*), American Toad (*Anaxyrus americanus*), Gray Treefrog (*Hyla versicolor*), Green Frog (*Rana clamitans*), Wood Frog (*Lithobates sylvaticus*), and Western Chorus Frog (*Pseudacris triseriata*). A summary of the surveys is provided in **Table 3**.

Table 3. Breeding Amphibians

Breeding Amphibian Monitoring Station	April 30	May 26
Weather Conditions	11 ^o C, clear, light breeze, no precipitation	25 ^o C, clear, light breeze, no precipitation
Station 1	Spring Peeper: code 1-2	Gray Treefrog: code 1-1
Station 2	No amphibian calls	No amphibian calls
Station 3	Spring Peeper: code 3 (adjacent)	No amphibian calls

Breeding Amphibian Monitoring Station	April 30	May 26
Station 4	Spring Peeper: code 3 (adjacent)	No amphibian calls
Station 5	Western Chorus Frog: code 1-3 Spring Peeper: code 3 (adjacent)	No amphibian calls
Station 6	Western Chorus Frog: code 2-3 American Toad: code 2-8 Spring Peeper: code 1-2 (adjacent)	Spring Peeper: code 1-2 Spring Peeper: code 3 (adjacent)
Station 7	Western Chorus Frog: code 1-1 Green Frog: code 1-1 Spring Peeper: code 2-7 Wood Frog: code 1-1	Gray Treefrog: code 2-7 Spring Peeper: code 2-6 (adjacent) American Toad: code 1-1 (adjacent) Gray Treefrog: code 1-1 (adjacent)
Station 8	Spring Peeper: code 1-1 Spring Peeper: code 2-4 (adjacent) Western Chorus Frog: code 1-1 (adjacent)	Spring Peeper: code 2-4 American Toad: code 1-1

***Note:**

The calling codes are designated according to the Marsh Monitoring Program Participant’s Handbook for Surveying Amphibians (Bird Studies Canada, 2009).

They are as follows:

- 1 – Individuals of one species can be counted, calls are not overlapping; second number denotes number of individuals.
- 2 – Calls of one species are overlapping; second number denotes estimated number of individuals.
- 3 – Full chorus of one species, calls continuous and overlapping, individuals not distinguishable.

During the first round of surveys, Station 1 was dry with exception to a small amount of standing water by the HDF culvert. This station was completely dry during May surveys. Approximately two Spring Peeper were heard during the first survey round, and one Gray Treefrog was heard during the second round.

During the April survey, Station 2 was dry with exception to a small amount of standing water by the HDF culvert and was observed to be completely dry during the May survey. No amphibian calls were heard during either survey.

No amphibian calls were heard at Station 3 during either of the two survey rounds, although a full chorus of Spring Peeper were heard approximately 200 m west of the station. The Marsh was also observed to be dry throughout both surveys.

Shallow water of approximately 8 cm was observed during both April and May surveys at Station 4. No amphibian calls were heard during either survey from the survey station; however, a full chorus of Spring Peeper were heard >200 m north from the station.

During the April survey, the wetland at Station 5 was observed to be dry with exception of some standing water at the HDF culvert on both the east and west sides of 10th Concession Road. Similar conditions were observed during the May survey, with standing water depths of approximately 5 cm. Three Western Chorus Frog were heard at this station, as well as a full chorus of Spring Peeper at a distance >100 m. No amphibian calls were heard at this station during the May survey.

Standing water of approximately 5 cm was observed in the centre of the marsh at Station 6 during both rounds of surveys. In the April survey, approximately three Western Chorus Frog and eight American Toad were heard at the station. Two Spring Peeper were heard at a distance >100 m. During May surveys, two Spring Peeper were heard at the station, and a full chorus of Spring Peeper were heard at a distance >100 m.

Shallow standing water was present at Station 7 during both rounds of surveys. In April, one Western Chorus Frog, one Green frog, one Wood Frog, and approximately seven Spring Peeper were heard calling. During the May survey, approximately seven Gray Treefrog were heard, as well as an American Toad, Gray Treefrog, and approximately six Spring Peeper at a distance >100 m.

Water was present in the pond near Station 8 during both surveys. During the April survey, one Spring Peeper was heard calling. At >100 m, approximately four Spring Peeper and one Western Chorus Frog were heard. During May surveys, approximately four Spring Peeper and one American Toad were heard at this station.

Western Chorus Frog is an L2 species that is designated as a Regional Species of Concern, as it is considered at risk within the TRCA jurisdiction over the long term (TRCA 2017). The other five species of amphibians recorded from the Study Area are considered common in southern Ontario and have no provincial rarity status.

4.3.3 Incidental Wildlife

Incidental observations of the following wildlife species were recorded during field investigations, recorded in April, May, and October 2020:

- Raccoon (*Procyon lotor*);
- Western Chorus Frog (*Pseudacris triseriata*);
- Bobolink (*Dolichonyx oryzivorus*);
- Eastern Meadowlark (*Sturnella magna*);
- Red-winged Blackbird;
- Mourning Dove (*Zenaida macroura*);
- Song Sparrow (*Melospiza melodia*);
- Northern Flicker (*Colaptes auratus*);
- American Robin (*Turdus migratorius*);
- Canada Goose (*Branta canadensis*);
- Mallard (*Anas platyrhynchos*);
- Black-capped Chickadee (*Parus atricapillus*);
- Spring Peeper;
- Red-bellied Woodpecker (*Melanerpes carolinus*);
- White-breasted Nuthatch (*Sitta carolinensis*);
- Ruby-crowned Kinglet (*Regulus calendula*);
- European Starling (*Sturnus vulgaris*);
- Red-tailed Hawk (*Buteo jamaicensis*), and

- American Crow (*Corvus brachyrhynchos*).

4.3.4 Headwater Drainage Features

Field visits to assess the Headwater Drainage Features (HDF) were conducted on June 7 and July 23, 2019 and on April 3, 2020. Two days prior to the June 7 field visit, there was approximately 11.2 mm of rain in the 72 hours before the assessment (all 11.2 mm on June 5; Pearson International Airport Climate Station) and the month of May had been quite wet with 97.6 mm (May 'normal' for 1981 to 2010 = 74.3 mm). In the 72 hours prior to the July 23 field visit, there was 9.8 mm of rain (July 20 = 4.6 mm, July 22 = 5.2 mm). There was approximately 0.2 mm of rain in the 72 hours before the April 3, 2020 assessment (all on March 31, 2020).

During the June 7, 2019 site visit, the HDFs at Sites A, B, C, D, and G were flowing. At Sites F, H, standing water was present. During the second site visit on July 23, 2019, all sites on **Figure 2** were visited and, all HDFs were observed to be dry. There was water in the pond at Site I but there was a mown path between the pond and the road. During the April 3, 2020 site visit, HDF Sites A, D, F, and H were observed to have standing water. Sites E, and G had trickling to slow-flowing water, and Sites B, and C had a moderate to swift flow observed. Water in the pond at Site I was present, however, no HDF connectivity to Site I was observed.

HDF A

This feature is located approximately 250 m north on 10th Concession from the intersection of King Road and 10th Concession. On April 3, 2020, the feature had a length of approximately 6 m of standing water near the culvert opening but was dry beyond the culvert (**Photo 1**). The culvert was 0.4 m in diameter, and the feature had a wetted width of 0.9 m. The standing water present was 0 – 0.03 m deep. The culvert opening was partially obstructed with garbage and vegetation. Riparian vegetation around this feature was all Reed Canary Grass spanning for 1.5 – 10 m, which also was completely comprised of a vegetated bottom. Some road runoff and transported sediment likely flows into the feature after rain events. This feature was observed to be flowing on June 7, 2019, however observed to be dry on July 23, 2019. This feature likely serves as contributing to downstream fish habitat, providing nutrient input.

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Photo 1: HDF A, facing north (April 3, 2020)

HDF B

This feature is located approximately 60 m north of HDF A, flowing east to west underneath Concession 10. Seepage was observed around the eastern culvert, spanning approximately 3 x 3 m. A moderate flow was observed during the April 3, 2020 visit. The culvert is 0.5 m in diameter and was unobstructed during the April survey. The standing water was 0.03 – 0.06 m deep. The feature bottom was completely vegetated with grass and leaf litter (**Photo 2**). The wetted width was 0.35 – 1.1 m. It is assumed to provide nutrient contribution to downstream fish habitat. Downstream of 10th Concession the flow became a slow trickle to standing water and the depth was about 0.04 m deep with a wetted width of 0.8 m which widens past the at the edge of the right-of-way. Riparian vegetation was comprised completely of Reed Canary Grass both upstream and downstream of the feature. Some woody debris was partially obstructing the west side of the culvert. This feature was observed to be flowing during the June 7, 2019 site visit, however, was dry during the July 23, 2019 site visit.



Photo 2: Western portion of HDF B, facing west (April 3, 2020)

HDF C

This feature is located approximately 80 m north of HDF B (**Photo 3**). In April 2020, a fast to moderate flow was observed upstream of the eastern culvert which is 75 cm in diameter. The wetted width was 0.6 – 0.8 m wide, and depth was 0.05 – 0.07 m deep with a completely vegetated bottom. Riparian vegetation dominated by grasses. There was a partially defined meander to the feature. The culvert was open and unobstructed, with minor road runoff and erosion. The HDF is assumed to provide nutrient contribution to downstream fish habitat. Downstream of the culvert was observed to have slow flow with a depth of about 0.1 m. The feature was 1.0 m wide at the culvert and widened further past the fence on private property. This part of the drainage feature had a sandy bottom with some vegetation growing within. Some defined bank and scour was defined approximately 11 m east of the culvert. Leaf litter and some branches were at the culvert. Right-of-way vegetation was predominantly Reed Canary Grass, and past the fence it was pasture. This feature was observed to be flowing during the June 7, 2019 site visit, however, was dry during the July 23, 2019 site visit.

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Photo 3: HDF C, facing east (April 3, 2020)

HDF D

This feature is located approximately 500 m north from HDF C. The upstream portion of the feature contained pools of very shallow standing water with a depth of 0.01 m at the 0.45 m diameter culvert (**Photo 4**). The width of the feature at this point was 0.6 m. A large open plowed field is east of the culvert and pooling water, containing a pocket of wetland vegetation consisting of Purple Loosestrife (*Lythrum salicaria*). Scour was evident around the culvert, with sediment deposition from the field restricting straight flow of water. The feature had a silty-clay bottom with some gravel from the adjacent roadside and ditch. Riparian vegetation comprised of meadow species with 20% tree cover.

The western side of the culvert had a slow flow with intermittent pools up to 0.03 m depth and width of 0.3 m. Sediment deposition was noted; however, the culvert was not obstructed. Meadow species, such as Reed Canary Grass, comprised the riparian vegetation. This feature was observed to be flowing during the June 7, 2019 site visit, however, was dry during the July 23, 2019 site visit.

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Photo 4: Eastern portion of HDF D, facing east (April 3, 2020)

HDF E

This feature is located approximately 110 m north of HDF D. The 0.50 m diameter culvert is perched, with a plunge pool water depth of 0.2 m, and water depth of up to 0.04 m through the rest of the feature (**Photo 5**). Exposed cables were present around the culvert, and some were damaged. Meadow vegetation with some Reed Canary Grass surrounds this feature, with entrenched banks of 0.6 – 1 m height. The wetted width was 0.2 m, with a bank width of 0.4 m. The feature had a sandy-clay bottom with occasional vegetation. The source of water appeared to be from the ditch on the east side of 10th Concession. This feature was observed to be dry during both June 7 and July 23, 2019 site visits.

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Palmer.



Photo 5: Exposed cables at HDF E, facing northeast (April 3, 2020)

HDF F

This feature, located approximately 400 m north of HDF E, has a 0.5 m diameter culvert with marsh vegetation (Reed Canary Grass and cattail) comprising the riparian vegetation. There is no defined channel through the shallow marsh (MAS2) with the width of the marsh supporting standing water observed to be 0.1 m deep feature (**Photo 6**). A small portion of the culvert was blocked with sediment build-up. This feature drains into the shallow marsh west of Concession 10 containing Reed Canary Grass and Red-osier Dogwood (*Cornus sericea*) where no standing water was present. Standing water was observed at this feature during the June 7, 2019 site visit, however, was dry during the July 23, 2019 site visit.



Photo 6: HDF F, facing east (April 3, 2020)

HDF G

This feature is located approximately 100 m north of HDF F. A slow flow was observed draining into a 1.2 m culvert at the eastern portion of this feature, with a wetted width of 1 m and depth of about 0.06 – 0.09 m. The feature bottom was 100% vegetated and included sand deposits. Riparian meadow vegetation surrounded the feature, which transitioned into mowed lawn beyond 2 m. This feature likely provides contributing fish habitat.

The western portion of this feature is within a thicket with willow trees. A slow flow was observed, flowing through a somewhat defined channel with banks of 0.5 m in height with some scouring observed a few metres downstream. The bottom of the feature was primarily stone and sand with minimal vegetation. The wetted width varied between 0.3 – 1.3 m, with a depth of 0.5 m. This feature was observed to be flowing during the June 7, 2019 site visit, however, was dry during the July 23, 2019 site visit.

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Photo 7: Eastern portion of HDF G, facing east (April 3, 2020)

HDF H

This feature is located 480 m north from HDF G. Water was trickling into the 0.45 m culvert on the eastern portion of this feature. Patches of pooled water were 0.06 – 0.08 m deep and the feature was immediately surrounded by Canary Reed Grass, and further surrounded by agricultural field. The feature bottom was completely vegetated.

The western portion of this feature had a somewhat defined channel, with minor bank erosion and a bank height of 0.1 m. Water was 0.05 – 0.1 m deep, and the feature width was 0.6 – 0.8 m. Rocks surrounded the culvert, and four (4) silt socks were placed several metres apart down the feature. The feature bottom was comprised of a combination of gravel, silty sand, and vegetation. Grass comprised the riparian vegetation around this feature. Standing water was observed at this feature during the June 7, 2019 site visit, however, was dry during the July 23, 2019 site visit.

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Photo 8: Western portion of HDF H, facing west (April 3, 2020)

HDF I

This feature is located at and arising from the shallow marsh pond (MAS2-1) at the intersection of 10th Concession and 15th Sideroad. There is no drainage channel that crosses 10th Concession. The width of the open water shallow marsh is approximately 50 m and likely a few metres deep. Approximately 10 m of cattail riparian vegetation surrounds this marsh, further surrounded by mowed lawn. Furthermore, a berm surrounds the western edge of this feature. Natural heritage online mapping had indicated connection of the HDF to the shallow marsh, however, this connection seems to have been removed. Water was observed in the pond during all site visits on June 7 and July 23, 2019 and April, 2020.



Photo 9: HDF I, facing west (April 3, 2020)

Based on the *Evaluation, Classification and Management of Headwater Drainage Features Guidelines*, no drainage features in the Study Area are permanent streams. Rather, all of the drainage features are considered intermittent or ephemeral. Additional information about the terrestrial features near the HDFs are provided in **Figure 2** and in **Section 4.1**.

4.4 Species at Risk Screening

Information obtained from MNRF's NHIC mapping indicates that there are records of the following provincially regulated SAR in the vicinity of the project area:

- Eastern Meadowlark – Threatened
- Bobolink – Threatened
- Cerulean Warbler – Threatened

In addition, there are four Endangered bat species in Ontario that could possibly inhabit a variety of forest habitats adjacent to the roadway:

- Eastern Small-footed Bat (*Myotis leibii*) – Endangered
- Little Brown Myotis (*Myotis lucifugus*) – Endangered
- Northern Myotis (*Myotis septentrionalis*) – Endangered

A habitat suitability screening is provided for the list of potential SAR in the general vicinity of the proposed road reconstruction works, based on the results of field surveys, habitat screening, and our professional experience (**Table 3**). While not listed as a SAR in Ontario, Chorus Frog is listed federally as Threatened and has been including the summary table.

Table 3. Species at Risk Habitat Screening

Species	Habitat Requirement Overview	Habitat Suitability
Eastern Meadowlark	The Eastern Meadowlark is most common in native grasslands, pastures and savannahs. It also uses a wide variety of other anthropogenic grassland habitats, including hayfields, weedy meadows, young orchards, golf courses and herbaceous fencerows. Eastern Meadowlarks occasionally nest in row crop fields such as corn and soybean, but these crops are considered low-quality habitat. In hayfields, it prefers older sites due to the availability of short, sparse, patchy stands of grass-dominated vegetation.	Potential – old field meadow, pasture fields. Recorded approximately 4 km from the 10 th Concession project area.
Bobolink	Bobolink occur and nest mainly in hayfields with the spread of agriculture in its range. Microhabitat requirements include moderate litter depth, high grass-to-legume ratios, and a high proportion of forb cover (e.g., clover). Birds avoid nesting in areas with dense shrub cover and deep litter layer (> 1-2 cm).	Potential – pasture fields. Recorded approximately 4 km from the 10 th Concession project area.
Cerulean Warbler	Cerulean Warblers spend their summers (breeding season) in mature, deciduous forests with large, tall trees and an open under storey.	No habitat – requires large, mature forested areas
Western Chorus Frog	The Great Lakes/St. Lawrence – Canadian Shield population of the western chorus frog is federally listed as threatened by COSEWIC. This small frog is primarily a lowland terrestrial species that requires access to terrestrial and aquatic habitats in close proximity to one another. Relying on marshes and wooded wetlands adjacent to forested habitats, this species also requires isolated, predator free pools for breeding. Temporary pools, such as vernal pools in wooded areas, are preferred. This species hibernates terrestrially in a variety of environs, including leaf litter, wood debris, and vacant animal burrows.	Recorded calling from pond on the west side of 10 th Concession (approximately 75 m from limit of disturbance)
Eastern Small-footed Bat (<i>Myotis leibii</i>)	Maternity Roosts: primarily under loose rocks on exposed rock outcrops, crevices and cliffs, and occasionally in buildings, under bridges and highway overpasses and under tree bark (MNRF, 2019a).	Potential – forested areas
Little Brown Myotis (<i>Myotis lucifugus</i>)	Maternal Roosts: Often associated with buildings (attics, barns etc.). Occasionally found in trees (25-44 cm in diameter at breast height [DBH]) (MNRF, 2019b).	Potential – forested areas

Species	Habitat Requirement Overview	Habitat Suitability
Northern Myotis (<i>Myotis septentrionalis</i>)	Maternity Roosts: Often associated with cavities of large diameter trees (25-44 cm DBH). Occasionally found in structures (attics, barns etc.) (MNRF, 2019c).	Potential – forested areas

Of the above listed species that have potential suitable habitat in the general project area, none of the listed provincially listed species were recorded during the field surveys and opportunistic (incidental) observations within the 10th Concession project area. Eastern Meadowlark and Bobolink were heard calling approximately 4 km from the project area limits. The federally list SAR Chorus Frog was recorded adjacent to the road alignment. Appropriate mitigation measures where needed have been identified for the protection of these species and their habitat.

5. Description of Road Reconstruction

Full road reconstruction to Township Standard with two 3.5 metre paved lanes and 1 metre shoulders is proposed for 10th Concession. The proposed works will provide improved structural adequacy of by applying Township minimum pavement structure of 400 mm Granular B, 150 mm Granular A, 60 mm base asphalt and 50 mm surface asphalt. Reconstruction will reduce the crests of the knolls and reduce the valleys along centerline of road to improve sightlines along the roadway and at driveways. To accommodate the cuts and fills associated with the road improvements it is proposed to increase the right-of-way from 20 metre to 26 metre width. It is proposed that the 6 metre widening be taken along the east side of the road.

6. Impact Assessment

6.1 Vegetation

The proposed roadway improvements are accommodated predominately within the existing road right-of-way limits thereby minimizing potential impacts to vegetation communities (**Figure 4**). The proposed works may result in minor encroachment into the edge of forest and wetland (marsh) communities, which includes the removal of individual edge trees. Potential impacts to the function of these communities are not expected. For wetland communities loss of edge areas and potential additional impacts associated with sedimentation which are the predominant concern and therefore erosion and sediment control will be necessary.

6.1.1 Tree Removals

Based on the current proposed design limits, 108 trees may require removal to accommodate the road improvement works (**Table 4, Figure 5**). This includes 79 (73%) native species and 23 (21%) non-native tree species, as well as 6 (6%) trees identified to the genus level. The majority of these trees are located in public lands along the municipal right of way, while some occur on private lands and were determined to have critical root zones that encroach into the proposed construction limits. Subject to inspection by an arborist during construction, some of these trees may be retainable, particularly some, if not all trees within Tree Groups 1, 2, and 6. Impacts to adjacent retained trees may also be possible, in the form of mechanical trunk damage and root compression by heavy machinery, and branch damage from adjacent works.

Table 4. Trees Proposed to be Removed

Scientific Name	Common Name	Total Count
<i>Malus</i> sp.	Apple	1
<i>Juglans nigra</i> *	Black Walnut	1
<i>Picea pungens</i>	Blue Spruce	5
<i>Juniperus virginiana</i> *	Eastern Red Cedar	1
<i>Thuja occidentalis</i> *	Eastern White Cedar	11
<i>Acer</i> sp.	Maple	1
<i>Acer negundo</i> *	Manitoba Maple	8
<i>Acer platanoides</i>	Norway Maple	8
<i>Picea abies</i>	Norway Spruce	3
<i>Betula papyrifera</i> *	Paper Birch	1
<i>Pinus sylvestris</i>	Scots Pine	3
<i>Acer saccharinum</i> *	Silver Maple	9
<i>Acer saccharum</i> *	Sugar Maple	17
<i>Picea glauca</i> *	White Spruce	17
<i>Salix</i> sp.	Willow	2
Unknown	Unknown	1
<u>TG1: (Potentially retainable)</u>		
<i>Fraxinus pennsylvanica</i> *	Green Ash	6
<i>Picea abies</i>	Norway Spruce	1
<u>TG2: (Potentially retainable)</u>		
<i>Picea pungens</i>	Blue Spruce	3
<i>Fraxinus pennsylvanica</i> *	Green Ash	5
<i>Acer saccharum</i> *	Sugar Maple	1
<u>TG6: (Potentially retainable)</u>		
<i>Acer saccharum</i> *	Sugar Maple	2
<i>Salix</i> sp.	Willow	1
Total		108

* Native Species

6.1.1.1 Tree Removals within TRCA Regulated Area Only

Of the total 108 trees that may require removal to accommodate the proposed road design, included in **Table 4**, 48 of those inventoried trees are proposed to be removed within TRCA Regulated Area (**Table 5**, **Figure 5**). This includes 33 (69%) native species and 11 (23%) non-native tree species, as well as 4 (8%) trees identified to the genus level. Tree Group 1 and Tree Group 2 are partially within TRCA Regulated Area, thus a portion of the tree groups have been included in **Table 5**.

Table 5. Trees Proposed to be Removed with TRCA Regulated Area

Tree ID	Scientific Name	Common Name	Effective DBH (cm)	Count
1428	<i>Acer saccharum</i> *	Sugar Maple	54	1
1434	<i>Acer saccharinum</i> *	Silver Maple	46	1
1435	<i>Acer saccharinum</i> *	Silver Maple	48	1
1436	<i>Acer saccharinum</i> *	Silver Maple	76	1
1437	<i>Acer saccharinum</i> *	Silver Maple	38	1
1438	<i>Acer saccharinum</i> *	Silver Maple	48	1
1439	<i>Acer saccharinum</i> *	Silver Maple	74	1
1440	<i>Picea glauca</i> *	White Spruce	32	1
1441	<i>Picea glauca</i> *	White Spruce	26	1
1442	<i>Picea glauca</i> *	White Spruce	30	1
1443	<i>Picea glauca</i> *	White Spruce	34	1
1448	<i>Acer platanoides</i>	Norway Maple	41	1
1449	<i>Acer platanoides</i>	Norway Maple	40	1
1450	<i>Acer platanoides</i>	Norway Maple	40	1
1451	<i>Acer negundo</i> *	Manitoba Maple	37	1
3	<i>Acer saccharum</i> *	Sugar Maple	47	1
4	<i>Salix</i> sp.	Willow species	69	1
4	<i>Salix</i> sp.	Willow species	44	1
5	<i>Acer saccharum</i> *	Sugar Maple	74	1
5	<i>Acer saccharum</i> *	Sugar Maple	86	1
6	<i>Juniperus virginiana</i> *	Eastern Red Cedar	22	1
6	<i>Acer negundo</i> *	Manitoba Maple	28	1
6	<i>Acer negundo</i> *	Manitoba Maple	21	1
6	<i>Acer negundo</i> *	Manitoba Maple	35	1
6	<i>Acer saccharum</i> *	Sugar Maple	85	1
6	<i>Acer saccharum</i> *	Sugar Maple	60	1
7	<i>Picea glauca</i> *	White Spruce	25	1
7	<i>Picea glauca</i> *	White Spruce	25	1
7	<i>Picea glauca</i> *	White Spruce	25	1
7	<i>Acer platanoides</i>	Norway Maple	30	1
AA	<i>Acer platanoides</i>	Norway Maple	45	1
AB	<i>Acer platanoides</i>	Norway Maple	30	1
AE	<i>Acer saccharum</i> *	Sugar Maple	35	1
AF	<i>Acer saccharum</i> *	Sugar Maple	35	1
AG	<i>Acer platanoides</i>	Norway Maple	25	1
AH	<i>Acer platanoides</i>	Norway Maple	18	1
AI	<i>Acer negundo</i> *	Manitoba Maple	24	1
AJ	<i>Acer</i> sp.	Maple	30	1

Tree ID	Scientific Name	Common Name	Effective DBH (cm)	Count
AK	<i>Unknown</i>	Unknown	30	1
TG1 (partially within TRCA Regulated Area)	<i>Fraxinus pennsylvanica*</i>	Green Ash	30	3
	<i>Picea abies</i>	Norway Spruce	24	1
TG2 (partially within TRCA Regulated Area)	<i>Picea pungens</i>	Blue Spruce	25	2
	<i>Fraxinus pennsylvanica*</i>	Green Ash	25	2
	<i>Acer saccharum*</i>	Sugar Maple	40	1
Total				48

*Native species

6.2 Wildlife and Species at Risk

Potential impacts to SAR and wildlife due to construction activity include very minor impacts to potential habitat and individuals. The primary concern for impacts is associated with the forested communities and wetland pockets. In these areas, construction activities such as vegetation removal, grading, use of machinery and nearby disturbances, should be avoided and/or minimized to the greatest extent feasible. Impacts to wildlife are associated with construction works and are therefore considered short-term.

6.3 Aquatic Impact Assessment

Based on the *Evaluation, Classification and Management of Headwater Drainage Features Guidelines*, the management classification for these drainage features should be *Conservation* or below. Based on the proposed design, all drainage features will remain on the landscape and culverts will be maintained in their current locations but extended to accommodate the new right-of-ways.

7. Mitigation Recommendations

Through Preliminary Design, mitigation measures will be recommended and detailed. These measures typically include standard mitigation to be applied across the whole Study Area, as well as site-specific measures. Specific mitigation measures applicable to the environmental conditions of the selected alternative will be finalized during the detailed design stage. The following general mitigation and enhancement measures are recommended for consideration through subsequent study phases:

- Install environmental protection and erosion control fencing along the limits of the reconstruction area at predetermined sensitive areas prior to the commencement of construction (includes prior to vegetation removal).
- To minimize the potential for erosion and off-site transport of sediment into surface water features and the natural environment, the project will implement Best Practices related to erosion and sediment control (ESC). ESC measures used by the contractor on all construction should meet guidelines as outlined in *Erosion and Sediment Control Guideline for Urban Construction*, December 2006 (ESC Guideline), prepared by the Greater Golden Horseshoe Area Conservation Authorities (GGHACA).
- Where feasible, trees proposed to be retained will be protected by tree protection fencing (TPF), which is to be placed at the dripline or in a location to minimize encroachment into the root zone and protect the trunk. Fencing provides protection from potential damage during construction

activities such as the use of machinery near trees and branches, and stockpiling of materials over the root zone. ESC fencing can be combined with TPF.

- Vegetation clearing should occur outside of the breeding bird season (generally late April to late July) to prevent nest destruction to comply with the Migratory Birds Convention Act. Winter season, during frozen ground conditions, is the ideal period for tree and vegetation removal if feasible. In the event that tree removal must occur within the breeding bird window a qualified biologist must screen the area. Clearing in identified nesting areas would be prohibited until such time that it has been confirmed that the young have fledged.
- Tree removal should also be avoided during the maternity roosting period for Endangered Bats (April 1 to September 30). If tree removals need to occur within this window, a qualified ecologist must screen for potential snag trees that may be used for roosting.
- Prior to work near any type of marsh, if construction activities occur within the period of April to July, areas with standing water that may support amphibians are to be surveyed by a qualified biologist for the presence of amphibians. If present these are to be relocated to outside of the construction area to suitable habitats.
- In the unlikely event that SAR are encountered, work will stop and the MNRF will be contacted.
- All exposed and newly constructed surfaces should be stabilized using appropriate means in accordance with the characteristics of the exposed soils. These surfaces should be fully stabilized and re-vegetated as quickly as possible following the completion of the works;
- All activities, including the maintenance of construction machinery, should be controlled to prevent the entry of petroleum products, debris, rubble, concrete or other deleterious substances into the natural environment. Refueling should not occur within 30 m of any woodland, wetland or watercourse.

7.1 Site Specific Mitigation

7.1.1 Erosion and Sediment Control Measures

The installation and maintenance of ESC measures are of specific importance to the protection of watercourse features and wetland communities from sediment laden water and to delineate the construction envelope to minimize damage to the adjacent natural area.

The TRCA Requires that the ESC measures be demonstrated on all relevant plans and/or drawings submitted. Further recommendations for the ESC plan include:

- The ESC measures should remain in place and in good working condition for the duration of the project, until landscaping and sodding has stabilized.
- All work areas are to be effectively isolated from wetland communities and drainage features with appropriate ESC measures in order to ensure that deleterious substances do not enter these areas at any time.
- ESC fencing/measures are to be erected as near to the development as possible.
- ESC measures are to be installed prior to beginning work and are maintained in working order throughout all stages of construction activities.

- That ESC fencing be erected to specifications outlined in Ontario Provincial Standard Drawings (OSPD), being at a minimum, a double row of sediment silt fencing consisting of a non-woven geotextile with straw bales staked in between.
- No sediment, sediment-laden water or deleterious substances are to be discharged into watercourses/drainage features at any time.
- All ESC measures are to be inspected daily including after every rainfall, cleaned, maintained and/or adjusted accordingly to ensure sediment does not enter drainage features at any time.
- Machinery or equipment will be maintained and refueled within the construction area defined by the ESC measures, and at no time will approach within 30 m of the watercourses or wetland areas.
- Any equipment, stockpiled material or construction material will be stored within the construction area defined by the ESC measures, and in a manner that prevents sediment or deleterious substances from entering the creek.
- Any dewatering (if required) is to be filtered to remove sediment prior to discharging to a well vegetated area at least 30 m from a watercourse.
- All disturbed areas will be appropriately and effectively stabilized and/or restored immediately following completion of the works with native species.

Specific locations for the installation of ESC measures have been identified for headwater drainage features, to include:

- ESC fencing on both sides at STA. 5+040 – 5+060 (HDF C)
- ESC fencing on west side at STA. 5+600 (HDF D)
- ESC fencing on west side at STA. 5+710 (HDF E)

All other headwater drainage features occur within woodland and wetland communities, for which ESC measures and protection fencing are recommended below.

7.1.2 *Woodland and Wetland Protection*

Tree/wetland protection fencing (combined with ESC fencing) to be installed:

- East side from STA 4+830 – 4+860
- West side from STA 4+880 – 4+950
- East side from STA 4+920 – 4+970
- East side from STA 5+580 – 5+660
- Both sides from STA 6+010 – 6+040
- East side from STA 6+130 – 6+150
- East side from STA 6+370 – 6+400
- East side from STA 6+540 – 6+650
- West side from STA 6+700 – 6+760

7.1.3 *Tree Protection*

A TPZ barrier is to be installed as per York Region's *Street Tree and Forest Preservation Guidelines*. In general, a vertical TPZ barrier is to be installed around every tree to be preserved, including trees outside

of the Regional road allowance. It is to be installed at the outer limit of the minimum required TPZ for each tree to be preserved wherever feasible and should enclose the entire TPZ adjacent to areas of constructions works. For groups of trees, TPZ barriers are to enclose the minimum required TPZ of each tree as well as the area between the trees, even if this area extends beyond the minimum required TPZ.

In accordance with York Region's guidelines (York Region, 2016), TPZ for all trees ≤ 24 cm DBH were given a minimum TPZ radius of 2.4 metres. For trees ≥ 25 cm DBH, TPZ was calculated using the following formula:

$$\text{TPZ (m)} = \frac{\text{DBH (cm)} \times 10}{100}$$

TPZ barriers are to be installed prior to the commencement of any site disturbances including tree removals. The barriers shall be made of either framed construction fencing or solid hoarding, unless otherwise specified and approved by the Region or its designate.

7.1.4 Tree Replacement Planting

It is estimated that 108 trees may require removal to accommodate the road improvement works. It is recommended that a tree compensation ratio of 2:1 be implemented, resulting in 216 trees to be planted. Planting and restoration efforts will aim to restore the natural areas where disturbances have occurred as a result of construction works. It is recommended that trees be planted in groupings at locations that will provide ecological buffer to existing woodlands or other features or runoff interception functions. Areas of new expanded roadway sightlines and shoulders should be avoided as restoration areas.

Typically required for TRCA regulated areas, the compensation ratios of the TRCA should be implemented as per the TRCA's Guideline for Determining Ecosystem Compensation (TRCA, 2018). However inventoried trees are located outside of/bordering the edge of the drainage features themselves. As such, their removals are not expected to impact the function of these features and compensation of these trees consistent with the remaining trees (outside regulated areas) is deemed as acceptable. The final number of tree replacement plantings, required for TRCA Regulated Areas, will be confirmed following tree removal during construction, in consultation with TRCA

As the primary objective of compensation is restoration rather than street tree establishment, it is recommended that smaller tree stock (150 – 200 cm potted/whip stock) be employed for practicality of implementation and to ensure greater establishment in areas without planned regular maintenance. Native tree species will be selected for planting to reflect the natural composition of the area.

8. Conclusions

The findings of this Natural Environmental Conditions study are the result of a background review, ecological field surveys, and an analysis of data using current scientific understanding of the ecology of the area and natural heritage policy requirements. This information is provided as input into the Environmental Assessment in the context of existing conditions and protection of the natural environment.

Memorandum

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King Township Road Reconstruction Environmental Assessments
10th Concession – Natural Environmental Conditions



Prepared By:

A handwritten signature in cursive script that reads "Jen Paterson".

Jen Paterson, M.Sc.
Ecologist

Prepared By:

A handwritten signature in cursive script that reads "Angela Zhou".

Angela Zhou, B.E.S.
Ecologist

Reviewed By:

A handwritten signature in cursive script that reads "Dirk Janas".

Dirk Janas, B.Sc.
Principal, Senior Ecologist

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Memorandum

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King Township Road Reconstruction Environmental Assessments
10th Concession – Natural Environmental Conditions



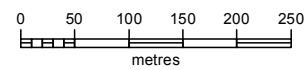
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CLIENT:
Ainley Group



PROJECT: King Twp Rd Reconstruction - 10th Conc.

PREPARED BY:
Palmer™

PROJECT NO.	1705608	REVISION:	1-1
DATE:	Feb 21, 2020	SCALE:	1:7000
DRAWN:	BE	DATUM:	NAD 1983
CHECKED:	JP	PROJECTION:	UTM zone 17

LEGEND:
 10th Concession
Approximate Study Area



Site Location

Figure 1



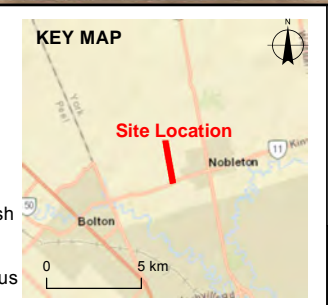
CLIENT:
Ainley Group

PROJECT: King Twp Rd Reconstruction - 10th Conc.
PROJECT NO. 1705608 REVISION: 2-1
DATE: Nov 16, 2020 SCALE: 1:2800

PREPARED BY:
Palmer™

DRAWN: BE, KG DATUM: NAD 1983
CHECKED: JP PROJECTION: UTM zone 17

- LEGEND:
- A** Headwater Drainage Feature (HDF)
 - Watercourse (TRCA)
 - ELC Community
 - BA1** Breeding Amphibian Survey Station
- Terrestrial System*
FO (Forest)
FOD: Deciduous Forest
- CU (Cultural)
CUM1: Mineral Cultural Meadow
CUP3-1: Red Pine Coniferous Plantation Type
CUP3-2: White Pine Coniferous Plantation Type
TAGM5: Fencerow
AG: Agricultural
- CV (Constructed)
CVC_1: Business Sector
CVR_3: Single Family Residential
- Wetland System*
MA (Marsh)
MAM2-2: Reed-canary Grass Mineral Meadow Marsh
MAS2: Mineral Shallow Marsh
MAS2-1: Cattail Mineral Shallow Marsh
- SW (Swamp)
SWD2-2: Green Ash Mineral Deciduous Swamp Type



Existing Environmental Constraints

Figure 2



CLIENT:	Ainley Group	
PROJECT:	King Twp Rd Reconstruction - 10th Conc.	
PROJECT NO.:	1705608	REVISION: 1-3
DATE:	Dec 03, 2020	SCALE: 1:2800
DRAWN:	BE, KG	DATUM: NAD 1983
CHECKED:	JP	PROJECTION: UTM zone 17

LEGEND:

- Inventory Tree
- Tree Protection Zone
- ⊕ Tree Grouping
- Watercourse (TRCA)
- TRCA Regulation Limit



Tree Inventory

Figure 3



CLIENT:
Ainley Group

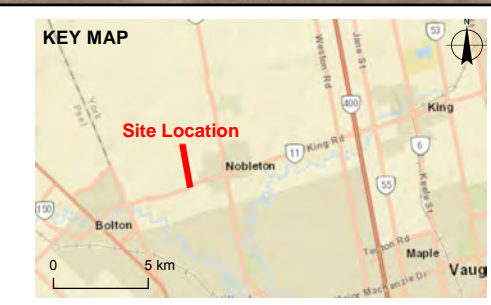
PROJECT: King Twp Rd Reconstruction - 10th Conc.
 PROJECT NO. 1705608 REVISION: 2-1
 DATE: Apr 14, 2020 SCALE: 1:2800

PREPARED BY:
Palmer™

DRAWN: BE DATUM: NAD 1983
 CHECKED: JP PROJECTION: UTM zone 17

- LEGEND:
- A Headwater Drainage Feature (HDF)
 - - - Proposed Limit of Disturbance
 - Proposed
 - Watercourse (TRCA)
 - ⬭ ELC Community

- Terrestrial System*
 FO (Forest)
 FOD: Deciduous Forest
 FOC: Coniferous Forest
- CU (Cultural)
 CUP3: Coniferous Plantation
- Wetland System*
 MA (Marsh)
 MAS2-1: Cattail Mineral Shallow Marsh
 MAM2-2: Reed-canary Grass Mineral Meadow Marsh
 MAS2: Mineral Shallow Marsh



Proposed Alignment

Figure 4



CLIENT:	Ainley Group		
PROJECT:	King Twp Rd Reconstruction - 10th Conc.		
PREPARED BY:			
PROJECT NO.	1705608	REVISION:	1-2
DATE:	Dec 03, 2020	SCALE:	1:2800
DRAWN:	KG	DATUM:	NAD 1983
CHECKED:	JP	PROJECTION:	UTM zone 17

LEGEND:

- Tree to be Retained
- Tree to be Removed
- Proposed Limit of Disturbance
- Proposed Alignment
- Watercourse (TRCA)
- TRCA Regulation Limit

Tree Protection Zone

- Tree to be Retained
- Tree Expected to be Injured (Potentially Retainable)
- Tree to be Removed



Tree Removals

Figure 5

Appendix A: Tree Inventory

Count	Tree ID	Scientific Name	Common Name	DBH (cm)	Effective DBH (cm)	Condition (G/F/P/D)	Comments	Recommendation	Within TRCA Regulated Area
1	1394	<i>Picea glauca</i>	White Spruce	27	27	G		Remove	No
1	1395	<i>Acer saccharum</i>	Sugar Maple	19,12,15	27	F	Leaf necrosis	Retain	No
1	1396	<i>Picea abies</i>	Norway Spruce	25	25	G		Remove	No
1	1397	<i>Acer saccharinum</i>	Silver Maple	48,25,42,28	74	F		Retain	No
1	1398	<i>Picea glauca</i>	White Spruce	25	25	F	Needle loss	Retain	No
1	1399	<i>Juglans nigra</i>	Black Walnut	21	21	G		Remove	No
1	1400	<i>Fraxinus americana</i>	White Ash	25	25	P	Suckering	Retain	No
1	1401	<i>Acer saccharinum</i>	Silver Maple	48,36,52,47	92	F	Moths nest	Remove	No
1	1402	<i>Acer saccharum</i>	Sugar Maple	65	66	G		Remove	No
1	1403	<i>Acer saccharinum</i>	Silver Maple	55,43	70	G		Retain	No
1	1404	<i>Pinus sylvestris</i>	Scots Pine	24	25	G		Retain	No
1	1405	<i>Acer saccharinum</i>	Silver Maple	21,22,28,28	50	F		Retain	No
1	1406	<i>Acer saccharinum</i>	Silver Maple	100	101	F	Fungus and dead branches	Retain	No
1	A	<i>Acer saccharum</i>	Sugar Maple	61	62	G		Remove	No
1	1407	<i>Malus sp.</i>	Apple species	32	33	F	Defoliation	Remove	No
1	1408	<i>Thuja occidentalis</i>	Eastern White Cedar	15,10,8,20	28	F		Remove	No
1	1409	<i>Thuja occidentalis</i>	Eastern White Cedar	11,18,20	29			Remove	No
1	1410	<i>Thuja occidentalis</i>	Eastern White Cedar	14,15,20	29			Remove	No
1	1411	<i>Thuja occidentalis</i>	Eastern White Cedar	15,10,25	31			Remove	No
1	1412	<i>Thuja occidentalis</i>	Eastern White Cedar	12,13,21	27			Remove	No
1	1413	<i>Thuja occidentalis</i>	Eastern White Cedar	17,16	23			Remove	No
1	1414	<i>Thuja occidentalis</i>	Eastern White Cedar	15,20,8	26			Remove	No
1	1415	<i>Thuja occidentalis</i>	Eastern White Cedar	9,15,16	24			Remove	No
1	1416	<i>Acer saccharum</i>	Sugar Maple	69	69	G		Remove	No
1	1417	<i>Acer negundo</i>	Manitoba Maple	9,7	11	F	One cut stump	Remove	No
1	1418	<i>Thuja occidentalis</i>	Eastern White Cedar	18,9,9,10	24			Remove	No
1	1419	<i>Picea abies</i>	Norway Spruce	57	57			Remove	No
1	1420	<i>Acer saccharinum</i>	Silver Maple	99	99	G		Remove	No
1	1421	<i>Picea pungens</i>	Blue Spruce	42	42			Remove	No
1	1422	<i>Acer saccharum</i>	Sugar Maple	36	36			Remove	No
1	1423	<i>Picea glauca</i>	White Spruce	28	28			Remove	No
1	1424	<i>Picea pungens</i>	Blue Spruce	31	31			Remove	No
1	1425	<i>Picea pungens</i>	Blue Spruce	41	41			Remove	No
1	1426	<i>Picea pungens</i>	Blue Spruce	36	36			Remove	No
1	1427	<i>Picea pungens</i>	Blue Spruce	38	38			Remove	No
1	1428	<i>Acer saccharum</i>	Sugar Maple	54	54	F	Hollow	Remove	Yes
1	1429	<i>Acer saccharum</i>	Sugar Maple	53	53	P		Remove	No
1	1430	<i>Betula papyrifera</i>	Paper Birch	10,9,8	16			Remove	No

Count	Tree ID	Scientific Name	Common Name	DBH (cm)	Effective DBH (cm)	Condition (G/F/P/D)	Comments	Recommendation	Within TRCA Regulated Area
1	1431	<i>Acer negundo</i>	Manitoba Maple	12,15,6	20			Remove	No
1	1432	<i>Acer saccharum</i>	Sugar Maple	33	33			Remove	No
1	1433	<i>Acer saccharinum</i>	Silver Maple	62	62	F	Pruned	Remove	No
1	1434	<i>Acer saccharinum</i>	Silver Maple	46	46		Pruned and suckering	Remove	Yes
1	1435	<i>Acer saccharinum</i>	Silver Maple	48	48		Pruned and suckering	Remove	Yes
1	1436	<i>Acer saccharinum</i>	Silver Maple	76	76		Pruned and suckering	Remove	Yes
1	1437	<i>Acer saccharinum</i>	Silver Maple	38	38		Pruned and suckering	Remove	Yes
1	1438	<i>Acer saccharinum</i>	Silver Maple	48	48		Pruned and suckering	Remove	Yes
1	1439	<i>Acer saccharinum</i>	Silver Maple	48,40,40	74		Pruned and suckering	Remove	Yes
1	1440	<i>Picea glauca</i>	White Spruce	32	32	G		Remove	Yes
1	1441	<i>Picea glauca</i>	White Spruce	26	26			Remove	Yes
1	1442	<i>Picea glauca</i>	White Spruce	30	30			Remove	Yes
1	1443	<i>Picea glauca</i>	White Spruce	34	34			Remove	Yes
1	1444	<i>Picea glauca</i>	White Spruce	26	26			Remove	No
1	1445	<i>Picea glauca</i>	White Spruce	25	25			Remove	No
1	1446	<i>Picea glauca</i>	White Spruce	26	26			Remove	No
1	1447	<i>Picea glauca</i>	White Spruce	26	26			Remove	No
1	1448	<i>Acer platanoides</i>	Norway Maple	41	41			Remove	Yes
1	1449	<i>Acer platanoides</i>	Norway Maple	40	40		Trunk wound and twisting	Remove	Yes
1	1450	<i>Acer platanoides</i>	Norway Maple	40	40		Seam	Remove	Yes
1	1451	<i>Acer negundo</i>	Manitoba Maple	18,19,16,21	37			Remove	Yes
1	1452	<i>Pinus sylvestris</i>	Scots Pine	28	28			Remove	No
1	1453	<i>Pinus sylvestris</i>	Scots Pine	24	24			Remove	No
1	1454	<i>Acer negundo</i>	Manitoba Maple	104	104			Remove	No
1	1455	<i>Thuja occidentalis</i>	Eastern White Cedar	28,8,16,13	45			Remove	No
1	1456	<i>Picea abies</i>	Norway Spruce	42	42			Remove	No
1	1457	<i>Pinus sylvestris</i>	Scots Pine	37	37			Remove	No
1	1458	<i>Thuja occidentalis</i>	Eastern White Cedar	36,37,22	56			Remove	No
1	1459	<i>Picea glauca</i>	White Spruce	15	15			Remove	No
1	1460	<i>Picea glauca</i>	White Spruce	20	20			Remove	No
1	1461	<i>Picea glauca</i>	White Spruce	18	18			Remove	No
1	1462	<i>Picea glauca</i>	White Spruce	16	16			Remove	No
1	3	<i>Acer saccharum</i>	Sugar Maple	40,25	47	F		Remove	Yes
1	4	<i>Salix</i> sp.	Willow species	40,50,25	69			Remove	Yes
1	4	<i>Salix</i> sp.	Willow species	25,20, 30	44			Remove	Yes
1	5	<i>Acer saccharum</i>	Sugar Maple	74	74	P		Remove	Yes
1	5	<i>Acer saccharum</i>	Sugar Maple	86	86	P		Remove	Yes
1	6	<i>Juniperus virginiana</i>	Eastern Red Cedar	18,13	22			Remove	Yes
1	6	<i>Acer negundo</i>	Manitoba Maple	13,15,20	28			Remove	Yes
1	6	<i>Acer negundo</i>	Manitoba Maple	21	21			Remove	Yes

Count	Tree ID	Scientific Name	Common Name	DBH (cm)	Effective DBH (cm)	Condition (G/F/P/D)	Comments	Recommendation	Within TRCA Regulated Area
1	6	<i>Acer negundo</i>	Manitoba Maple	35	35			Remove	Yes
1	6	<i>Acer saccharum</i>	Sugar Maple	85	85			Remove	Yes
1	6	<i>Acer saccharum</i>	Sugar Maple	60	60			Remove	Yes
1	7	<i>Picea glauca</i>	White Spruce	25	25			Remove	Yes
1	7	<i>Picea glauca</i>	White Spruce	25	25			Remove	Yes
1	7	<i>Picea glauca</i>	White Spruce	25	25			Remove	Yes
1	7	<i>Acer platanoides</i>	Norway Maple	30	30			Remove	Yes
1	AA	<i>Acer platanoides</i>	Norway Maple	45	45	G		Remove	Yes
1	AB	<i>Acer platanoides</i>	Norway Maple	30	30	G		Remove	Yes
1	AC	<i>Pinus resinosa</i>	Red Pine	25	25	G		Retain	Yes
1	AD	<i>Juglans nigra</i>	Black Walnut	30	30	G		Retain	Yes
1	AE	<i>Acer saccharum</i>	Sugar Maple	35	35	S		Remove	Yes
1	AF	<i>Acer saccharum</i>	Sugar Maple	35	35	P		Remove	Yes
1	AG	<i>Acer platanoides</i>	Norway Maple	25	25	F		Remove	Yes
1	AH	<i>Acer platanoides</i>	Norway Maple	15, 10	18	F		Remove	Yes
1	AI	<i>Acer negundo</i>	Manitoba Maple	20, 10, 10	24	F		Remove	Yes
1	AJ	<i>Acer sp.</i>	Maple	30	30	D		Remove	Yes
1	AK	<i>Unknown</i>	Unknown	30	30	D		Remove	Yes
1	AL	<i>Acer saccharum</i>	Sugar Maple	45	45	F		Remove	No
1	AM	<i>Acer saccharum</i>	Sugar Maple	45	45	F		Remove	No
1	AN	<i>Acer saccharum</i>	Sugar Maple	45	45	F		Remove	No
1	AO	<i>Acer saccharum</i>	Sugar Maple	50	50	F		Retain	No
6	TG1	<i>Fraxinus pennsylvanica</i>	Green Ash	25-35DBH	30	F-D		Remove	Partial
1	TG1	<i>Picea abies</i>	Norway Spruce	24	24	G		Remove	No
3	TG2	<i>Picea pungens</i>	Blue Spruce	25	25	G		Partial	Partial
5	TG2	<i>Fraxinus pennsylvanica</i>	Green Ash	10-35DBH	25	P		Partial	Partial
1	TG2	<i>Acer saccharum</i>	Sugar Maple	40	40	G		Partial	Partial
2	TG3	<i>Tilia americana</i>	Basswood	25, 10	27	G		Retain	Partial
1	TG3	<i>Tilia americana</i>	Basswood	25, 10	27	G		Retain	Partial
6	TG3	<i>Acer saccharum</i>	Sugar Maple	30-55	40	F		Retain	Partial
10	TG4	<i>Tilia americana</i>	Basswood	10-20DBH	15	G		Retain	No
1	TG4	<i>Prunus virginiana</i>	Chokecherry	15	15	G		Retain	No
1	TG4	<i>Acer negundo</i>	Manitoba Maple	15	15	G		Retain	No
4	TG4	<i>Acer saccharum</i>	Sugar Maple	40-55DBH	47	G-P		Retain	No
1	TG4	<i>Salix sp.</i>	Willow species	40	40	F	Pruned	Retain	No
3	TG5	<i>Tilia americana</i>	Basswood	10-20DBH	15	G-F		Retain	No
1	TG5	<i>Robinia pseudoacacia</i>	Black Locust	10	10	F		Retain	No
1	TG5	<i>Acer saccharum</i>	Sugar Maple	40	40	G		Retain	No
1	TG6	<i>Salix sp.</i>	Willow species	0, 25, 20, 20, 1	45	G		Partial	No
2	TG6	<i>Acer saccharum</i>	Sugar Maple	30+40	35	G		Partial	No
1	TG7	<i>Populus tremuloides</i>	Trembling Aspen	25	25	F		Retain	No
1	TG7	<i>Acer saccharum</i>	Sugar Maple	35	35	F		Retain	No
1	TG7	<i>Quercus alba</i>	White Oak	25	25	F		Retain	No
13	TG7	<i>Pinus strobus</i>	White Pine	15-20DBH	17	G		Retain	No
3	TG7	<i>Acer platanoides</i>	Norway Maple	20	20	G		Retain	No

Count	Tree ID	Scientific Name	Common Name	DBH (cm)	Effective DBH (cm)	Condition (G/F/P/D)	Comments	Recommendation	Within TRCA Regulated Area
5	TG8	<i>Quercus alba</i>	White Oak	15	15	F		Retain	No
10	TG8	<i>Pinus strobus</i>	White Pine	15-20DBH	17	G		Retain	No
1	TG8	<i>Populus tremuloides</i>	Trembling Aspen	25	25	F		Retain	No
1	TG8	<i>Acer saccharum</i>	Sugar Maple	35	35	F		Retain	No
1	TG8	<i>Acer platanoides</i>	Norway Maple	20	20	G		Retain	No
3	TG9	<i>Picea pungens</i>	Blue Spruce	30	30	G		Retain	No

Memorandum

Date: January 13, 2021

Project #: 1705608

To: Steve Fournier and Jody Marks, Ainley Group

From: Jen Paterson and Dirk Janas, Palmer

CC:

Re: **King Township Road Reconstruction Environmental Assessments
8th Concession – Natural Environmental Conditions**

1. Introduction

Palmer was retained by the Ainley Group to assess the natural heritage environmental conditions in support the Class Environmental Assessment for the reconstruction of 8th Concession, 10th Concession and 15th Sideroad, in the Township of King. The 8th and 10th Concession from King Road to 15th Sideroad along with the 15th Sideroad from 10th Concession to Highway 27 will undergo various reconstructions including additional right-of-ways, culvert replacements, road realignment, and road resurfacing.

This Technical Memo will address the proposed reconstruction works for 8th Concession, between King Road and 15th Sideroad, in the Community of Nobleton, Township of King (the project area - **Figure 1**). Separate technical memos have been prepared for 10th Concession and for 15th Sideroad.

This Technical Memo is prepared as part of the road reconstruction design prepared by Ainley and is submitted to support both the Environmental Assessment (EA) process and the Toronto and Region Conservation Authority (TRCA) approval and permitting process. This Technical Memo describes the background review, agency consultation and field investigations undertaken to support the characterization of existing natural environmental conditions through the project area and the identification of potential impacts. As part of this collaborative process, input has been provided to Ainley regarding ecological features and recommended general and site-specific mitigation measures to be advanced as part of the EA and preliminary/detailed design.

The objectives of this study are to inventory and evaluate the existing natural heritage features and ecological functions within the project Study Area, including Ecological Land Classification (ELC) mapping, Species at Risk (SAR) habitat screening and assessment, evaluation of sensitive natural features, and assessment of wildlife habitat. This information has been used as part of the development of the proposed reconstruction design and to provide guidance on the design and mitigation recommendations and implementation.

As part of this Technical Memo, the following supporting Figures and Appendices have been provided:

- **Figure 1** – Project Area Location
- **Figure 2** – Existing Environmental Conditions
- **Figure 3** – Tree Inventory
- **Figure 4** – Proposed Alignment
- **Figure 5** – Tree Removals
- **Appendix A** – Tree Inventory

2. Environmental Policy

2.1 Migratory Birds Convention Act

The *Migratory Birds Convention Act* (MBCA) and Migratory Birds Regulations (MBR) (2014) protect most species of migratory birds and their nests and eggs anywhere they are found in Canada. General prohibitions under the MBCA and MBR protect migratory birds, their nests and eggs and prohibit the deposition of harmful substances in waters / areas frequented by them. The MBR includes an additional prohibition against incidental take, which is the inadvertent harming or destruction of birds, nests or eggs.

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

2.2 Endangered Species Act

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

The protection provisions for species and their habitat within the ESA apply only to those species listed as endangered or threatened on the SARO list. Special Concern species may be afforded protection through policy instruments respecting significant wildlife habitat as defined by the Province or other relevant authority, or other protections contained in Official Plan (OP) policies.

2.3 Provincial Policy Statement

The Provincial Policy Statement (PPS) provides direction to regional and local municipalities regarding planning policies for the protection and management of natural heritage features and resources (OMMAH, 2014). Section 2.1 of the PPS defines eight natural heritage feature (NHF) types and adjacent lands, and provides planning policies for each. Of these NHF, development is not permitted in:

- Significant Coastal Wetlands;
- Significant Wetlands in Ecoregions 5E, 6E and 7E;
- Fish Habitat, except in accordance with provincial and federal requirements; or

- Habitat of species designated as Endangered and Threatened, except in accordance with provincial and federal requirements.

Additionally, unless it can be demonstrated through an EIS that there will be no negative impacts on the natural features or their ecological functions, development and site alteration are also not permitted in:

- Significant Wetlands in the Canadian Shield north of Ecoregions 5E, 6E and 7E;
- Significant Woodlands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Mary's River);
- Significant Valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Mary's River);
- Significant Wildlife Habitat;
- Significant Areas of Natural and Scientific Interest;
- Other Coastal Wetlands in Ecoregions 5E, 6E and 7E; and
- Lands defined as *Adjacent Lands* to all the above natural heritage features.

Each of these natural heritage features is afforded varying levels of protection subject to guidelines, and in some cases, regulations. The project area is located in Ecoregion 6E (Crins, Gray, Uhlig, & Wester, 2009). The NHF definitions are used in this report to guide the identification and protection of ecological elements in the project area.

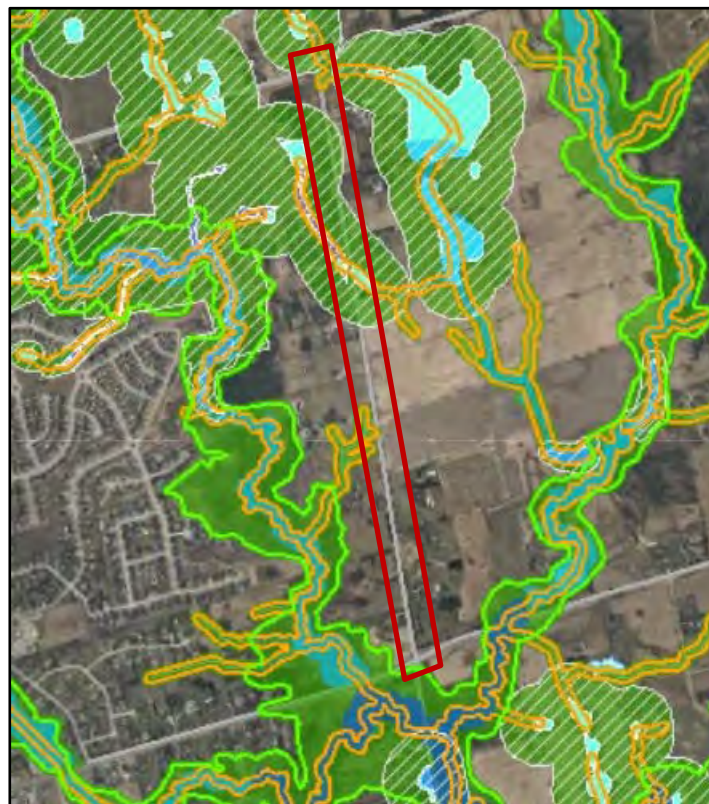
The identification and provisions for the protection of natural features identified in the PPS are for projects such as land development that are subject to approvals under the *Planning Act*. While road reconstruction is subject to the *Environmental Assessment Act*, NHF defined and identified under the PPS are taken into consideration as part of the natural environment assessment.

2.4 TRCA Regulations and Policies

Relevant TRCA regulations and policies include the following:

- Ontario Regulation 166/06 - *Development, Interference with Wetlands and Alterations to Shorelines and Watercourses*. Through this regulation, TRCA regulates activities in natural and hazardous areas (e.g. areas in and near rivers, streams, floodplains, wetlands, and slopes, and shorelines).
- *The Living City Policies* (TRCA, 2014) and associated *Planning and Development Procedural Manual* (TRCA, 2008). These documents present TRCA's planning and permit review practices and technical guidelines. Relevant policies will be discussed in applicable sections of this report.

The project area falls within regulated lands (orange and green zones on **Map A**). The associated TRCA policies, regulations and permitting will therefore apply and approvals will be required from the agency.



Map A. TRCA Regulation Limits (shown in orange) within the project area – 8th Concession

3. Study Approach

3.1 Background Review

Palmer has reviewed relevant background material to provide a focus to field investigations and ensure compliance with applicable regulations and policy. Background information collection is guided by the *Natural Heritage Information Request Guide* (Ministry of Natural Resources and Forestry, 2018). Current direction from the Ministry of Natural Resources and Forestry (MNRF) and Ministry of Environment, Conservation and Parks (MECP) is to gather natural heritage information and species occurrence records from available sources; the Natural Heritage Information Centre (NHIC) Make-a-Map application being the main course of information and records from the Ministry itself (Ministry of Natural Resources and Forestry, 2019). The information gathered is recommended to be balanced and supplemented by professional ecological review of potential habitats and characteristics of a project site.

The background review included the collection and review of relevant mapping and reports, including regulations and policies, OPs, and zoning by-laws; and, the NHIC Make-a-Map application for species occurrences and designated area mapping. In addition to these, the following data sources were reviewed for the project:

- **Land Information Ontario (LIO):** certain data types including aquatic resource area (ARA) information is available through these publicly available data layers (Government of Ontario, 2019).
- **Conservation Authorities:** TRCA collects and maintains natural heritage mapping and data, and publish reports, that all provide regional and often site-specific ecological context (TRCA Open Data website).
- **Fisheries and Oceans Canada (DFO):** The DFO maintains mapping of aquatic species at risk (SAR) habitats, including the critical habitat, occupied and contributing habitat ranges of SAR and Special Concern species (Fisheries and Oceans Canada, 2019).
- **Aerial Photography, including historical photos:** Available on-line mapping sources were reviewed to identify current potential habitat types, biogeography and terrain. Historical photos were reviewed to identify past land uses (University of Toronto, 2019).

Following the *Information Request Guide*, MECP advice and direction should be solicited once potential Species at Risk (SAR) requirements associated with the *ESA* are identified via field investigation and analysis.

The Village of Nobleton is situated within the Humber River watershed and specifically within the East Humber River subwatershed. The northern half of the 8th Concession Study Area occurs within the Oak Ridges Moraine (ORM) Conservation Plan Area. The southern half of the Study Area occurs within the Greenbelt Plan Area (**Map B**).

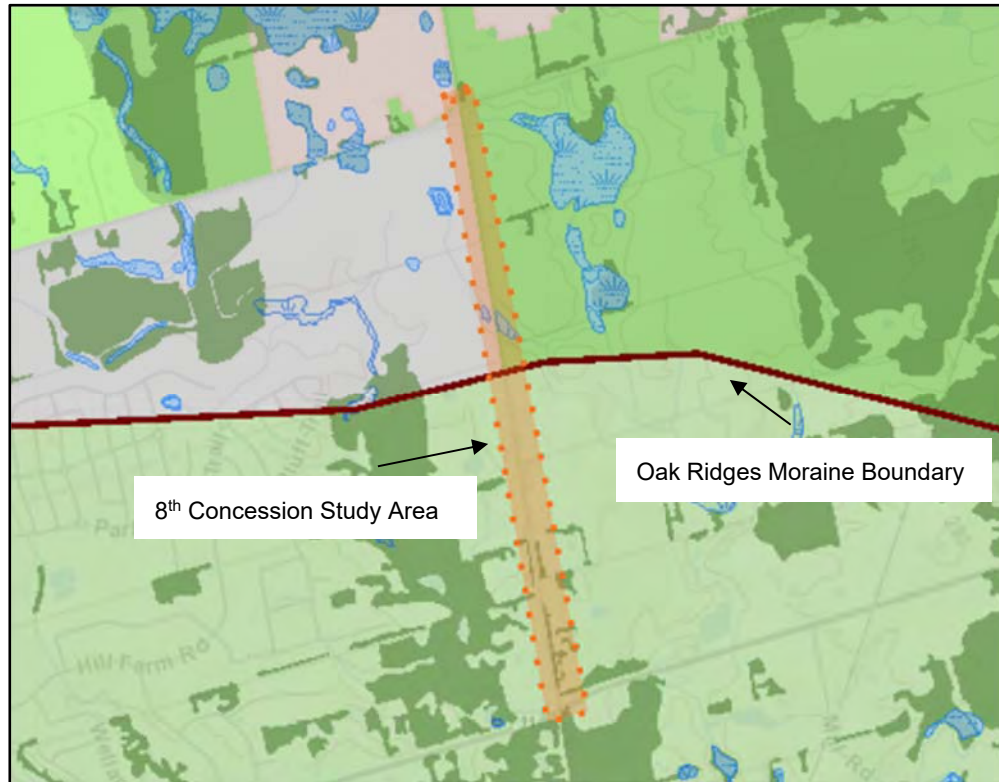
According to the MNRF NHIC mapping, there are wetland communities that are part of the Black Duck Provincially Significant Wetland Complex within the Study Area, as well as small, forested areas (**Map B**). The Linton – Kelly Lake Channels - Earth Science Area of Natural and Scientific Interest (ANSI) occurs on the north side of 15th Sideroad, to the north of the Study Area. Within the vicinity of the 8th Concession Study Area, there are records of the provincially Endangered Butternut (*Juglans cinerea*).

According to the DFO Aquatic Species at Risk online mapping, Redside Dace (*Clinostomus elongatus*), an endangered species, is located to the east of 8th Concession (**Map C**). Correspondence with a MECP Management Biologist confirmed that watercourses crossing 8th Concession would be considered 'contributing' Redside Dace habitat and that the main branch to the east of 8th Concession is considered recovery habitat (J. Andersen, MECP, *pers. comm.*).

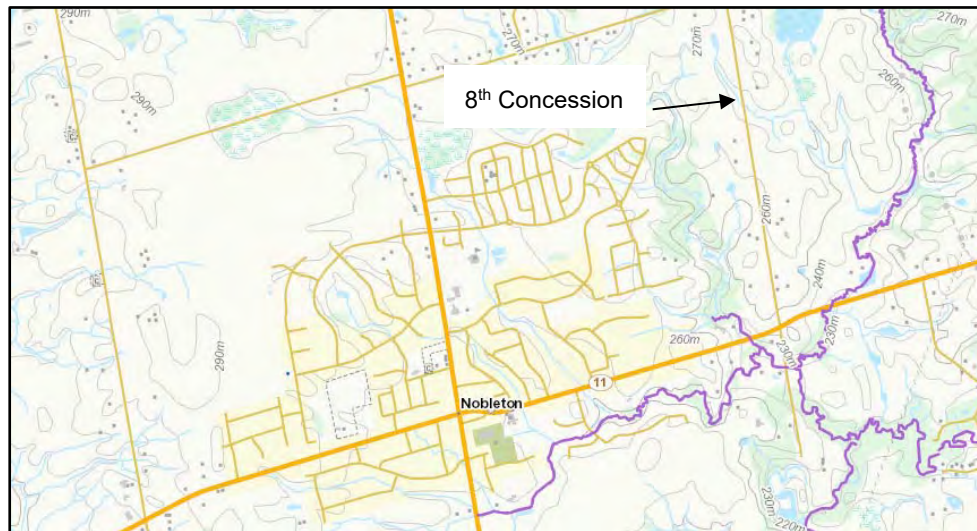
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King Township Road Reconstruction Environmental Assessments
8th Concession – Natural Environmental Conditions



Map B. *MNRF NHIC Mapping for 8th Concession Study Area (Greenbelt Plan Area shown in light green)*



Map C. *Snapshot from DFO online aquatic species at risk mapping. Purple line indicates Redside Dace habitat (accessed July 25, 2019)*

3.2 Agency Consultation

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

- **Pre-consultation Meeting:** A Pre-consultation meeting was attended by Ainley, Palmer and TRCA on July 29, 2019.
- **Study Area Natural Heritage Information:** MECP was contacted to confirm Redside dace habitat classification (May 17, 2019).

3.3 Ecological Surveys

Palmer ecologists undertook field investigations to complete, Ecological Land Classification, inventory the flora along the road alignment, conduct a tree inventory, characterize headwater drainage features, assess physical terrain characteristics, and to provide an assessment of the ecological features and functions within the project area. Survey methods are described below.

3.3.1 Vegetation

On June 19 and 21, 2019, and October 23, 2020 vegetation communities were mapped and described following the Ecological Land Classification (ELC) System for Southern Ontario (Lee *et al.* 1998), and the 2008 update tables for anthropogenic cover descriptions. Vegetation community boundaries were delineated on field maps through the interpretation of recent aerial photographs and TRCA data and refined in the field. Information collected during ELC surveys includes dominant species cover, community structure, as well as level of disturbance, presence of indicator species, and other notable features.

3.3.2 Tree Inventory

A tree inventory was completed within and directly adjacent to the area of proposed disturbance along the project area by a Certified Arborist on August 27 and August 28, 2019, and October 23, 2020. The tree inventory was completed for all trees ≥ 10 centimetre (cm) diameter at breast height (DBH). Information collected during the inventory includes species name, tree tag number, DBH, location, a general health assessment and notes on tree trunk and canopy conditions. The attributes of trees located on private properties were estimated whereas trees in the right-of-way were measured. Searches for Butternut (*Juglans cinerea*), an *Endangered* SAR tree, were completed during the tree inventory.

3.3.3 Wildlife

Birds

Nest searches were conducted within the wetland communities within the project area on April 3, 2020. Incidental bird observations were also recorded on this day throughout the project area. Both of these tasks were completed by scanning through the field with binoculars and documenting any bird calls and songs heard and searches for nests.

Amphibians

Breeding amphibian surveys were conducted on April 30 and May 26, 2020. Surveys were completed in accordance with the *Marsh Monitoring Protocol* (BSC, 2009) to record evidence of breeding amphibians during suitable breeding timing windows and weather conditions. Surveys were completed in the evenings between 21:35 and 22:00 h. Weather conditions were between 11°C and 25°C with few clouds, no precipitation, and light wind.

Species were identified by call, and an abundance code for each species heard calling was assessed by the following the Amphibian Monitoring protocol:

- Code 0: No calls heard.
- Code 1: Calls not overlapping or simultaneous, number of individual frogs can be counted
- Code 2: Calls overlapping or simultaneous, number of individuals can still be distinguished, number of individual frogs cannot be counted, but a reliable estimate of numbers can be made based on location and call voices
- Code 3: Full chorus, calls simultaneous and overlapping, numbers of calling males cannot be reasonably counted or estimated

Incidental Wildlife Observations

Incidental observations of wildlife were recorded during field investigations. Incidental observations included direct sightings and indirect evidence such as nests, tracks, scat, and browse.

3.3.4 Headwater Drainage Features

Headwater Drainage Feature (HDF) Assessments were conducted on June 7 and July 23, 2019 and on April 3, 2020. Surveys were completed in accordance with the *Evaluation, Classification and Management of Headwater Drainage Features Guideline* (TRCA and CVC, 2014) in order to classify the various characteristics of the features and to identify the functions they provide.

3.3.5 Species at Risk

For the purposes of this memo, SAR include species listed as Endangered, Threatened or Special Concern under Ontario's ESA. The protection provisions for species and their habitat within the ESA apply only to those species listed as Endangered or Threatened on the SARO list. Special Concern species may be afforded protection through policy instruments respecting significant wildlife habitat as defined by the Province or other relevant authority, or other protections contained in OP policies.

Prior to field work, existing SAR records were queried through correspondence with the MNR/Aurora District and the Natural Heritage Information Centre (NHIC) database.

Habitats within the project area were characterized and screened for evidence of or potential use by these species. A brief discussion of the status, habitat requirements, and assessment of likely presence of SAR species on the subject property is provided in **Section 4.5**.

4. Existing Conditions

4.1 Vegetation Communities

The overall project area is characterized by past disturbance and is dominated by cultural and agricultural influenced vegetation with regenerating shrub and woodland areas, as well as small wetland pockets. In general, the vegetation present is in a relatively disturbed or early successional state, which is reflective of the recent cultural history (e.g., agricultural uses, rural residences) of the project area and the existing uses.

Field investigations and background data review identified seven (7) different vegetation communities immediately adjacent to the 8th Concession project area (**Figure 2**). The ELC descriptions of these vegetation communities are provided in **Table 1**.

Table 1. Vegetation Communities identified in the 8th Concession Study Area

Vegetation ELC Community	Vegetation Community Description
MAS2-1 – Cattail Mineral Shallow Marsh Type <i>Part of the Black Duck Provincially Significant Wetland Complex</i>	<p>This community extends from 8th Concession to the east and west. On the east side of 8th Concession, the canopy cover in this community is composed of mature Weeping Willow (<i>Salix babylonica</i>) and Tartarian Honeysuckle (<i>Lonicera tatarica</i>), providing 0 to 10% cover at a height of 10 to 25 m. The subcanopy is comprised of ash (<i>Fraxinus</i> sp.) and Manitoba Maple (<i>Acer negundo</i>), providing 0 to 10% cover at a height of 2 to 10 m. The understory is dominated by cattail (<i>Typha</i> sp.), providing greater than 60% cover at a height of 1 to 2 m. The ground layer is dominated by cattail, providing greater than 60% cover at a height of 0.5 to 1 m. This community has a wire fence surrounding it.</p> <p>A second MAS2-1 community on the west side of 8th Concession is community is characterized by an understory dominated by cattail, providing greater than 60% cover at a height of 0.5 to 2 m. The ground layer is composed of cattail and Reed Canary Grass (<i>Phalaris arundinacea</i>), providing 25 to 60% cover at a height of 0.5 to 1 m.</p>
MA - Marsh	Two small marsh communities (MA) were identified along the west side of 8 th Concession. The understory is composed of scattered shrubs including willow (<i>Salix</i> sp.) and other deciduous shrubs with cattails, providing 30% cover at a height of 4 to 5 m. The ground layer is composed of herbaceous grasses, providing 80% cover at a height of 0.2 to 0.5 m. There appears to be flow from the adjacent property to the north through the unmowed drainage feature into the marsh.
FOD – Deciduous Forest	This community has a canopy cover dominated by maple (<i>Acer</i> sp.), providing greater than 80% cover at a height of 20 to 25 m. The subcanopy is composed of maple and American Basswood (<i>Tilia americana</i>), providing 75% cover at a height of 10 to 20 m. The understory is composed of tree saplings. The ground layer species could not be determined from the road.
FOC – Coniferous Forest	The canopy is dominated by White Spruce (<i>Picea glauca</i>), providing greater than 60% cover at a height of 15 to 20 m. The subcanopy is composed of White Spruce and Eastern White Cedar (<i>Thuja occidentalis</i>) and ash, providing greater than 60% cover at

Vegetation ELC Community	Vegetation Community Description
	<p>a height of 10 to 15 m. The understory is composed of scattered Common Buckthorn (<i>Rhamnus cathartica</i>), providing 25% cover at a height of 5 to 10 m. The ground layer is comprised of goldenrod (<i>Solidago</i> sp.) and abundant coniferous needles, providing 10 to 15% cover at a height of 0.2 to 0.5 m.</p>
<p>CUT1 - Mineral Cultural Thicket Ecosite</p>	<p>This community is connected to a roadside ditch along the east side of 8th Concession. There is no canopy or subcanopy present in this community. The understory is composed of willow shrubs, providing 25 to 30% cover at a height of 2 to 10 m. The ground layer is dominated by herbaceous species including goldenrod with Smooth Brome Grass (<i>Bromus inermis</i>) and buttercup (<i>Ranunculus</i> sp.), providing 100% cover at a height of 0.2 to 0.5 m. This community contains a small cattail patch in front of the large Crack Willows (<i>Salix fragilis</i>) along the southern edge of the property. Wetland species appeared to be less than 50% cover.</p> <p>Another small thicket community is located at the intersection of 8th Concession and 15th Sideroad. This community is dominated by Common Lilac (<i>Syringa vulgaris</i>) and other woody shrub vegetation at an understory height of 2 to 5 m, providing 50-60% cover.</p>
<p>CUM1 - Mineral Cultural Meadow</p>	<p>This community type is located in a few areas within the project area on both sides of 8th Concession. This community lacks canopy, subcanopy, and understory cover, and is mainly dominated by common herbaceous meadow species such as goldenrod, grasses, Common Milkweed (<i>Asclepias syriaca</i>), and Common Dandelion (<i>Taraxacum officinale</i>).</p>
<p>THDM2-10 – Apple Deciduous Shrub Thicket Type</p>	<p>On the north side of 8th Concession across from the above mentioned Mineral Cultural Thicket community is a Common Apple (<i>Malus pumila</i>) thicket dominated the subcanopy at a height of 5 to 8 m, providing 50-60% cover. This feature lacks canopy and understory cover. Goldenrod dominate the ground vegetation along with grasses, providing greater than 60% cover at a height of <0.5 m.</p>
<p>CUP3-1 – Red Pine Coniferous Plantation</p>	<p>The west side of 8th Concession is dominated by coniferous plantation. The canopy is dominated by Red Pine (<i>Pinus resinosa</i>), providing greater than 60% cover at a height of 10 to 25 m. The subcanopy is composed of White Spruce and Eastern White Cedar, providing greater than 60% cover at a height of 2 to 10 m. The understory is composed of White Spruce and Eastern White Cedar, providing 25 to 60% cover at a height of 1 to 2 m. The ground layer is dominated by typical cultural meadow species including goldenrod and pasture grasses, providing greater than 60% cover at a height of 0.2 to 0.5 m.</p>
<p>CUP3-2 – White Pine Coniferous Plantation</p>	<p>This community is located on the west side of 8th Concession. The canopy is dominated by White Pine (<i>Pinus strobus</i>) at a height of 5 to 10 m, providing greater than 60% cover. All trees are in good conditions with a DBH of 5 to 10 cm. This feature lacks other species in the subcanopy, understory, and ground layer.</p>
<p>CUP1 – Deciduous Plantation</p>	<p>This community does not have a canopy or understory layer. The subcanopy is dominated by planted Manitoba Maple and Black Locust (<i>Robinia pseudoacacia</i>),</p>

Vegetation ELC Community	Vegetation Community Description
	providing 50 to 60% cover at a height of 2 to 10 m. The ground layer is dominated by cultural meadow species, providing 100% cover at a height of 0.2 to 0.5 m.
CVR_3 – Single Family Residential	This community type exists throughout the project area, on both sides of 8 th Concession. These communities contain single family dwellings and associated driveways, garages, lawns, etc.
TAGM5 – Fencerow	This community type exists throughout the project area, on both sides of 8 th Concession. The fencerow running east-west in the northwestern portion of the project area, across from the large CUP3-1 community, is dominated by Blue Spruce (<i>Picea pungens</i>) in the canopy. The fencerow that is just south is dominated by Norway Maple (<i>Acer platanoides</i>) in the canopy. The fencerow running north-south on the west side of 8 th Concession is dominated by Norway Spruce (<i>Picea glauca</i>) with two Red Pine in the canopy. The fencerow that is just south, running east-west, contains mainly Blue Spruce along with two Norway Maple and one Balsam Poplar (<i>Populus balsamifera</i>) in the canopy.
AG – Agricultural	Located in various areas of the project area, this community type supports agricultural crops and lacks natural woody or herbaceous vegetation and cover.

4.2 Tree Inventory

The tree inventory comprised 172 individual trees and eight tree groups (TG), including 131 (76%) native and 39 (23%) non-native species, as well as 2 (1%) trees identified to the genus level (**Table 2**). There were no Species at Risk (SAR) trees observed, such as Butternut. The full tree inventory is provided in **Appendix A**. The locations of inventoried trees are shown on **Figure 3**.

Table 2. Summary of Tree Inventory Results

Scientific Name	Common Name	Total Count
<i>Acer saccharinum</i> *	Silver Maple	11
<i>Acer saccharum</i> *	Sugar Maple	17
<i>Fraxinus americana</i> *	White Ash	12
<i>Gleditsia triacanthos</i> *	Honey Locust	1
<i>Malus pumila</i>	Common Apple	4
<i>Picea abies</i>	Norway Spruce	2
<i>Picea glauca</i> *	White Spruce	11
<i>Pinus strobus</i> *	Eastern White Pine	4
<i>Pinus sylvestris</i>	Scots Pine	4
<i>Populus tremuloides</i> *	Trembling Aspen	1
<i>Prunus serotina</i> *	Black Cherry	3
<i>Salix babylonica</i>	Weeping Willow	1
<i>Salix</i> sp.	Willow species	1

Scientific Name	Common Name	Total Count
<i>Ulmus americana</i> *	White Elm	2
<u>TG1:</u>		
<i>Acer platanoides</i>	Norway Maple	4
<i>Picea pungens</i>	Blue Spruce	2
<i>Picea glauca</i> *	White Spruce	3
<u>TG2: (M)</u>		
<i>Tilia americana</i> *	Basswood	2
<i>Picea glauca</i> *	White Spruce	19
<i>Pinus sylvestris</i>	Scots Pine	6
<i>Carya</i> sp.	Hickory species	1
<i>Prunus serotina</i> *	Black Cherry	1
<i>Acer saccharum</i> *	Sugar Maple	2
<u>TG3:</u>		
<i>Prunus serotina</i> *	Black Cherry	1
<i>Pinus strobus</i> *	Eastern White Pine	8
<i>Acer platanoides</i>	Norway Maple	1
<u>TG4:</u>		
<i>Picea abies</i>	Norway Spruce	15
<i>Pinus resinosa</i> *	Red Pine	2
<u>TG5: (O)</u>		
<i>Thuja occidentalis</i> *	Eastern White Cedar	5
<i>Fraxinus americana</i> *	White Ash	1
<u>TG6: (R)</u>		
<i>Fraxinus americana</i> *	White Ash	3
<u>TG7: (S)</u>		
<i>Fraxinus americana</i> *	White Ash	3
<i>Acer saccharum</i> *	Sugar Maple	4
<i>Prunus serotina</i> *	Black Cherry	2
<u>TG8:</u>		
<i>Fraxinus americana</i> *	White Ash	13
Total		172

* Native Species

4.3 Wildlife

4.3.1 Birds

No nests were observed within the wetland areas during field surveys on April 3, 2020. Several Red-winged Blackbird (*Agelaius phoeniceus*) were observed calling near Headwater Drainage Feature (HDF) M, suggesting potential nests within the wetland feature (MAS2-1).

4.3.2 Breeding Amphibians

During the HDF surveys on April 3, 2020, multiple Spring Peeper (*Pseudacris crucifer*) were heard calling within the shallow marsh (MAS2-1) near HDF Site M, west of 8th Concession.

Amphibian breeding surveys were conducted and targeted at potentially suitable wetland areas in the Study Area at three locations. Four species of amphibians were recorded during the surveys: Spring Peeper (*Pseudacris crucifer*), American Toad (*Anaxyrus americanus*), Gray Treefrog (*Hyla versicolor*), and Western Chorus Frog (*Pseudacris triseriata*). A summary of the surveys is provided in **Table 3** and monitoring station locations are shown on **Figure 2**.

Table 3. Breeding Amphibians

Breeding Amphibian Monitoring Station	April 30	May 26
Weather Conditions	11°C, clear, light breeze, no precipitation	25°C, clear, light breeze, no precipitation
Station 1	American Toad: code 1-1 American Toad: code 1-1 (adjacent) Spring Peeper: code 3 (adjacent)	Spring Peeper: code 3 Gray Treefrog: code 1-3 American Toad: code 1-1 (adjacent)
Station 2	Spring Peeper: code 1-1 (adjacent) American Toad: code 1-1 (adjacent)	Spring Peeper: code 2-10 (adjacent) Gray Treefrog: code 1-1 (adjacent) American Toad: code 1-1 (adjacent)
Station 3	American Toad: code 3 Spring Peeper: code 2-6 (adjacent)	Spring Peeper: code 1-1 Gray Treefrog: code 1-1 Spring Peeper: code 3 (adjacent) Gray Treefrog: code 3 (adjacent) American Toad: code 2-3 (adjacent)

***Note:**

The calling codes are designated according to the Marsh Monitoring Program Participant’s Handbook for Surveying Amphibians (Bird Studies Canada, 2009).

They are as follows:

- 1 – Individuals of one species can be counted, calls are not overlapping; second number denotes number of individuals.
- 2 – Calls of one species are overlapping; second number denotes estimated number of individuals.
- 3 – Full chorus of one species, calls continuous and overlapping, individuals not distinguishable.

During both amphibian surveys, limited pockets of shallow standing water were observed within the Cattail Mineral Shallow Marsh on both sides of 8th Concession Road at Station 1. One American Toad was heard calling within the survey area, as well as another American Toad and full chorus of Spring Peeper at a distance >100 m from the survey station during the first survey. During the second round of surveys, a full chorus of Spring Peeper and three Gray Treefrog were heard calling at the survey station. One American Toad was heard at >100 m from the survey station.

During both surveys, no flowing or standing water was observed at the drainage feature at Station 2. No amphibian calls were heard from the survey station during either April or May surveys; however, one Spring Peeper and one American Toad were heard calling from >100 m from the station during the first round of

surveys. Similarly, during May surveys, approximately ten Spring Peeper, one Gray Treefrog, and one American Toad were heard calling from >100 m from the survey station.

Water was present in the Marsh at Station 3 during the April survey, however, appeared to be dry during the May survey. In April, a full chorus of American Toad was heard at the survey station, as well as approximately 6 Spring Peeper >100 m from the station. During the second round of surveys in May, one Spring Peeper and one Gray Treefrog were heard at the survey station. Further away, a full chorus of Spring Peeper, Gray Treefrog, and approximately 3 American Toad were heard.

All three species of amphibians recorded from the Study Area are considered common in southern Ontario and have no provincial rarity status.

Incidental Wildlife

Incidental observations of the following wildlife species were recorded during field investigations, recorded in April and May 2020:

- Spring Peeper;
- Red-winged Blackbird;
- American Woodcock (*Scolopax minor*);
- Eastern Meadowlark (*Sturnella magna*);
- Mourning Dove (*Zenaida macroura*);
- Song Sparrow (*Melospiza melodia*);
- Turkey Vulture (*Cathartes aura*);
- American Robin (*Turdus migratorius*); and
- American Crow (*Corvus brachyrhynchos*).

4.4 Headwater Drainage Features

Field visits to assess the Headwater Drainage Features (HDF) were conducted on June 7 and July 23, 2019 and on April 3, 2020. Two days prior to the June 7 field visit, there was approximately 11.2 mm of rain in the 72 hours before the assessment (all 11.2 mm on June 5; Pearson International Airport Climate Station) and the month of May had been quite wet with 97.6 mm (May 'normal' for 1981 to 2010 = 74.3 mm). In the 72 hours prior to the July 23 field visit, there was 9.8 mm of rain (July 20 = 4.6 mm, July 22 = 5.2 mm). There was approximately 0.2 mm of rain in the 72 hours before the April 3, 2020 assessment (all on March 31, 2020).

During the June 7, 2019 site visit, HDF M was observed to have standing water. No water was observed at the other HDF locations. During the second site visit on July 23, 2019, all sites on **Figure 2** were visited and observed to be dry.

HDF J

This feature is located on the west side of 8th Concession, approximately 750 m from the intersection of 8th Concession and King Road. During the June 7 and July 23, 2019 and April 3, 2020 visit, the feature was dry with no defined channel observed. Vegetation surrounding this feature was comprised of grasses.

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Photo 1: HDF J, facing west (April 3, 2020)

HDF K

This feature is located approximately 50 m north of HDF J. During the April 3, 2020 visit, moderate flow was observed from the perched culvert of 0.6 m in diameter and dropping into a plunge pool with a depth of 0.2 m. From the plunge pool, a slow trickle flowed west into the adjacent field. Meadow riparian vegetation surrounded the feature, including grasses, goldenrod, and Reed Canary Grass. The feature had a gravelly and sandy bottom. The feature width varied between 0.6 – 1.1 m wide. This feature was observed to be dry during the June and July site visits in 2019.

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Photo 2: HDF K, facing west (April 3, 2020)

HDF L

This feature is located approximately 50 m north of HDF K. The 0.2 m diameter culvert was observed be dry during all three site visits between June 2019 and April 2020. Vegetation surrounding this feature was comprised exclusively of grasses.

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Photo 3: HDF L, facing west (April 3, 2020)

HDF M

This feature is located approximately 450 m north of HDF L. A slow flow was observed at the 0.9 m diameter culvert on the west side of 8th Concession which was partially obstructed by Reed Canary Grass in April 2020. Water was observed to be 0.3 – 0.7 m deep, and the width of the feature being the entire shallow marsh community (MAS2-1), approximately 60 m wide at the road. Riparian vegetation within the marsh consisted of cattail and Reed Canary Grass. The feature had a sandy-clay bottom. It is unlikely to serve as fish habitat as the culvert was partially blocked, however may provide contributing fish habitat.

The eastern portion of the feature contained standing water at a depth of 0.6 m and width encompassing the entire wetland (MAS 2-1). The feature bottom was completely vegetated with cattail and Reed Canary Grass. Standing water was observed at this feature in June 2019 but was dry in July of 2019.

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Photo 4: Western portion of HDF M, facing west (April 3, 2020)

HDF N

This feature is located approximately 70 m south of the intersection of 8th Concession and 15th Sideroad. A slow trickle of water was observed at the 0.6 m diameter culvert on the west side of 8th Concession on April 3, 2020. Water was 0.1 – 0.3 m deep, and the feature had a wetted width of 0.2 – 0.3 m. The bottom was completely vegetated, and meadow riparian vegetation surrounded the feature.

A slow flow was observed at the eastern portion of the feature in April 2020. The feature bottom contained small rocks and vegetation. Water was 0.2 – 0.1 m deep, with a wetted width of 0.2 – 0.35 m. Reed Canary Grass comprised the riparian vegetation, which transitioned into an agricultural field further from the feature. No defined channel was observed near the culvert, but a somewhat defined depression was observed further out in the agricultural field, appearing to lead to a small Phragmites patch. No water was observed in June 2019 and this feature was also dry in July 2019.

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Photo 5: Eastern portion of HDF N, facing east (April 3, 2020)

HDF O

This feature is located crossing under 15th Sideroad at the intersection of 8th Concession and 15th Sideroad. The northern portion of this feature was surrounded by cut woody debris, somewhat obstructing the 0.5 m diameter culvert. A slow trickle was observed with a depth of 0.1 – 0.2 m in April 2020. The feature bottom was comprised of sandy clay.

South of 15th Sideroad, riparian vegetation surrounding the feature included a maple and willow dominated woodlot, providing approximately 70% cover. A moderate flow and depth of 0.1 m was observed in April 2020. Bank erosion was observed with heights of 0.1 – 1 m on both sides of the feature. The wetted width varied between 1 – 1.5 m, which narrows past a fence a few metres from the road. The feature bottom was comprised of sandy clay. No water was observed in June 2019 and this feature was also dry in July 2019.

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Photo 5: Eastern portion of HDF N, facing east (April 3, 2020)

Based on the *Evaluation, Classification and Management of Headwater Drainage Features Guidelines*, no drainage features in the Study Area are permanent (perennial) streams. Rather, all of the drainage features are considered intermittent or ephemeral. Additional information about the terrestrial features near the HDFs are provided in **Figure 2** and in **Section 4.1**.

4.5 Species at Risk Screening

Information obtained from MNRF's NHIC mapping indicates that there are records of the following provincially regulated SAR in the vicinity of the project area:

- Redside Dace – Endangered
- Butternut – Endangered
- Eastern Wood-pewee – Special Concern

In addition, there are three Endangered bat species that could possibly inhabit roadside trees adjacent to the roadway:

- Eastern Small-footed Bat (*Myotis leibii*) – Endangered
- Little Brown Myotis (*Myotis lucifugus*) – Endangered

- Northern Myotis (*Myotis septentrionalis*) – Endangered

A habitat suitability screening is provided for the list of potential SAR in the general vicinity of the proposed road reconstruction works, based on the results of field surveys, habitat screening, and our professional experience (**Table 3**).

Table 3. Species at Risk Habitat Screening

Species	Habitat Requirement Overview	Habitat Suitability
Redside Dace (<i>Clinostomus elongatus</i>)	The Redside dace is found in pools and slow-moving areas of small streams and headwaters with a gravel bottom. They are generally found in areas with overhanging grasses and shrubs, and can leap up to 10 cm out of the water to catch insects.	‘Contributing’ habitat
Butternut (<i>Juglans cinerea</i>)	Butternut grows best on rich, moist, well-drained loams often found on stream bank sites but may be found on well-drained gravelly sites, especially those of limestone origin.	Potential – Hedgerows, semi open areas
Eastern Small-footed Bat (<i>Myotis leibii</i>)	Maternity Roosts: primarily under loose rocks on exposed rock outcrops, crevices and cliffs, and occasionally in buildings, under bridges and highway overpasses and under tree bark (MNRF, 2019a).	Potential – forested areas
Little Brown Myotis (<i>Myotis lucifugus</i>)	Maternal Roosts: Often associated with buildings (attics, barns etc.). Occasionally found in trees (25-44 cm in diameter at breast height [DBH]) (MNRF, 2019b).	Potential – forested areas
Northern Myotis (<i>Myotis septentrionalis</i>)	Maternity Roosts: Often associated with cavities of large diameter trees (25-44 cm DBH). Occasionally found in structures (attics, barns etc.) (MNRF, 2019c).	Potential – forested areas
Eastern Wood-pewee (<i>Contopus virens</i>)	Lives in the mid-canopy layer of forest clearings and edges of deciduous and mixed forests. It prefers intermediate-age forest stands with little understory vegetation.	No suitable habitat within project area
Eastern Meadowlark (<i>Sturnella magna</i>)	The Eastern Meadowlark is most common in native grasslands, pastures and savannahs. It also uses a wide variety of other anthropogenic grassland habitats, including hayfields, weedy meadows, young orchards, golf courses and herbaceous fencerows. Eastern Meadowlarks occasionally nest in row crop fields such as corn and soybean, but these crops are considered low-quality habitat. In hayfields, it prefers older sites due to the availability of short, sparse, patchy stands of grass-dominated vegetation.	Recorded in fields to the east and west of 8 th Concession project area.

Eastern Meadowlark (*Sturnella magna*) were observed and heard calling on both east and west sides of 8th Concession. Eastern Meadowlark is a grassland bird that prefer pastures and hayfields as their habitat and are designated as Threatened in Ontario. One Eastern Meadowlark was observed hopping through and singing in the field near HDF L. Three more Eastern Meadowlark were heard calling and singing on the

east side of 8th Concession, between 15th Sideroad and King Road. No other SAR were recorded during the field surveys and opportunistic (incidental) observations within the 8th Concession Project Area.

5. Description of Road Reconstruction

Full road reconstruction to Township Standard with two 3.5 metre paved lanes and 1 metre shoulder is proposed for 8th Concession. The proposed works will provide improved structural adequacy by applying Township minimum pavement structure of 400 mm Granular B, 150 mm Granular A, 60 mm base asphalt and 50 mm surface asphalt. Reconstruction will reduce the crests of the knolls and reduce the valleys along centerline of road to improve sightlines along the roadway and at driveways. To accommodate the cuts and fills associated with the road improvements it is proposed to increase the right-of-way from 20 metre to 26 metre width. It is proposed that the 3 metres be taken along the east and west sides of the road.

6. Impact Assessment

6.1 Vegetation

The proposed roadway improvements are accommodated predominately within the existing road right-of-way limits thereby minimizing potential impacts to vegetation communities (**Figure 4**). The proposed works may result in minor encroachment into the edge of treed and wetland (marsh) communities, which includes the removal of individual edge trees. Potential impacts to the function of these communities are not expected. For wetland communities, loss of edge and potential additional impacts associated with sedimentation which are the predominant concern and therefore erosion and sediment control will be necessary.

6.1.1 Tree Removals

Based on the current proposed design limits, 156 trees may require removal to accommodate the road improvement works (**Table 4, Figure 5**). This includes 116 (74%) native species and 38 (25%) non-native tree species, as well as 2 (2%) trees identified to the genus level. The majority of these trees are located in public lands along the municipal right of way, while some occur on private lands and were determined to have critical root zones that encroach into the proposed construction limits. Subject to inspection by an arborist during construction, some of these trees may be retainable, particularly some, if not all trees within Tree Groups 1, 3, and 4. Impacts to adjacent retained trees may also be possible, in the form of mechanical trunk damage and root compression by heavy machinery, and branch damage from adjacent works.

Table 4. Trees Proposed to be Removed

Scientific Name	Common Name	Total Count
<i>Acer saccharinum</i> *	Silver Maple	11
<i>Acer saccharum</i> *	Sugar Maple	17
<i>Fraxinus americana</i> *	White Ash	8
<i>Gleditsia triacanthos</i> *	Honey Locust	1

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Scientific Name	Common Name	Total Count
<i>Malus pumila</i>	Common Apple	4
<i>Picea abies</i>	Norway Spruce	1
<i>Picea glauca</i> *	White Spruce	10
<i>Pinus strobus</i> *	Eastern White Pine	2
<i>Pinus sylvestris</i>	Scots Pine	4
<i>Populus tremuloides</i> *	Trembling Aspen	1
<i>Prunus serotina</i> *	Black Cherry	3
<i>Salix babylonica</i>	Weeping Willow	1
<i>Salix</i> sp.	Willow species	1
<i>Ulmus americana</i> *	White Elm	0
<u>TG1: (Potentially retainable)</u>		
<i>Acer platanoides</i>	Norway Maple	4
<i>Picea pungens</i>	Blue Spruce	2
<i>Picea glauca</i> *	White Spruce	3
<u>TG2: (M)</u>		
<i>Tilia americana</i> *	Basswood	2
<i>Picea glauca</i> *	White Spruce	19
<i>Pinus sylvestris</i>	Scots Pine	6
<i>Carya</i> sp.	Hickory species	1
<i>Prunus serotina</i> *	Black Cherry	1
<i>Acer saccharum</i> *	Sugar Maple	2
<u>TG3: (Potentially retainable)</u>		
<i>Prunus serotina</i> *	Black Cherry	1
<i>Pinus strobus</i> *	Eastern White Pine	8
<i>Acer platanoides</i>	Norway Maple	1
<u>TG4: (Potentially retainable)</u>		
<i>Picea abies</i>	Norway Spruce	15
<i>Pinus resinosa</i> *	Red Pine	2
<u>TG6: (R)</u>		
<i>Fraxinus americana</i> *	White Ash	3
<u>TG7: (S)</u>		
<i>Fraxinus americana</i> *	White Ash	3
<i>Acer saccharum</i> *	Sugar Maple	4
<i>Prunus serotina</i> *	Black Cherry	2
<u>TG8:</u>		
<i>Fraxinus americana</i> *	White Ash	13
Total		156

* Native Species

6.1.1.1 Tree Removals with TRCA Regulated Area Only

Of the total 154 trees that may require removal to accommodate the proposed road design, included in **Table 4**, 39 of those inventoried trees are proposed to be removed within TRCA Regulated Area (**Table 5**, **Figure 5**). This includes 33 (85%) native species and 5 (13%) non-native tree species, as well as 1 (2%) tree identified to the genus level. Tree Group 8 is partially within TRCA Regulated Area, thus a portion of the tree group has been included in Table 5.

Table 5. Trees Proposed to be Removed with TRCA Regulated Area

Tree ID	Scientific Name	Common Name	Effective DBH (cm)	Count
1469	<i>Acer saccharum</i> *	Sugar Maple	54	1
1470	<i>Acer saccharum</i> *	Sugar Maple	56	1
1471	<i>Acer saccharum</i> *	Sugar Maple	70	1
1472	<i>Acer saccharum</i> *	Sugar Maple	92	1
1473	<i>Acer saccharum</i> *	Sugar Maple	52	1
1474	<i>Acer saccharum</i> *	Sugar Maple	74	1
F	<i>Picea glauca</i> *	White Spruce	22	1
G	<i>Picea glauca</i> *	White Spruce	25	1
H	<i>Pinus strobus</i> *	Eastern White Pine	40	1
I	<i>Picea abies</i>	Norway Spruce	50	1
K	<i>Picea glauca</i> *	White Spruce	30	1
L	<i>Picea glauca</i> *	White Spruce	30	1
P	<i>Salix</i> sp.	Willow species	67	1
Q	<i>Salix babylonica</i>	Weeping Willow	28	1
T	<i>Acer saccharum</i> *	Sugar Maple	65	1
U	<i>Fraxinus americana</i> *	White Ash	38	1
W	<i>Fraxinus americana</i> *	White Ash	31	1
X	<i>Fraxinus americana</i> *	White Ash	43	1
Y	<i>Fraxinus americana</i> *	White Ash	25	1
1	<i>Malus pumila</i>	Common Apple	46	1
2	<i>Malus pumila</i>	Common Apple	12	2
3	<i>Fraxinus americana</i> *	White Ash	90	1
TG6	<i>Fraxinus americana</i> *	White Ash	23	3
TG7	<i>Fraxinus americana</i> *	White Ash	40	3
TG7	<i>Acer saccharum</i> *	Sugar Maple	40	4
TG7	<i>Prunus serotina</i> *	Black Cherry	40	2

Tree ID	Scientific Name	Common Name	Effective DBH (cm)	Count
TG8 (partially within TRCA Regulated Area)	<i>Fraxinus americana</i> *	White Ash	20	4
Total				39

*Native species

6.2 Wildlife and Species at Risk

Potential impacts to SAR and wildlife due to construction activity include very minor impacts to potential habitat. The primary concern for impacts is associated with removal of larger trees with habitat value and the two wetlands that are part of the PSW. In these areas, construction activities such as vegetation removal, grading, use of machinery and nearby disturbances, should be avoided and/or minimized to the greatest extent feasible. Impacts to wildlife are associated with construction works and are therefore considered short-term. Potential impacts to Redside Dace Contributing Habitat can be mitigated through the implementation of the mitigation measures detailed in **Section 7** below, particularly as they relate to Erosion and Sediment Control (ESC).

6.3 Aquatic Impact Assessment

Based on the *Evaluation, Classification and Management of Headwater Drainage Features Guidelines*, the management classification for these drainage features should be *Conservation* or below. Based on the proposed design, all drainage features will remain on the landscape and culverts will be maintained in their current locations but extended to accommodate the new right-of-ways. Any culvert replacements will be designed to maintain conveyance and hydrological functions of the HDF.

7. Mitigation Recommendations

Through Preliminary Design, mitigation measures will be recommended and detailed. These measures typically include standard mitigation to be applied across the whole Study Area, as well as site-specific measures. Specific mitigation measures applicable to the environmental conditions of the selected alternative will be finalized during the detailed design stage. The following general mitigation and enhancement measures are recommended for consideration through subsequent study phases:

- Install environmental protection and erosion control fencing along the limits of the reconstruction area at predetermined sensitive areas prior to the commencement of construction (includes prior to vegetation removal).
- To minimize the potential for erosion and off-site transport of sediment into surface water features and the natural environment, the project will implement Best Practices related to erosion and sediment control (ESC). ESC measures used by the contractor on all construction should meet guidelines as outlined in Erosion and Sediment Control Guideline for Urban Construction,

December 2006 (ESC Guideline), prepared by the Greater Golden Horseshoe Area Conservation Authorities (GGHACA).

- Where feasible, trees proposed to be retained will be protected by tree protection fencing (TPF), which is to be placed at the dripline or in a location to minimize encroachment into the root zone and protect the trunk. Fencing provides protection from potential damage during construction activities such as the use of machinery near trees and branches, and stockpiling of materials over the root zone. ESC fencing can be combined with TPF.
- Vegetation clearing should occur outside of the breeding bird season (generally late April to late July) to prevent nest destruction to comply with the Migratory Birds Convention Act. Winter season, during frozen ground conditions, is the ideal period for tree and vegetation removal if feasible. In the event that tree removal must occur within the breeding bird window a qualified biologist must screen the area. Clearing in identified nesting areas would be prohibited until such time that it has been confirmed that the young have fledged.
- Tree removal should also be avoided during the maternity roosting period for Endangered Bats (April 1 to September 30). If tree removals need to occur within this window, a qualified ecologist must screen for potential snag trees that may be used for roosting.
- Prior to work near any type of marsh, if construction activities occur within the period of April to July, areas with standing water that may support amphibians are to be surveyed by a qualified biologist for the presence of amphibians. If present these are to be relocated to outside of the construction area to suitable habitats.
- In the unlikely event that SAR are encountered, work will stop and the MNRF will be contacted.
- Consultation with MECP will be required regarding proposed culvert replacement in Redside dace contributing habitat.
- All exposed and newly constructed surfaces should be stabilized using appropriate means in accordance with the characteristics of the exposed soils. These surfaces should be fully stabilized and re-vegetated as quickly as possible following the completion of the works;
- All activities, including the maintenance of construction machinery, should be controlled to prevent the entry of petroleum products, debris, rubble, concrete or other deleterious substances into the natural environment. Refueling should not occur within 30 m of any woodland, wetland or watercourse.

7.1 Site Specific Mitigation

7.1.1 Erosion and Sediment Control Measures

The installation and maintenance of ESC measures are of specific importance to the protection of watercourse features and wetland communities from sediment laden water and to delineate the construction envelope to minimize damage to the adjacent natural area.

The TRCA Requires that the ESC measures be demonstrated on all relevant plans and/or drawings submitted. Further recommendations for the ESC plan include:

- The ESC measures should remain in place and in good working condition for the duration of the project, until landscaping and sodding has stabilized.

- All work areas are to be effectively isolated from wetland communities and drainage features with appropriate ESC measures in order to ensure that deleterious substances do not enter these areas at any time.
- ESC fencing/measures are to be erected as near to the development as possible.
- ESC measures are to be installed prior to beginning work and are maintained in working order throughout all stages of construction activities.
- That ESC fencing be erected to specifications outlined in Ontario Provincial Standard Drawings (OSPD), being at a minimum, a double row of sediment silt fencing consisting of a non-woven geotextile with straw bales staked in between.
- No sediment, sediment-laden water or deleterious substances are to be discharged into watercourses/drainage features at any time.
- All ESC measures are to be inspected daily including after every rainfall, cleaned, maintained and/or adjusted accordingly to ensure sediment does not enter drainage features at any time.
- Machinery or equipment will be maintained and refueled within the construction area defined by the ESC measures, and at no time will approach within 30 m of the watercourses or wetland areas.
- Any equipment, stockpiled material or construction material will be stored within the construction area defined by the ESC measures, and in a manner that prevents sediment or deleterious substances from entering the creek.
- Any dewatering (if required) is to be filtered to remove sediment prior to discharging to a well vegetated area at least 30 m from a watercourse.
- All disturbed areas will be appropriately and effectively stabilized and/or restored immediately following completion of the works with native species.

Specific locations for the installation of ESC measures have been identified for headwater drainage features, to include:

- ESC fencing on west side at STA. 1+790 – 1+810 (HDF K)
- ESC fencing on east side at STA. 3+000 – 3+020 (HDF N)

All other headwater drainage features occur within woodland and wetland communities, for which ESC measures and protection fencing are recommended below.

7.1.2 Woodland and Wetland Protection

Tree/wetland protection fencing (combined with ESC fencing) to be installed:

- West side from STA 1+290 – 1+320
- Both sides from STA 2+310 – 2+440

7.1.3 Tree Protection

A TPZ barrier is to be installed as per York Region's *Street Tree and Forest Preservation Guidelines*. In general, a vertical TPZ barrier is to be installed around every tree to be preserved, including trees outside of the Regional road allowance. It is to be installed at the outer limit of the minimum required TPZ for each tree to be preserved wherever feasible and should enclose the entire TPZ adjacent to areas of constructions

works. For groups of trees, TPZ barriers are to enclose the minimum required TPZ of each tree as well as the area between the trees, even if this area extends beyond the minimum required TPZ.

In accordance with York Region's guidelines (York Region, 2016), TPZ for all trees ≤ 24 cm DBH were given a minimum TPZ radius of 2.4 metres. For trees ≥ 25 cm DBH, TPZ was calculated using the following formula:

$$\text{TPZ (m)} = \frac{\text{DBH (cm)} \times 10}{100}$$

TPZ barriers are to be installed prior to the commencement of any site disturbances including tree removals. The barriers shall be made of either framed construction fencing or solid hoarding, unless otherwise specified and approved by the Region or its designate.

7.1.4 Tree Replacement Planting

It is estimated that 156 trees may require removal to accommodate the road improvement works. It is recommended that a tree compensation ratio of 2:1 be implemented, resulting in 312 trees to be planted. Planting and restoration efforts will aim to restore the natural areas where disturbances have occurred as a result of construction works. It is recommended that trees be planted in groupings at locations that will provide ecological buffer to existing woodlands or other features or runoff interception functions. Areas of new expanded roadway sightlines and shoulders should be avoided as restoration areas.

Typically required for TRCA regulated areas, the compensation ratios of the TRCA should be implemented as per the TRCA's Guideline for Determining Ecosystem Compensation (TRCA, 2018). However inventoried trees are located outside of/bordering the edge of the drainage features themselves. As such, their removals are not expected to impact the function of these features and compensation of these trees consistent with the remaining trees (outside regulated areas) is deemed as acceptable. The final number of tree replacement plantings, required for TRCA Regulated Areas, will be confirmed following tree removal during construction, in consultation with TRCA

As the primary objective of compensation is restoration rather than street tree establishment, it is recommended that smaller tree stock (150 – 200 cm potted/whip stock) be employed for practicality of implementation and to ensure greater establishment in areas without planned regular maintenance. Native tree species will be selected for planting to reflect the natural composition of the area.

8. Conclusions

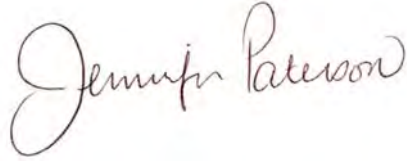
The findings of this Natural Environmental Conditions study are the result of a background review, ecological field surveys, and an analysis of data using current scientific understanding of the ecology of the area and natural heritage policy requirements. This information is provided as input into the detailed design in the context of existing conditions and protection of the natural environment.

Memorandum

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King Township Road Reconstruction Environmental Assessments
8th Concession – Natural Environmental Conditions

Prepared By:



Jen Paterson, M.Sc.
Ecologist

Prepared By:



Angela Zhou, B.E.S.
Ecologist



Reviewed By:

Dirk Janas, B.Sc.
Principal, Ecologist

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CLIENT:
Ainley Group

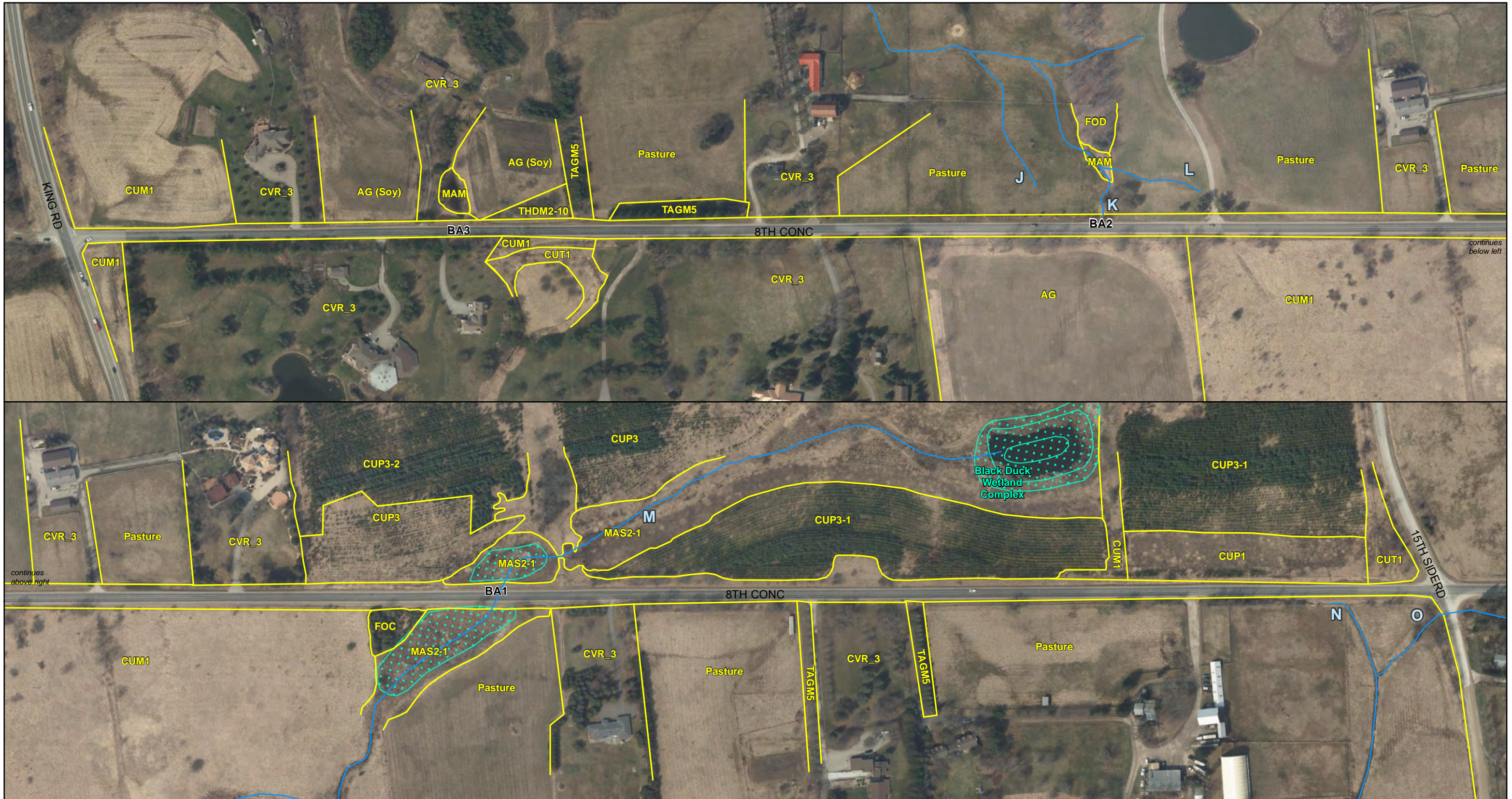
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 PROJECT NO. 1705608 REVISION: 1-1
 DATE: May 08, 2020 SCALE: 1:7000
 DRAWN: BE DATUM: NAD 1983
 CHECKED: JP PROJECTION: UTM zone 17

LEGEND:
 8th Concession Approximate Study Area
 Wetland - Evaluated-Provincial
 Wetland - Not evaluated per OWES



Site Location

Figure 1



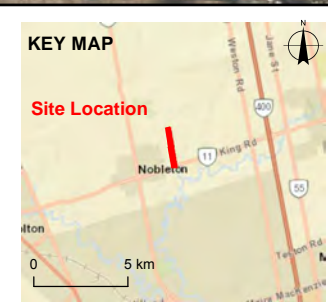
CLIENT:
Ainley Group

PROJECT: King Twp Rd Reconstruction - 8th Conc.
 PROJECT NO. 1705608 REVISION: 3-1
 DATE: Jan 13, 2021 SCALE: 1:2800

PREPARED BY:
Palmer™

DRAWN: BE, KG DATUM: NAD 1983
 CHECKED: JP PROJECTION: UTM zone 17

- LEGEND:
- Headwater Drainage Feature (HDF)
 - Watercourse (TRCA)
 - ELC Community
 - Wetland - Evaluated-Provincial
 - BA1 Breeding Amphibian Survey Station
- Terrestrial System**
- FO (Forest)
 - FOD: Deciduous Forest
 - FOC: Coniferous Forest
 - CU (Cultural)
 - CUM1: Mineral Cultural Meadow
 - CUP1: Deciduous Plantation
 - CUP3: Coniferous Plantation
 - CUP3-1: Red Pine Coniferous Plantation Type
 - CUP3-2: White Pine Coniferous Plantation Type
 - CUT1: Mineral Cultural Thicket
- Wetland System**
- MA (Marsh)
 - MAS2-1: Cattail Mineral Shallow Marsh
- Other Land Use**
- TAGM5: Fencerow
 - AG: Agricultural
 - TH (Thicket)
 - THDM2-10: Apple Deciduous Shrub Thicket Type
 - CV (Constructed)
 - CVR_3: Single Family Residential



Existing Environmental Conditions

Figure 2



CLIENT:
Ainley Group

PROJECT: King Twp Rd Reconstruction - 8th Conc.
 PROJECT NO. 1705608 REVISION: 1-2
 DATE: Dec 03, 2020 SCALE: 1:2800

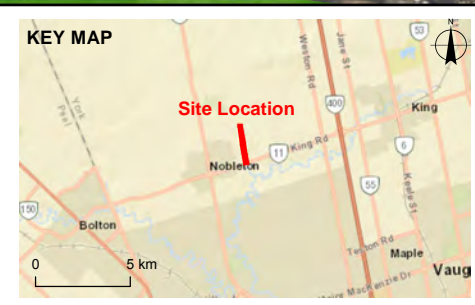
PREPARED BY:
Palmer™

DRAWN: BE, KG DATUM: NAD 1983
 CHECKED: JP PROJECTION: UTM zone 17

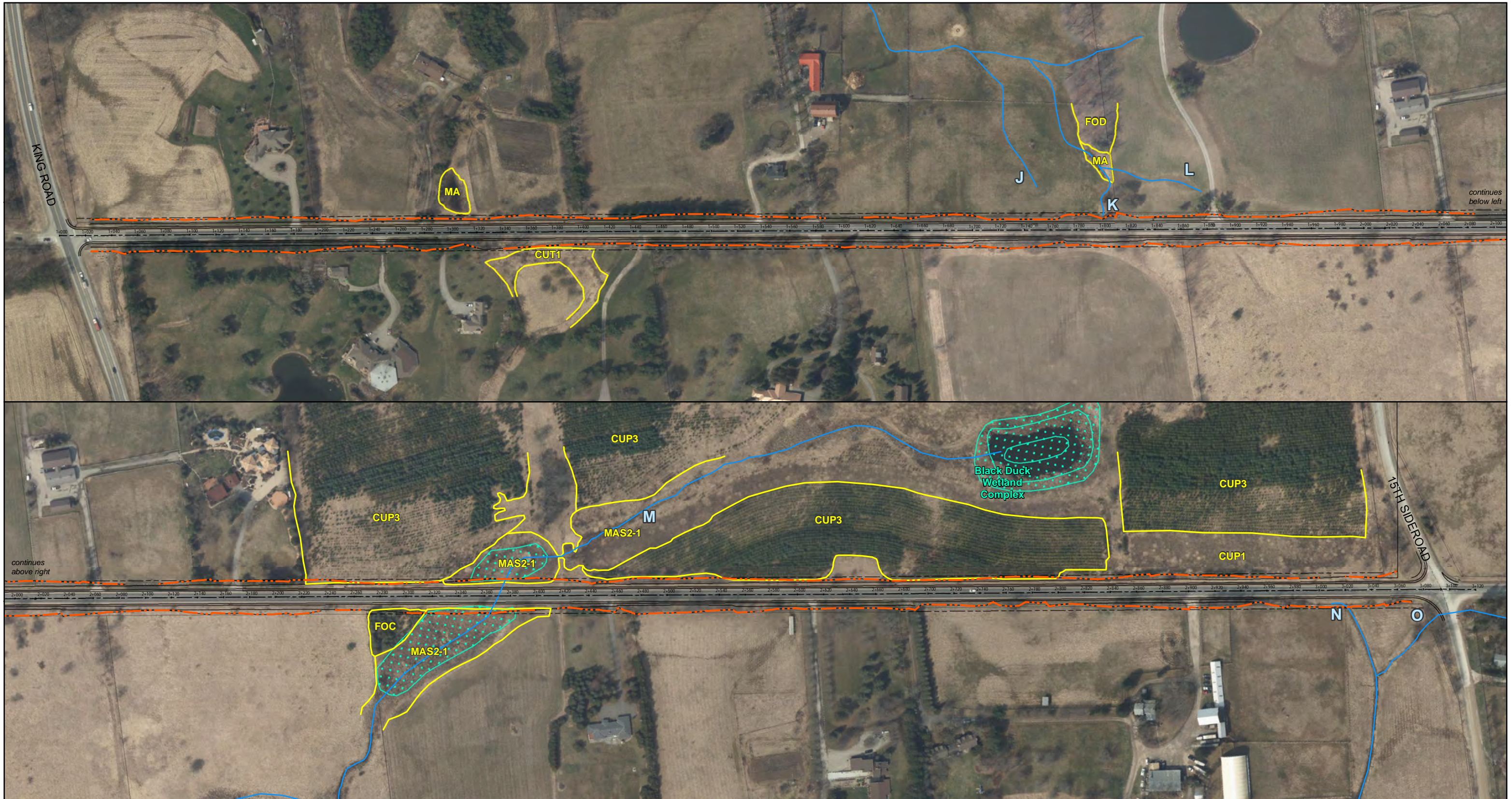
LEGEND:

- Inventory Tree
- Tree Protection Zone
- ⊕ Tree Grouping
- Watercourse (TRCA)
- TRCA Regulation Limit

Imagery (2019) provided by Regional Municipality of York.



Tree Inventory
Figure 3



CLIENT:
Ainley Group

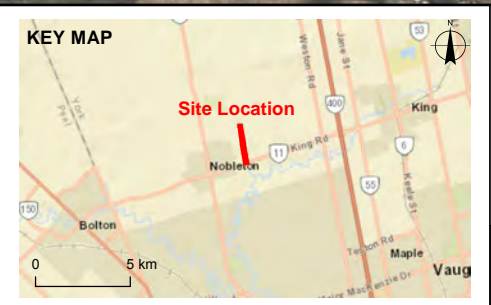
PROJECT: King Twp Rd Reconstruction - 8th Conc.
 PROJECT NO. 1705608 REVISION: 1-1
 DATE: May 08, 2020 SCALE: 1:2800

PREPARED BY:
Palmer™

DRAWN: BE DATUM: NAD 1983
 CHECKED: JP PROJECTION: UTM zone 17

- LEGEND:
- Headwater Drainage Feature (HDF)
 - Proposed Limit of Disturbance
 - Proposed Alignment
 - Watercourse (TRCA)
 - ELC Community
 - Wetland - Evaluated-Provincial

- Terrestrial System*
 FO (Forest)
 FOD: Deciduous Forest
 FOC: Coniferous Forest
- Wetland System*
 MA (Marsh)
 MAS2-1: Cattail Mineral Shallow Marsh
- CU (Cultural)
 CUP3: Coniferous Plantation
 CUP1: Deciduous Plantation
 CUT1: Mineral Cultural Thicket



Proposed Alignment

Figure 4



CLIENT:
Ainley Group

PROJECT: King Twp Rd Reconstruction - 8th Conc.
 PROJECT NO. 1705608 REVISION: 1-1
 DATE: Dec 03, 2020 SCALE: 1:2800
 DRAWN: KG DATUM: NAD 1983
 CHECKED: JP PROJECTION: UTM zone 17

PREPARED BY:
Palmer™

PROJECT NO. 1705608 REVISION: 1-1
 DATE: Dec 03, 2020 SCALE: 1:2800
 DRAWN: KG DATUM: NAD 1983
 CHECKED: JP PROJECTION: UTM zone 17

LEGEND:

- Tree to be Retained
- Tree to be Removed
- Proposed Limit of Disturbance
- Proposed
- Tree Protection Zone
- Tree to be Retained
- Tree Expected to be Injured (Potentially Retainable)
- Tree to be Removed
- Watercourse (TRCA)
- TRCA Regulation Limit

Imagery (2019) provided by Regional Municipality of York.



Tree Removals

Figure 5

Appendix A: Tree Inventory

Count	ID	Scientific Name	Common Name	DBH (cm)	Effective DBH (cm)	Condition (G/F/P/D)	Comments	Recommendation	Within TRCA Regulated Area
1	1463	<i>Picea glauca</i>	White Spruce	30	30	F		Remove	No
1	1464	<i>Picea glauca</i>	White Spruce	32	32	G		Remove	No
1	1465	<i>Picea glauca</i>	White Spruce	37	37	G		Remove	No
1	1466	<i>Picea glauca</i>	White Spruce	32	32	G		Remove	No
1	1467	<i>Pinus sylvestris</i>	Scots Pine	50	50	G		Remove	No
1	1468	<i>Pinus sylvestris</i>	Scots Pine	38	38	G		Remove	No
1	1469	<i>Acer saccharum</i>	Sugar Maple	54	54	F	fence growing through	Remove	Yes
1	1470	<i>Acer saccharum</i>	Sugar Maple	56	56	F	fence growing through	Remove	Yes
1	1471	<i>Acer saccharum</i>	Sugar Maple	70	70	F	fence growing through	Remove	Yes
1	1472	<i>Acer saccharum</i>	Sugar Maple	92	92	F	fence growing through	Remove	Yes
1	1473	<i>Acer saccharum</i>	Sugar Maple	52	52	F	fence growing through	Remove	Yes
1	1474	<i>Acer saccharum</i>	Sugar Maple	74	74	F	fence growing through	Remove	Yes
1	1475	<i>Acer saccharum</i>	Sugar Maple	88	88	F	fence growing through	Remove	No
1	1476	<i>Picea glauca</i>	White Spruce	31	31	G		Remove	No
1	1477	<i>Acer saccharinum</i>	Silver Maple	65	65	G		Remove	No
1	1478	<i>Acer saccharinum</i>	Silver Maple	40	40	G		Remove	No
1	1479	<i>Fraxinus americana</i>	White Ash	37	37	F	Only top alive	Remove	No
1	1480	<i>Fraxinus americana</i>	White Ash	27	27	F	suckering	Remove	No
1	1481	<i>Acer saccharinum</i>	Silver Maple	60	60	G		Remove	No
1	1482	<i>Acer saccharinum</i>	Silver Maple	26	26	F	broken top	Remove	No
1	1483	<i>Acer saccharinum</i>	Silver Maple	38	38	F	exposed roots	Remove	No
1	1484	<i>Acer saccharinum</i>	Silver Maple	36	36	F	exposed roots	Remove	No
1	1485	<i>Acer saccharinum</i>	Silver Maple	35	35	F	exposed roots	Remove	No
1	1486	<i>Fraxinus americana</i>	White Ash	30	30	D		Remove	No
1	1487	<i>Acer saccharinum</i>	Silver Maple	45	45	F	exposed roots	Remove	No
1	1488	<i>Acer saccharinum</i>	Silver Maple	40	40	G		Remove	No
1	1489	<i>Acer saccharinum</i>	Silver Maple	42	42	G		Remove	No
1	1490	<i>Acer saccharinum</i>	Silver Maple	50	50	G		Remove	No
1	1491	<i>Populus tremuloides</i>	Trembling Aspen	36	36	G		Remove	No
1	1492	<i>Pinus sylvestris</i>	Scots Pine	28	28	P		Remove	No
1	1493	<i>Prunus serotina</i>	Black Cherry	50	50	F	dead branches	Remove	No

Count	ID	Scientific Name	Common Name	DBH (cm)	Effective DBH (cm)	Condition (G/F/P/D)	Comments	Recommendation	Within TRCA Regulated Area
1	1494	<i>Pinus sylvestris</i>	Scots Pine	46	46	P	Woodpecker holes	Remove	No
1	A	<i>Pinus strobus</i>	Eastern White Pine	20	20	G		Retain	No
1	B	<i>Gleditsia triacanthos</i>	Honey Locust (cultivar)	15	15	F		Remove	No
1	C	<i>Picea glauca</i>	White Spruce	18	18	G		Remove	No
1	D	<i>Pinus strobus</i>	Eastern White Pine	42	42	G		Remove	No
1	E	<i>Picea abies</i>	Norway Spruce	45	45	F		Retain	No
1	F	<i>Picea glauca</i>	White Spruce	22	22	G		Remove	Yes
1	G	<i>Picea glauca</i>	White Spruce	25	25	G		Remove	Yes
1	H	<i>Pinus strobus</i>	Eastern White Pine	40	40	G		Remove	Yes
1	I	<i>Picea abies</i>	Norway Spruce	50	50	G		Remove	Yes
1	J	<i>Picea glauca</i>	White Spruce	22	22	G		Retain	Yes
1	K	<i>Picea glauca</i>	White Spruce	30	30	G		Remove	Yes
1	L	<i>Picea glauca</i>	White Spruce	30	30	G		Remove	Yes
1	N	<i>Pinus strobus</i>	Eastern White Pine	32	32	G		Retain	No
1	P	<i>Salix</i> sp.	Willow species	45,40,30	67	F		Remove	Yes
1	Q	<i>Salix babylonica</i>	Weeping Willow	28	28	F		Remove	Yes
1	T	<i>Acer saccharum</i>	Sugar Maple	65	65	G		Remove	Yes
1	U	<i>Fraxinus americana</i>	White Ash	38	38	P	dead branches and pruned	Remove	Yes
1	V	<i>Fraxinus americana</i>	White Ash	105	105	F		Retain	Yes
1	W	<i>Fraxinus americana</i>	White Ash	18,22,12	31	P	dead top	Remove	Yes
1	X	<i>Fraxinus americana</i>	White Ash	41,13	43	F		Remove	Yes
1	Y	<i>Fraxinus americana</i>	White Ash	25	25	P	suckering	Remove	Yes
1	Z	<i>Fraxinus americana</i>	White Ash	24	24	P		Retain	Yes
1	AA	<i>Fraxinus americana</i>	White Ash	14	14	P		Retain	Yes
1	AB	<i>Ulmus americana</i>	White Elm	23	23	F		Retain	Yes
1	AC	<i>Ulmus americana</i>	White Elm	21	21	F	Top lean	Retain	Yes
1	AD	<i>Fraxinus americana</i>	White Ash	20	20	P		Retain	Yes
1	1	<i>Malus pumila</i>	Common Apple	80, 30, 15, 10	46	F		Remove	Yes
2	2	<i>Malus pumila</i>	Common Apple	10-15DBH	12	G		Remove	Yes
1	3	<i>Fraxinus americana</i>	White Ash	90	90	P	Possibly dead	Remove	Yes
1	4	<i>Acer saccharum</i>	Sugar Maple	50	50	G		Remove	No
4	5	<i>Acer saccharum</i>	Sugar Maple	30-45DBH	38	F		Remove	No

Count	ID	Scientific Name	Common Name	DBH (cm)	Effective DBH (cm)	Condition (G/F/P/D)	Comments	Recommendation	Within TRCA Regulated Area
4	6	<i>Acer saccharum</i>	Sugar Maple	30-40DBH	35	F/P/D	One dead	Remove	No
1	7	<i>Malus pumila</i>	Common Apple	15-20DBH	17	F	Five stems	Remove	No
1	8	<i>Prunus serotina</i>	Black Cherry	25	25	P	dead branches	Remove	No
1	9	<i>Prunus serotina</i>	Black Cherry	45	45	P	dead branches	Remove	No
4	TG1	<i>Acer platanoides</i>	Norway Maple	10-20DBH	15	G		Remove/Potential Retain	No
2	TG1	<i>Picea pungens</i>	Blue Spruce	10-20DBH	15	G		Remove/Potential Retain	No
3	TG1	<i>Picea glauca</i>	White Spruce	10-20DBH	15	G		Remove/Potential Retain	No
2	TG2	<i>Tilia americana</i>	Basswood	40	40	P		Remove	No
12	TG2	<i>Picea glauca</i>	White Spruce	38-12DBH	25	G		Remove	No
6	TG2	<i>Pinus sylvestris</i>	Scots Pine	17	17	G		Remove	No
1	TG2	<i>Carya sp.</i>	Hickory species	30	30	G		Remove	No
1	TG2	<i>Prunus serotina</i>	Black Cherry	48	48	G		Remove	No
7	TG2	<i>Picea glauca</i>	White Spruce	35	35	G		Remove	No
2	TG2	<i>Acer saccharum</i>	Sugar Maple	30-55DBH	40	G		Remove	No
1	TG3	<i>Prunus serotina</i>	Black Cherry	25, 15, 15	33	G		Remove/Potential Retain	No
8	TG3	<i>Pinus strobus</i>	White Pine	15-35DBH	25	G		Remove/Potential Retain	No
1	TG3	<i>Acer platanoides</i>	Norway Maple	15	15	G		Remove/Potential Retain	No
2	TG4	<i>Pinus resinosa</i>	Red Pine	20	20	G		Remove/Potential Retain	No
15	TG4	<i>Pinus strobus</i>	Norway Spruce	40-65DBH	55	G		Remove/Potential Retain	No
5	TG5	<i>Thuja occidentalis</i>	Eastern White Cedar	20	20	G		Retain	Yes
1	TG5	<i>Fraxinus americana</i>	White Ash	12,10	16	F		Retain	Yes
3	TG6	<i>Fraxinus americana</i>	White Ash	15-30	23	P		Remove	Yes
3	TG7	<i>Fraxinus americana</i>	White Ash	40	40	F		Remove	Yes
4	TG7	<i>Acer saccharum</i>	Sugar Maple	30-50	40	G		Remove	Yes
2	TG7	<i>Prunus serotina</i>	Black Cherry	40	40	G		Remove	Yes
13	TG8	<i>Fraxinus americana</i>	White Ash	10-30DBH	20	P/D		Remove	Partial