ENVIRONMENTAL IMPACT STATEMENT
STANLEY AVE PROPERTIES, CITY OF NIAGARA FALLS

Prepared for:

Panoramic Properties Ltd.

Prepared by:

Colville Consulting Inc.

File: C18034
May 2023

COLVILLE CONSULTING INC.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

1.0 INTRODUCTION

Colville Consulting Inc. was retained by Panoramic Properties Ltd. to complete a Environmental Impact Statement (EIS) for various properties located adjacent to the corner of Stanley Ave and Lyons Creek Road in the City of Niagara Falls. The intent of this EIS is to delineate the extent of potential natural heritage features on the Subject Lands to assist in the preparation of a land use plan, as well as conduct a high-level assessment of potential impacts development may have on these features. Further impact assessments will be completed as part of the EIS for Site Plan Approval following detailed design. A summary of our assessment is included below.

1.1 Description of the Subject Property

The Subject Properties located adjacent to the corner of Stanley Ave and Lyons Creek Road in the City of Niagara Falls. The locations of these properties are illustrated in Figure 1 and have been assigned property identifiers from Property 1-3. Property 1 corresponds with what is also referred to as the campground property. The golf course property has been assigned the identifier of Property 2, and the lands south of Lyons Creek Road have been designated as Property 3. The properties are 24.8ha, 50.3ha and 21.1 ha, respectively.

Based on our review of background mapping, it is our understanding that natural heritage features on the Subject Properties (see Figure 2a and 2b) consist of a portion of a Significant Woodland, Provincially Significant Wetland, adjacent watercourses, as well as potential habitat of Endangered and Threatened species. Although only a portion of the Subject Properties are woodland and wetland, these areas are contiguous with a larger woodland/wetland complex occurring on lands west and south of the property. Due to the presence of wetlands and adjacent watercourses, portions of the properties have been designated as Environmental Protection Area in the Niagara Falls and Niagara Region Official Plans. The presence of the woodland feature results in the treed portion of the property being designated as an Environmental Conservation Area in the aforementioned Official Plans. Additionally, the adjacent watercourse causes portions of the Subject Lands to be designated as a regulated feature by the Niagara Peninsula Conservation Authority (NPCA).

As mapping indicates that natural heritage features are located on and adjacent to the Subject Properties, any development within or adjacent to these features is subject to environmental policies of the Niagara Region, the City of Niagara Falls and the NPCA. These policies generally require that a proposed development demonstrate no impact to natural heritage features. The extent of mapped natural heritage features on the Subject Properties are illustrated on Figure 2a and 2b.

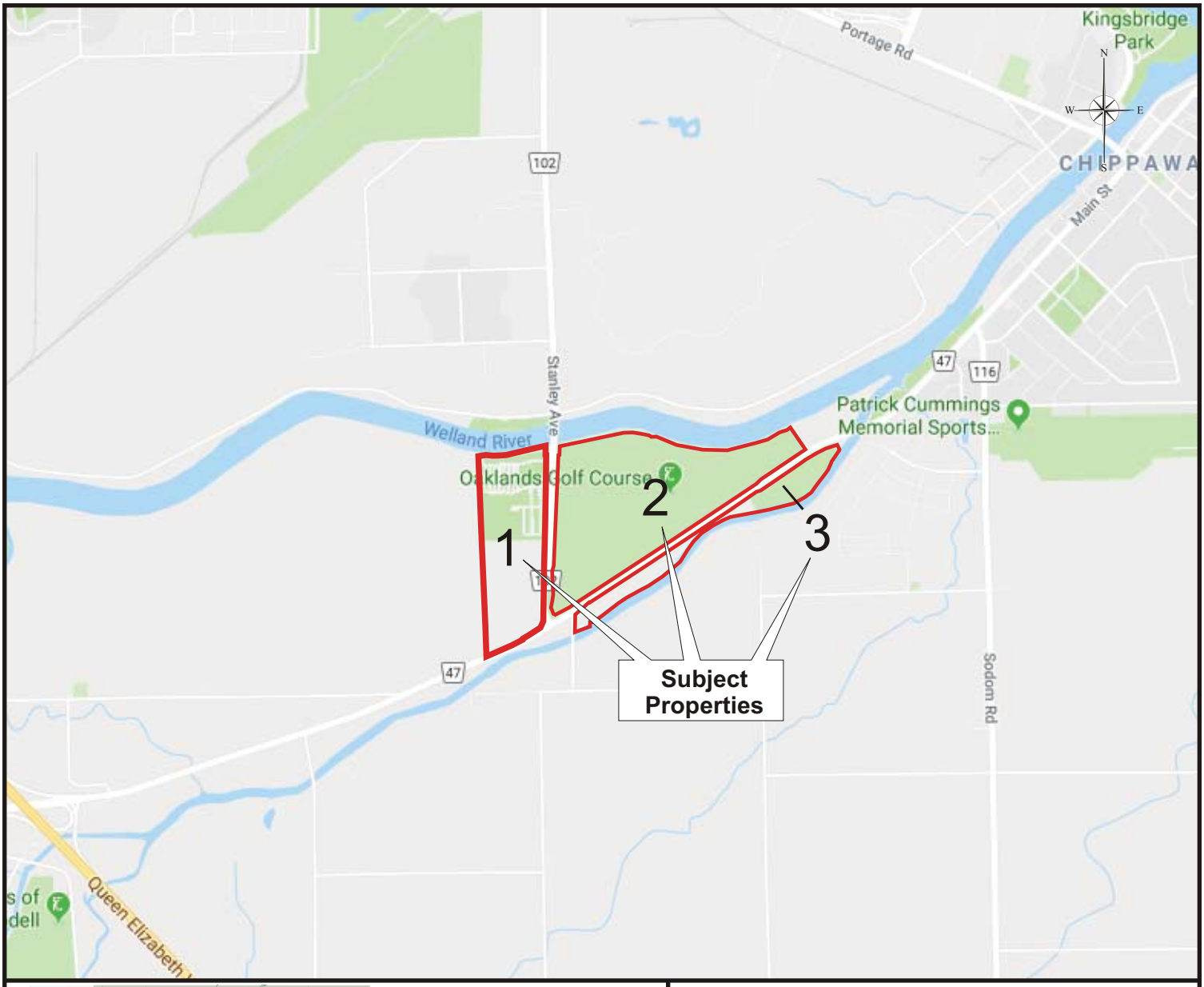


Figure 1
Location of Subject Lands

Environmental Impact Statement
Stanley Avenue Properties

Prepared for: **Panoramic Properties Ltd**

Prepared by: COLVILLE CONSULTING INC.

January 2023

FILE: 18034

2.0 ENVIRONMENTAL POLICY

2.1 Provincial Policy Statement

The Provincial Policy Statement (PPS) was issued under Section 3 of the Planning Act, and came into effect on May 22, 1996. The PPS was updated in 1997,2014, and most recently in 2020. It applies to all applications submitted after March 1, 2005 and states that decisions affecting planning matters "shall be consistent with" policy statements issued under the Act. This EIS has been prepared in compliance with Part V, Policy 2.1 of the PPS, which deals specifically with the long-term protection and management of natural heritage features and areas.

The intent of the PPS is to ensure that natural features and areas be protected for the long term. The PPS indicates that diversity and connectivity of natural features in an area, and the long-term ecological function and biodiversity of natural heritage systems, should be maintained, restored or, where possible, improved, recognizing linkages between and among natural heritage features and areas, surface water features and ground water features.

Natural heritage features and areas are defined in the PPS as those which are important for their environmental and social values as a legacy of the natural landscapes of an area and include: significant wetlands, significant coastal wetlands, fish habitat, significant woodlands south and east of the Canadian Shield, significant valleylands south and east of the Canadian Shield, significant habitat of endangered species and threatened species, significant wildlife habitat and significant areas of natural and scientific interest.

Development and site alteration is not permitted in:

- significant wetlands I Ecoregions 5E, 6E and 7E; and
- significant coastal wetlands

Unless it can be demonstrated that there will be no negative impacts on the natural heritage features or their ecological functions, development and site alteration is not permitted in:

- significant wetlands north of Ecoregions 5E, 6E and 7E;
- significant woodlands and valleylands south and east of the Canadian Shield;
- significant wildlife habitat;
- significant areas of natural and scientific interest; and
- coastal wetlands in Ecoregions 5E, 6E and 7E.

In addition, development and site alteration is not permitted in fish habitat or the habitat of endangered and threatened species, except in accordance with provincial and federal requirements.

Furthermore, development and site alteration is not be permitted on adjacent lands to the natural heritage features identified above, unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions.

2.2 Niagara Region Policy Plan

Regional Policy Plan Amendment 187 was approved by the Ontario Municipal Board on April 16, 2008 and is an update to Section 7 (Environmental Policy) of the Regional Niagara Policy Plan (2007). This amendment conforms to Section 2.1 of the PPS.

Among other important environmental considerations, the policies address the Region's natural vegetation and wildlife, water resources, landforms, geology and soils, and core natural heritage features such as woodlands, wetlands and fish habitat. Those natural areas considered to be of provincial importance, as identified in the PPS, are identified in the Region's Core Natural Heritage System. The following components are identified in the Region's Core Natural Heritage System:

a) Core Natural Areas which are classified as Environmental Protection Areas (EPA) and Environmental Conservation Areas (ECA);

b) Potential Natural Heritage Corridors connecting the Core Natural Areas;

c) Greenbelt Natural Heritage and Water Resources System; and

d) Fish Habitat (this includes key hydrologic features).

Environmental Protection Areas (EPA) include: provincially significant wetlands; provincially significant Life Science ANSIs; and significant habitat of endangered and threatened species.

Environmental Conservation Areas (ECA) include: significant woodlands; significant wildlife habitat; significant habitat of species of concern; regionally significant Life Science ANSIs; other evaluated wetlands; significant valleylands; savannahs and tallgrass prairies; alvars; and publicly owned conservation lands.

The Core Natural Heritage Map which accompanies Amendment 187 illustrates the Region's Core Natural Heritage System, which includes EPA, ECA, potential corridor, fish habitat and the Greenbelt Natural Heritage and Water Resources System. This map indicates that portion of the Subject Property has been identified as EPA due to the presence of the Provincially Significant Wetland and an ECA due to the Significant Woodland.

For development applications that are proposed within or adjacent to the Core Natural Heritage System, the Regional policies require that an EIS be completed. Table 1, which was modified from Amendment 187, illustrates under what circumstances an EIS is required. For example, because there is a Provincially Significant Wetland and Significant Woodland identified on the Subject Lands, an EIS is required.

Table 1: EIS Requirements for lands adjacent to Core Natural Areas

Core Natural Heritage System Component	Adjacent Lands Where an EIS Shall Be Required for Development Applications
Environmental Protection Area	
➢ Provincially Significant ANSI	All lands within 50 metres
➢ Significant Habitat of Threatened and Endangered Species	All lands within 50 metres
Environmental Conservation Area	
➢ Significant Woodlands	All lands within 50 metres.
➢ Significant Wildlife Habitat	All lands within 50 metres.
➢ Significant Habitat for Species of Concern	All lands within 50 metres.

Source: Table 7-1 of the Regional Policy Plan Amendment

2.3 City of Niagara Falls

The City of Niagara Falls Official Plan has been drafted to complement the Regional Policy Plan and contains policies specific to the management of natural heritage systems. It is the intent of the Official Plan to designate lands that contribute to the natural environment of the city, either due to their ecological significance, the areas being significant due to the natural heritage features present and/or having inherent physical hazards. The purpose of identifying these lands is not only to acknowledge the need to maintain and protect these areas, but also to control development in and around these areas due to their susceptibility.

Schedule A-1 of the City of Niagara Falls Official Plan illustrates that portions of the property have been designated Environmental Protection Area (EPA) and Environmental Conservation Area (ECA).

Environmental Protection Areas (EPA) include: Provincially Significant Wetlands, NPCA regulated wetlands greater than 2ha in size, Provincially Significant Life ANSIs, significant habitat of threatened and endangered species, floodways and erosion hazard areas and environmentally sensitive areas.

Environmental Conservation Areas (ECA) include: significant woodlands, significant valley lands, significant wildlife habitat, fish habitat, significant Life and Earth Science ANSIs, sensitive ground water areas, and locally significant wetlands or NPCA wetlands less than 2ha in size.

Section 11.1.17 of the Official Plan states that an EIS shall be required as part of a complete application under the Planning Act for site alteration or development on lands:

a) within or adjacent to an Environment Protection Area or Environmental Conservation Area as shown on Schedule A or A- 1; or

b) that contain or are adjacent to a natural heritage feature.

No development is permitted within any Provincially Significant Wetland.

2.4 Niagara Peninsula Conservation Authority

In order to administer Ontario Regulation 155/06, the Niagara Peninsula Conservation Authority (NPCA) has created a document titled Policies for the Administration of Ontario Regulation 155/06 and the Planning Act (NPCA 2018). The purpose of the document is to provide guidance for development applications that are located in and adjacent to natural heritage features and hazard lands. Regulated features on the Subject Properties are primarily associated with the Welland River and Lyons Creek, and include the valleys, floodplains and wetlands associated with these watercourses, as well as two small watercourses that drain to Lyons Creek. Although not directly associated with Lyons Creek, a portion of the Lyons Creek Provincially Significant Wetland Complex is located on and adjacent to the campground property. Policies related to the management of floodplains, valleylands and watercourses are included in Sections 4, 6 and 9 respectively. Policies related to the management of wetlands are included in Section 8.

3.0 STUDY APPROACH

3.1 Background Review

Prior to the commencement of primary field inventories, a review of background material available for the Subject Lands and surrounding area was conducted. Some of the background information reviewed included:

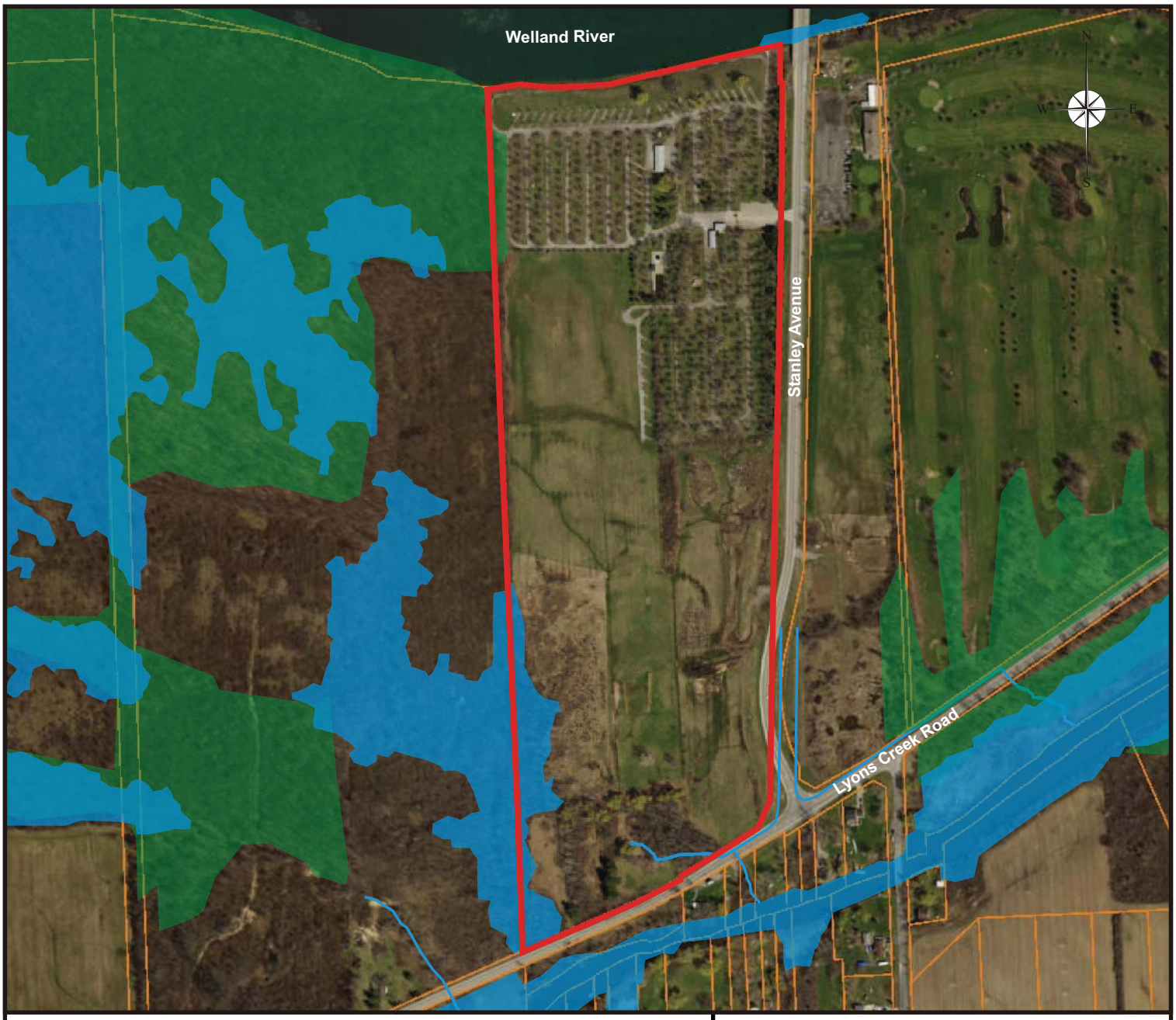
- City of Niagara Falls Official Plan (City of Niagara Falls 2017);
- Niagara Region Core Natural Heritage Mapping (Niagara Region 2008);
- Niagara Region Official Plan (2015);
- Ontario Ministry of Natural Resources and Forestry (MNRF) Species at Risk List for the City of Niagara Falls (MNRF 2018);
- NPCA Policy Document: Policies for the Administration of Ontario Regulation 155/06 and the Planning Act (NPCA 2018);
- Background mapping and data available from the NPCA and Ministry of Natural Resources and Forestry; and
- Niagara Natural Areas Inventory (NPCA 2010).

3.2 Field Inventories

In order to ensure all natural heritage features on the properties were assessed adequately, Colville Consulting conducted the following inventories and assessments on the Subject Properties:

1) Breeding bird surveys;
2) Three-season botanical inventory;
3) Assessment and description of the vegetation communities on the properties using the Ecological Land Classification System for Southern Ontario;
4) Amphibian Call Surveys;
5) Bat Maternal Roost Tree Assessment and Acoustic Monitoring;
6) Searches for Reptiles and Amphibians;
7) Watercourse Assessments;
8) Species at Risk screening; and
9) Documentation of other wildlife on the Subject Lands.

The methods employed for each of the above components are provided in the appropriate sections below.



Legend

- Subject Lands
- Watercourse
- Significant Woodland
- Provincially Significant Wetland

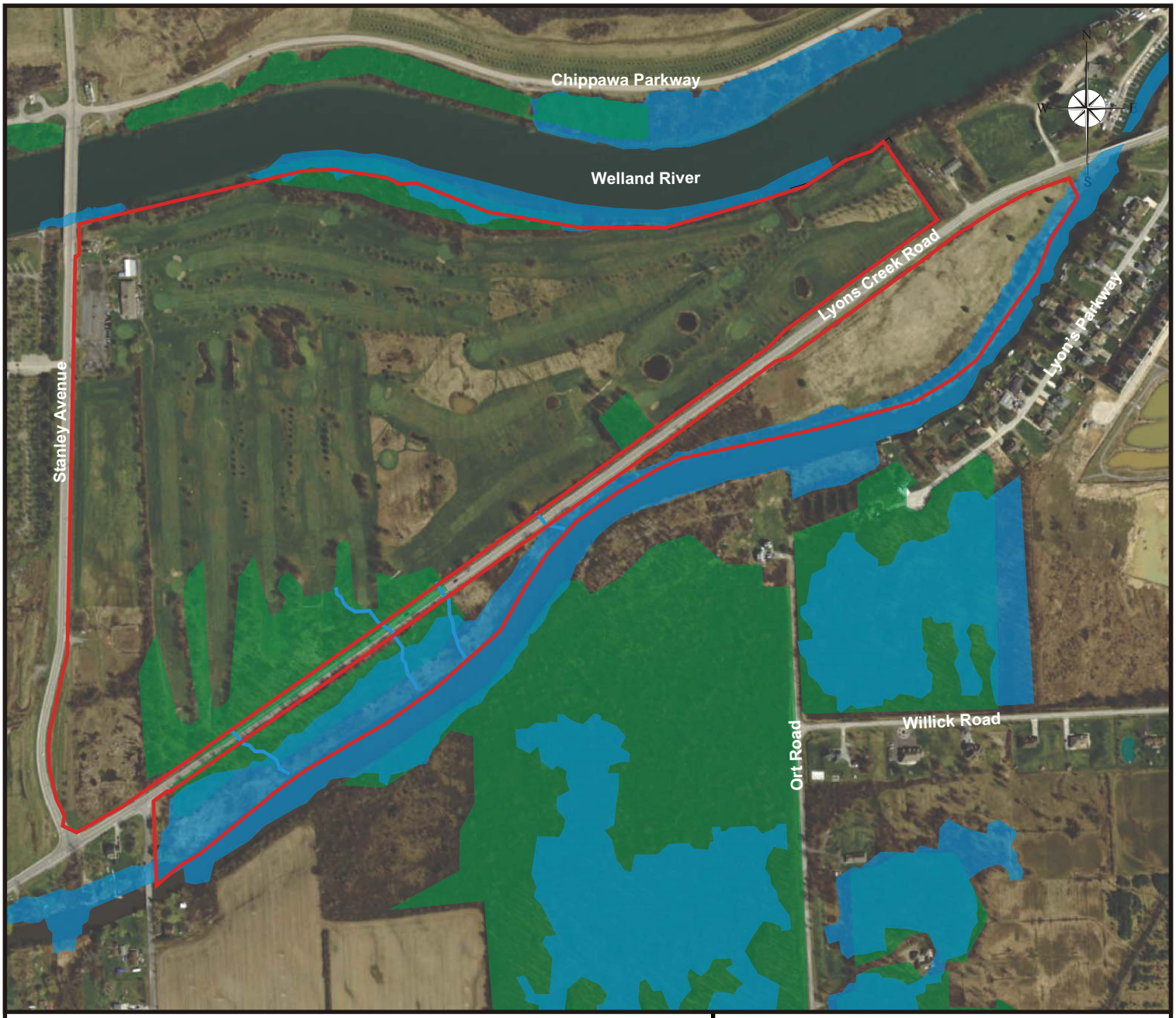
Figure 2-A
Mapped Natural Heritage Features on Subject Property 1

Environmental Impact Statement
Stanley Avenue Properties

Prepared for: **Panoramic Properties Ltd.**

Prepared by: COLVILLE CONSULTING INC.

January 2023 | File: C18034



Legend

- Subject Lands
- Watercourse
- Significant Woodland
- Provincially Significant Wetland

Figure 2-B
Mapped Natural Heritage Features on Properties 2 and 3

Environmental Impact Statement
Stanley Avenue Properties

Prepared for: **Panoramic Properties Ltd.**

Prepared by: COLVILLE CONSULTING INC.

January 2023 | File: C18034

4.0 FIELD OBSERVATIONS

4.1 Botanical Inventories and Vegetation Mapping

Botanical inventories of the Subject Properties were conducted on July 28, July 29, and October 30, 2018 and May 13, 2021. Vegetation communities (ELC units – following Lee et al. 1998) were mapped and described, and a list of botanical species was compiled (see Appendix A). Species status was assessed for Ontario (Oldham and Brinker 2009) and Niagara Region (Oldham 2010). Vegetation communities are described below and mapped on Figure 3a and 3b.

4.1.1 Botanical Inventories

The plant list includes 266 vascular plant taxa (genera, species, subspecies, varieties and hybrids) observed over three field visits on the dates of July 28, 29, & October 20, 2018 and May 13, 2021. Of the plants observed during the timing of the field visits within the Study Area, one species is listed as Threatened (American Water Willow), six (6) species are ranked as provincially rare, 14 species are ranked as locally rare, and 14 species are ranked as locally uncommon. The locations of the various species of conservation concern are described in Appendix A.

4.1.2 Vegetation Communities

Nineteen vegetation community types were described from the study area and classified according to the Ecological Land Classification System for Southern Ontario (ELC). The extent of vegetation communities are illustrated in Figure 3a and 3b and site conditions are represented in the photos in Appendix B. Polygon descriptions are provided below.

Submerged Shallow Aquatic Ecosite (SAS1) / Mixed Shallow Aquatic Ecosite (SAM1) Complex

This vegetation community was noted just outside of the Study Area in the Welland River and Lyons Creek. It occurs between the open water channel, which is too deep to support vegetation, and the floating leaved (SAF) or emergent marsh (MAS) communities located further inland along the shoreline. This submerged vegetation community is, for the most part, outside of the Study Area, and was therefore not described in detail. Typically, submergent species of Pondweed and Watermilfoil dominate, with the occasional floating leaved plants such as Water lilies and Duckweeds. The most appropriate classification for the communities described here would be the Water Milfoil Submerged Shallow Aquatic Type (SAS1-4); and for those areas with a higher percentage of floating-leaved vegetation, the Water Milfoil Mixed Shallow Aquatic Type (SAM1-7). The Welland River supports little to no floating leaved plants while the opposite was true for the Lyons Creek.

In other examples in both the Welland River and Lyons Creek, Tape-grass dominates some of the submerged community with few other species present. In this variation, the most appropriate ELC classification would be the Wild Celery Submerged Shallow Aquatic Type (SAS1-5). This community seems to typically occur in more open, fast flowing waters on coarser substrates. The ELC vegetation community map simply labels all of the variations of vegetation type noted above to the ecosite level of SAS1 / SAM1.

Water Lily - Bullhead Lily Floating-leaved Shallow Aquatic Type (SAF1-1)

Inland and adjacent to the submerged shallow aquatic and mixed shallow aquatic communities (however, too narrow to map) occurs the Water Lily - Bullhead Lily Floating-leaved Shallow

Aquatic Type (SAF1-1). In the study area, these vegetation communities are restricted to the Lyons Creek channel and were not observed to the north on the Welland River.

The dominant species in this vegetation community was the White Water Lily. Also abundant was the Bullhead Lily. Occasionally observed was the provincially rare Large Yellow Pond-lily. Free-floating plants occurred occasionally in this vegetation community, including Lesser Duckweed and Star Duckweed. A mix of submerged species also occurred in places below the floating-leaved plants. These submerged species included Common Coontail, Canada Waterweed, Tape-grass, Milfoil and Bladderwort species. Bulb-bearing Water-hemlock, Dodder species, Arrow-arum and American Water Willow also occurred rarely in this vegetation type.

Duckweed Floating-leaved Shallow Aquatic Type (SAF1-3)

Near the middle of the golf course, on the tableland, is a series of three linear ponds. Surrounded in part by small pockets of woodland and forested swamp, these ponds support a Duckweed Floating-leaved Shallow Aquatic Type (SAF1-3). The water surface was nearly covered by Duckweed and Wolffia species during observations. The edges of the pond were mostly surrounded by Pin Oak Swamp (SWD1-3) and forest (FOD9) on drier knolls. Along a portion of this pond, the golf course greens are mowed to the water's edge. The other two linear water features or ponds to the west are fully mowed around all of the edges and do not support a cover of floating-leaved vegetation.

To the east of the golf course grounds, another series of three circular dug out ponds are also mowed up to the edge and do not support a cover of floating leaved plants, but are fringed with a thin band of Narrow-leaved Cattail around the base of the steep rims. These cattail vegetation communities were too small and narrow to map, but are mentioned here.

Shallow Marsh (MAS) Vegetation Types

The shorelines of the Welland River and Lyons Creek support a number of Shallow Marsh (MAS) communities. Along the Welland River, these communities are less pronounced due to the daily fluctuations of water levels attributed to the operations of the Hydro Canal. Where narrow bands of emergent marsh occurred, they were too narrow to describe and map. In contrast, Lyons Creek supports extensive and ecologically significant emergent marsh communities. These extremely rich habitats support many significant species.

Three types of emergent shallow marsh were described along the shoreline of Lyons Creek within the Study Area. One is a Narrow-leaved Sedge Mineral Shallow Marsh Type (MAS2-3). This community begins along the Lyons Creek shoreline at the downstream edge of the Study Area and continues upstream in a narrow band. Tussock Sedge and Canada Blue-joint Grass dominate this vegetation type, with an abundance of Hedge Bindweed vines tangled throughout.

Just upstream, the shallow emergent marsh widens into a large expanse of Cattail Organic Shallow Marsh Type (MAS3-1). Narrow-leaved Cattail forms the dominant vegetation cover, along with Lakebank Sedge and Tussock Sedge. Also abundant is Canada Blue-joint grass and Spotted Touch-me-not, along with Sensitive Fern in the understory layer. An abundance of Hedge Bindweed vines are tangled throughout the emergent vegetation.

Where the shallow marsh (MAS) meets the open water of the floating-leaved (SAF) and submerged and mixed aquatic communities (SAS/SAM) in Lyons Creek, a very unique and provincially rare vegetation type occurs. At the open water edge of the cattail and graminoid dominated shallow marsh, a floating-leaved bed of Swamp Loosestrife, Water Smartweed and Marsh Cinquefoil mark the open water channel. This provincially rare vegetation type is unique

because Arrow-arum emerges above the bed of floating leaved species described above. Marsh Bellflower, Purple Loosestrife and Sweetflag are also abundant in this narrow band (only 1-2m or more wide). Currently, the ELC does not describe an emergent marsh vegetation type dominated by Arrow-arum. The closest classification for this unique vegetation community, which is too narrow to map, is the Water Willow Organic Shallow Marsh Type (MAS3-12). This is a provincially rare vegetation type. If the Arrow-arum Organic Shallow Marsh Type were listed in the next approximation of the ELC, it would also be provincially rare.

Fresh - Moist Lowland Deciduous Forest (FOD7) / Green Ash Mineral Deciduous Swamp Type (SWD2-2) / Silky Dogwood Mineral Thicket Swamp (SWT2-8) Complex

Along the upland edge of the shallow marsh communities (MAS), where the frequency of standing water permits woody vegetation to form the dominant cover, is a narrow fringe of Silky Dogwood Mineral Thicket Swamp (SWT2-8). This vegetation type was included as a complex as it was too narrow and discontinuous to be defined on the map. It often occurs between the shallow marsh (MAS) and the forested swamp communities along the Lyons Creek and Welland River floodplains.

Just inland from the interface of the open marsh and thicket swamp is the Green Ash Mineral Deciduous Swamp Type (SWD2-2). Southeast of Lyons Creek Road and Stanley Avenue, the lower elevations of the forested floodplain support a tall canopy (forming 10 - 25% cover) of mature trees dominated by Green Ash much greater than Pin Oak. The sub-canopy forms an additional 60% cover dominated by younger Green Ash trees and tall shrubs of Common Buckthorn and to a lesser extent, young White Elm, Pin Oak and Maple species. Also abundant in the sub-canopy are scattered tall shrubs of Ashy Willow. In the dense (>60% cover) shrub and regeneration layer, Grey Dogwood and Common Buckthorn dominate with an abundance of Red/Green Ash and Pin Oak saplings and Wild Grape vines along with Multiflora Rose, Silky Dogwood, non-native Honeysuckle shrubs and occasionally, Southern Arrowood. In the ground layer, Panicled Aster, One-sided Aster, Rough Goldenrod, White Avens and Jumpseed form 60-90% cover. Below the Aster and Goldenrod layer, creeping stems of Moneywort carpet parts of the floodplain along with clumps of Fowl Mana Grass and Sedges and trailing vines of Poison Ivy.

Further inland and closer to the roadbed of Lyons Creek Road, along the upper elevations of this vegetation community complex, occurs the Fresh - Moist Lowland Deciduous Forest (FOD7). The above mentioned species occur with a greater mix of Red Maple, Swamp Maple, Black Walnut, Sugar Maple, Red Oak and Bitternut Hickory in the canopy and sub-canopy layers. In the ground layer, instead of Panicled Aster and One-sided Aster or Rough Goldenrod, this drier forest supports an abundance of grasses such as Orchard Grass and Kentucky Bluegrass along with Tall Goldenrod, Enchanter's Nightshade, White Avens, Wild Strawberry, Wild Grape and Thicket Creeper.

Pin Oak Mineral Deciduous Swamp Type (SWD1-3) / Fresh - Moist Lowland Deciduous Forest (FOD7) complex

Just to the northeast, and further downstream along the Lyons Creek floodplain, a triangular shaped stand of Fresh - Moist Lowland Deciduous Forest (FOD7) occurs and is also dominated by Green Ash and the above-mentioned species, as these two lowland forested areas were likely contiguous with one another at one time. In contrast, however, the lower elevations do not support a complex of Green Ash Swamp, but instead are complexed with the Pin Oak Mineral Deciduous Swamp Type (SWD1-3).

Fresh - Moist Willow Lowland Deciduous Forest Type (FOD7-3)

Further downstream, the shoreline of Lyons Creek was planted with a row of Weeping Willow trees. The canopy is dominated by these large diameter willow trees, with little to no vegetation occurring in the underlying layers. A narrow band of the Narrow-leaved Sedge Mineral Shallow Marsh Type (MAS2-3) occurs at the waterline, where the floodplain is not shaded to the water's edge. Beyond this band of Weeping Willow trees and the narrow-leaved sedge - blue-joint grass shallow marsh, just outside of the Study Area, is the Water Lily - Bullhead Lily Floating-leaved Shallow Aquatic Type (SAF1-1) and submerged communities of the Lyons Creek.

Fresh - Moist Lowland Deciduous Forest (FOD7)

To the west, along the edge of the Study Area boundary and adjacent to Stanley Avenue, but south of Lyons Creek Road, a disturbed stretch of the Lyons Creek floodplain supports a mature stand of open grown, large canopied, Black Walnut, Crack Willow, White Willow and Weeping Willow trees. Open patches of grasses and goldenrods form the ground cover layer between and below the widely spaced trees.

Pin Oak Mineral Deciduous Swamp Type (SWD1-3) / Fresh - Moist Lowland Deciduous Forest (FOD7) complex

To the north of the study area, along the Welland River floodplain, stands a remnant Pin Oak Mineral Deciduous Swamp Type (SWD1-3) / Fresh - Moist Lowland Deciduous Forest (FOD7) complex. A number of old and large diameter Pin Oak and Swamp White Oak were noted. Pin Oak and Red/Green Ash co-dominate the canopy layer, with Red Maple, Swamp White Oak and Shagbark Hickory as associates forming greater than 60% cover. Also occurring occasionally in the >25m high canopy are White and Crack Willow trees. The sub-canopy layer forms less than 60% cover and is dominated by regenerating Green Ash trees and very tall shrubs of Common Buckthorn. Sub-canopy sized White Elm trees are also abundant, along with hanging vines of Wild Grape. In the dense (>60% cover) shrub layer, Common Buckthorn, Grey Dogwood and Green Ash saplings are most abundant. Wild Grape also trails throughout the shrub layer and Spicebush also occurs. Creeping vines of Poison Ivy and Thicket Creeper form the ground layer which has less than 60% cover. This vegetation complex spans the moisture gradient of the bank of the Welland River. The lowland deciduous forest ecosite occurs upslope, and down the slope gradient, along the soil catena, is the deciduous swamp, which is often inundated with standing water as the river rises or bursts its bank. This process is evidenced by stranded floating debris.

Fresh - Moist Oak - Maple - Hickory Deciduous Forest Ecosite (FOD9) / Naturalized Deciduous Hedgerow Ecosite (FODM11)

Adjacent to Lyons Creek Road and situated on the tableland, above the lowland valley slope of the Lyons Creek floodplain is a Fresh - Moist Oak - Maple - Hickory Deciduous Forest Ecosite (FOD9), which also has components of a Naturalized Deciduous Hedgerow Ecosite (FODM11). The canopy in this irregular forest community is dominated by Red Oak, White Oak, Sugar Maple, American Beech and Shagbark Hickory, with several large-diameter individuals also occurring. This forest community has been historically altered to allow for the current golf use and now consists primarily of a series of narrow woodland rows.

The sub-canopy (with >60% cover) is dominated by Sugar Maple, American Beech and White or Green Ash. The shrub or regeneration layer supports an abundance of Ash, Sugar Maple and American Beech saplings, along with shrubs of Choke Cherry forming 25-60% cover. The ground

layer is formed by a greater than 60% cover of Sugar Maple and Ash seedlings, with numerous sedges, particularly Pennsylvania Sedge, and plants of mostly Enchanter's Nightshade.

Fresh - Moist Oak - Maple - Hickory Deciduous Forest Ecosite (FOD9) / Pin Oak Mineral Deciduous Swamp Type (SWD1-3) Complex

An isolated stand of the Fresh - Moist Oak - Maple - Hickory Deciduous Forest Ecosite (FOD9) / Pin Oak Mineral Deciduous Swamp Type (SWD1-3) complex is located north of Lyons Creek Road. This forest community consists of a mix of knolls and very shallow depressional areas, which has established on the former agricultural lands. Red Maple and Pin Oak dominate the community, with oak species also occurring as associates.

Another small remnant stand of Pin Oak Mineral Deciduous Swamp Type (SWD1-3) / Fresh - Moist Oak - Maple - Hickory Deciduous Forest Ecosite (FOD9) occurs in the middle of the golf course. This forested swamp, now tile drained and mowed in the understory layer, occurs adjacent to a pond that supports the Duckweed floating-leaved aquatic community described above. Adjacent to the pond, a slight ridge or upland knoll supports a mature stand of Fresh - Moist Oak - Maple - Hickory Deciduous Forest Type (FOD9). These upland knolls were too small to map and therefore included as a complex with the Pin Oak Swamp.

Dry - Moist Old Field Meadow Type (CUM1-1)

A large meadow occurs on the Lyons Creek floodplain south of Lyons Creek Road. Here Kentucky Bluegrass, Tall Goldenrod, Hairy Aster, New England Aster, Common Teasel and Thistle species form the dominant cover. A few young White Pine trees were also noted. This Dry - Moist Old Field Meadow Type (CUM1-1) is lined by Weeping Willow trees along the edge of Lyons Creek and bound by Lyons Creek Road to the north.

Although most of the study area is mowed and maintained as a golf course and trailer park, numerus old field meadow patches occur and are mapped as distinct polygons separated from regularly mowed areas.

A number of areas on the managed golf course are less frequently maintained and are depicted on the map as Dry - Moist Old Field Meadow Type (CUM1-1). Cool season grasses such as Orchard Grass, Kentucky Bluegrass and Timothy Grass dominate this vegetation type. There is little to no shrub or tree species present as a result of periodic mowing employed to suppress woody vegetation from succeeding. Areas within the trailer park grounds are periodically mowed and have also been mapped as old field meadow. Woody vegetation, typically Grey Dogwood, Buckthorn, Honeysuckle and Ash species, have been allowed to succeed in parts of this meadow forming scattered thickets (CUT). One of the low areas supports a Willow thicket swamp, although it is too small to map.

Fresh - Moist Deciduous Woodland Ecosite (WODM5) / Dry - Moist Old Field Meadow Type (CUM1-1) Complex

Northeast of Lyons Creek Road and Stanley Avenue, woodland and old field meadow occur together as a complex mix. Patches of pioneer trees species such as Green Ash, Black Walnut, Cottonwood, White Elm and Willow form young and very open stands of the Fresh - Moist Deciduous Woodland Ecosite (WODM5) complexed with open areas of Dry - Moist Old Field Meadow Type (CUM1-1). Orchard Grass, Kentucky Blue Grass and Timothy grass are dominant in the ground layer with Tall Goldenrod and Panicled Aster. Historically piles of fill are also abundant in this area.

Fresh - Moist Deciduous Woodland Ecosite (WODM5) / Cultural Thicket Ecosite (CUT1)

West of Stanley Ave, the old field meadows transition into Fresh - Moist Deciduous Woodland Ecosite (WODM5), with components of Cultural Thicket Ecosite (CUT1). This vegetation community occurs in the location of the former homestead and farm on the property, which is visible in the 1968 air photos. Green Ash and Cottonwood dominate the open and variable canopy, with the same species in the sub-canopy and regeneration layer. Abundant in the regeneration or shrub layer is Grey Dogwood, which forms a dense canopy that limits growth in the ground layer. The north and eastern portions of this community contain fill that has been colonized by Phragmites, with scattered trees throughout.

Mowed Trailer Park with Woodland Canopy (WODM5)

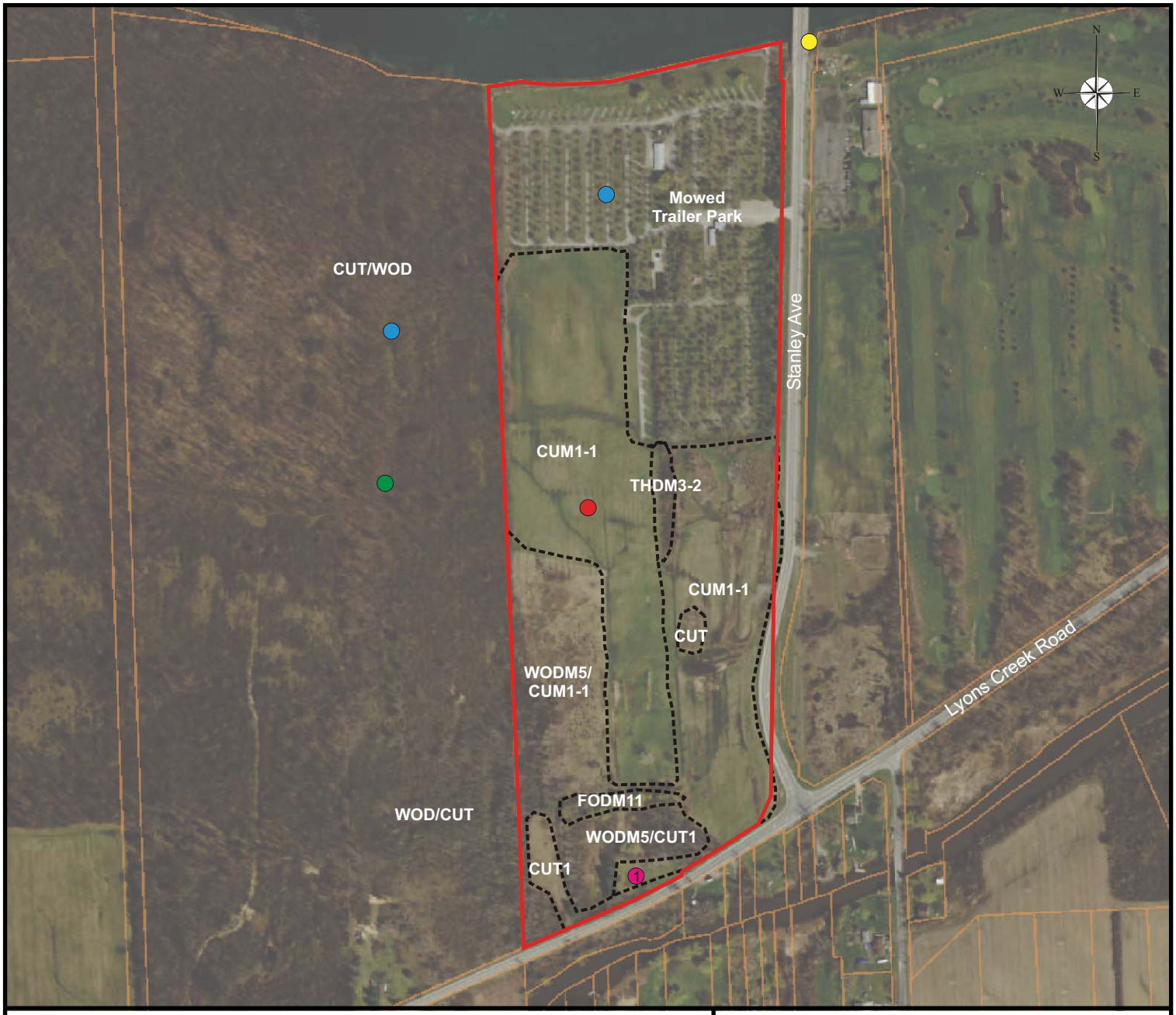
West of Stanley Ave. along the Welland River is a trailer park laid out on mowed lawn with a series of looping roadways made of a loose gravel aggregate base and set below a very sparse woodland canopy of trees. Green Ash trees with partly dead canopies are the dominant species. Typically, only the canopy of the Ash trees are dead and numerous basal suckering stems occur from the base or lower trunk and branches. Silver Maple, Red Maple and their hybrid Swamp Maple also occur as specimen or canopy trees. As well, a number of very large Cottonwood trees can also be found, including other planted trees such as Norway Maple, Norway Spruce, White Spruce and Austrian Pine. Most of the canopy trees are of even age and few trees in the sub canopy size class occur. Due to a regular mowing regime, no shrub layer occurs and regenerating sapling sized trees are very rare. The ground layer is mowed lawn throughout this entire polygon, right down the bank of the Welland River up to the waterline.

Grey Dogwood Cultural Thicket Type (CUT1-4)

East of Stanley Road, the bank of the Welland River, along golf course property, is covered in dense thickets of Grey Dogwood, Common Buckthorn and Hawthorn species. Occasionally growing here along this narrow Grey Dogwood Cultural Thicket Type (CUT1-4) are scattered Willow or Ash trees.

Grey Dogwood Cultural Thicket Type (CUT1-4) / Fresh - Moist Lowland Deciduous Forest (FOD7) complex

Downstream along the bank of the Welland River, on the other side of the old growth floodplain swamp, is another narrow band of Grey Dogwood Cultural Thicket (CUT1-4). Numerous trees line this section of the river. The most common trees species here are Crack Willow, White Willow, Red/Green Ash, Cottonwood, Swamp Maple, Red Maple and Pin Oak. As such, the abundance of trees along the river bank allow this thicket to be complexed as a Grey Dogwood Thicket (CUT1-4) / Fresh - Moist Lowland Deciduous Forest (FOD7) remnant with 35-60% canopy cover. Grey Dogwood, Common Buckthorn, Red/Green Ash and Wild Grape are abundant in the shrub or thicket layer. Tall Goldenrod and grass form the ground layer with an abundance of trailing vines of Poison Ivy, Wild Grape and Thicket Creeper.



Legend

	Property Boundary
CUT1	Cultural Thicket Ecosite
CUM1-1	Dry - Moist old Field Meadow Type
FODM11	Naturalized Deciduous Hedgerow Ecosite
THDM3-2	Shrub Deciduous Hedgerow Thicket Type
WODM5	Fresh-Moist Deciduous Woodland
	Barn Swallow
	Approximate Location of Eastern Wood-pewee
	Observed Location of Bobolink
	Approximate Location of Wood Thrush
	Amphibian Monitoring Station

Figure 3a

ELC Vegetation Communities on Property 1

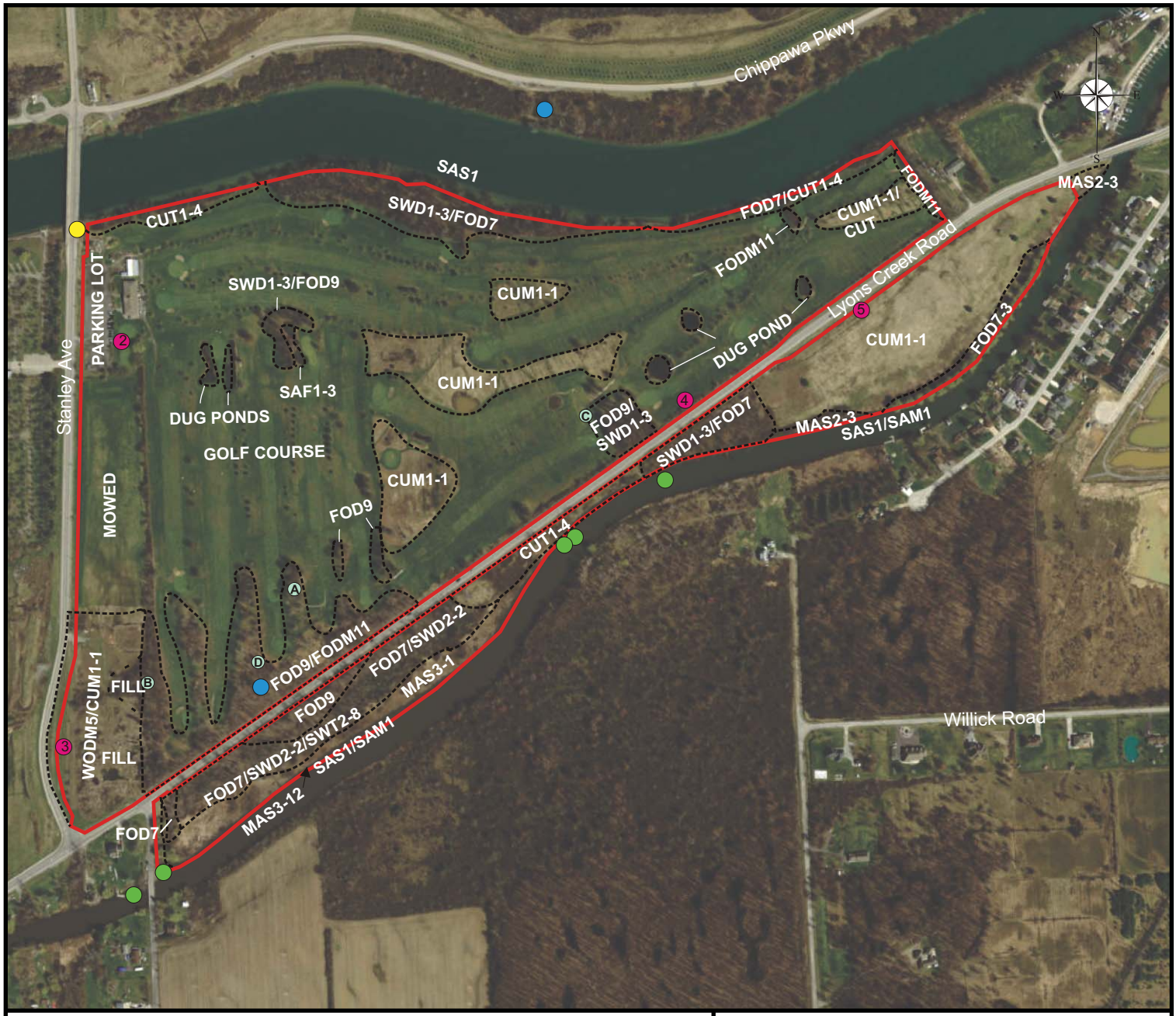
Environmental Impact Statement
Stanley Avenue Properties

Prepared for: Panoramic Properties Inc.

Prepared by: Colville Consulting Inc.

January 2023

FILE: 18034



Legend

Subject Property

CUM1-1	Dry - Moist Old Field Meadow Type
CUT1-4	Grey Dogwood Cultural Thicket Type
FOD7	Fresh-Moist Lowland Deciduous Forest
FOD7-3	Fresh-Moist Willow Lowland Deciduous Forest
FOD9	Fresh - Moist Oak - Maple - Hickory Deciduous Forest Ecosite
FODM11	Naturalized Deciduous Hedgerow Ecosite
MAS2-3	Narrow-leaved Sedge Mineral Shallow Marsh Type
MAS3-1	Cattail Organic Shallow Marsh Type
MAS3-12	Water Willow Organic Shallow Marsh Type
SAF1-3	Duckweed Floating-leaved Shallow Aquatic Type
SAS1-4	Water Milfoil Submerged Shallow Aquatic Type
SAS1-5	Wild Celery Submerged Shallow Aquatic Type
SAM1-7	Water Milfoil Mixed Shallow Aquatic Type
SWD2-2	Green Ash Mineral Deciduous Swamp Type
SWD1-3	Pin Oak Mineral Deciduous Swamp
SWT2-8	Silky Dogwood Mineral Thicket Swamp

- Barn Swallow Nest Location
- Location of American Water-Willow
- Approximate location of Eastern Wood-pewee
- Amphibian Monitoring Station
- Location of Acoustic Bat Monitor

Figure 3b
ELC Vegetation Communities on Subject Properties 2 and 3

Environmental Impact Statement
Stanley Avenue Properties

Prepared for: **Panoramic Properties Ltd.**

Prepared by: COLVILLE CONSULTING INC.

January 2023

FILE: 18034

Naturalized Deciduous Hedgerow Ecosite (FODM11)

On the table land, other narrow bands of vegetation include a number of examples of the Naturalized Deciduous Hedgerow Ecosite (FODM11).

Native Shrub Deciduous Hedgerow Thicket Type (THDM3-2)

On the trailer park property, perhaps developed along a former fence line, is an example of a Native Shrub Deciduous Hedgerow Thicket Type (THDM3-2).

4.2 WILDLIFE AND WILDLIFE HABITAT

4.2.1 Breeding Bird Survey

Breeding bird surveys were conducted on June 12 and July 4, 2018 to inventory breeding birds on and adjacent to the Subject Lands. Walking transects were conducted on each day, under suitable weather conditions with little to no wind or precipitation. A thorough search of the Subject Properties, including the campground, golf course and Lyons Creek area was completed during both surveys, with the surveys on June 12 beginning at 05:30 and concluding at 10:00, and the July 4 surveys beginning at 5:41 and finishing at 10:00. All birds seen or heard calling were recorded and the highest breeding evidence per species was determined in accordance with the criteria of the Atlas of the Breeding Birds of Ontario (Cadman et al. 2007).

A total of 51 species of birds were observed or heard on or above the Subject Lands and 1 additional species on adjacent lands. According to Ontario conservation status ranks (S-rank) designations, with the exception of 3 non-native species, S2 Great Egret and S3 Black-crowned Night-heron all other recorded species are considered to be "secure" (S5 - common, widespread and abundant) or "apparently secure" (S4 - uncommon but not rare) in the province of Ontario. The recorded species are also considered to be very common to common permanent or summer residents in the Niagara Region with the exception of the uncommon summer resident Black-crowned Night-heron, Bobolink, Common Tern, Eastern Towhee, Great Blue Heron, Turkey Vulture, Willow Flycatcher, Wood Thrush; uncommon permanent resident Carolina Wren, Red-bellied Woodpecker and rare summer resident Great Egret (Niagara Natural Areas Inventory, 2010).

The Barn Swallows observed flying and calling over the Subject Properties on both site visits are listed as Threatened under Ontario's Endangered Species Act. 2007 (ESA) and have been designated as Special Concern in Canada by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Active nests with young were observed under the Stanley Avenue bridge between the golf course and campground properties (Figure 3a and 3b).

The Bobolink pair observed flying, landing and calling in the meadow area of the campground on the Subject Property on the first site visit are listed as Threatened provincially and Special Concern federally.

Eastern Wood-pewee were heard calling on the first site visit in the active campground, as well north of Lyons Creek Road. No nests were observed in either location. This species was also heard calling from the woodland/thicket west of the campground and north of the Welland River on the second site visit. Eastern Wood-pewee is designated as Special Concern in Ontario and Canada (Figure 3a and 3b).

The Wood Thrush heard calling on the first site visit in the adjacent forest/thicket west of the campground is designated as Special Concern in Ontario and Canada.

Table 2: List of bird species documented on and adjacent to Property 1.

Species	S Rank	Niagara Status*	Camp Area	Meadow	Woodland/ Thicket	Adjacent Lands	Highest Breeding Evidence**	Breeding Code***
American Goldfinch	S5B	C R	X	X	X		PO	S
American Crow	S5B	C R				X	PO	H
American Robin	S5B	VC R	X	X	X	X	CO	FY
Baltimore Oriole	S4B	C R	X		X	X	CO	NY
Barn Swallow	S4B	VC R	X	X		X	PO	S
Black-capped Chickadee	S5	C P	X		X		PO	S
Blue Jay	S5	VC P			X	X	CO	FY
Bobolink	S4B	U R		X			PR	P
Brown-headed Cowbird	S4B	VC R	X		X		PO	S
Chipping Sparrow	S5B	C R	X		X		PO	S
Common Grackle	S5B	VC R	X		X	X	CO	FY
Common Tern	S4B	U R			X		OBS	X
Common Yellowthroat	S5B	C R			X		PO	S
Double-crested Cormorant	S5B	VC R	X			X	OBS	X
Downy Woodpecker	S5	C P	X				PO	H
Eastern Towhee	S4B	U R			X		PO	H
Eastern Wood-pewee	S4B	C R	X			X	PO	S
European Starling	SNA	VC P	X	X		X	CO	FY
Gray Catbird	S4B	C R	X		X	X	PR	A
House Sparrow	SNA	VC P	X				PO	S
House Wren	S5B	C R	X				PO	S
Indigo Bunting	S4B	CR				X	PO	S
Killdeer	S5B,S5N	CR	X	X			PO	S
Mallard	S5	C R	X				PO	P
Mourning Dove	S5	VC R	X		X		PO	S
Northern Cardinal	S5	C P	X		X		PO	S
Northern Flicker	S4B	C R	X				PO	H
Northern Rough-wing Swallow	S4B	U R	X			X	PO	S
Red-bellied Woodpecker	S4	U P	X				PO	S
Red-tailed Hawk	S5	U R			X		PO	H
Red-winged Blackbird	S4	VC R	X	X	X	X	PR	A
Ring-billed Gull	S5B,S4N	VC R	X				OBS	X
Rose-breasted Grosbeak	S4B	C R	X		X	X	PR	A
Savannah Sparrow	S4B	VC R		X	X		PO	S
Song Sparrow	S5B	VC R	X	X	X		CO	FY
Spotted Sandpiper	S5	C R		X		X	PO	H
Tree Swallow	S4B	VC R	X			X	PO	S
Warbling Vireo	S5B	C R	X		X		PR	A
Willow Flycatcher	S5B	U R			X		PO	S
Wood Thrush	S4B	U R				X	PO	S
Yellow Warbler	S5B	C R			X	X	PO	S

* VC – very common; C – common; U – uncommon; UR – Uncommon to rare; O – Occasional; P – permanent resident; R – summer resident; S - Straggler (Niagara Natural Areas Inventory, 2010)
** OBS – observed, no evidence of breeding; PO – possible breeding; PR – probable breeding; CO - confirmed breeding
*** X – observed in its breeding season, no evidence of breeding
H – species observed in its breeding season in suitable nesting habitat
S – singing male present in its breeding season in suitable nesting habitat
P – pair observed in their breeding season in suitable nesting habitat
A – agitated behavior or anxiety calls of an adult
FY – recently fledged young
CF – adult carrying food for young NY – nest with young

Table 3: List of bird species documented on and adjacent to Property 2.

Species	S Rank	Niagara Status*	Green/ Rough	Woodland/ Thicket	Adjacent Lands	Highest Breeding Evidence**	Breeding Code***
American Goldfinch	S5B	C R	X	X		PO	S
American Crow	S5B	C R		X	X	PO	H
American Robin	S5B	VC R	X	X		CO	FY
Baltimore Oriole	S4B	C R	X	X		PR	A
Barn Swallow	S4B	VC R	X	X	X	PO	H
Black-capped Chickadee	S5	C P	X	X		CO	FY
Black-crowned Night-heron	S3B,S3N	U R		X		PO	H
Blue Jay	S5	VC P		X	X	PO	H
Brown-headed Cowbird	S4B	VC R	X	X		PO	S
Canada Goose	S5	VC P		X		PO	H
Cedar Waxwing	S5B	C R	X	X		PO	H
Chipping Sparrow	S5B	C R	X			PO	S
Common Grackle	S5B	VC R	X	X		CO	FY
Common Tern	S4B	U R		X		OBS	X
Common Yellowthroat	S5B	C R		X	X	PO	S
Double-crested Cormorant	S5B	VC R	X			OBS	X
Downy Woodpecker	S5	C P	X	X		CO	NY
Eastern Kingbird	S4B	C R		X	X	PO	S
Eastern Wood-pewee	S4B	C R		X	X	PO	S
European Starling	SNA	VC P	X			CO	FY
Gray Catbird	S4B	C R		X	X	PR	A
Great Blue Heron	S4	U R	X	X		OBS	X
Great Egret	S2B	R R	X			OBS	X
House Sparrow	SNA	VC P	X			PO	S
House Wren	S5B	C R		X	X	PO	S
Indigo Bunting	S4B	CR		X	X	PO	S
Killdeer	S5B,S5N	CR	X			PO	S
Mallard	S5	C R		X	X	PO	P
Mourning Dove	S5	VC R	X			PR	P
Northern Cardinal	S5	C P	X	X	X	PO	S
Northern Flicker	S4B	C R	X	X	X	PO	S
Northern Rough-wing Swallow	S4B	U R	X	X	X	PO	S
Red-bellied Woodpecker	S4	U P		X		PO	S
Red-eyed Vireo	S5B	C R		X		PO	S
Red-winged Blackbird	S4	VC R	X	X		CO	FY
Ring-billed Gull	S5B,S4N	VC R	X	X		OBS	X
Rock Dove	SNA	VC P	X			OBS	X
Rose-breasted Grosbeak	S4B	C R		X	X	PR	A
Savannah Sparrow	S4B	VC R	X	X	X	PO	S
Song Sparrow	S5B	VC R	X	X	X	PR	A
Spotted Sandpiper	S5	C R	X			PO	H
Tree Swallow	S4B	VC R	X	X	X	PO	S
Warbling Vireo	S5B	C R	X	X	X	PR	A
Willow Flycatcher	S5B	U R		X	X	PO	S
Yellow Warbler	S5B	C R		X	X	PO	S

* VC – very common; C – common; U – uncommon; UR – Uncommon to rare; O – Occasional; P – permanent resident; R – summer resident; S - Straggler (Niagara Natural Areas Inventory, 2010)

** OBS – observed, no evidence of breeding; PO – possible breeding; PR – probable breeding; CO - confirmed breeding

*** X – observed in its breeding season, no evidence of breeding
H – species observed in its breeding season in suitable nesting habitat
S – singing male present in its breeding season in suitable nesting habitat
P – pair observed in their breeding season in suitable nesting habitat
A – agitated behavior or anxiety calls of an adult
FY – recently fledged young
CF – adult carrying food for young NY – nest with young

Table 4: List of bird species documented on and adjacent to Property 3.

Species		S Rank	Niagara Status*	Woodland/ Thicket	Meadow/ Treed Bank	Adjacent Lands	Highest Breeding Evidence**	Breeding Code***
American Goldfinch		S5B	C R	X	X		PO	S
American Crow		S5B	C R	X	X	X	PO	H
American Robin		S5B	VC R	X	X	X	PO	S
Baltimore Oriole		S4B	C R	X			PO	S
Barn Swallow		S4B	VC R		X		OBS	X
Black-capped Chickadee		S5	C P	X	X		PO	S
Black-crowned Night-heron		S3B,S3N	U R	X	X		PO	H
Blue Jay		S5	VC P	X			PO	H
Brown-headed Cowbird		S4B	VC R	X	X		PO	S
Carolina Wren		S4	U P	X			PO	S
Cedar Waxwing		S5B	C R	X	X		PO	H
Chipping Sparrow		S5B	C R	X		X	PO	S
Common Grackle		S5B	VC R	X	X		CO	FY
Common Yellowthroat		S5B	C R	X	X	X	PO	S
Downy Woodpecker		S5	C P	X	X		PO	S
Eastern Kingbird		S4B	C R	X			CO	NY
Eastern Wood-pewee		S4B	C R			X	PO	S
European Starling		SNA	VC P	X	X		CO	FY
Gray Catbird		S4B	C R	X			PO	S
Great Blue Heron		S4	U R	X			OBS	X
Great Crested Flycatcher		S4B	C R	X			PO	S
Great Egret		S2B	R R		X		OBS	X
House Sparrow		SNA	VC P		X	X	PO	S
House Wren		S5B	C R	X			PO	S
Indigo Bunting		S4B	CR	X			PO	S
Killdeer		S5B,S5N	CR		X		PO	S
Mallard		S5	C R		X		PO	H
Mourning Dove		S5	VC R	X	X		PR	P
Northern Cardinal		S5	C P	X	X	X	PO	S
Northern Flicker		S4B	C R			X	PO	S
Red-tailed Hawk		S5	U R	X			PO	H
Red-winged Blackbird		S4	VC R	X	X		PR	A
Ring-billed Gull		S5B,S4N	VC R		X		OBS	X
Rose-breasted Grosbeak		S4B	C R	X	X		PR	A
Savannah Sparrow		S4B	VC R		X		PO	S
Song Sparrow		S5B	VC R	X	X		CO	FY
Turkey Vulture		S5B	U R		X		OBS	X
Warbling Vireo		S5B	C R	X	X	X	PO	S
Yellow Warbler		S5B	C R	X	X	X	PR	A

* VC – very common; C – common; U – uncommon; UR – Uncommon to rare; O – Occasional; P – permanent resident; R – summer resident; S - Straggler (Niagara Natural Areas Inventory, 2010)

** OBS – observed, no evidence of breeding; PO – possible breeding; PR – probable breeding; CO - confirmed breeding

*** X – observed in its breeding season, no evidence of breeding

H – species observed in its breeding season in suitable nesting habitat

S – singing male present in its breeding season in suitable nesting habitat

P – pair observed in their breeding season in suitable nesting habitat

A – agitated behavior or anxiety calls of an adult

FY – recently fledged young

CF – adult carrying food for young NY – nest with young

4.2.2 Amphibian Call Surveys

Amphibian call surveys were conducted on April 12, May 14 and June 18, 2018. Five survey locations were established on the Subject Properties to assess amphibian use of various potential habitats. The locations of survey stations are illustrated on Figure 3a and 3b. Each station was surveyed for a period of three minutes, between one half-hour after sunset, and midnight. All species of calling amphibians were recorded along with a calling code (0 – no calling; 1- calls not overlapping, can be discretely counted; 2 – calls overlapping, but numbers of individuals can still be estimated; 3 – full chorus, numbers of individuals cannot be estimated), along with an estimate of the number of individual amphibians where possible.

The amphibian survey conducted on April 12, 2018 commenced at approximately 21:30. Air temperature during the April 12, 2018 survey was 6°C, with partly cloudy conditions and winds estimated to be 1 on the Beaufort Scale. The May 14, 2018 visit began at approximately 22:00, while the air temperature was 11°C, winds were estimated to be 1 on the Beaufort Scale and it was partly cloudy. The final amphibian survey was completed on June 18, 2018, beginning at approximately 22:00. Light precipitation was present, and air temperature was 19°C with little wind during the survey. The results of the amphibian surveys are presented in Table 4.

Table 5. Results of amphibian call surveys.

		Spring Peeper	Western Chorus Frog	Grey Treefrog	American Toad	Northern Leopard Frog	Green Frog
Station 1	April 12, 2018	1-3	2-6	-	-	-	-
	May 14, 2018	1-1	1-1	-	-	-	-
	June 18, 2018	-	-	-	-	-	-
Station 2	April 12, 2018	-	1-2	-	-	-	-
	May 14, 2018	-	-	1-3	1-2	1-1	-
	June 18, 2018	-	-	-	-	-	-
Station 3	April 12, 2018	1-2	2-4	-	-	-	-
	May 14, 2018	-	1-1	1-2	-	1-1	-
	June 18, 2018	-	-	-	-	-	-
Station 4	April 12, 2018	1-2	2-4	-	-	-	-
	May 14, 2018	-	-	1-1	-	1-2	-
	June 18, 2018	-	-	-	1-2	-	1-1
Station 5	April 12, 2018	-	-	-	-	-	-
	May 14, 2018	-	-	-	-	1-2	-
	June 18, 2018	-	-	-	-	-	1-3

*Numbers in cells represent (calling code – estimated numbers).

4.2.3 Reptile Surveys

Active hand searches for reptiles and amphibians were conducted on May 14, June 12, July 4, 2018, August 24, 2019, April 9, May 13, and June 22, 2021 and May 5, 12, June 23 and August 5, 2022 generally following methods described in OMNRF (2016). These searches resulted in the observation of Eastern Gartersnake on two occasions adjacent to the Welland River, on the edge

of the SWD1-3/FOD7 community, as well as one Eastern Gartersnake on the edge of the FOD9/FODM11, north of Lyons Creek Road.

As illustrated in Figures 3a and 3b, several excavated ponds have been constructed on the property as part of the golf course use. Each pond was assessed for potential use by turtles on April 9, May 13 and June 22, 2021 and May 5, 12, June 23 and August 5, 2022 using methods adopted from OMNRF (2015b). No turtles were observed in the small ponds on the south and eastern portions of the property, however Midland Painted Turtles were observed in the ponds southeast of the clubhouse.

4.2.4 Bat Roosting Habitat Survey

Initial assessments of potential bat roosting and maternal habitat on the property were conducted on February 6 and May 14, 2018 utilizing methods described in Bat and Bat habitat Surveys of Treed Habitats (MNRF 2016a). No significant snags or cavity trees that may provide potential maternal or roost habitat were observed on the Subject Lands during these assessments.

Although no significant potential roost trees were identified, acoustic bat monitoring was conducted on the Subject Lands to determine if maternity roost colonies were present and determine the presence of SAR bats. Passive acoustic monitors were deployed on June 23, 2022 and recovered on July 6, 2022 for a total of 14 monitoring days. The four additional monitoring days were completed to account for inclement weather during the monitoring period and ensure sufficient data was collected. Deployment sites were selected based on a snag tree assessment to identify potential high quality roosting habitat, including dead standing trees, cracks, hollows, and exfoliating bark. From our observations on the Subject Lands, the highest quality potential roost sites were identified within the ELC communities (FOD9/FOM11) on the southwestern portion of the former golf course. The location of the bat monitors are illustrated in Figure 3b.

Four passive acoustic monitoring devices were used at four separate locations during the monitoring period. Sites were monitored using identical equipment consisting of the SM4Bat Full spectrum monitor and SMM-U1 Omni-directional ultrasonic microphones developed by Wildlife Acoustics Inc. All bat calls that were recorded by the equipment were analyzed using the Kaleidoscope Pro auto-identification program, and confirmed for accuracy through manual review. Table 6 below illustrates the total number of bat passes observed at all monitors during the deployment time and a more detailed summary of bat calls recorded is provided in Appendix C.

Table 6. Results of Acoustic Bat Monitoring.

	Big Brown Bat (EPTFUS)	Eastern Red Bat (LASBOR)	Hoary Bat (LASCIN)	Silver-haired Bat (LASNOC)	Little Brown Bat (MYOLUC)	Northern Bat (MYOSEP)	Monitor Totals
Unit A	5	3	57	8	10	0	83
Unit B	98	0	160	89	0	0	347
Unit C	367	1	49	138	0	0	555
Unit D	162	0	212	41	1	1	417
Total Passes	632	4	478	276	11	1	1402

*Bat passes do not equal the actual number of bats. Individual bats can make multiple passes. Monitor Totals are over the course of 14 nights of monitoring.

A total of 1402 identifiable bat passes were recorded on the Subject Lands over the duration of the monitoring period. Of these recordings, the majority were identified as either Big Brown Bats, Hoary Bats or Silver-haired Bats. Eastern Red Bat was also documented on the Subject Lands in lower numbers, suggesting they may be using the sites as intermittent feeding grounds, but unlikely to be using it for roosting.

The number and location of bat passes observed on the Subject Lands indicates that bat species may be roosting within scattered trees on the property, however the frequency of passes is not conclusive to determine maternal use of trees on the property. Any potential roosting in these areas is likely related to the proximity of Lyons Creek or the Welland River and higher quality foraging habitat associated with these areas.

During the summer, the Little Brown Myotis, Northern Myotis, Eastern Small-footed Myotis and Tri-colored Bats are found in a variety of forested habitats, as well as abandoned buildings, barns and attics. In forested habitats, cavities in trees, loose bark, foliage and other cover objects are used for roosting. These species forage in a variety of habitats where flying insects and spiders are present, often in association with wetlands, ponds and streams. Overwintering typically occurs in caves.

Myotis bat species were detected by two detectors throughout the monitoring period. From our analysis it was determined that the vast majority of these calls were observed at Unit A, while a significantly smaller number were recorded at Unit D. A total of 10 calls were observed at Unit A which occurred in low numbers over six separate nights. Based on the characteristics of this woodland feature, and the number and timing of calls recorded, it is highly unlikely that the woodland feature is being used for roosting for Myotis species and the detections are related to foraging or movement.

4.2.5 Incidental Wildlife Observation

Incidental wildlife observations including signs were recorded during each visit to the properties and included Eastern Cottontail, Grey Squirrel, Mink, Muskrat, Red Squirrel, White-tailed Deer, Bullfrog, Greenfrog and Midland Painted Turtle.

During our assessment of this properties, observations of potential road mortality were conducted along Lyon's Creek Road and Stanley Avenue. During these observations, two Snapping Turtles were seen adjacent to Lyons Creek Road near the east end of the Subject Lands, as well as one Eastern Gartersnake that was found dead on Lyons Creek Road.

Incidental insect observations include American Dog Tick (*Dermacentor variabilus*) Ants (Formicidae), Bumble Bee (Bombini), Cabbage White Butterfly *(Pieris rapae),* Clouded Sulphur (*Colias philodice*), Cricket (Gryllidae), Deer Fly (Chrysops), Dragonfly (Odonata), Emerald Ash Borer *(Agrilus planipennis),* Honey Bee *(Apis mellifera),* Flesh Fly (Sarcophagidae), Leafhopper (Cicadellidae), Little Wood-Satyr (Megisto cymela), Monarch **(***Danaus plexippus***),** Mosquito (Culicidae), Moth (Lepidoptera), Robber Fly (Asilidae), Skipper Butterfly (Hesperiidae) and Yellow Jacket (Vespula or Dolichovespula).

4.3 Aquatic Habitat Assessment

As illustrated on Figure 2a and 2b, the Welland River forms the north boundaries of Properties 1 and 2, and Lyons Creek forms the south boundary of Property 3. Both watercourses are directly adjacent to the property boundaries. Lyons Creek is a tributary to the Welland River, which are both managed as Type 1 Fish Habitat.

Table 7. Welland River and Lyons Creek Fish Species List

Scientific Name	Common Name	Thermal Regime Preference	Tolerance to Disturbance	SRank	Nat. Status (SARA)	Prov. Status (ESA)
Ambloplites rupestris	Rock Bass	Coolwater	Intermediate	S5		
Ameiurus nebulosus	Brown Bullhead	Warmwater	Intermediate	S5		
Ameiurus melas	Black Bullhead	Warmwater	Intermediate	S4		
Ameiurus natalis	Yellow Bullhead	Warmwater	Tolerant	S4		
Amia calva	Bowfin	Warmwater	Intermediate	S4		
Alosa pseudoharengus	Alewife	Coolwater	Intermediate	SNA		
Catostomus commersonii	White Sucker	Coolwater	Tolerant	S5		
Cottus bairdii	Mottled Sculpin	Coolwater	Intermediate	S5		
Culaea inconstans	Brook Stickleback	Coolwater	Intermediate	S5		
Cyprinella spiloptera	Spotfin Shiner	Warmwater	Intermediate	S4		
Cyprinus carpio	Common Carp	Warmwater	Tolerant	SNA		
Dorosoma cepedianum	Gizzard Shad	Coolwater	Tolerant	S4		
Esox americanus vermiculatus	Grass Pickerel	Warmwater	Intermediate	S3	SC	SC
Esox lucius	Northern Pike	Coolwater	Intermediate	S5		
Esox masquinongy	Muskellunge	Warmwater	Intermediate	S4		
Etheostoma caeruleum	Rainbow Darter	Coolwater	Intolerant	S4		
Etheostoma nigrum	Johnny Darter	Coolwater	Tolerant	S5		
Fundulus diaphanus	Banded Killifish	Coolwater	Tolerant	S5		
Ictalurus punctatus	Channel catfish	Warmwater	Tolerant	S4		
Labidesthes sicculus	Brook Silverside	Warmwater	Intermediate	S4		
Lepomis cyanellus	Green Sunfish	Warmwater	Tolerant	S4		
Lepomis gibbosus	Pumpkinseed	Warmwater	Intermediate	S5		
Lepomis macrochirus	Bluegill	Warmwater	Intermediate	S5		
Luxilus chrysocephalus	Striped Shiner	Coolwater	Intermediate	S4		
Luxilus cornutus	Common Shiner	Coolwater	Intermediate	S5		
Micropterus dolomieu	Smallmouth Bass	Coolwater	Intermediate	S5		
Micropterus salmoides	Largemouth Bass	Warmwater	Tolerant	S5		
Morone americana	White Perch	Warmwater	Intermediate	SNA		
Moxostoma macrolepidotum	Shorthead Redhorse	Warmwater	Intermediate	S5		
Moxostoma valenciennesi	Greater Redhorse	Warmwater	Intolerant	S3		
Neogobius melanostomus	Round Goby	Coolwater	Intermediate	SNA		
Notemigonus crysoleucas	Golden Shiner	Coolwater	Intermediate	S5		
Notropis atherinoides	Emerald Shiner	Coolwater	Intermediate	S5		
Notropis hudsonius	Spottail shiner	Coolwater	Intermediate	S5		
Noturus gyrinus	Tadpole Madtom	Warmwater	Intermediate	S4		
Osmerus mordax	Rainbow Smelt	Coolwater	Intermediate	S5		
Perca flavescens	Yellow Perch	Coolwater	Intermediate	S5		
Percina caprodes	Logperch	Warmwater	Intolerant	S5		
Percopsis omiscomaycus	Trout-perch	Coolwater	Intermediate	S5		
Pomoxis nigromaculatus	Black Crappie	Coolwater	Tolerant	S4		
Pimephales notatus	Bluntnose Minnow	Warmwater	Intermediate	S5		
Pimephales promelas	Fathead Minnow	Warmwater	Tolerant	S5		
Pomoxis annularis	White Crappie	Warmwater	Tolerant	S4		
Scardinius erythrophthalmus	Rudd	Coolwater	Tolerant	SNA		
Semotilus atromaculatus	Creek Chub	Coolwater	Intermediate	S5		
Umbra limi	Central Mudminnow	Coolwater	Tolerant	S5		

Fish community information for these watercourses were provided by MNRF and are listed in Table 7. The species listed are mostly warm to coolwater, and most have an intermediate tolerance to disturbance. Species of conservation concern are Grass Pickerel (Special Concern) and Greater Redhorse (S3).

Located on the south end of the campground property is a small drainage channel that originates at the former driveway on the property and appears to have been constructed to drain the former homestead. The channel measures approximately 100m in length prior to discharging to a catch basin at Lyons Creek Road. The shallow channel on the property appears to have been constructed to drain surface water from the southeast corner of the property and measures approximately 0.7-1.0m in width. This channel ephemerally conveys water following snow melt and major precipitation events. The perched nature of the watercourse and high gradient of the channel south of Lyons Creek Road will limit any potential fish movement into the watercourse.

Background mapping also indicates that a small watercourse is located in the central portion of the golf course property, north of Lyons Creek Road. The portion of this watercourse on the property measures approximately 60m in length and was constructed to drain surface water from the golf course. Several tile drains appear to discharge into this watercourse feature. Due to the constructed nature of this watercourse, the channel is generally well defined and varies in width from 0.7-1.2m. Flow from this watercourse is ephemeral, with water directed to the Lyons Creek Road ditching, prior to being conveyed to a cross culvert under Lyons Creek Road. Due to the limited hydroperiod and high gradient south of Lyons Creek Road, this watercourse is providing a simple contribution function to fish habitat in Lyons Creek.

5.0 ASSESSMENT OF SIGNIFICANT NATURAL HERITAGE FEATURES

5.1 Significant Habitat of Endangered and Threatened Species

No Endangered species were documented on the property and Threatened species observed on the property were limited to Barn Swallow, Bobolink, and American Water-willow. Barn Swallows were observed flying and calling over the Subject Properties on both site visits. Active nests with young were observed under the Stanley Avenue bridge, between the golf course and campground properties. Based on our assessment, the Subject Properties are providing potential foraging habitat for this species, however nesting habitat is absent. Significant habitat for this species is not present on the Subject Properties.

A pair of Bobolinks were observed flying, landing and calling in the cultural meadow area of the campground on Property 1 during the first site visit. Bobolinks are considered an obligate-grassland species, breeding in a variety of natural grassland habitat types, including remnant prairies, savannahs and alvar grasslands (McCracken et al. 2013). A search for nests was not conducted as part of the breeding bird assessment work to minimize the potential for nest disturbance or predation, however for the purposes of this assessment, it is assumed that this species is nesting within the meadow south of the campground.

American water-willow was observed at a number of locations along the north shoreline of Lyons Creek, within or on the edge of the Study Area. This species is normally found along the shores of rivers, streams and shallow lakes on a substrate of gravel, sand or organic material OMNR 2013). All occurrences were just offshore, forming colonies on the water surface of the Lyons Creek. The locations of each colony is marked on Figure 3b and occurred in the SAF1-1 vegetation type or SAS1/SAM1 community.

As part of our assessment of this property we submitted an information request to the Ministry of Natural Resources and Forestry (MNRF) (Appendix D and E). Information provided by MNRF indicated that one Endangered species (Eastern Flowering Dogwood) and two additional Threatened species (Bank Swallow, Eastern Meadowlark) have been documented in the vicinity

of the Subject Lands. Potential habitat of Eastern Flowering Dogwood is present in the FOD7 and FOD9 communities on the property, however this species was not observed during botanical inventories. Therefore it is concluded that this property is not providing habitat for this species.

Eastern Meadowlarks are known to use habitats similar to Bobolink. Although breeding bird surveys were conducted as part of this project, this species was not detected on or adjacent to the Subject Lands. Therefore it is our conclusion the Subject Lands are not providing habitat for this species.

Bank swallows nest in burrows in natural and human-made settings where there are vertical faces in silt and sand deposits. Although relatively steep banks are present in locations along the Welland River, potential habitat for Bank Swallows is not present on the Subject Lands.

5.1.1 Other Potential Species of Conservation Concern

In addition to the above, Special Concern species observed on the property were limited to Eastern Wood-pewee and Wood Thrush. The Eastern Wood-pewee is one of the most common and widespread songbirds associated with North America's eastern forests (COSEWIC 2012). Often associated with forest clearings and edges, Eastern Wood-Pewee breeds in virtually every type of wooded community in eastern North America (Watt et al. 2020). Breeding territories of Eastern Wood-pewee in Southern Ontario are reported to range from 1.37ha to 2.03ha in size (COSEWIC 2012). This species is still considered common in the Niagara Region, however the declining population of this species has prompted the federal and provincial governments to designate this species as Special Concern.

Male Eastern Wood-pewees were heard calling on the first site visit in the active campground, as well north of Lyons Creek Road. No nests were observed in either location, suggesting that the observation may have been related to courtship. If the calling from these areas was related to territory defence, nesting was not likely occurring in the locations where these individuals were observed.

Based on our assessment, it is not likely that the scattered trees in the campground are providing significant habitat for Eastern Wood-pewees, since the dead and declining Ash trees and sporadic Red Maple in this area are not typical breeding habitat for this species. Similarly, habitat in the woodland north of Lyons Creek Road is not typical of breeding habitat for this species, since this species is typically avoids nesting near roadways. It is therefore our conclusion that the observations of these individual on June 12, 2018 do not represent breeding individuals.

Eastern Wood-pewee were also heard calling from the woodland/thicket west of the campground and north of the Welland River on the second site visit. Since these individuals were also determined to be males, and the habitats where they were observed are not typical of breeding habitat for this species, it is expected that these observations do not represent breeding individuals.

A Wood Thrush was heard calling on the first site visit in the adjacent forest/thicket west of the campground. Wood Thrush typically breed in larger forested areas, as well as 1 ha fragments and semi-wooded residential areas and parks, where this species will defend a breeding territory of between 0.08-4.0 ha in size. Although the habitat available west of the property is not typical of breeding habitat for this species, it is possible that this species is breeding in a more open portion of the thicket/woodland in this area. If this species is breeding on lands to the west, it appears that the breeding territory of the observed individual will not extend on the Subject Lands, and it is likely that this species is currently avoiding the current edge associated with the

campground. It is therefore our conclusion that habitat for Wood Thrush does not extend onto the property and redevelopment of the lands will not impact habitat of this species.

Although only observed incidentally, Monarch butterflies were noted as incidental species on the property. Our inventories indicate that Common Milkweed occurs sporadically in the cultural meadow and Swamp Milkweed was present in wetland communities. It is possible that these scattered stems of milkweed could provide feeding habitat for Monarch caterpillars, however none were noted.

Information provided by MNRF indicates that three additional Special Concern Species (Eastern Pondmussel, Snapping Turtle and Grass Pickerel) have been documented in the vicinity of the properties. Potential habitat for these species is present in the Welland River and Lyons Creek, and it is assumed that these species may be present in these watercourses.

5.2 Significant Woodlands

During our review of background mapping available for this property, it was noted that portions of the Subject Properties have been designated as Significant Woodland in the Niagara Region Policy Plan and Niagara Falls Official Plan (Figure 2a and 2b). As part of this assessment, we refined the extent of woodlands on the properties and this section has been prepared to determine the significance of these woodlands.

To be considered as significant, Policy 7.B.1.5 of the Niagara Region Policy Plan states that a woodland must meet one or more of the following criteria:

a) Contain Threatened or Endangered species or Species of Concern;
b) In size, is equal to or greater than 2 hectares, if located inside Urban Areas;
c) Contains interior woodland habitat at least 100 metres in from the woodland boundaries;
d) Contains older growth forest and be 2 hectares or greater in area;
e) Overlap or contain one or more of the other significant natural heritage features listed in Policies 7.B.1.3 or 7.B.1.4; or
f) Abut or be crossed by a watercourse or water body and be 2 or more hectares in area.

The extents of each woodland polygon on the property is illustrated in Figures 4a and 4b, and an assessment of significance is included below.

Area 1

Area 1 is an open-canopied woodland and thicket located west of Stanley Ave. This area consists of mature Green Ash and Cottonwood, which are remnant from the former homestead on the property, interspersed with cultural thicket. Our assessment indicates that this woodland measures approximately 4.5ha in size (including the presumed woodland community west of the property) and includes a portion of the mapped PSW on the property. Although this woodland satisfies the associated significant woodland criteria, the primary functional components of this woodland are located on the west side of Property 1 and the property to the west.

Of note, mature Honey Locusts were observed within this woodland area, in the vicinity of the old homestead. Since these individuals were planted, they are not conserved to be naturally occurring specimens.

Legend

- Subject Lands
- Watercourses
- Refined Extent of Significant Woodland
- Provincially Significant Wetland
- Potential Bobolink Habitat

Figure 4A

Natural Heritage Constratints on Subject Property 1

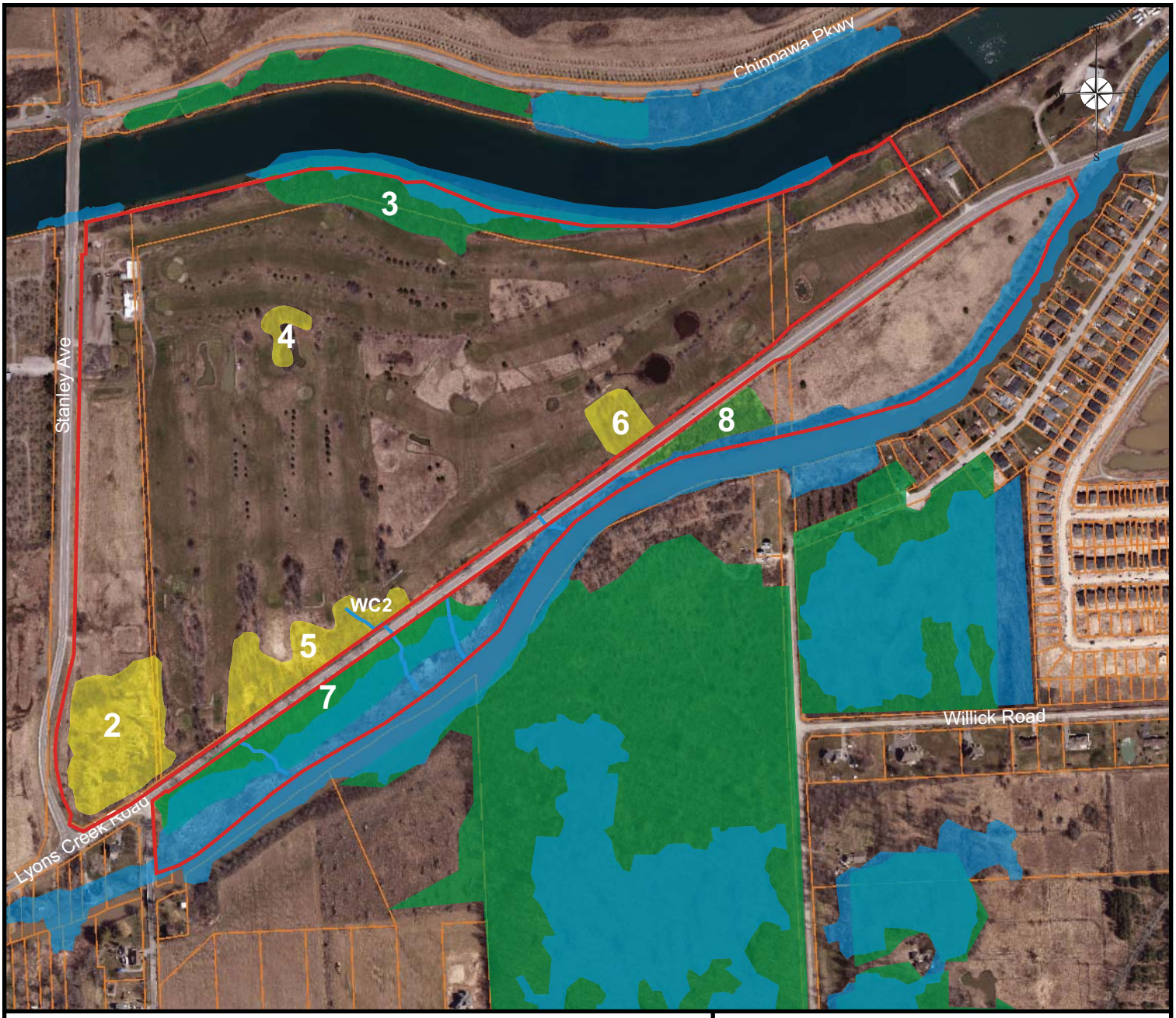
Environmental Impact Statement
Stanley Avenue Properties

Prepared for: **Panoramic Properties Inc.**

Prepared by: COLVILLE CONSULTING INC.

January 2023

FILE: 18034



Legend

- Subject Lands
- Watercourses
- Refined Extent of Significant Woodland
- Extent of Non-Significant Woodland
- Provincially Significant Wetland

Figure 4B
Natural Heritage Constraints on Subject Properties 2 and 3

Environmental Impact Statement
Stanley Avenue Properties

Prepared for: **Panoramic Properties Ltd.**

Prepared by: COLVILLE CONSULTING INC.

May 2023

FILE: 18034

Area 2

Located northeast of Lyons Creek Road and Stanley Avenue, an open woodland and old field meadow occur together as a complex. Where trees do occur, Green Ash, Black Walnut, Cottonwood, White Elm and Willow form young and very open stands of Fresh - Moist Deciduous Woodland Ecosite. This mixed vegetation community measures approximately 1.7ha in size and does not satisfy any of the criteria to be considered a significant woodland (see Table 8).

Area 3

At the north of the Study Area is a remnant stand of Pin Oak Deciduous Swamp and lowland deciduous forest, which occurs along the Welland River slope and floodplain. This woodland measures approximately 2.0ha in size, occurs adjacent to the Welland River and a portion of the woodland has also been included within the PSW. As a result, this woodland has been determined to meet the criteria of Significant Woodland.

Area 4

A small stand of Pin Oak Mineral Deciduous Swamp and deciduous forest occurs in the middle of the golf course. This treed area measures approximately 0.2ha in size and does not satisfy any criteria to be considered Significant Woodland. This community is therefore excluded from any further assessment.

Table 8. Assessment of Significant Woodland Criteria.

Criteria	Area 1	Area 2	Area 3	Area 4	Area 5	Area 6	Area 7	Area 8
Endangered or Threatened species or Species of Concern	No	No	No	No	No	No	No	No
Size	4.5ha	1.7ha	2.0ha	0.2ha	1.4ha	0.4ha	2.7ha	0.7ha
Interior Habitat	No	No	No	No	No	No	No	No
Older Growth	No	No	No	No	No	No	No	No
Other Natural Heritage Features	Yes	No	Yes	No	No	No	Yes	Yes
Watercourses or Waterbodies	Yes	No	Yes	No	No	No	Yes	n/a
Conclusion	Criteria satisfied	Criteria not satisfied	Criteria satisfied	Criteria not satisfied	Criteria not satisfied	Criteria not satisfied	Criteria satisfied	Criteria satisfied

Area 5

Located at the south end of the golf course property is a stand of Oak - Maple - Hickory Deciduous Forest. This irregular forest community has been historically altered to allow for the current golf use and now consists primarily of a series of narrow hedgerows. Since most of the woodland rows measure less than 40m in width, this woodland is functioning more as a hedgerow than a woodland. The contiguous portions of this woodland measure approximately 1.4ha in size and the woodland is not considered to satisfy any of the criteria to be considered Significant Woodland.

Area 6

Located north of Lyons Creek Road is a small and isolated stand of deciduous forest and Pin Oak Mineral Deciduous Swamp. This woodland community has established on the property following the abandonment of the agricultural use in the late 1960's or early 1970's. The woodland measures approximately 0.4ha in size and does not satisfy any of the criteria to be considered Significant Woodland.

Area 7

Located along the slope and floodplain associated with Lyons Creek is a complex of lowland deciduous forest, swamp and thicket swamp. This woodland measures approximately 2.7ha in size, occurs adjacent to Lyons Creek and a portion of the woodland has also been included within the PSW. As a result, this woodland has been determined to meet the criteria of Significant Woodland.

Area 8

A small stand of Pin Oak Mineral Deciduous Swamp and lowland deciduous forest occurs south of Lyon's Creek Road and west of the meadow. This treed area measures approximately 0.7ha in size, including a portion of the community considered as part of the PSW. Due to the proximity to the PSW, this woodland has been determined to meet the criteria of Significant Woodland.

Although lands to the west of Property 1 were not assessed as part of this project, it appears from our observations from the Subject Lands that vegetation on the central and northern portions of this property are more consistent with a thicket than woodland. Therefore, the majority of lands west of Property 1 were not considered to be Significant Woodland.

5.3 Provincially Significant Wetlands

As illustrated in Figures 2a and 2b, a portion of the Welland River East Provincially Significant Wetland Complex is located at the north end of the Study Area, in association with the Welland River and riparian areas. Our assessment confirms that this wetland is primarily located within the Welland River, however a portion of the wetland does extend into the woodland at the north end of the property.

Mapping available from the Ministry of Natural Resources and Forestry (MNRF) indicates that the entire channel of Lyons Creek and a portion of the riparian areas have been included within the Lyons Creek Provincially Significant Wetland Complex. A portion of this wetland complex is also located on the south end of the campground property, as well as the adjacent lands. Botanical work completed as part of this project verifies the extent of the wetland adjacent to Lyons Creek. It is also our assessment that the vegetation community on the south end of the campground property is more consistent with a woodland than a wetland, however for the purposes of this assessment, the extent of the mapped wetland is illustrated and discussed.

Our assessment indicates that a small complex of Pin Oak Mineral Deciduous Swamp and deciduous forest occurs in association with a dug pond in the central portion of the golf course property. Collectively, this vegetation community and the associated pond measures approximately 0.3ha in size. It is our assessment that this wetland feature is too small and not providing sufficient ecological function to be evaluated using the Ontario Wetland Evaluation System (OWES). No other ponds on these properties are of sufficient size or function to be considered for evaluation.

Although ponds on the property are not of sufficient size or function to be considered for evaluation, an assessment of these ponds was conducted to determine if any of these areas meet the criteria to be regulated by the NPCA. Based on the assessment completed by Terra-Dynamics, all of the ponds occur over an aquitard and none of these ponds are connected to a surface watercourse (see Appendix F). Therefore, none of these ponds are considered to be regulated by the NPCA.

5.4 Watercourse Assessment

As illustrated on Figure 2a and 2b, the Welland River forms the north boundaries of Properties 1 and 2, and Lyons Creek forms the south boundary of Property 3. Both watercourses are directly adjacent to the property boundaries and provide Critical Fish Habitat. No portion of the proposed development on these lands will impact either of these watercourses.

Two small ephemeral tributaries to Lyons Creek were identified in background mapping and assessed as part of this study. These watercourses have been assigned the identifies of Watercourse 1 and Watercourse 2. The refined extents of these watercourses are illustrated in Figures 4a and 4b and an assessment of each is provided below.

Watercourse 1

As part of our survey of these properties, we completed an assessment of the watercourse on Property 1 (Watercourse 1) using the Evaluation, Classification and Management of Headwater Drainage Features Guidelines (TRCA 2014). Using the data and observations from our assessment of this watercourse, Hydrology, Riparian Habitat, Fish and Fish Habitat and Terrestrial Habitat conditions were classified. The classification of each condition is provided below.

Please note that this watercourse was not of sufficient size or drainage area to apply OSAP S4.M10.

Hydrology Classification

Based on our assessment, Watercourse 1 on and downstream of the Subject Property conveys ephemeral flow. No standing water was present during our observations, and the small drainage area suggests a limited flow volume and duration. Because this watercourse is constructed, has no groundwater seepage or wetland functions and has a substrate that consists of the native silty-clay soil, this watercourse is classified as providing limited hydrology functions.

Riparian Habitat

As described above, vegetation adjacent to this watercourse consists of woodland and thicket, which is regenerating on the former homestead on this property. The limited length of the watercourse and associated vegetation provides limited riparian corridor functions.

Fish and Fish Habitat

Since this watercourse ultimately conveys flow and allochthonous materials to Lyons Creek downstream of the property, this watercourse is providing a limited contributing function to fish habitat in Lyons Creek.

Terrestrial Habitat

Although terrestrial habitat is present adjacent to this watercourse, terrestrial areas adjacent to this watercourse provide limited habitat and movement functions.

Management Recommendations

Based on our assessment, Watercourse 1 on and adjacent to this property is providing limited functions, and therefore no management is required per TRCA (2014). It is recommended that water from this drainage area be captured in the future stormwater management system and continue to be conveyed to Lyons Creek.

Watercourse 2

Watercourse 2 was also assessed using TRCA (2014). The classification of each condition is provided below.

Hydrology Classification

Based on our assessment, Watercourse 2 conveys ephemeral flow. No standing water was present during any of our observations, and the small drainage area suggests a limited flow volume and duration. Because this watercourse is constructed and only conveys surface drainage from a portion of the golf course, this watercourse is classified as providing limited hydrologic functions.

Riparian Habitat

Vegetation adjacent to this watercourse consists of former manicured area associated with the golf course and hedgerow. Downstream of the property, Watercourse 2 is conveyed in the roadside ditch associated with Lyons Creek Road, before being conveyed under the road. The limited length of the watercourse and associated vegetation provides limited riparian corridor functions.

Fish and Fish Habitat

This watercourse ultimately conveys flow and allochthonous materials to Lyons Creek downstream of the property, and therefore this watercourse is providing a limited contributing function to fish habitat in Lyons Creek.

Terrestrial Habitat

Terrestrial habitat is limited upstream of this watercourse, and terrestrial areas adjacent to this watercourse provide limited habitat and movement functions.

Management Recommendations

Based on our assessment, Watercourse 2 on and adjacent to this property is providing limited functions, and therefore no management is required per TRCA (2014). Similar to Watercourse 1, it is recommended that water from this drainage area be captured in the future stormwater management system and continue to be conveyed to Lyons Creek.

5.5 Significant Valleylands

Due to their prominence on the landscape, the valleys associated with the Welland River and Lyons Creek have been designated as Significant Valleylands. It is understood that no formal assessment of these valleyland features has been completed as part of the designation as Significant Valleyland, however it is anticipated that these features will be providing surface water functions, are prominent on the landscape, and contain diverse and unique vegetation communities and species.

The valleylands associated with this reach of Lyons Creek generally occur south of Lyons Creek Road. As described above, Lyons Creek and this associated valley contains a number of regionally rare or uncommon species, and is also providing habitat for at least one Threatened species. The hydro related flow diversion in this area creates a unique tidal wetland in this section of Lyons Creek, which likely contributes to the overall species diversity. The valley associated with Lyons Creek generally becomes less prominent and more developed towards the east end of the study area.

The Welland River is the largest watershed in the Niagara Region, and as a result, also has the largest valley system. Although not as unique as the Lyons Creek valley, valleylands associated with the Welland River generally provide opportunities for wildlife movement through the region, as well as provide a range of hydrologic and wildlife habitat functions. The Welland River valley in the vicinity of the Subject Lands is generally naturalized, however urban land uses east of the property limits potential wildlife functions of the valley.

5.6 Significant Wildlife Habitat

The SWH Criteria Schedule for Ecoregion 7E (OMNRF 2015a) identifies four main types of Significant Wildlife Habitat (SWH): seasonal concentrations areas, rare vegetation communities and specialized wildlife habitat, habitats of species of Conservation Concern, animal movement corridors. These are discussed below in relation to the natural features on and adjacent to the site and an assessment table is provided in Appendix G.

5.6.1 Seasonal Concentration Areas

The Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E identifies 14 types of seasonal concentrations of animals that may be considered significant wildlife habitat. These include, but are not limited to:

- Waterfowl Stopover and Staging Areas (Aquatic and Terrestrial);
- Shorebird Migratory Stopover Area;
- Raptor Wintering Area;
- Bat Hibernacula;
- Bat Maternity Colonies;
- Turtle Wintering Areas;
- Reptile Hibernaculum;
- Colonially -Nesting Bird Breeding Habitat (Bank and Cliff);
- Colonially -Nesting Bird Breeding Habitat (Tree/Shrubs);
- Colonially -Nesting Bird Breeding Habitat (Ground);
- Migratory Butterfly Stopover Areas;
- Landbird Migratory Stopover Areas; and
- Deer Winter Congregation Areas.

Potential bat roosting habitat on the property is generally limited to scattered larger Oak trees on the former golf course property. Acoustic monitors were deployed to assess use of these trees and resulted in the passes reported in Table 6 and Appendix C.

To be considered Significant Wildlife Habitat, maternity colonies must contain more than 10 Big Brown Bats or more than adult female Silver-haired Bats. The number of Silver-haired Bats detected at each of the monitors is not sufficient to be considered SWH. Although the number of

passes exceeded five on some nights, the variability in passes between nights is more reflective of feeding and not a maternal colony.

Detector C recorded the most passes of Big Brown Bats, as compared to the other three monitors. The number of passes was highly variable between nights, as indicated in data provided in Appendix C. Based on the timing of passes, it is probable that most of the recorded passes were associated with foraging or movements rather than roosting behaviour, since most passes were recorded outside of expected emergence and return periods.

Based on the assessment of data, the number of detections of Big Brown Bats and Silver-haired Bats does not suggest sufficient use to be considered significant wildlife habitat.

During our assessments of the property, Midland Painted Turtles were observed in the former irrigation ponds southwest of the clubhouse on Property 2. Based on observations, it appears that water depth in these ponds is sufficient to provide potential overwintering opportunities for these turtles. However, as these ponds are constructed, these ponds do not qualify as candidate Significant Wildlife Habitat.

Although no surveys were conducted in Lyons Creek or the Welland River, it is assumed that these areas are providing overwintering habitat for turtles.

Based on our assessment, habitat and use of habitats on the property is not consistent with significant wildlife habitat criteria established for seasonal concentrations of animals.

5.6.2 Rare Vegetation Communities

Rare vegetation communities often contain rare species, which depend on such habitats for their survival and cannot readily move to or find alternative habitats. Those areas that qualify as rare habitats are assigned an SRank of S1, S2 or S3 by the Natural Heritage Information Center (NHIC).

The Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E identifies 7 specialized habitats that may be considered significant wildlife habitat. They are:

- Cliffs and Talus Slopes;
- Sand Barren;
- Alvar;
- Old Growth Forest;
- Savannah;
- Tallgrass Prairie; and
- Other Rare Vegetation Communities.

A unique vegetation community described as Arrow-arum Organic Shallow Marsh Type was noted in association with the shallow marsh (MAS), floating-leaved (SAF) and submerged and mixed aquatic communities (SAS/SAM) in the Study Area. This community is not currently included in the ELC, and is therefore considered to be provincially rare. This narrow vegetation community occurs in the Welland River and Lyons Creek, and is too small to illustrate on mapping.

Based on the location of this community, no portion of the project will impact this vegetation community.

5.6.3 Specialized Habitats of Wildlife considered SWH

Some wildlife species require large areas of suitable habitat for their long-term survival and many wildlife species require substantial areas of suitable habitat for successful breeding. Their populations are at risk of decline when habitat becomes fragmented or reduced in size

Specialized habitats for wildlife include:

- Waterfowl Nesting Area;
- Bald Eagle and Osprey Nesting, Foraging and Perching Habitat;
- Woodland Raptor Nesting Habitat;
- Turtle Nesting Areas;
- Seeps and Springs;
- Amphibian Breeding Habitat (Woodland);
- Amphibian Breeding Habitat (Wetlands); and
- Woodland Area-Sensitive Bird Breeding Habitat.

Amphibian vocalization surveys were conducted to assess use of wetlands associated with Lyons Creek and former irrigation ponds on the property. Amphibian breeding was documented in the PSW on the south end of Property 1, however the documented numbers were not consistent with SWH.

Suitable potential amphibian breeding habitat is not present in the floodplain wetland and woodland associated with Welland River.

Amphibian breeding was confirmed in several of the constructed ponds on golf course property. None of these ponds contains habitat that is considered candidate SWH. As these irrigation ponds will be removed as part of the proposed development, further vocalization surveys are being conducted in 2023 to inform the phased decommissioning of these ponds and assist with planning the location and function of replacement ponds to be constructed in buffer areas.

No evidence of turtle nesting was observed during our surveys, however an anecdotal report of turtle nesting in the riparian area associated with Lyons Creek was provided be a local resident. Although this use was not confirmed, it is possible that nesting could occur in portions of the riparian area that provides suitable site conditions. Since any potential nesting sites are located in the buffer associated with Lyons Creek and the PSW, any potential nesting habitat in these areas will be maintained.

Aside from potential turtle nesting habitat in the riparian area of Lyons Creek, it is our conclusion that no specialized habitats for wildlife are present on the Subject Properties.

5.6.4 Habitats of Species of Conservation Concern

Habitats of Species of Conservation Concern include wildlife species that are listed as Special Concern or those that are provincially rare (S1-S3). Habitats of Species of Conservation Concern do not include habitats of Endangered or Threatened species as identified by the Endangered Species Act.

The following habitats are considered candidate SWH:

- Marsh Breeding Bird Habitat;
- Open Country Bird Breeding Habitat;
- Shrub/Early Successional Bird Breeding Habitat;

- Terrestrial Crayfish; and
- Special Concern and Rare Wildlife Species.

Although not detected on the property, a Wood Thrush was heard calling in the woodland/thicket west of the campground property (approximate location illustrated on Figure 3a). This individual was not documented using the Subject Lands, and habitat on the property in the vicinity of the observation is not suitable for this species. As a result, the Subject Lands do not appear to be providing habitat for Wood Thrush.

Eastern Wood-pewee

Eastern Wood-pewee were heard calling on the first site visit from the woodland on the south end of the golf course property, as well as from the north end of the campground property. property. No nests were observed in either location, suggesting that the observation may have been related to courtship. If the calling from these areas was related to territory defence, nesting was not likely occurring in the locations where these individuals were observed.

It is not likely that significant habitat for Eastern Wood-pewee occurs on Properties 1 or 2.

Monarch

Our assessment of the site indicates that potential breeding and feeding habitat for Monarch butterflies is located in the cultural meadow and meadow marsh portions of the property, where Common and Swamp Milkweed were observed, along with sparse wildflowers. Although Milkweed stems and wildflowers are present in these areas, the abundance of these species suggests these properties are not providing significant habitat for Monarch butterflies.

5.6.5 Migration Corridors

The SWHTG defines animal movement corridors as elongated, naturally vegetated parts of the landscape used by animals to move from one habitat to another. To qualify as significant wildlife habitat, these corridors should be a critical link between habitats that are regularly used by wildlife.

Based on our review of air photos, it is possible that the lands adjacent to the Welland River and Lyons Creek are providing migration and dispersal opportunities for wildlife and plants. The lands west of the Subject Lands may also be providing a linkage between the Welland River and Lyon's Creek.

During our assessments of the Subject Property, single Snapping Turtles were observed on two occasions adjacent to Lyons Creek Road, near the east end of the Subject Property. These observations may suggest that Snapping Turtles are periodically crossing Lyons Creek Road either travelling to or from the Subject Lands. Similar anecdotal observations have also been reported by residents in the area.

Although it is possible that Snapping Turtles or other wildlife species could be moving between Lyons Creek and the Welland River across the property, it is likely that this use is incidental and limited to species that would utilize the available meadow habitat. Since the confluence of Lyons Creek and the Welland River is located east of the Subject Lands, it is more likely that aquatic species are using water connections to move between the two watercourses and not moving overland.

6.0 DEVELOPMENT OPPORTUNITIES AND POTENTIAL IMPACTS

6.1 Significant Habitat of Threatened Species

No Endangered species were documented on the Subject Properties during our surveys, however a Threatened species (Bobolink) was observed in the meadow community on the campground property. Bobolink is an obligate grassland species that will breed in a variety of grassland habitat types, as well as pastures and hayfields.

Although nesting was not confirmed, it is suspected that the cultural meadow is providing breeding habitat for Bobolink. The extent of potential Bobolink habitat is illustrated in Figure 4a. Prior to any development in this area, it is recommended that the registration process available in Ontario Regulation 242/08 be utilised, and suitable replacement of habitat or similar compliance measures be discussed with the Ministry of Environment, Conservation and Parks (MECP). Provided steps outlined in Ontario Regulation 242/08 are followed, development on these properties will not have an adverse effect on Bobolink.

6.2 Species of Special Concern

To Species of Special Concern (Eastern Wood-pewee and Monarch) were documented on the properties during our survey work.

Eastern Wood-pewee

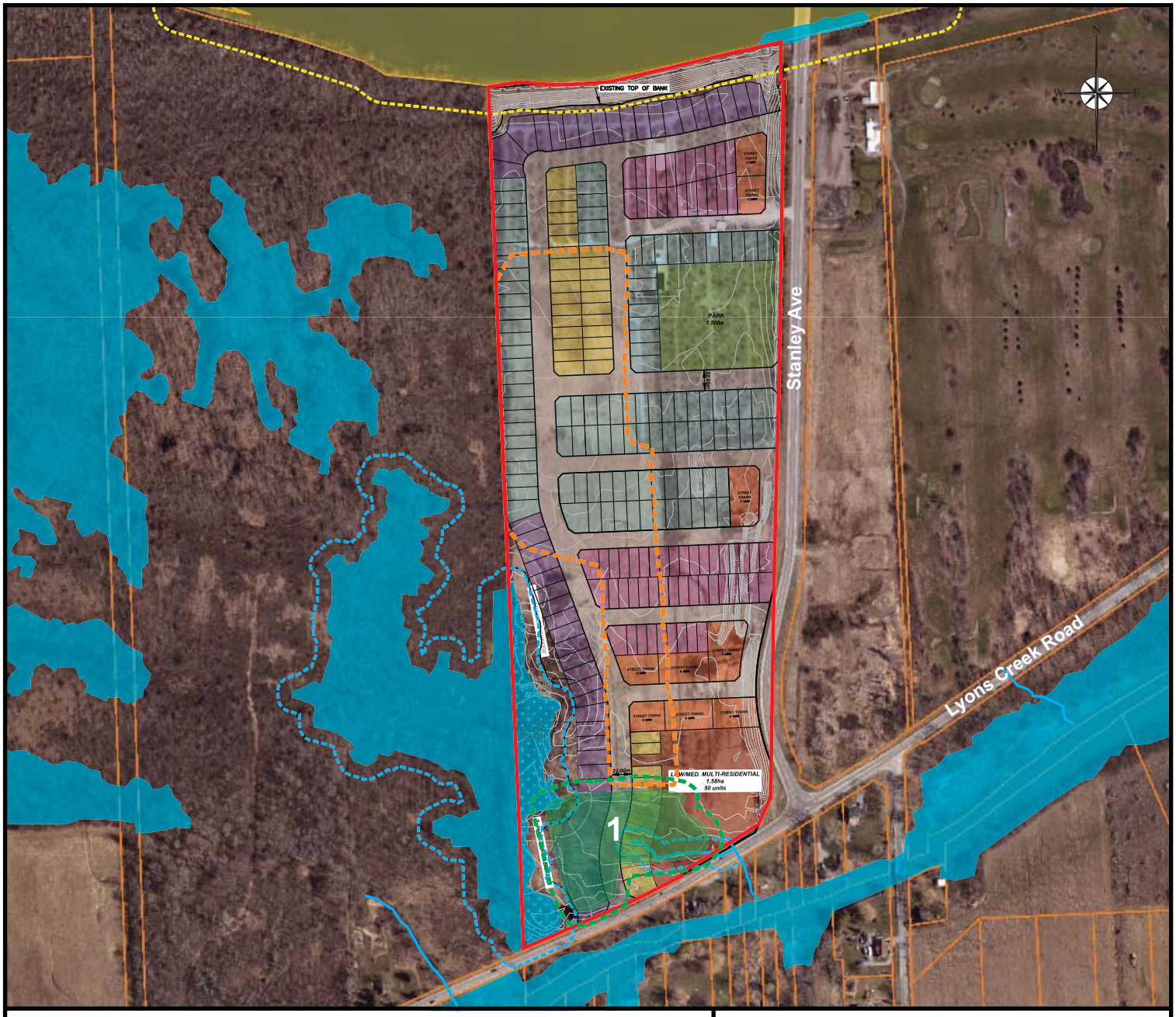
Eastern Wood-pewee were heard calling on the first site visit from the woodland on the south end of the golf course property, as well as from the north end of the campground property. property. No nests were observed in either location, suggesting that the observation may have been related to courtship. If the calling from these areas was related to territory defence, nesting was not likely occurring in the locations where these individuals were observed.

Based on our assessment, it is not likely that the sporadic trees in the campground are providing significant habitat for Eastern Wood-pewees, since habitat in the area of this observation is not typical for breeding. Similarly, habitat in the woodland north of Lyons Creek Road is not typical of breeding habitat for this species, since this species is typically avoids nesting near roadways. It is therefore our conclusion that the Subject Lands are not providing significant habitat for Eastern Wood-pewee. It is therefore our conclusion that the proposed development on this property will not affect significant habitat of this species.

Monarch

Monarch caterpillars feed on the leaves of milkweed plants and are confined to areas where milkweed grows. Adult butterflies can be found in a variety of habitat types, where they feed on nectar from wildflowers. Our assessment of the site indicates that potential breeding and feeding habitat for Monarch butterflies is located in the cultural meadow and meadow marsh portions of the property. Since the meadow marsh areas will not be altered by the proposed development, no impact to Swamp Milkweed will result from these works.

As discussed above, scattered Common Milkweed plants are present in the cultural meadow. Although a portion of this habitat will be lost as a result of this development, it is recommended that common Milkweed stems be relocated or planted in the buffer areas to remain and wildflower seed mixes be incorporated into parklands and buffers where possible. Provided Milkweed plants can be incorporated into various portions of the property, potential habitat for Monarch butterflies will be maintained on the property.



Legend

- Subject Lands
- Watercourse
- 15m Buffer from Watercourse
- Refined Extent of Significant Woodland
- 15m Buffer Significant Woodland
- Provincially Significant Wetland
- 15m Buffer from Provincially Significant Wetland
- Welland River
- 30m Buffer from Welland River
- Extent of Bobolink Habitat

Figure 5A
Refined Natural Heritage Features and Development Plan on Subject Property 1

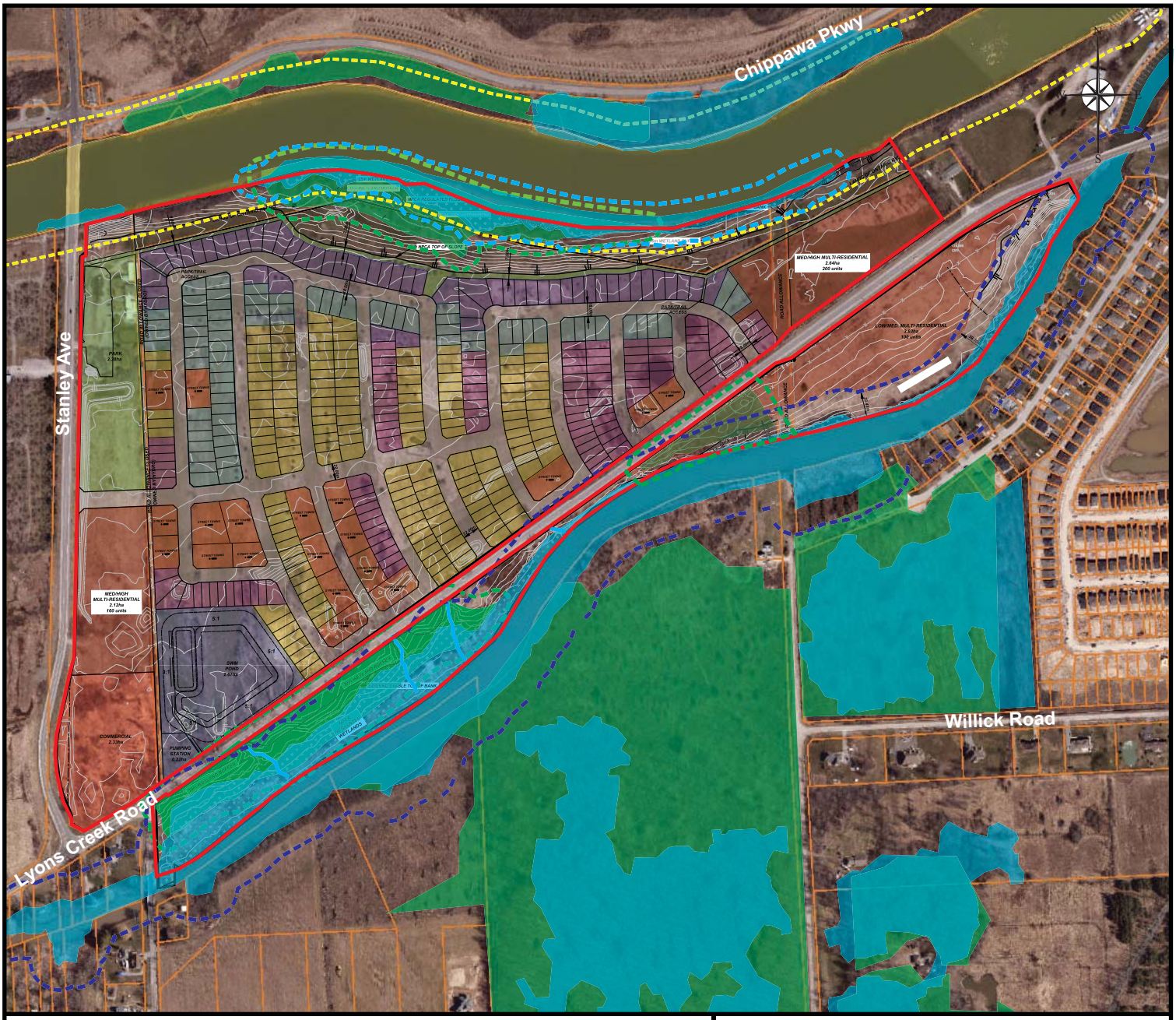
Environmental Impact Statement
Stanley Avenue Properties

Prepared for: Panoramic Properties Inc.

Prepared by: Colville Consulting Inc.

May 2023

FILE: 18034



Legend

- Subject Lands
- Refined Significant Woodland
- 15mSetback from Significant Woodland
- Provincially Significant Wetland
- 15m Setback from Provincially Significant Wetland
- 30m Setback from Provincially Significant Wetland
- Welland River
- 30m Setback from Welland River

Figure 5B
Refined Natural Heritage Features and Development Plan on Subject Properties 2 & 3

Environmental Impact Statement
Stanley Avenue Properties

Prepared for: **Panoramic Properties Ltd.**

Prepared by: COLVILLE CONSULTING INC.

May 2023

FILE: 18034

6.3 Significant Woodlands

Four of the woodland pockets on these properties were deemed to be Significant Woodland. These woodlands are Areas 1, 3 , 7 and 8. The woodland associated with Area 1 measures approximately 4.5ha in size (including the woodland community west of the property). Our assessments indicate that this woodland consists primarily of a mix of declining Green Ash and mature Cottonwood, which is providing habitat for a variety of common wildlife species.

As illustrated in Figure 5a, approximately 0.7ha of the woodland and thicket on Property 1 will be removed to facilitate the development. The open woodland and thicket on this portion of the property primarily contains trees that are remnant from the former homestead, along with abundant declining Green Ash. This portion of the woodland was not providing any documented significant habitat functions and removal of the proposed woodland and thicket area will not result in an impact to the overall function of the woodland on or adjacent to the property.

Since the woodland and thicket community on this property contains abundant declining Green Ash and is likely to further decline, it is recommended that restoration and enhancement of the woodland and buffer be consisted as part of future assessments and studies of this property.

The woodland community associated with the Welland River was assigned the designation of Area 3. This woodland represents a remnant forest community and appears to be functioning more highly than Area 1. This is likely due to the proximity to the Welland River and the associated wildlife movement corridor. To maintain the habitat functions associated with this woodland, it is recommended that a buffer of 15m be incorporated into future development plans, however further assessment of the buffer should be completed following detailed design.

Similar to Area 3, the woodland at Area 7 appears to be providing significant habitat functions, due to the proximity to Lyon's Creek. To maintain the habitat functions associated with this woodland, it is recommended that a buffer of 15m be incorporated into future development plans. Similar to the above, the appropriateness of the recommended 15m buffer should be reassessed following detailed design.

Woodland 8 measures approximately 0.7ha in size and was deemed to be significant due to the proximity with Lyons Creek. It is recommended that a buffer of 15m be incorporated into future development plans, with the appropriateness of this buffer to be reassessed following detailed design.

6.4 Provincially Significant Wetlands

A portion of the Welland River East Provincially Significant Wetland Complex is located at the north end of the Study Area, in association with the Welland River and riparian areas. Our assessment confirms that this wetland is primarily located within the Welland River and riparian areas.

Since the majority of wetland functions are provided by the Welland River, the recommended 30m buffer associated with the Welland River will be sufficient to maintain wetland functions provided by the Welland River East Wetland Complex. The identified swamp in the riparian area appears to be providing more woodland functions than wetland functions and is generally less sensitive than the Welland River. Therefore a buffer of 15m is currently recommended to be maintained from the wetland as mapped, however further assessment may be required following detailed design.

As illustrated in Figures 4a and 4b, the entire channel of Lyons Creek and a portion of the riparian areas have been included within the Lyons Creek Provincially Significant Wetland Complex. Since this wetland contains a relatively diverse species assemblage and provides a significant habitat function, it is recommended that a 30m buffer be maintained from wetlands associated with Lyons Creek.

A portion of the Lyons Creek Provincially Significant Wetland Complex is also located on the south end of the campground property, as well as the adjacent lands. Our assessment indicates that this wetland unit is comprised primarily of swamp and thicket swamp, and is generally lower functioning that the wetland units associated with the Lyons Creek. To maintain functions of this wetland, it is recommended that a buffer of 15m be maintained adjacent to the wetland, with further assessment to be completed following detailed design.

Based on the water balance completed by Terra-Dynamics Consulting Inc., it is understood that the proposed buffers associated with wetlands on Properties 1 and 2 are sufficient to maintain hydroperiods in the assessed wetlands. Our assessments indicate that a 30m buffer from the wetlands on Property 3 is more than sufficient to maintain ecological functions of the wetland, however the water balance suggests that a 33m buffer is appropriate to maintain the current hydrologic conditions. For the purposes of design, it is recommended that lot lines be located 30m from the wetland, with a minimum of 3m of the adjacent properties graded to maintain flow to the wetland feature. Provided grading within 33m of the wetland area maintains current overland flow conditions, development on this property will not impact wetlands associated with Lyons Creek.

6.5 Significant Valleylands

Significant Valleylands are associated with the Welland River and Lyons Creek. Valleylands associated with this reach of Lyons Creek contains a number of regionally rare or uncommon species, and is also providing habitat for at least one Threatened species. The valley associated with Lyons Creek generally becomes less prominent and more developed towards the east end of the study area, however it is recommended that lands within 30m of Lyons Creek be retained and naturalized to maintain species and vegetation communities in Lyons Creek and provide a continuous valley corridor in the area.

The Welland River valley generally provides opportunities for wildlife movement through the region, as well as provides a range of hydrologic and wildlife habitat functions. To maintain continuity and wildlife habitat functions of the Welland River Valley in this area, it is recommended that lands below and adjacent to the top of bank be retained and left to naturalize.

6.6 Significant Wildlife Habitat

Significant wildlife habitat on the Subject Properties was determined to consist of a rare vegetation community in Lyons Creek, potential turtle nesting habitat associated with Lyons Creek and migration corridors adjacent to Lyons Creek and the Welland River. As discussed above, a narrow band of vegetation described as Arrow-arum Organic Shallow Marsh Type is present along Lyons Creek. This vegetation community is not currently described in the ELC. Due to the rarity of this community, is considered to be provincially rare.

Since this vegetation community occurs in association with the existing PSW in Lyons Creek, and likely results from water lever fluctuations in Lyons Creek, the 30m buffer recommended from the PSW is more than sufficient to protect the integrity of this community.

As these properties are generally bound by Lyons Creek and the Welland River, migration corridors associated with these watercourses also occur on the properties. Observations on the properties do not suggest that there is a significant wildlife corridor function provided by these watercourses, and therefore the buffers associated with the PSW's, woodland and these watercourses will be sufficient to maintain wildlife movement in the area.

Although not observed, it is possible that turtle nesting has occurred within the riparian areas of Lyons Creek. As any potential habitat is located within the 30m buffer proposed adjacent to Lyons Creek and the associated PSW, any potential nesting habitat will be maintained in this area.

6.7 Fish Habitat

As discussed above, the Welland River forms the north boundaries of Properties 1 and 2, and Lyons Creek forms the south boundary of Property 3. Both watercourses are directly adjacent to the property boundaries and provide Critical Fish Habitat. To protect fish habitat in these watercourses, it is recommended that a buffer of 30m be provided from the Welland River and Lyons Creek. Recommendations to enhance these buffers are provided in Section 7.0 below.

Two small tributaries to Lyons Creek are present north of Lyons Creek Road. Both watercourses were determined to be providing flow and nutrients to Lyons Creek, however this contribution is very limited and can be maintained post development through appropriate stormwater management. As a result, neither of these watercourses are considered to be providing a significant fish habitat function or require any management considerations.

7.0 CONCLUSIONS AND RECOMMENDATIONS

As discussed above, natural heritage features on and adjacent to the property consists of a portion of Significant Woodlands, Provincially Significant Wetlands, potential habitat for a Threatened species, Significant Wildlife Habitat and fish habitat associated with the Welland River and Lyons Creek. Based on our assessment, the proposal to redesignate the Subject Lands to Residential and the proposed land use plan will have no impact on the PSW's, fish habitat, Significant Valleylands or Significant Wildlife Habitat, and have no significant impact on Significant Woodlands.

To help avoid potential impacts to natural heritage features, it is recommended that lands containing the illustrated extents of the PSW's be designated as EPA, while the Significant Valleylands, Significant Wildlife Habitat and Significant Woodlands be designated as ECA. It is our conclusion that the above noted buffers will be sufficient to maintain the integrity of the associated natural heritage features, however the appropriateness of these buffers should be reassessed following detailed design.

During our breeding bird surveys, a pair of Bobolinks were observed in the cultural meadow area associated with the campground property. Since this species has been designated as Threatened in the province, it is recommended that MECP staff be consulted to ensure any site alteration in this area is compliant with the Ontario Regulations 829/21 and 830/21.

It is recommended that detailed mitigation measures form part of the future assessment, however as this time it is recommended that the following mitigation measures be considered while moving into detailed design.

- The buffers recommended in this report should be incorporated into the detailed design, along with any recommendations of the water balance.
- It is recommended that buffers associated with the above noted features be maintained as natural features and measures such as continuous fencing be implemented to assist with minimizing encroachments into these areas.
- Efforts should be made to maintain trees on the properties where possible.
- Any required tree removal for future surveys or assessments should be completed during a season that will not impact sensitive life stages of wildlife that may be utilizing the properties.
- As the former irrigation ponds on these properties appear to be providing habitat for various wildlife species, it is recommended that pond specific dewatering and wildlife relocation plans be prepared and implemented prior to draining and filling the ponds.

In addition to the above, it is recommended that future studies of these properties consider restoration and enhancement works in retained woodlands, wetlands and buffers. As an example, to enhance the function of the proposed buffer associated with Lyon's Creek, it is recommended that a habitat enhancement plan be prepared. This plan should include components such as invasive species management, incorporation of native tree and shrub material, addition of habitat features such as sand for turtle nesting habitat and pools to provide additional opportunities for amphibian breeding and turtle overwintering. Similar enhancements should be considered in suitable areas elsewhere on the properties.

Please do not hesitate to contact the undersigned at 905-935-2161 should you have any questions regarding this EIS. Alternatively you can reach me by email at ian@colvilleconsultinginc.ca.

Respectfully submitted by:

Ian Barrett, M.Sc.
Colville Consulting Inc.

8.0 LITERATURE CITED

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

COSEWIC. 2012. COSEWIC assessment and status report on the Eastern Wood-pewee *Contopus virens* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 39 pp.

Lee, H.T., W.D. Bakowsky, J.L. Riley, J. Bowles, M. Puddister, P. Uhlig and S. McMurray. 1998. Ecological Community Classification for Southern Ontario: First Approximation and Its Application. Ontario Ministry of Natural Resources, Southcentral Science Section, Science Development and Transfer Branch. SCSS Field Guide FG-02.

McCracken, J.D., R.A. Reid, R.B. Renfrew, B. Frei, J.V. Jalava, A. Cowie, and A.R. Couturier. 2013. Recovery Strategy for the Bobolink (*Dolichonyx oryzivorus*) and Eastern Meadowlark (*Sturnella magna*) in Ontario. Ontario Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources, Peterborough, Ontario. viii + 88 pp.

Niagara Peninsula Conservation Authority. 2010. Natural Areas Inventory 2006–2009, Volume 1. Niagara Peninsula Conservation Authority 609pp.

Niagara Peninsula Conservation Authority. 2018. NPCA Policy Document: Policies for the Administration of Ontario Regulation 155/06 and the Planning Act. 132pp.

Oldham, M.J. and S.R. Brinker. 2009. Rare Vascular Plants of Ontario, Fourth Edition. Ontario Ministry of Natural Resources, Peterborough, Ontario. 188 pp. Ontario Ministry of Natural Resources. 1999. Natural Heritage Reference Manual for Policy 2.3 of the Provincial Policy Statement.

Oldham, M.J. 2010. Checklist of the Vascular Plants of Niagara Regional Municipality Ontario. Section 9.0 in Niagara Region Natural Areas Inventory, Volume 2. Niagara Peninsula Conservation Authority. 428pp.

Ontario Ministry of Municipal Affairs and Housing. 2014. Provincial Policy Statement. Queen's Printer for Ontario, Ontario, Canada.

Ontario Ministry of Natural Resources. 2010. Natural Heritage Reference Manual for natural heritage policies of the Provincial Policy Statement, 2005. Second Edition. Toronto, ON: Queen's Printer for Ontario. 248 pp.

Ontario Ministry of Natural Resources. 2013. Recovery Strategy for the American Water-willow (*Justicia americana*) in Ontario. Ontario Recovery Strategy Series. Ontario Ministry of Natural Resources, Peterborough, Ontario. iii + 5 pp + Appendix vi + 36 pp. Adoption of the Recovery Strategy for the American Water-willow (*Justicia americana*) in Canada (Parks Canada Agency 2011).

Ontario Ministry of Natural Resources and Forestry. 2015a. Significant Wildlife Habitat Criteria Schedules For Ecoregion 7E. Ontario Ministry of Natural Resources and Forestry 40pp.

Ontario Ministry of Natural Resources and Forestry. 2015b. Survey Protocol for Blanding's Turtle (*Emydoidea blandingii*) in Ontario. Species Conservation Policy Branch. Peterborough, Ontario. ii + 16 pp.

Ontario Ministry of Natural Resources and Forestry. 2016. Survey Protocol for Ontario's Species at Risk Snakes. Ontario Ministry of Natural Resources and Forestry, Species Conservation Policy Branch. Peterborough, Ontario. ii + 17 pp.

Ontario Ministry of Natural Resources and Forestry. 2017a. Survey Protocol for Species at Risk Bats within Treed Habitats - Little Brown Myotis, Northern Myotis & Tri-Colored Bat. Ontario Ministry of Natural Resources and Forestry Guelph District. 13pp.

Ontario Ministry of Natural Resources and Forestry. 2017b. City of Niagara Falls SAR. Guelph, ON: Ontario Ministry of Natural Resources, Guelph District. 3 pp.

Regional Municipality of Niagara. April 16, 2008. Amendment 187 to the Official Plan for the Niagara Planning Area as Approved by the Ontario Municipal Board. Section Seven – Environmental Policies.

Regional Municipality of Niagara. 2013. Core Natural Heritage Map.

TRCA 2014. Evaluation, Classification and Management of Headwater Drainage Features Guideline. Toronto and Region Conservation Authority and Credit Valley Conservation, TRCA Approval July 2013 (Finalized January 2014).

Watt, D. J., J. P. McCarty, S. W. Kendrick, F. L. Newell, and P. Pyle (2020). Eastern Wood-Pewee (*Contopus virens*), version 1.0. In Birds of the World (P. G. Rodewald, Editor). Cornell Lab of Ornithology, Ithaca, NY, USA. https://doi.org/10.2173/bow.eawpew.01

Appendix A

Vascular Plant Checklist

Plant List for the Stanley Ave. Properties (west and east of Stanley Ave. between Lyons Creek and the River Welland), Niagara Falls, ON. Conducted on July 28, 29 and October 20, 2018 and May 13, 2021

Scientific Name	Common Names	Coe. Cons.	Coe. Wet.	Global Rank	COSEWIC	COSSARO	SRank	Lrare	FOD7/ SWD2-2	FOD9/ SWD1	MAS/ SAM/ SAF/SAS	WODM5/ CUT1-4/ CUM1-1	Notes
Acer negundo	Manitoba Maple	0	-2	G5			S5		x			x	
Acer platanoides	Norway Maple	0	5	G?			SE5					x	
Acer rubrum	Red Maple	4	0	G5			S5		x	x			
Acer saccharinum	Silver Maple	5	-3	G5			S5					x	
Acer saccharum ssp. saccharum	Sugar Maple	4	3	G5			S5		x	x		x	
Acer X freemanii	Freeman's Maple			G?			S5		x			x	
Achillea millefolium ssp. lanulosa	Woolly Yarrow	0	3	G5			S5					x	
Acorus americanus	Sweetflag	8	-5	G5			S4	R			x		Occasional, throughout the deepwater edge of the the Lyons Creek emergent shallow marsh (MAS) with Peltandra virginica, Decodon verticillata, Potentilla palustris, Campanula aparinoides, Polygonum amphibium and Lythrum salicaria
Aesculus hippocastanum	Horse Chestnut	0	5	G?			SE2					x	Planted at old homestead on Lyons Creek Road just west of Stanley Ave.
Agrimonia gryposepala	Tall Agrimony	2	2	G5			S5		x				
Agrostis gigantea	Redtop Grass	0	0	G4G5			SE5					x	
Agrostis stolonifera	Creeping Bent Grass	0	-3	G5			S5			x	x	x	
Alliaria petiolata	Garlic Mustard	0	0	G?			SE5		x				
Allium sp	Onion Species										x		
Alnus glutinosa	Black Alder	0	-2	G?			SE4					x	
Ambrosia artemisiifolia	Common Ragweed	0	3	G5			S5					x	
Apios americana	Groundnut	6	-3	G5			S5	U			x		Occasional, in the Lyons Creek Shallow Marsh (MAS) growing with Typha angustifolia, Carex lacustris, Carex stricta, Calamogrostis canadensis, Imaptiens capensis, Onoclea sensibilis and Calystegia sepium
Apocynum sp	Dogbane Species									x		x	
Arctium lappa	Great Burdock	0	5	G?			SE5			x			
Arctium minus ssp. minus	Common Burdock	0	5	G?			SE5					x	
Arisaema triphyllum ssp. triphyllum	Jack-in-the-pulpit	5	-2	G5			S5		x	x			
Artemisia sp	Wormwood Species											x	
Asclepias incarnata ssp. incarnata	Swamp Milkweed	6	-5	G5			S5				x		
Asclepias syriaca	Common Milkweed	0	5	G5			S5					x	
Aster laevis var. laevis	Smooth Aster	7	5	G5			S5	U	x				Rare, along the open edge and in openings of the floodplain forest (FOD7) along Lyons Creek
Aster lanceolatus ssp. lanceolatus	Panicled Aster	3	-3	G5			S5		x			x	
Aster lateriflorus var. lateriflorus	One-sided Aster	3	-2	G5			S5		x				
Aster novae-angliae	New England Aster	2	-3	G5			S5		x			x	
Aster pilosus var. pilosus	Hairy Aster	4	2	G5			S5		x			x	
Athyrium filix-femina var. angustum	Northern Lady Fern	4	0	G5			S5			x			
Atriplex patula	Spearscale	0	-2	G5			S5					x	
Bidens frondosa	Devil's Beggar-ticks	3	-3	G5			S5			x			
Bidens sp	Beggar-ticks Species									x			
Boehmeria cylindrica	False Nettle	4	-5	G5			S5		x				
Bromus inermis ssp. inermis	Smooth Brome	0	5	G4G5			SE5					x	
Butomus umbellatus	Flowering-rush	0	-5	G5			SE5				x		
Calamagrostis canadensis	Canada Blue-joint	4	-5	G5			S5				x		
Calystegia sepium ssp. angulata	Hedge Bindweed	2	0	G5			S5				x		

Scientific Name	Common Names	Coe. Cons.	Coe. Wet.	Global Rank	COSEWIC	COSSARO	SRank	Lrare	FOD7/ SWD2-2	FOD9/ SWD1	MAS/ SAM/ SAF/SAS	WODM5/ CUT1-4/ CUM1-1	Notes
Campanula aparinoides	Marsh Bellflower	7	-5	G5			S5	R			x		Abundant, throughout the deepwater edge of the the Lyons Creek emergent marsh (MAS) with *Peltandra virginica, Decodon verticillata, Potentilla palustris, Campanula aparinoides, Polygonum amphibium* and *Lythrum salicaria*
Cardamine sp	Bitter Cress Species									x			
Carex bebbii	Bebb's Sedge	3	-5	G5			S5			x			
Carex cf. blanda	Common Wood Sedge	3	0	G5?			S5		x				
Carex crinita	Fringed Sedge	6	-4	G5			S5			x			
Carex gracillima	Graceful Sedge	4	3	G5			S5		x	x		x	
Carex granularis	Meadow Sedge	3	-4	G5			S5					x	
Carex lacustris	Lakebank Sedge	5	-5	G5			S5				x		
Carex cf. lurida	Sallow Sedge	6	-5	G5			S5			x			
Carex pensylvanica	Pennsylvania Sedge	5	5	G5			S5			x			
Carex radiata	Radiate Sedge	4	5	G4			S5		x				
Carex stricta	Tussock Sedge	4	-5	G5			S5	U			x		Abundant, in the Lyons Creek Shallow Marsh (MAS) growing with *Typha angustifolia, Carex lacustris, Carex stricta, Calamogrostis canadensis, Imaptiens capensis, Onoclea sensibilis* and *Calystegia sepium*
Carex tenera	Slender Straw Sedge	4	-1	G5			S5		x			x	
Carex vulpinoidea	Fox Sedge	3	-5	G5			S5		x	x			
Carex spp	Sedge Species								x	x	x	x	
Carpinus caroliniana	Blue Beech	6	0	G5			S5		x				
Carya cordiformis	Bitternut Hickory	6	0	G5			S5			x		x	
Carya ovata	Shagbark Hickory	6	3	G5			S5		x	x		x	
Celastrus scandens	Climbing Bittersweet	3	3	G5			S5			x			
Centaurea jacea	Brown Knapweed	0	5	G?			SE5		x			x	
Cephalanthus occidentalis	Buttonbush	7	-5	G5			S5			x	x		
Ceratophyllum demersum	Common Coontail	4	-5	G5			S5	R			x		Occasional, in the Water Lily - Bulhead Lily Floating-leaved Shallow Aquatic Type (SAF1-1) along Lyons Creek and the Submerged Shallow Aquatic (SAS) community in Lyons Creek and the Welland River
Chelone glabra	Turtlehead	7	-5	G5			S5				x		
Chenopodium album var. album	Lamb's Quarters	0	1	G5			SE5					x	
Chrysanthemum leucanthemum	Ox-eye Daisy	0	5	G?			SE5					x	
Cichorium intybus	Chicory	0	5	G?			SE5					x	
Cicuta bulbifera	Bulb-bearing Water-hemlock	5	-5	G5			S5				x		
Cinna arundinacea	Stout Woodreed	7	-3	G5			S4			x			
Circaea lutetiana ssp. canadensis	Canada Enchanter's Nightshade	3	3	G5			S5		x	x			
Cirsium arvense	Canada Thistle	0	3	G?			SE5					x	
Cirsium vulgare	Bull Thistle	0	4	G5			SE5					x	
Clematis virginiana	Virgin's Bower	3	0	G5			S5	U	x				Rare, in the FOD7/CUT floodplain forest along the Welland River with *Fraxinus pensylvanica, Salix x rubens, Salix alba, Rhamnus cathartica, Cornus foemina, Vitis riparia* and grasses, Thicket Creeper and Poison Ivy
Convallaria majalis	Lily-of-the-valley	0	5	G5			SE5					x	Planted at old homestead on Lyons Creek Road just west of Stanley Ave.
Conyza canadensis	Horseweed	0	1	G5			S5					x	
Cornus amomum ssp. obliqua	Silky Dogwood	5	-4	G5			S5		x	x	x	x	

Scientific Name	Common Names	Coe. Cons.	Coe. Wet.	Global Rank	COSEWIC	COSSARO	SRank	Lrare	FOD7/ SWD2-2	FOD9/ SWD1	MAS/ SAM/ SAF/SAS	WODM5/ CUT1-4/ CUM1-1	Notes
Cornus foemina ssp. racemosa	Grey Dogwood	2	-2	G5			S5		x	x		x	
Cornus rugosa	Rough-leaved Dogwood	6	5	G5			S5			x			Rare shrub observed on golfcourse
Crataegus crus-galli	Cockspur Hawthorn	4	0	G5			S5		x				
Crataegus mollis	Downy Hawthorn	4	-2	G5			S5		x				
Crataegus punctata	Dotted Hawthorn	4	5	G5			S5		x				
Cuscuta gronovii	Common Dodder	4	-3	G5			S5				x		
Cuscuta cf. polygonorum	Smartweed Dodder			G?			S1	R			x		Occasional, growing on Smartweed in the Lyons Creek Shallow Marsh (MAS) and Mixed Shallow Aquatic (SAM) edge.
Dactylis glomerata	Orchard Grass	0	3	G?			SE5		x			x	
Daucus carota	Wild Carrot	0	5	G?			SE5		x			x	
Decodon verticillatus	Swamp Loosestrife	7	-5	G5			S5	R			x		Abundant, throughout the deepwater edge of the the Lyons Creek emergent marsh (MAS) with *Peltandra virginica, Decodon verticillata, Potentilla palustris, Campanula aparinoides, Polygonum amphibium* and *Lythrum salicaria*
Digitaria sp	Crabgrass Species											x	
Dipsacus fullonum ssp. sylvestris	Common Teasel	0	5	G?			SE5		x			x	
Echinochloa sp	Barnyard Grass Species											x	
Eleocharis sp	Spike-rush Species									x			
Elodea canadensis	Canada Waterweed	4	-5	G5			S5	U			x		Occassional, in the Water Lily - Bulhead Lily Floating-leaved Shallow Aquatic Type (SAF1-1) along Lyons Creek and the Submerged Shallow Aquatic (SAS) community in Lyons Creek and the Welland River
Elymus repens	Quack Grass	0	3	G5			SE5		x			x	
Epifagus virginiana	Beechdrops	6	5	G5			S5			x			
Equisetum arvense	Field Horsetail	0	0	G5			S5		x			x	
Erechtites hieracifolia	Pilewort	2	3	G5			S5		x				
Erigeron annuus	Daisy Fleabane	0	1	G5			S5		x				
Eupatorium maculatum ssp. maculatum	Spotted Joe-pye-weed	3	-5	G5			S5				x		
Eupatorium perfoliatum	Common Boneset	2	-4	G5			S5		x	x	x		
Euthamia graminifolia	Grass-leaved Goldenrod	2	-2	G5			S5			x		x	
Fagus grandifolia	American Beech	6	3	G5			S5			x			
Festuca rubra	Red Fescue		1	G5			S5		x			x	
Fragaria virginiana ssp. virginiana	Common Strawberry	2	1	G5			S5		x			x	
Fraxinus americana	White Ash	4	3	G5			S5			x			
Fraxinus nigra	Black Ash	7	-4	G5			S5	U	x				Rare, understory tree in wet locations of the floodplain forest (FOD7) and Green Ash Swamp (SWD2-2) along Lyons Creek
Fraxinus pennsylvanica	Red Ash	3	-3	G5			S5		x	x		x	
Geranium maculatum	Spotted Crane's-bill	6	3	G5			S5			x			
Geum canadense	White Avens	3	0	G5			S5		x				
Geum laciniatum	Rough Avens	4	-3	G5			S4		x	x			
Geum sp	Avens Species											x	
Glechoma hederacea	Ground Ivy	0	3	G?			SE5					x	
Gleditsia triacanthos	Honey Locust	3	0	G5			S2	R				x	A few mature trees planted at old homestead on Lyons Creek Road just west of Stanley Ave.
Glyceria striata	Fowl Manna Grass	3	-5	G5			S5		x				
Hesperis matronalis	Dame's Rocket	0	5	G4G5			SE5					x	

Scientific Name	Common Names	Coe. Cons.	Coe. Wet.	Global Rank	COSEWIC	COSSARO	SRank	Lrare	FOD7/ SWD2-2	FOD9/ SWD1	MAS/ SAM/ SAF/SAS	WODM5/ CUT1-4/ CUM1-1	Notes
Hieracium caespitosum ssp. caespitosum	Field Hawkweed	0	5	G?			SE5			x			
Hypericum perforatum	Common St. John's-wort	0	5	G?			SE5		x			x	
Hypericum punctatum	Spotted St. John's-wort	5	-1	G5			S5		x	x			
Impatiens capensis	Spotted Touch-me-not	4	-3	G5			S5		x	x	x		
Inula helenium	Elecampane	0	5	G?			SE5					x	
Iris sp	Iris Species											x	
Juglans nigra	Black Walnut	5	3	G5			S4		x	x		x	
Juncus effusus ssp. solutus	Soft Rush	4	-5	G5			S5			x		x	
Juncus tenuis	Path Rush	0	0	G5			S5		x	x		x	
Justicia americana	Water Willow	9	-5	G5	THR	VUL	S2	R			x		Rare colonies, along the deepwater edge of the the Lyons Creek emergent marsh (MAS) with *Peltandra virginica, Decodon verticillata, Polygonum amphibium, Potentilla palustris, and Campanula aparinoides* and expanding out into the Water Lily - Bulhead Lily Floating-leaved Shallow Aquatic Type (SAF1-1). Locations marked with an "x" on vegetation community map.
Lactuca sp	Lettuce Species											x	
Leersia oryzoides	Rice Cut Grass	3	-5	G5			S5				x		
Leersia virginica	White Grass	6	-3	G5			S4		x	x	x		
Lemna minor	Lesser Duckweed	2	-5	G5			S5			x	x		
Lemna trisulca	Star Duckweed	4	-5	G5			S5	U			x		Occasional, in the Water Lily - Bulhead Lily Floating-leaved Shallow Aquatic Type (SAF1-1) and the Submerged Shallow Aquatic (SAS) community along Lyons Creek
cf. Leontodon autumnalis ssp. autumnalis	Fall Hawkbit	0	5	G?			SE5					x	
Ligustrum vulgare	Common Privet	0	1	G?			SE5		x			x	
Linaria vulgaris	Butter-and-eggs	0	5	G?			SE5					x	
Lindera benzoin	Spicebush	6	-2	G5			S5		x	x			
Lobelia inflata	Indian Tobacco	3	4	G5			S5			x			
Lonicera morrowii	Morrow's Honeysuckle	0	5	G?			SE3		x			x	
Lonicera tatarica	Tartarian Honeysuckle	0	3	G?			SE5		x			x	
Lonicera sp	Honeysuckle Species											x	
Lotus corniculatus	Bird's-foot Trefoil	0	1	G?								x	
Ludwigia palustris	Marsh Purslane	5	-5	G5			S5			x			
Lycopus americanus	Cut-leaved Water-horehound	4	-5	G5			S5			x			
Lycopus uniflorus	Northern Water-horehound	5	-5	G5			S5			x	x		
Lysimachia ciliata	Fringed Loosestrife	4	-3	G5			S5		x	x			
Lysimachia nummularia	Moneywort	0	-4	G?			SE5		x				
Lythrum salicaria	Purple Loosestrife	0	-5	G5			SE5		x		x	x	
Maianthemum racemosum ssp. racemosum	False Solomon's Seal	4	3	G5			S5			x			
Malus pumila	Common Apple	0	5	G5			SE5		x				
Medicago lupulina	Black Medick	0	1	G?			SE5					x	
Melilotus alba	White Sweet-clover	0	3	G5			SE5					x	
Menispermum canadense	Moonseed	7	0	G5			S4	U		x			Rare, in mature Oak - Maple - Hickory Forest (FOD9) on golf course property
Morus alba	White Mulberry	0	0	G?			SE5					x	
Myriophyllum spicatum	Spiked Water-milfoil	0	-5	G?			SE5				x		

Scientific Name	Common Names	Coe. Cons.	Coe. Wet.	Global Rank	COSEWIC	COSSARO	SRank	Lrare	FOD7/ SWD2-2	FOD9/ SWD1	MAS/ SAM/ SAF/SAS	WODM5/ CUT1-4/ CUM1-1	Notes
Myriophyllum cf. verticillatum	Low Water-milfoil	7	-5	G5			S5	Excluded species MJO			x		Rare, in the Water Lily - Bulhead Lily Floating-leaved Shallow Aquatic Type (SAF1-1) and the Submerged Shallow Aquatic (SAS) community along Lyons Creek. Needs confirmation of taxonomic ID
Nuphar advena	Large Yellow Pond-lily	7	-5	G5			S3	R			x		Occasional, in the Water Lily - Bullhead Lily Floating-leaved Shallow Aquatic Type (SAF1-1) and the Submerged Shallow Aquatic (SAS) community along Lyons Creek
Nuphar variegata	Bulhead Pond-lily	4	-5	G5			S5	U			x		Abundant, in the Water Lily - Bulhead Lily Floating-leaved Shallow Aquatic Type (SAF1-1) and the Submerged Shallow Aquatic (SAS) community along Lyons Creek
Nymphaea odorata ssp. odorata	Small White Water-lily	5	-5	G5			SU	U			x		Dominant, in the Water Lily - Bulhead Lily Floating-leaved Shallow Aquatic Type (SAF1-1) and the Submerged Shallow Aquatic (SAS) community along Lyons Creek
Oenothera biennis	Common Evening-primrose	0	3	G5			S5					x	
Onoclea sensibilis	Sensitive Fern	4	-3	G5			S5		x	x	x		
Ostrya virginiana	Hop Hornbeam	4	4	G5			S5			x			
Oxalis sp	Wood-sorrel Species									x			
Panicum capillare	Witch Panic Grass	0	0	G5			S5					x	
Dichanthelium sp	Panic Grass Species									x			
Parthenocissus inserta	Thicket Creeper	3	3	G5			S5		x	x	x	x	
Peltandra virginica ssp. virginica	Green Arrow-arum	9	-5	G5			S2	R			x		Dominant, along the deep water edge of the Lyons Creek emergent marsh (MAS/SAM) with *Decodon verticillata, Potentilla palustris, Campanula aparinoides, Polygonum amphibium* and *Lythrum salicaria*
Penstemon digitalis	Foxglove Beard-tongue	6	1	G5			S4S5	U				x	Occasional to rare in the open meadows and thickets of the trailer park property west of Stanley Ave.
Phalaris arundinacea	Reed Canary Grass	0	-4	G5			S5		x	x	x	x	
Phleum pratense	Timothy	0	3	G?			SE5					x	
Phragmites australis	Common Reed	0	-4	G5			S5		x	x	x	x	
Phytolacca americana	Pokeweed	3	1	G5			S4			x			
Picea abies	Norway Spruce	0	5	G?			SE3					x	Planted and escaped from cultivation
Picea glauca	White Spruce	6	3	G5			S5					x	Planted and escaped from cultivation
Picea pungens	Blue Spruce			G?			SE?		x				Planted
Pilea pumila	Common Clearweed	5	-3	G5			S5		x				
Pinus nigra	Austrian Pine	0	-5	G?			SE2					x	Planted
Pinus strobus	Eastern White Pine	4	3	G5			S5			x		x	
Plantago lanceolata	Ribgrass	0	0	G5			SE5					x	
Plantago major	Common Plantain	0	-1	G5			SE5					x	
Plantago rugelii	Pale Plantain	1	0	G5			S5					x	
Poa palustris	Fowl Blue Grass	5	-4	G5			S5				x		
Poa pratensis ssp. pratensis	Kentucky Blue Grass	0	1	G?			S5		x			x	
Podophyllum peltatum	Mayapple	5	3	G5			S5			x			
Polygonum amphibium	Water Smartweed	5	-5	G5			S5	U			x		Abundant, throughout the deepwater edge of the Lyons Creek emergent marsh (MAS) with *Peltandra virginica, Decodon verticillata, Potentilla palustris, Campanula aparinoides, Polygonum amphibium* and *Lythrum salicaria*

Scientific Name	Common Names	Coe. Cons.	Coe. Wet.	Global Rank	COSEWIC	COSSARO	SRank	Lrare	FOD7/ SWD2-2	FOD9/ SWD1	MAS/ SAM/ SAF/SAS	WODM5/ CUT1-4/ CUM1-1	Notes
Polygonum arifolium	Halberd-leaved Smartweed		-5	G?			S3	U			x		Rare, in emergent Cattail shallow marsh (MAS)
Polygonum aviculare	Common Knotweed	0	1	G?			SE5					x	
Polygonum hydropiper	Common Smartweed	0	-5	G5			SE5			x			
Polygonum pensylvanicum	Pink Knotweed	3	-4	G5			S5			x			
Polygonum persicaria	Lady's Thumb	0	-3	G?			SE5			x			
Polygonum punctatum	Dotted Smartweed	4	-5	G5			S5			x			
Polygonum sagittatum	Arrow-leaved Tearthumb	5	-5	G5			S4			x			
Polygonum virginianum	Jumpseed	6	0	G5			S4		x	x			
Populus alba	European White Poplar	0	5	G5			SE5		x			x	
Populus deltoides ssp. deltoides	Eastern Cottonwood	4	-1	G5			S5		x	x		x	
Populus tremuloides	Trembling Aspen	2	0	G5			S5					x	
Potamogeton spp	Pondweed Species										x		
Potentilla palustris	Marsh Cinquefoil	7	-5	G5			S5	R			x		Abundant, throughout the deepwater edge of the the Lyons Creek emergent marsh (MAS) with *Peltandra virginica, Decodon verticillata, Potentilla palustris, Campanula aparinoides, Polygonum amphibium* and *Lythrum salicaria*
Potentilla recta	Rough-fruited Cinquefoil	0	5	G?			SE5		x			x	
Potentilla simplex	Common Cinquefoil	3	4	G5			S5		x	x		x	
Prunella vulgaris ssp. lanceolata	Heal-all	5	5	G5			S5		x			x	
Prunus avium	Sweet Cherry	0	5	G?			SE4					x	
Prunus serotina	Black Cherry	3	3	G5			S5		x	x		x	
Prunus virginiana ssp. virginiana	Choke Cherry	2	1	G5			S5		x	x		x	
Pyrus communis	Common Pear	0	5	G5			SE4		x	x		x	
Quercus alba	White Oak	6	3	G5			S5			x			
Quercus bicolor	Swamp White Oak	8	-4	G5			S4		x	x			
Quercus palustris	Pin Oak	9	-3	G5			S4		x	x		x	
Quercus rubra	Red Oak	6	3	G5			S5		x	x			
Ranunculus acris	Tall Buttercup	0	-2	G5			SE5		x				
Ranunculus sceleratus var. sceleral	Cursed Crowfoot	2	-5	G5			S5			x			
Rhamnus cathartica	Common Buckthorn	0	3	G?			SE5		x	x		x	
Rhamnus frangula	Glossy Buckthorn	0	-1	G?			SE5		x	x		x	
Rhus radicans ssp. negundo	Climbing Poison-ivy	5	-1	G5			S5		x				
Rhus typhina	Staghorn Sumac	1	5	G5			S5		x	x		x	
Ribes americanum	Wild Black Currant	4	-3	G5			S5		x		x		
Robinia pseudo-acacia	Black Locust	0	4	G5			SE5					x	Planted and escaped from cultivation
Rosa multiflora	Multiflora Rose	0	3	G?			SE4		x				
Rosa palustris	Swamp Rose	7	-5	G5			S5				x	x	
Rosa sp	Rose Species											x	
Rubus allegheniensis	Common Blackberry	2	2	G5			S5			x		x	
Rubus idaeus ssp. melanolasius	Wild Red Raspberry	0	-2	G5			S5		x	x	x	x	
Rubus occidentalis	Black Raspberry	2	5	G5			S5		x	x		x	
Rudbeckia hirta	Black-eyed Susan	0	3	G5			S5		x				
Rumex crispus	Curly Dock	0	-1	G?			SE5		x			x	
Rumex sp	Dock Species										x		One of the wetland species
Sagittaria latifolia	Common Arrowhead	4	-5	G5			S5				x		
Salix alba	White Willow	0	-3	G5			SE4		x			x	Planted and escaped
Salix alba var. tristis	Weeping Willow	0	-3	G5			SE4					x	Planted and escaped
Salix amygdaloides	Peach-leaved Willow	6	-3	G5			S5		x				
Salix cinerea	Ashy Willow	0	5	G5			SE2		x	x		x	
Salix X rubens	Hybrid White Willow	0	-4	G?			SE4		x	x		x	
Sambucus canadensis	Common Elderberry	5	-2	G5			S5			x	x		
Scirpus atrovirens	Black Bulrush	3	-5	G5?			S5					x	

Scientific Name	Common Names	Coe. Cons.	Coe. Wet.	Global Rank	COSEWIC	COSSARO	SRank	Lrare	FOD7/ SWD2-2	FOD9/ SWD1	MAS/ SAM/ SAF/SAS	WODM5/ CUT1-4/ CUM1-1	Notes
Scirpus cyperinus	Wool Grass	4	-5	G5			S5				x		
Scirpus fluviatilis	River Bulrush	7	-5	G5			S4S5	R			x		Rare, in the Shallow Marsh (MAS) along Lyons Creek and Welland River
Scirpus validus	Softstem Bulrush	5	-5	G?			S5				x		
Scutellaria lateriflora	Blue Skullcap	5	-5	G5			S5			x	x		
Setaria pumila	Yellow Foxtail	0	0	G?			SE5			x		x	
Sisyrinchium cf. montanum	Common Blue-eyed Grass	4	-1	G5			S5			x			
Solanum dulcamara	Bittersweet Nightshade	0	0	G?			SE5		x	x	x		
Solanum nigrum	Black Nightshade	0	0	G?			SE1			x			
Solidago altissima var. altissima	Tall Goldenrod	1	3	G?			S5		x	x	x	x	
Solidago juncea	Early Goldenrod	3	5	G5			S5		x	x		x	
Solidago rugosa ssp. rugosa	Rough Goldenrod	4	-1	G5			S5		x	x			
Sonchus sp	Sow-thistle Species											x	
Sparganium eurycarpum	Giant Bur-reed	3	-5	G5			S5				x		
Sparganium sp	Bur-reed Species									x			
Spiraea alba	Narrow-leaved Meadowsweet	3	-4	G5			S5					x	
Syringa vulgaris	Common Lilac	0	5	G?			SE5					x	
Taraxacum officinale	Common Dandelion	0	3	G5			SE5		x			x	
Teucrium canadense ssp. canadense	Wood Germander	6	-2	G5T?			S5?	R			x		Rare, on the upland edge of the Shallow Marsh (MAS) along the Welland River on golf course property
Tilia americana	Basswood	4	3	G5			S5		x	x			
Trifolium pratense	Red Clover	0	2	G?			SE5					x	
Trifolium repens	White Clover	0	2	G?			SE5					x	
Tussilago farfara	Coltsfoot	0	3	G?			SE5		x				
Typha angustifolia	Narrow-leaved Cattail	3	-5	G5			S5				x		
Ulmus americana	White Elm	3	-2	G5?			S5		x	x		x	
Urtica dioica ssp. dioica	European Stinging Nettle	0	-1	G5T?			SE2			x			
Utricularia sp	Bladderwort Species										x		
Vallisneria americana	Tape-grass	6	-5	G5			S5	U			x		Dominant submergent plant, in the Submerged Shallow Aquatic (SAS) community in Lyons Creek and the Welland River and occassional in the Water Lily - Bulhead Lily Floating-leaved Shallow Aquatic Type (SAF1-1) along Lyons Creek
Verbascum blattaria	Moth Mullein	0	4	G?			SE5					x	
Verbascum thapsus	Common Mullein	0	5	G?			SE5		x			x	
Verbena hastata	Blue Vervain	4	-4	G5			S5			x	x		
Verbena urticifolia	White Vervain	4	-1	G5			S5			x			
Veronica officinalis	Common Speedwell	0	5	G5			SE5		x	x			
Viburnum lentago	Nannyberry	4	-1	G5			S5		x			x	
Viburnum opulus	European Highbush Cranberry	0	0	G5			SE4			x			
Viburnum recognitum	Southern Arrow-wood	7	-2	G5			S4		x		x	x	
Vicia cracca	Cow Vetch	0	5	G?			SE5					x	
Vicia tetrasperma	Sparrow Vetch	0	5	G?			SE5		x				
Vitis riparia	Riverbank Grape	0	-2	G5			S5		x	x	x	x	
Wolffia borealis	Dotted Water Meal	4	-5	G5			S4S5	R		x			Dominant in the eastern most of the three linear dugout ponds (SAF1-3) on the golf course and surrounded by remnant stand of Pin Oak Swamp (SWD1-3). Forming a nearly complete cover with Lemna minor

Scientific Name	Common Names	Coe. Cons.	Coe. Wet.	Global Rank	COSEWIC	COSSARO	SRank	Lrare	FOD7/ SWD2-2	FOD9/ SWD1	MAS/ SAM/ SAF/SAS	WODM5/ CUT1-4/ CUM1-1	Notes
Wolffia columbiana	Columbia Water Meal	4	-5	G5			S4S5	R		x			Dominant in the eastern most of the three linear dugout ponds (SAF1-3) on the golf course and surrounded by remnant stand of Pin Oak Swamp (SWD1-3). Forming a nearly complete cover with Lemna minor

Legend

Coe. Cons. - Coefficient of Conservatism. Scores for each species range from 0 (low conservatism) to 10 (high conservatism).
A conservatism value of 0 indicates species is widespread. A value of 8, 9 or 10 indicates that a species is a habitat specialist.
Coe. Wet. - Coefficient of Wetness
5 - Almost always occur in upland areas
4, 3, 2 - Usually occur in upland areas
1, 0, -1 - Found equally in upland and wetland areas
-2, -3, -4 Usually occur in wetlands
-5 Almost always occur in wetlands

Grank - Global Rank G1 — Critically Imperiled, G2 — Imperiled, G3 — Vulnerable, G4 — Apparently Secure, G5 — Secure

COSEWIC - Committee on the Status of Endangered Wildlife in Canada
COSSARO - Committee on the Status of Species at Risk in Ontario

Srank - Subnational Rank
S1 — Critically Imperiled - Critically imperiled in the province because of extreme rarity, (often 5 or fewer occurrences)
S2 — Imperiled - Imperiled in the province because of rarity due to very restricted range, very few populations (often 20 or fewer)
S3 — Vulnerable - Vulnerable in the province due to a restricted range, relatively few populations (often 80 or fewer)
S4 — Apparently Secure - Uncommon but not rare
S5 — Secure - Common, widespread, and abundant in the province
SE — Exotic

Lrank - Local Rank
R - Rare
U - Uncommon

Appendix B

Site Photos

Photo 1. Example of vegetation conditons in the campground area on the north end of Property 1.

Photo 2. Example of vegetation conditons in the CUM1-1 community on Property 1.

Photo 3. Example of vegetation conditons in the WOD/CUT community on Property 1.

Photo 4. Example of vegetation conditons in the WODM5 community on Property 1.

Photo 5. Example of conditons in the watercourse on the south end of Property 1.

Photo 6. Example of vegetation conditons within the Welland River valley adjacent to the SWD1-3/FOD7 community on Property 2.

Photo 7. Example of vegetation conditons in the SWD1-3/FOD7 community on Property 2.

Photo 8. Example of vegetation conditons in the SWD1-3/FOD7 community on Property 2.

Photo 9. Example of vegetation conditons in the west watercourse on Property 2.

Photo 10. Example of conditons in the dug pond and adjacent SWD1-3/FOD9 community on Property 2.

Photo 11. Example of vegetation conditons in one of the dug ponds on the east end of Property 2.

Photo 12. Example of vegetation conditons in the FOD7/SWD2-2 community on Property 3.

Photo 13. Example of vegetation conditons in and adjacent to Lyons Creek on Property 3.

Photo 14. Example of vegetation conditons in the CUM1-1 community on Property 3.

Appendix C

Acoustic Bat Monitoring Data

KALEIDOSC Bats of North America 4.3.0 S/A: 0

UNIT A	EPTFUS	LASBOR	LASCIN	LASNOC	MYOLEI	MYOLUC	MYOSEP	PERSUB	NOID	NOISE
	5	3	57	8		10			69	236
20220623	1		9						13	10
20220624	1		4						7	16
20220625			8	1					13	49
20220626		1	5	2					5	16
20220627			1			3			1	6
20220628		1	2			1			5	3
20220629	1	1	3						3	10
20220630			7	1		1			5	30
20220701	1		8	1					5	16
20220702									1	11
20220703				2		2			3	5
20220704	1		5			2			3	31
20220705			3	1		1			4	16
20220706			2						1	17

EPTFUS	LASBOR	LASCIN	LASNOC	MYOLEI	MYOLUC	MYOSEP	PERSUB
0.778551	0.026058	0	1	1	2.02E-05	1	1
0.870924	1	0	1	1	1	1	1
0.553784	1	2.67E-05	1	1	1	1	1
1	1	0	1	1	1	1	1
1	0.038894	3.4E-06	0.61789	1	1	1	1
1	1	0.041004	1	1	0.006063	1	1
1	0.123938	0.001907	1	1	0.581418	1	1
0.47408	0.039617	0.000574	1	1	1	1	1
1	1	0	1	1	0.182253	1	1
0.829495	1	0	1	1	1	1	1
1	1	1	1	1	1	1	1
1	1	1	0.020852	1	0.03297	1	1
0.638373	1	1.3E-06	1	1	0.03404	1	1
1	1	0.00039	0.850731	1	0.18224	1	1
1	1	0.001679	1	1	1	1	1

UNIT B	EPTFUS	LASBOR	LASCIN	LASNOC	MYOLEI	MYOLUC	MYOSEP	PERSUB	NOID	NOISE
*	98		160	89					341	253
20220623	4		8	5					4	8
20220624	1		21	2					19	18
20220625	18		14	17					49	34
20220626	9		14	8					25	29
20220627	1		3						7	15
20220628	2		5	2					9	6
20220629	3		6	4					15	19
20220630	11		17	9					42	28
20220701	2		16	10					14	19
20220702	3		8	3					16	13
20220703	2		7	2					20	15
20220704	32		17	12					57	25
20220705	6		12	4					29	12
20220706	4		12	11					35	12

EPTFUS	LASBOR	LASCIN	LASNOC	MYOLEI	MYOLUC	MYOSEP	PERSUB
0	1	0	0	1	1	1	1
0.183346	1	2E-07	0.153782	1	1	1	1
1	1	0	1	1	1	1	1
1.04E-05	1	0	0.000147	1	1	1	1
0.0045	1	0	0.103268	1	1	1	1
0.456373	1	0.000534	1	1	1	1	1
0.381407	1	1.89E-05	0.686684	1	1	1	1
0.303721	1	9.4E-06	0.19464	1	1	1	1
0.000908	1	0	0.109749	1	1	1	1
1	1	0	0.005491	1	1	1	1
0.243568	1	0	0.604778	1	1	1	1
0.433358	1	1E-07	0.836792	1	1	1	1
0	1	0	0.195339	1	1	1	1
0.017057	1	0	0.692448	1	1	1	1
0.674328	1	0	0.000774	1	1	1	1

UNIT C	EPTFUS	LASBOR	LASCIN	LASNOC	MYOLEI	MYOLUC	MYOSEP	PERSUB	NOID	NOISE
*	367	1	49	138					839	6312
20220623	13			6					49	660
20220624	37		2	9					89	769
20220625	61		12	28					112	658
20220626	15		6	1					40	553
20220627			3	1					18	519
20220628	8		5	6					37	379
20220629	25		4	6					65	335
20220630	43		3	8					90	343
20220701	24		3	7					27	726
20220702	33		1	11					71	292
20220703	32		3	21					59	194
20220704	34	1	3	22					87	295
20220705	29			11					51	269
20220706	13		4	1					44	320

EPTFUS	LASBOR	LASCIN	LASNOC	MYOLEI	MYOLUC	MYOSEP	PERSUB
0	0.912204	0	0	1	1	1	1
1.1E-06	1	1	0.07349	1	1	1	1
0	1	0.961639	0.332471	1	1	1	1
0	1	0.001082	5.14E-05	1	1	1	1
0	1	0.000534	1	1	1	1	1
1	1	0.00039	0.850731	1	1	1	1
0.002262	1	0.001587	0.070162	1	1	1	1
0	1	0.116309	0.611783	1	1	1	1
0	1	0.72751	0.750979	1	1	1	1
0	1	0.344573	0.31109	1	1	1	1
0	1	1	0.054222	1	1	1	1
0	1	0.755958	2.9E-06	1	1	1	1
0	0.133927	0.802377	1.8E-06	1	1	1	1
0	1	1	0.026484	1	1	1	1
0	1	0.014326	1	1	1	1	1

UNIT D	EPTFUS	LASBOR	LASCIN	LASNOC	MYOLEI	MYOLUC	MYOSEP	PERSUB	NOID	NOISE
*	162		212	41		1	1		197	175
20220623	10		8	2					6	3
20220624	5		7			1			11	7
20220625	20		4	5					24	16
20220626	23		7	5					25	19
20220627	8		4				1		0	4
20220628	5		3	2					4	0
20220629	5		5						11	15
20220630	17		11	5					19	16
20220701	11		38	4					16	26
20220702	9		96	2					40	23
20220703	7		5						5	9
20220704	29		5	2					11	17
20220705	8		8	11					21	10
20220706	5		11	3					4	10

EPTFUS	LASBOR	LASCIN	LASNOC	MYOLEI	MYOLUC	MYOSEP	PERSUB
0	1	0	1	1	0.17454	0.077576	1
3.7E-06	1	9E-07	1	1	1	1	1
0.001671	1	4E-07	1	1	0.1845	1	1
0	1	0.064082	0.659047	1	1	1	1
0	1	0.00082	0.885766	1	1	1	1
2.7E-06	1	0.003443	1	1	1	0.019637	1
0.005419	1	0.013922	0.750773	1	1	1	1
0.000816	1	7.43E-05	1	1	1	1	1
0	1	0	0.835074	1	1	1	1
0.000614	1	0	1	1	1	1	1
0.510475	1	0	1	1	1	1	1
0.000023	1	0.000232	1	1	1	1	1
0	1	0.040488	1	1	1	1	1
0.029159	1	0.000012	0.000671	1	1	1	1
0.030396	1	0	0.880971	1	1	1	1

Unit	EPTFUS	LASBOR	LASCIN	LASNOC	MYOLEI	MYOLUC	MYOSEP	PERSUB	Total
Unit A	5	3	57	8	0	10	0	0	83
Uniit B	98	0	160	89	0	0	0	0	347
Unit C	367	1	49	138	0	0	0	0	555
Unit D	162	0	212	41	0	1	1	0	417
Unit Totals	632	4	478	276	0	11	1	0	1402

Appendix D

Correspondence from MNRF

Ministry of Natural Resources And Forestry

Ministère des Richesses naturelles et des Forets

Box 5000
4890 Victoria Ave. N.
Vineland Station, Ontario
LOR 2E0

Telephone: (905) 562-4147
Facsimile: (905) 562-1154

July 27, 2018

Ian Barrett
Colville Consulting Inc.
404 Queenston St
St Catharines, ON L2P 2Y2
ian@colvilleconsultinginc.ca

RE: 8970 and 9015 Stanley Avenue Properties

Dear Mr. Ian Barrett,

The Ministry of Natural Resources and Forestry (MNRF), Guelph District – Vineland Field Office, has reviewed the natural heritage information available for the above-noted property and surrounding area (the "study area"), and offers the following comments:

WETLANDS

The Ministry has identified the following provincially significant wetlands (PSWs) within the study area:

- Lyons Creek Wetland Complex
- Welland River East Wetland Complex

FISHERIES

Restricted activity timing windows are applied to protect fish from impacts of undertakings in and around water during critical life cycle stages. The recommended timing restrictions for Welland River and Lyon's Creek are March 1st to July 1st (Note: dates represent when work should be avoided).

The MNRF notes that the following fish species have been documented in the area: black crappie, bluntnose minnow, common shiner, creek chub, emerald shiner, fathead minnow, green sunfish, johnny darter, largemouth bass, logperch, mottled sculpin, Moxostoma sp., Pimephales sp., rainbow darter, rock bass, round goby, smallmouth bass, spottail shiner, white sucker, yellow perch, brook silverside, white perch, bowfin, gizzard shad, golden shiner, rainbow smelt, pumpkinseed, trout-perch, bluegill, common carp, northern pike, central mudminnow, tadpole madtom, Lepomis sp., Muskellunge, shorthead redhorse, white crappie, brown bullhead, grass pickerel, greater redhorse, channel catfish, yellow bullhead, alewife, brook stickleback, striped shiner, banded killifish, spotfin shiner, black bullhead, rudd

SPECIES AT RISK

There are records in the area for the following species at risk (SAR) and rare species:

- Eastern Flowering Dogwood *(Cornus florida)* (Endangered)
- Eastern Pondmussel (*Ligumia nasuta*) (Endangered)
- American Water-willow *(Justicia americana)* (Threatened)
- Bank Swallow (*Riparia riparia*) (Threatened)
- Eastern Meadowlark (*Sturnella magna*) (Threatened)
- Bobolink (*Dolichonyx oryzivorus*) (Threatened)
- Barn Swallow *(Hirundo rustica)* (Threatened)
- Snapping Turtle (*Chelydra serpentina*) (Special Concern)
- Wood Thrush (Hylocichla mustelina) (Special Concern)
- Grass Pickerel (*Esox americanus vermiculatus)* (Special Concern)
- Deer-tongue Panicgrass (*Dichanthelium clandestinum*) (S2)
- Kansas Hawthorn (*Crataegus coccinioides*) (S2)
- Shellbark Hickory (*Carva laciniosa*) (S3)
- Green Arrow Arum (*Peltandra virginica*) (S3)
- Halberd-leaved Smartweed (*Persicaria arifolia*) (S3)
- Black Gum (*Nyssa sylvatica*) (S3)
- Greater Redhorse (*Moxostoma valenciennesi*) (S3)

Threatened and Endangered Species receive both individual species and habitat protection under the *Endangered Species Act, 2007* (ESA). SAR habitat prescribed under regulation is listed in Ont. Reg. 242/08 (https://www.ontario.ca/laws/regulation/080242).

Please be advised that because the province has not been surveyed comprehensively for the presence of listed species, the absence of a record does not necessarily indicate the absence of SAR from an area. To determine the presence of SAR for a given study area, the District's recommended approach is as follows:

I. Habitat Inventory

The Ministry recommends undertaking a comprehensive botanical inventory of the entire area that may be subject to direct and indirect impacts from the proposed activity. The vegetation communities should be classified as per the "Ecological Land Classification (ELC) for Southern Ontario" system, to either the "Ecosite" or "Vegetation Type" level. For aquatic habitats in the study area, we recommend that you collect data on the physical characteristics of the waterbodies and inventory the riparian zone vegetation, so that these habitats can be classified as per the Aquatic Ecosites described in the ELC manual.

II. Potential SAR within the Study Area

A list of SAR that have the potential to occur in the area can be produced by cross-referencing the ecosites described during the habitat inventory with the habitat descriptions of SAR known to occur within the planning area. The list of SAR known to occur in the City of Niagara Falls is attached for your reference. The species-specific COSEWIC status reports (https://www.canada.ca/en/environment-climate-change/services/committee-status-endangered-wildlife.html) are a good source of information on habitat needs and will be helpful in determining the suitability of the study areas ecosites for a given species.

Please note that the Species at Risk in Ontario (SARO) List is a living document that is periodically amended as a result of species assessment and re-assessments conducted by the Committee on the Status of Species at Risk in Ontario (COSSARO). The SARO List can

be accessed on the following webpage: https://www.ontario.ca/environment-and-energy/species-risk-ontario-list.

COSSARO also maintains a list of species to be assessed in the future. It is recommended that you take COSSARO's list of anticipated assessments into consideration, especially when the proposed start date of an activity is more than 6 months away, or the project will be undertaken over a period greater than 6 months. This list can be viewed at: https://www.ontario.ca/page/how-comment-protecting-species-risk.

III. SAR Surveys

The Ministry recommends that each potential SAR identified under Step II is surveyed for, regardless of whether or not the species has been previously recorded in the area. The survey report should describe how each SAR was surveyed for, and provide a rationale for why certain species were not afforded a survey (e.g., habitat within the study area is not suitable for a specific SAR). Please note that some targeted surveys may require provincial authorizations (e.g., ESA permit or Wildlife Scientific Collector's Permit).

ADDITIONAL INFORMATION

Natural heritage features (e.g. wetlands, ANSIs) can be viewed for a given study area through the MNRF's "Make a Map" web application: https://www.ontario.ca/page/make-natural-heritage-area-map. Digital data layers can be obtained through the Land Information Ontario (LIO) geowarehouse https://www.ontario.ca/page/land-information-ontario.

Additionally, the MNRF recommends contacting the municipality and the conservation authority to determine if they have any additional information or records of interest for the study area.

Please be advised that it is your responsibility to comply with all other relevant provincial or federal legislation, municipal by-laws, other MNRF approvals or required approvals from other agencies. If your investigations reveal the presence of Threatened or Endangered species, please contact the MNRF at esa.guelph@ontario.ca for further direction.

I trust that the above information is of assistance.

Sincerely,

Elizabeth Reimer
A/Management Biologist

Appendix E

Species at Risk Screening

Niagara Falls

Species At Risk Designations	
ENDANGERED	
THREATENED	
SPECIAL CONCERN	
EXTIRPATED	

AMPHIBIANS		ESA Protection	Key Habitats Used By Species	Subject Property
Allegheny Mountain Dusky Salamander (*Desmognathus ochrophaeus*)	***Known to Occur***	*Species and General Habitat Protection*	Generally found near forested brooks, springs, or seeps. It uses this habitat to forage, as well as for overwintering and brooding. It nests in springs and seeps. Shelter is provided in wet cavities along stream edges or seeps, or under stones, leaf litter, or logs.	Breeding and overwintering habitat not present on properties.
Northern Dusky Salamander (*Desmognathus fuscus*)	***Known to Occur***	*Species and General Habitat Protection*	Generally prefer rocky woodland streams, seepages, and springs where water is running or trickling	Breeding and overwintering habitat not present on properties.

BIRDS		ESA Protection	Key Habitats Used By Species	Subject Property
Acadian Flycatcher (*Empidonax virescens*)	**Known to Occur**	*Species and General Habitat Protection*	Generally requires large areas of mature, undisturbed forest; avoids the forest edge; often found in well wooded swamps and ravines	Suitable breeding habitat not present on properties. Not detected during breeding bird surveys.
Bald Eagle (*Haliaeetus leucocephalus*)	**Known to Occur**	*N/A*	Prefers deciduous and mixed-deciduous forest; and habitat close to water bodies such as lakes and rivers. They roost in super canopy trees such as Pine.	Suitable habitat not present on properties. Not detected during breeding bird surveys.
Bank Swallow (*Riparia riparia*)	**Known to Occur**	*Species and General Habitat Protection*	It nests in a wide variety of naturally and anthropogenically created vertical banks, which often erode and change over time including aggregate pits and the shores of large lakes and rivers.	Suitable breeding habitat not present on properties. Not detected during breeding bird surveys.
Barn Swallow (*Hirundo rustica*)	**Known to Occur**	*Species and General Habitat Protection*	Prefers farmland; lake/river shorelines; wooded clearings; urban populated areas; rocky cliffs; and wetlands. They nest inside or outside buildings; under bridges and in road culverts; on rock faces and in caves etc.	Active nests observed under Stanley Aveneue bridge over Welland River. Observed flying and calling over all properties.
Bobolink (*Dolichonyx oryzivorus*)	**Known to Occur**	*Species and General Habitat Protection*	Generally prefers open grasslands and hay fields. In migration and in winter uses freshwater marshes and grasslands	Observed flying, landing and calling in cultural meadow on campground property. Nesting on property not confirmed, but suspected to occur.
Chimney Swift (*Chaetura pelagica*)	**Known to Occur**	*Species and General Habitat Protection*	Historically found in deciduous and coniferous, usually wet forest types, all with a welldeveloped, dense shrub layer; now most are found in urban areas in large uncapped chimneys	Suitable breeding habitat not present on properties. Not detected during breeding bird surveys.
Common Nighthawk (*Chordeiles minor*)	**Known to Occur**	*N/A*	Generally prefer open, vegetation-free habitats, including dunes, beaches, recently harvested forests, burnt-over areas, logged areas, rocky outcrops, rocky barrens, grasslands, pastures, peat bogs, marshes, lakeshores, and river banks. This species also inhabits mixed and coniferous forests. Can also be found in urban areas (nest on flat roof-tops)	Suitable habitat not present on properties. Not detected on properties.
Eastern Meadowlark (*Sturnella Magna*)	**Known to Occur**	*Species and General Habitat Protection*	Generally prefers grassy pastures, meadows and hay fields. Nests are always on the ground and usually hidden in or under grass clumps.	Suitable breeding habitat present on properties. Not detected during breeding bird surveys.
Eastern Whip-poor-will (*Caprimlugus vociferus*)	**Known to Occur**	*Species and General Habitat Protection*	Generally prefer semi-open deciduous forests or patchy forests with clearings; areas with little ground cover are also preferred; In winter they occupy primarily mixed woods near open areas.	Suitable breeding habitat not present on properties. Not detected on properties.
Eastern Wood-Pewee (*Contopus virens*)	**Known to Occur**	*N/A*	Associated with deciduous and mixed forests. Within mature and intermediate age stands it prefers areas with little understory vegetation as well as forest clearings and edges.	Detected calling on and adjacent to properties. Use of habitat on Subject Lands not significant.

Golden-winged Warbler (*Vermivora chrysoptera*)	**Known to Occur**	*N/A*	Generally prefer areas of early successional vegetation, found primarily on field edges, hydro or utility right-of-ways, or recently logged areas.	Potential habitat present on properties. Not detected during breeding bird surveys.
Henslow's Sparrow (*Ammodramus henslowii*)	**Historically Known to Occur**	*Species and General Habitat Protection*	Generally found in old fields, pastures and wet meadows. They prefer areas with dense, tall grasses, and thatch, or decaying plant material	Suitable breeding habitat not present on properties. Not detected during breeding bird surveys.
Least Bittern *(Ixobrychus exilis)*	**Known to Occur**	*Species and General Habitat Protection*	generally located near pools of open water in relatively large marshes and swamps that are dominated by cattail and other robust emergent plants	Potential breeding habitat present adjacent to Lyons Creek. Not detected during breeding bird surveys.
Northern Bobwhite (*Colinus virginianus*)	**Historically Known to Occur**	*Species and General Habitat Protection*	Generally inhabits a variety of edge and grassland type - habitats including nonintensively farmed agricultural lands.	Suitable breeding habitat not present on properties. Not detected during breeding bird surveys.
Peregrine Falcon (*Falco peregrinus*)	**Known to Occur**	*N/A*	Generally nest on tall, steep cliff ledges adjacent to large waterbodies; some birds adapt to urban environments and nest on ledges of tall buildings, even in densely populated downtown areas.	Suitable breeding habitat not present on properties. Not detected during breeding bird surveys.
Red-Headed Woodpecker (*Melanerpes erythrocephalus*)	**Known to Occur**	*N/A*	Generally prefer open oak and beech forests, grasslands, forest edges, orchards, pastures, riparian forests, roadsides, urban parks, golf courses, cemeteries, as well as along beaver ponds and brooks	Potential habitat present on properties, however no cavities noted in trees. Not detected during breeding bird surveys.
Wood Thrush (*Hylocichla mustelina*)	**Known to Occur**	*N/A*	Nests mainly in second-growth and mature deciduous and mixed forests, with saplings and well-developed understory layers. Prefers large forest mosaics, but may also nest in small forest fragments.	Detected while calling west of campground property. Species not documented on or near properties.
Yellow-breasted Chat (*Icteria virens*)	**Known to Occur**	*Species and General Habitat Protection*	Generally prefer dense thickets around wood edges, riparian areas, and in overgrown clearings	Suitable breeding habitat not present on properties. Not detected during breeding bird surveys.

FISH			**Key Habitats Used By Species**	**Subject Property**
American Eel (*Anguilla rostrata*)	**Known to Occur**	*Species and General Habitat Protection*	All fresh water, estuaries and coastal marine waters that are accessible to the Atlantic Ocean; 12-mile Creek watershed and Lake Ontario	Potential habitat not present in vicinity of properties.
Grass Pickerel (*Esox americanus vermiculatus*)	**Known to Occur**	*N/A*	Generally occur in wetlands with warm, shallow water and an abundance of aquatic plants; occur in the St. Lawrence River, Lake Ontario, Lake Erie, and Lake Huron	Potential habitat present in Lyons Creek.
Greater Redhorse *(Moxostoma valenciennesi)*	**Known to Occur (S3)**	*N/A*	Moderate to swift current riffles, runs and pools of medium to large rivers with clear water and substrates of gravel, cobble or boulders; lakes	Potential habitat not present in vicinity of properties.
Lake Chubsucker (*Erimyzon sucetta*)	**Known to Occur**	*Species and General Habitat Protection*	Generally prefer marshes, wetlands and lakes with clear, still waters and abundant aquatic plants	Potential habitat not present in vicinity of properties.
Lake Sturgeon (*Acipenser fulvescens*)	**Known to Occur**	*Species and General Habitat Protection*	Generally inhabits the bottoms of shallow areas of large freshwater lakes and rivers	Potential habitat not present in vicinity of properties.

INSECTS		ESA Protection	**Key Habitats Used By Species**	**Subject Property**
Monarch Butterfly *(Danaus plexippus)*	**Known to Occur**	*N/A*	Exist primarily wherever milkweed and wildflowers exist; abandoned farmland, along roadsides, and other open spaces	Scattered Common and Swamp Milkweed documented on the properties, along with widlflowers. Adult Monarchs documenetd on property, but habitat present does not appear to be signficant.

Rusty-patched Bumble Bee (*Bombus affinis*)	**Formerly Occurred and May Still Occur**	*Species and General Habitat Protection*	Generally inhabits a range of diverse habitats including mixed farmland, sand dunes, marshes, urban and wooded areas. It usually nests underground in abandoned rodent burrows	Suitable habitat not present on properties. Not detected during inventories.
West Virginia White (*Pieris virginiensis*)	**Known to Occur**	*N/A*	Generally prefer moist, deciduous woodlands. The larvae feed only on the leaves of the two-leaved toothwort (Cardamine diphylla), which is a small, spring-blooming plant of the forest floor.	Suitable habitat not present on properties. Not detected during inventories.

MAMMALS		ESA Protection	**Key Habitats Used By Species**	**Subject Property**
Gray Fox (*Urocyon cinereoargenteus*)	**Suspected to Occur**	*Species and General Habitat Protection*	Generally prefers deciduous forests, marshes, swampy areas, and urban areas	Suitable habitat not present on property. Not detected during inventories.
Eastern small-footed Myotis (*Myotis leibii*)	**Suspected to Occur**	*Species and General Habitat Protection*	Overwintering habitat: Caves and mines that remain above 0 degrees Celsius Maternal Roosts: primarily under loose rocks on exposed rock outcrops, crevices and cliffs, and occasionally in buildings, under bridges and highway overpasses and under tree bark.	Potential roosting or maternal habitat on properties limited to exfoliating bark on dead ash trees. Properties not providing significant habitat for roosting bats.
Little Brown Myotis (*Myotis lucifugus*)	**Suspected to Occur**	*Species and General Habitat Protection*	Overwintering habitat: Caves and mines that remain above 0 Maternal Roosts: Often associated with buildings (attics, barns etc.). Occasionally found in trees (25-44 cm dbh).	Potential roosting or maternal habitat on properties limited to exfoliating bark on dead ash trees. Properties not providing significant habitat for roosting bats.
Northern Myotis (*Myotis septentrionalis*)	**Suspected to Occur**	*Species and General Habitat Protection*	Overwintering habitat: Caves and mines that remain above 0 degrees Celsius Maternal Roosts: Often asssociated with cavities of large diameter trees (25-44 cm dbh). Occasionally found in structures (attics, barns etc.)	Potential roosting or maternal habitat on properties limited to exfoliating bark on dead ash trees. Properties not providing significant habitat for roosting bats.
Tri-colored Bat (*Perimyotis subflavus*)	**Suspected to Occur**	*Species and General Habitat Protection*	Overwintering habitat: Caves and mines that remain above 0 degrees Celsius Maternal Roosts: Can be in trees or dead clusters of leaves or arboreal lichens on trees. May also use barns or similar structures.	Typical roosting and maternal habitat not present on properties.

MOSSES		ESA Protection	**Key Habitats Used By Species**	**Subject Property**
Spoon-leaved Moss *(Bryoandersonia illecebra)*	**Known to Occur**	*Species and General Habitat Protection*	Generally found in deciduous forests; found on soil that is in or near flat, low-lying, seasonally wet areas.	Suitable habitat not present on properties. Not detected during inventories.

MUSSELS		ESA Protection	**Key Habitats Used By Species**	**Subject Property**
Eastern Pondmussel *(Ligumia nasuta)*	**Known to Occur**	*Species and General Habitat Protection*	Sheltered areas of lakes and in slow-moving areas of rivers and canals with sand or mud bottoms.	Potential habitat present in Lyons Creek and Welland River.

PLANTS		ESA Protection	**Key Habitats Used By Species**	**Subject Property**
American Chestnut (*Castanea dentata*)	**Known to Occur**	*Species and General Habitat Protection*	Found in deciduous forest communities; this tree prefers arid forests with acid and sandy soils.	Suitable habitat not present on properties. Not detected during bontanical inventories.
American Ginseng (*Panax quinquefolius*)	**Known to Occur**	*Species and General Habitat Protection*	Grows in rich, moist, undisturbed and relatively mature deciduous woods in areas of neutral soil (such as over limestone or marble bedrock).	Suitable habitat not present on properties. Not detected during bontanical inventories.

American Water-willow (*Justicia americana*)	**Known to Occur**	*Species and General Habitat Protection*	Generally grows along shorelines and sometimes in nearby wetlands, as well as along streams where the bottom is composed of gravel, sand or organic matter.	Species detected in Lyons Creek. Habitat of this species limited to Lyons Creek.
Black Gum *(Nyssa sylvatica)*	**Known to Occur (S3)**	*N/A*	Dry to wet woods and savannahs.	Suitable habitat present on properties. Not detected during bontanical inventories.
Butternut (*Juglans cinerea*)	**Known to Occur**	*Species and General Habitat Protection*	Generally grows in rich, moist, and well-drained soils often found along streams. It may also be found on well-drained gravel sites, especially those made up of limestone. It is also found, though seldomly, on dry, rocky and sterile soils. In Ontario, the Butternut generally grows alone or in small groups in deciduous forests as well as in hedgerows	Suitable habitat present on properties. Not detected during bontanical inventories.
Common Hoptree (*Ptelea trifoliata*)	**Known to Occur**	*Species and General Habitat Protection*	Generally grows in sandy soils in areas with a lot of natural disturbance - such as the outer edge of shoreline vegetation, sand spits, and sand points.	Suitable habitat not present on properties. Not detected during bontanical inventories.
Deerberry (*Vaccinium stamineum*)	**Known to Occur**	*Species and General Habitat Protection*	Generally occurs on sandy and welldrained soil, often in dry open woodlands (Niagara Gorge)	Suitable habitat not present on properties. Not detected during bontanical inventories.
Deer Tongue Panic Grass *(Dichanthelium clandestinum)*	**Known to Occur (S2)**	*N/A*	Usually in moist and often sandy ground: floodplains and thickets on stream banks; aspen forests, borders, and clearings; marshy ground, ditches.	Suitable habitat not present on properties. Not detected during bontanical inventories.
Drooping Trillium *(Trillium flexipes)*	**Historically Known to Occur**	*Species Protection and Habitat Regulation*	Generally grows in deciduous and mixed forests, in the drier areas of its habitat, although it is occasionally found in slightly moist environments; Also grows around edges and hedgerows	Suitable habitat not present on properties. Not detected during bontanical inventories.
Eastern Flowering Dogwood (*Cornus florida*)	**Known to Occur**	*Species Protection and Habitat Regulation*	Generally grows in deciduous and mixed forests, in the drier areas of its habitat, although it is occasionally found in slightly moist environments; Also grows around edges and hedgerows	Suitable habitat present on properties. Not detected during bontanical inventories.
Green Arrow Arum *(Peltandra virginica)*	**Known to Occur (S3)**	*N/A*	Shallow waters in streams, rivers amd creeks.	Observed growing in Lyons Creek.
Halberd-leaved Smartweed *(Persicaria arifolia)*	**Known to Occur (S3)**	*N/A*	Wet mucky soil under alders at margin of peat bogs; wet, shaded ground along streams, ponds, swamps and lakes; rick thickets and marshy borders; wet depressions and seepage areas In mature hardwood forests	Observed growing in Lyons Creek.
Honey Locust *(Gleditsia triacanthos)*	**Known to Occur (S2)**	*N/A*	Mesic to wet forests and forest edges on rich bottomlands; in Ontario also on stabilized sand spits and dunes, frequently planted	Planted individuals west of Stanley Avenue. These individuals do not represent natural occurrences.
Kansas Hawthorn *(Crataegus coccinioides)*	**Known to Occur (S2)**	*N/A*	Dry uplands on limestone hillsides. Well drained loamy soils.	Suitable habitat not present on properties. Not detected during bontanical inventories.
Large Yellow Pond-Lily *(Nuphar advena)*	**Known to Occur (S3)**	*N/A*	Alkaline and neutral water 0.5 to 2 m deep.	Observed growing in Lyons Creek.
Red Mulberry (*Morus rubra*)	**Known to Occur**	*Species Protection and Habitat Regulation*	Generally grows in moist forest habitats. In Ontario, these include slopes and ravines of the Niagara Escarpment, and sand spits and bottom lands; Can grow in open areas such as hydro corridors	Suitable habitat not present on properties. Not detected during bontanical inventories.
Round-leaved Greenbrier (*Smilax rotundifolia*)	**Known to Occur**	*Species Protection and Habitat Regulation*	Generally grows in open moist to wet woodlands, oftengrowing on sandy soils . Habitat is variable.	Suitable habitat not present on properties. Not detected during bontanical inventories.
Shellbark Hickory *(Carva laciniosa)*	**Known to Occur (S3)**	*N/A*	Wet or wet -mesic deciduous forests	Suitable habitat not present on properties. Not detected during bontanical inventories.
Shumard Oak (*Quercus shumardii*)	**Known to Occur**	*N/A*	Generally grows in deciduous forests, where the soils are poorly drained clay and clay loam. Requires full sunlight.	Suitable habitat not present on property. Not detected during bontanical inventories.
Smartweed Dodder *(Cuscuta cf. polygonorun)*	**Known to Occur (S1)**	*N/A*	Moist to wet prairies, soggy thickets along rivers, fens, sandy marshes, and other wet places.	Observed growing on smartweed in Lyons Creek.
Swamp Rose-mallow (*Hibiscus moscheutos*)	**Known to Occur**	*N/A*	Generally grows in open, coastal marshes, but it is also sometimes found in open wet woods, thickets and drainage ditches	Suitable habitat present on properties. Not detected during bontanical inventories.
White Wood Aster (*Eurybia divaricata*)	**Known to Occur**	*Species and General Habitat Protection*	generally grows in open, dry, deciduous forests. It has been suggested that it may benefit from some disturbance, as it often grows along trails.	Suitable habitat present on properties. Not detected during bontanical inventories.

REPTILES	ESA Protection	**Key Habitats Used By Species**	**Subject Property**

Blanding's Turtle (*Emydonidea blandingii*)	**Known to Occur**	*Species and General Habitat Protection*	Generally occur in freshwater lakes, permanent or temporary pools, slow-flowing streams, marshes and swamps. They prefer shallow water that is rich in nutrients, organic soil and dense vegetation. Adults are generally found in open or partially vegetated sites, and juveniles prefer areas that contain thick aquatic vegetation including sphagnum, water lilies and algae. They dig their nest in a variety of loose substrates, including sand, organic soil, gravel and cobblestone. Overwintering occurs in permanent pools that average about one metre in depth, or in slow-flowing streams.	Suitable habitat not present on properties. Not detected on properties.
Eastern Musk Turtle (*Sternotherus odoratus*)	**Known to Occur**	*Species and General Habitat Protection*	Generally prefer habitats with sandy, well-drained soil and open vegetative cover, such as open woods, brushland, fields, forest edges and disturbed sites. The species is often found near water.	Typical habitat not present on properties. Not detected on properties.
Eastern Ribbonsnake (*Thamnophis sauritus*)	**Known to Occur**	*N/A*	Generally occur along the edges of shallow ponds, streams, marshes, swamps, or bogs bordered by dense vegetation that provides cover. Abundant exposure to sunlight is also required, and adjacent upland areas may be used for nesting.	Suitable habitat potentially present on properties. Not detected on properties.
Snapping Turtle (*Chelydra serpentina*)	**Known to Occur**	*N/A*	Generally inhabit shallow waters where they can hide under the soft mud and leaf litter. Nesting sites usually occur on gravely or sandy areas along streams. Snapping Turtles often take advantage of man-made structures for nest sites, including roads (especially gravel shoulders), dams and aggregate pits.	Suitable habitat potentially present on properties. Not detected on properties.

Appendix F

Irrigation Pond Hydrologic Evaluation

March 29, 2023

Craig A. Rohe, Senior Planner
Upper Canada Consultants
3-30 Hannover Drive
St. Catharines, ON L2W 1A3

Re: Irrigation Pond Hydrologic Evaluation, Panoramic Properties Ltd., Former Oaklands Golf Club, Niagara Falls, ON

Dear Mr. Rohe,

1.0 Introduction and Background Information

Terra-Dynamics Consulting Inc. (Terra-Dynamics) respectfully submits this Irrigation Pond Hydrologic Evaluation for the Former Oaklands Golf Club, City of Niagara Falls, Ontario (Site, Figure 1). The 46 hectare Site is associated with 8970 Stanley Avenue, as well as Lots 1 and 2 Broken Front on Chippawa Creek and Part of Lot 20, Concession 3, former Township of Willoughby. Future development of the Site is proposed to be a mixture of single and multi-residential homes (Upper Canada Consultants, 2020). Within this former golf course are a series of 10 ponds which were constructed for irrigation (Figure 2).

The Niagara Peninsula Conservation Authority (NPCA) have requested "*further details as to how the constructed irrigation ponds do not meet the definition of a wetland under the Conservation Authorities Act*" (NPCA, 2023). This hydrologic evaluation was completed to provide those '*further details*' supporting that the constructed irrigation ponds do not represent wetlands regulated by the Niagara Peninsula Conservation Authority (NPCA) pursuant to O. Reg. 155/06.

It is our understanding that the NPCA does not currently have any formal thresholds, or criteria, for determination of a '*groundwater'* hydrologic connection between a '*wetland*' and a watercourse, where no surface water connection is apparent, but leaves this to qualified consultants to demonstrate (NPCA, 2021). A curriculum vitae is attached in Appendix A displaying the author's qualifications to complete this hydrologic evaluation.

This work demonstrates that the irrigation ponds at the former golf course do not constitute '*conservation authority regulated wetland*' under the Conservation Authority Act (Conservation Ontario, Ministry of Natural Resources and Forestry, 2005), specifically with respect to clause "b", see below:

wetland means land that,

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

d. has vegetation dominated by hydrophytic plants or water tolerant plants the dominance of which has been favoured by the presence of abundant water, but does not include periodically soaked or wet land that is used for agricultural purposes and no longer exhibits a wetland characteristic referred to in clause (c) or (d).

2.0 Physical Setting

The Site is within the Haldimand Clay Plain, which is the primary physiographic region south of the Niagara Escarpment in the Niagara Peninsula, and is comprised of glaciolacustrine clays and silts (Chapman and Putnam, 1984), a physical feature that "…*prevents significant infiltration to depth*…"(NPCA, 1999).

2.1 Soils

The Site's soils are derived from heavy lacustrine clay classified as Niagara Loamy Phase, having 15-40 cm of loamy textures over the underlying clay (Kingston and Presant, 1989). These Niagara Loamy Phase soils are imperfectly drained, moderately to slowly permeable (Kingston and Presant, 1989). Surface runoff ranges from slow on level topography to rapid on slopes, and surface cracking is common during dry summer periods. No tile-drainage is mapped at the Site (OMAFRA, 2023).

2.2 Overburden

The surficial geology below the irrigation ponds is glaciolacustrine silty clay (Ontario Geological Survey (OGS), 2003). The thickness of the clay and silt underlying the Site is between 22 to 23 m (NPSPA, 2013). Geologic cross-sections drawn through the Site (Figures 4 and 5) visualize the extent of the underlying silty clay as per the regional interpretation by the Ontario Geological Survey (OGS) (Burt, 2020).

2.3 Hydrogeologic Setting - Overburden Aquitard

The Ontario Geological Survey (OGS) have mapped the overburden underlying the irrigation ponds as a series of aquitards (i.e. Upper Whittlesey, Halton, Lower Whittlesey and Wentworth) (Burt, 2020, Figure 1, Appendix B, Section L-L', Borehole logs BH12-NP-2014 and BH26-NP-2014). This is consistent with classification of this unit as an overburden aquitard by the Ministry of the Environment (Conservation and Parks) that "…*transmit very small amounts of groundwater*" (Gartner Lee Limited, 1987). An aquitard is:

> *A geologic formation, group of formations, or part of a formation through which almost no water moves; a low-permeability geologic unit that can store groundwater, but that transmits groundwater slowly* (NPSPA, 2013).

2.4 Irrigation Ponds and Surface Watercourses

The 10 former golf course irrigation ponds (Figure 3) were constructed prior to 2000 based upon aerial photography but after 1965, however: (a) Irrigation Ponds 1 and 2 were enlarged between 2000 and 2006 and, (b) Ponds 3 and 5 were constructed between 2000 and 2006 (Niagara Navigator, 2023).

The Ontario Hydro Network (OHN) has mapped nine of the ten irrigation ponds (Pond 5 was not mapped) as between 0.02 to 0.09 hectares and are on average 0.6 hectares in size (MNRF, 2010a). However, the Ontario Hydro Network has not mapped any watercourses to, or from, these ponds (MNRF, 2010b). NPCA also mapped nine of the ten irrigation ponds (Pond 5 was not mapped), and identified the ponds as constructed, but did not identify any outlets or inlets to the ponds except for an inferred ephemeral swale between Ponds 4 and 6 (NPCA, 2017). It is estimated that the deepest ponds would be between 1.5 and 2 metres deep (Colville Consulting Inc., 2023).

3.0 Discussion

The irrigation ponds do not meet condition (*b*) of the four wetland tests to constitute '*conservation authority regulated wetland*' under the *Conservation Authorities Act*. This conclusion is because the wetlands do not "*directly contribute to the hydrological function of a watershed through connection with a surface watercourse"* (Section 1.0) and "*there is no groundwater connection*" (CO and MNRF, 2005) between the irrigation ponds and nearby watercourses. Reasons for this conclusion include:

1. There are no surface watercourses, swales, or drainage ditches that connect the irrigation ponds to the broader watershed; and

2. A low permeability aquitard is present beneath the Site that does not transmit appreciable quantities of water.

This is "*information to the contrary*" as referenced by Conservation Ontario and MNRF (2005) since no groundwater connection exists between the irrigation ponds and a surface watercourse.

Consequently, the irrigation ponds at the Site are not Conservation Authority regulated wetlands by virtue of no hydrologic connection above, or below, ground.

5.0 Conclusions and Recommendations

The following conclusions are provided:

1. The irrigation ponds are not connected to surface watercourses;

2. The irrigation ponds are underlain by silty clay;

3. The silty clay is an aquitard not transmitting "*appreciable*" quantities of water because of low permeability/hydraulic conductivity;

4. There is no hydrologic connection, above or below ground, between the irrigation ponds and the nearby watercourses; and

5. The irrigation ponds are not regulated by the Niagara Peninsula Conservation Authority.

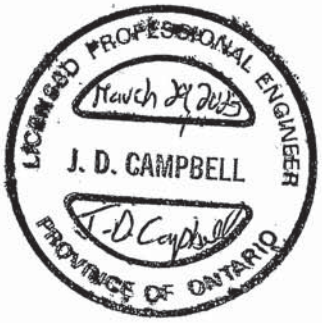
The following recommendation is provided with respect to the Site:

1. The irrigation ponds at the Site should not be regulated by the NPCA.

We trust this information is sufficient for your present needs. Please do not hesitate to contact me if you have any questions.

Yours truly,

TERRA-DYNAMICS CONSULTING INC.



Jayme D. Campbell, P. Eng.
Senior Water Resources Engineer

cc. Ian Barrett, Senior Biologist/Senior Manager, Colville Consulting Inc.

Attachments
Figure 1 – Location of Subject Lands
Figure 2 – Base Map
Figure 3 – Site Details
Figure 4 – Geologic Cross-Section A-A'
Figure 5 – Geologic Cross-Section B-B'
Appendix A – Curriculum Vitae
Appendix B – Supporting Information

6.0 References

Burt, A., 2020. Results of the 2014-2017 drilling programs on the Niagara Peninsula: Graphic logs, descriptions and analytical data; Ontario Geological Survey, Miscellaneous Release – Data 383.

Chapman, L.J., and Putnam, D.F., 1984. The Physiography of Southern Ontario. Ontario Geological Survey, Special Volume 2, 270 p.

Colville Consulting Inc., 2023. Re: Oakland Ponds, Ian Barrett (Senior Biologist/Senior Manager) to Jayme Campbell (Terra-Dynamics Consulting Inc.).

Conservation Ontario and Ministry of Natural Resources (and Forestry), 2005. Guidelines for Developing Schedules of Regulated Areas.

Gartner Lee Limited (GLL), 1987. Water Resources of the Niagara Frontier and the Welland River Drainage Basin. Prepared for the Ontario Ministry of the Environment.

Kingston, M.S. and Presant, E.W., 1989. The Soils of the Regional Municipality of Niagara, Report No.60 of the Ontario Institute of Pedology, Volume 1.

Ministry of Natural Resources and Forestry (MNRF), 2010a. Ontario Hydro Network, Waterbody, Provincial mapping unit.

Ministry of Natural Resources and Forestry (MNRF), 2010b. Ontario Hydro Network, Watercourse, Provincial mapping unit.

Niagara Navigator, 2023. Aerial Photography.

Niagara Peninsula Conservation Authority, 2023. Re: NPCA Review: Am-2021-016 and AM-2022-015 Oaklands-King Waldorf/Lyon's Narrows Second Submission.

Niagara Peninsula Conservation Authority, 2021. Re: 5600 McLeod Road, Niagara Falls – Question. E-mail from Sarah Mastroianni, Manager, Planning and Development, to Jayme Campbell, Senior Water Resource Engineer.

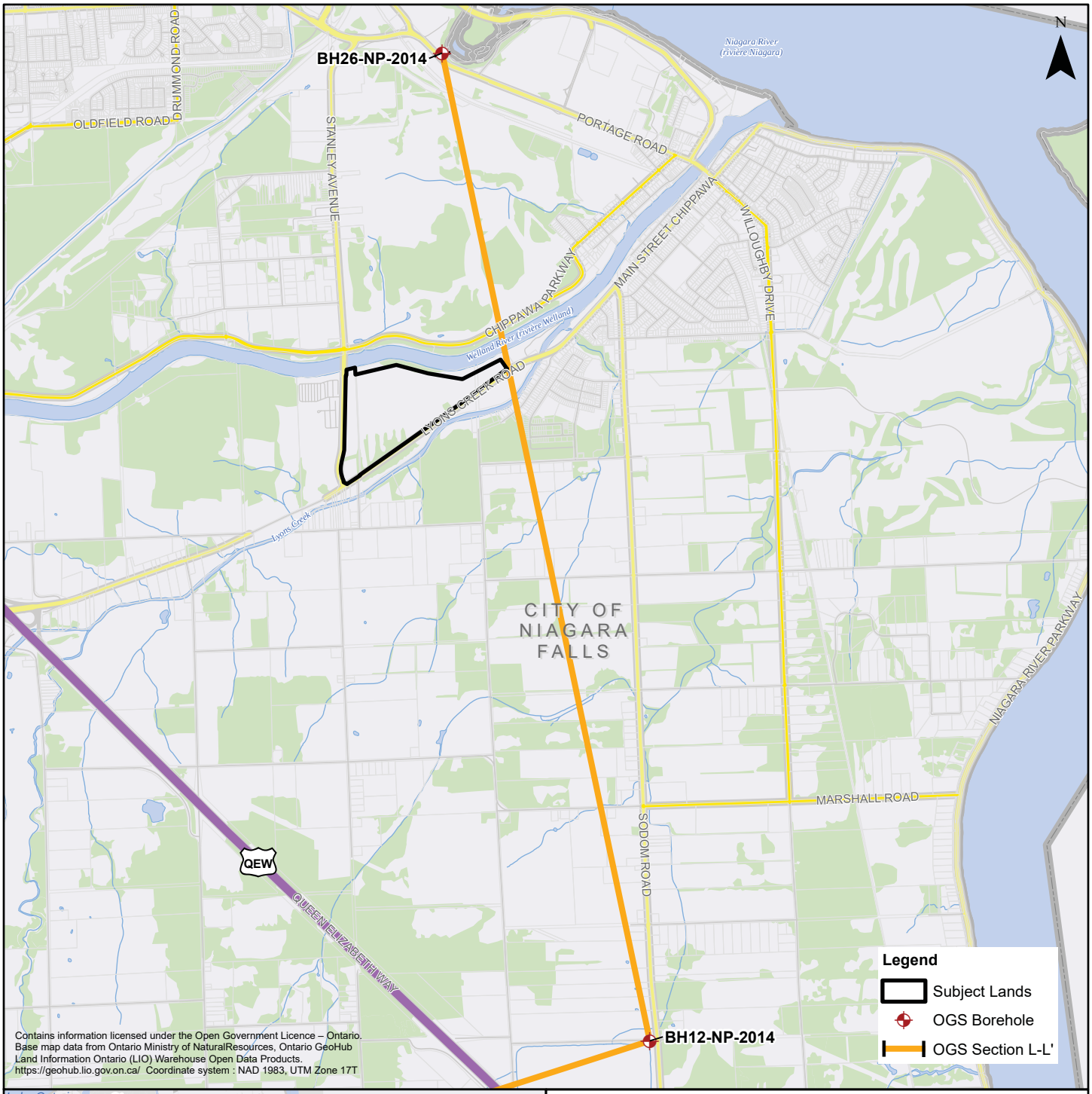
Niagara Peninsula Conservation Authority, 2017. Contemporary Watercourse Mapping.

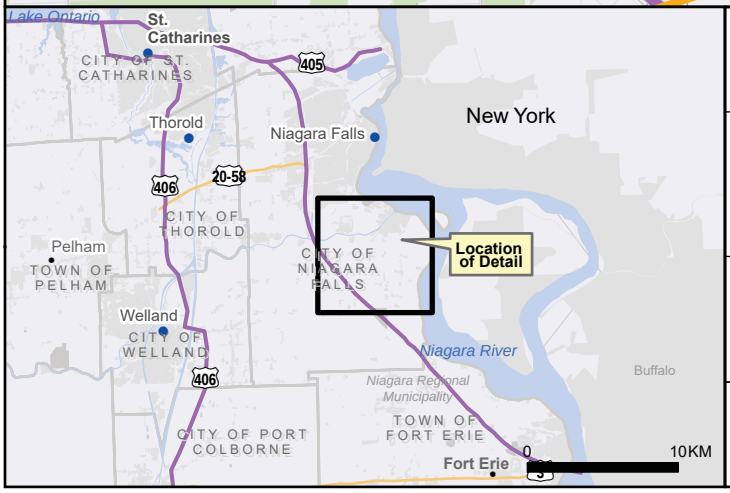
Niagara Peninsula Conservation Authority (NPCA), 1999. Port Robinson West Subwatershed Study.

Niagara Peninsula Source Protection Authority (NPSPA), 2013. Updated Assessment Report, Niagara Peninsula Source Protection Area.

Ontario Geological Survey (OGS), 2003. Surficial geology of southern Ontario. Miscellaneous Release Data – 128. Project Summary and Technical Document, 53 pp.

Upper Canada Consultants, 2020. Concept Plan 5 of Subdivision, Oaklands – Option B.





Location of Subject Lands

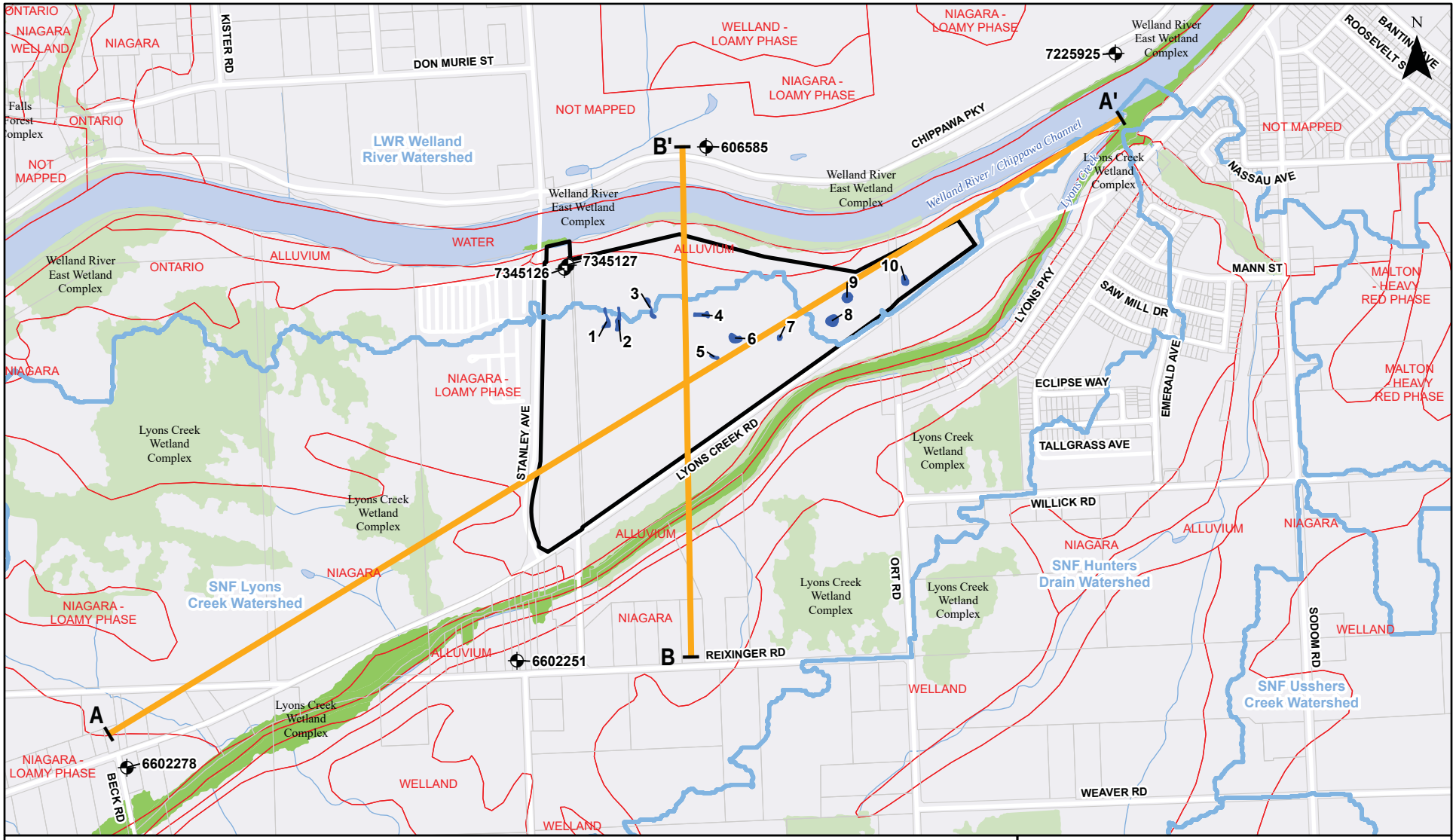
Former Golf Course, Lyons Narrows,
Irrigation Pond Hydrologic Evaluation,
Panoramic Properties Ltd.

TDC Terra-Dynamics Consulting Inc.

0 1 KM

Figure 1

Path: H:\TERRA_DYNAMICS\9441 - TD ___ Lyons Narrows\gis\mxd\2023 03 28 Pond Hydrologic Evaluation\Figure 1 Location of Subject Lands.mxd Revised: March 28, 2023



Subject Lands

Watershed Boundary

Irrigation Pond

Soil Survey Complex

MECP Water Well Records for Geologic Section

Geologic Cross-section

Wetland (Type)

Marsh

Swamp

Base Map

Former Golf Course, Lyons Narrows,
Irrigation Pond Hydrologic Evaluation,
Panoramic Properties Ltd.

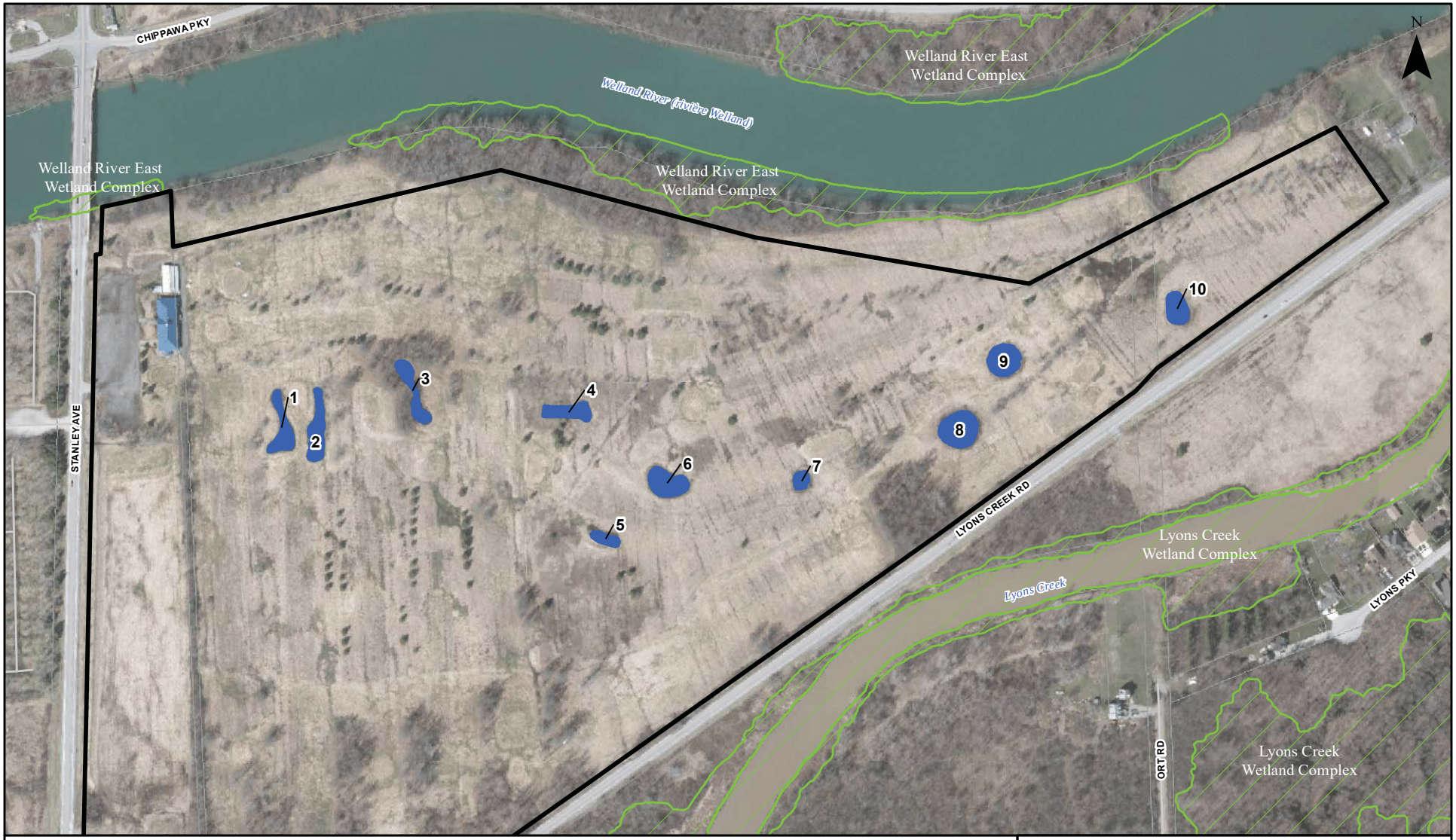
TDC Terra-Dynamics Consulting Inc.

0 500 M

1:15,000

Figure 2

Path: H:\TERRA_DYNAMICS\9441 - TD ___ Lyons Narrows\gis\mxd\2023 03 28 Pond Hydrologic Evaluation\Figure 2 Base Map.mxd Revised: March 28, 2023



Subject Lands
Irrigation Pond
Provincially Significant Wetlands

Former Irrigation Ponds

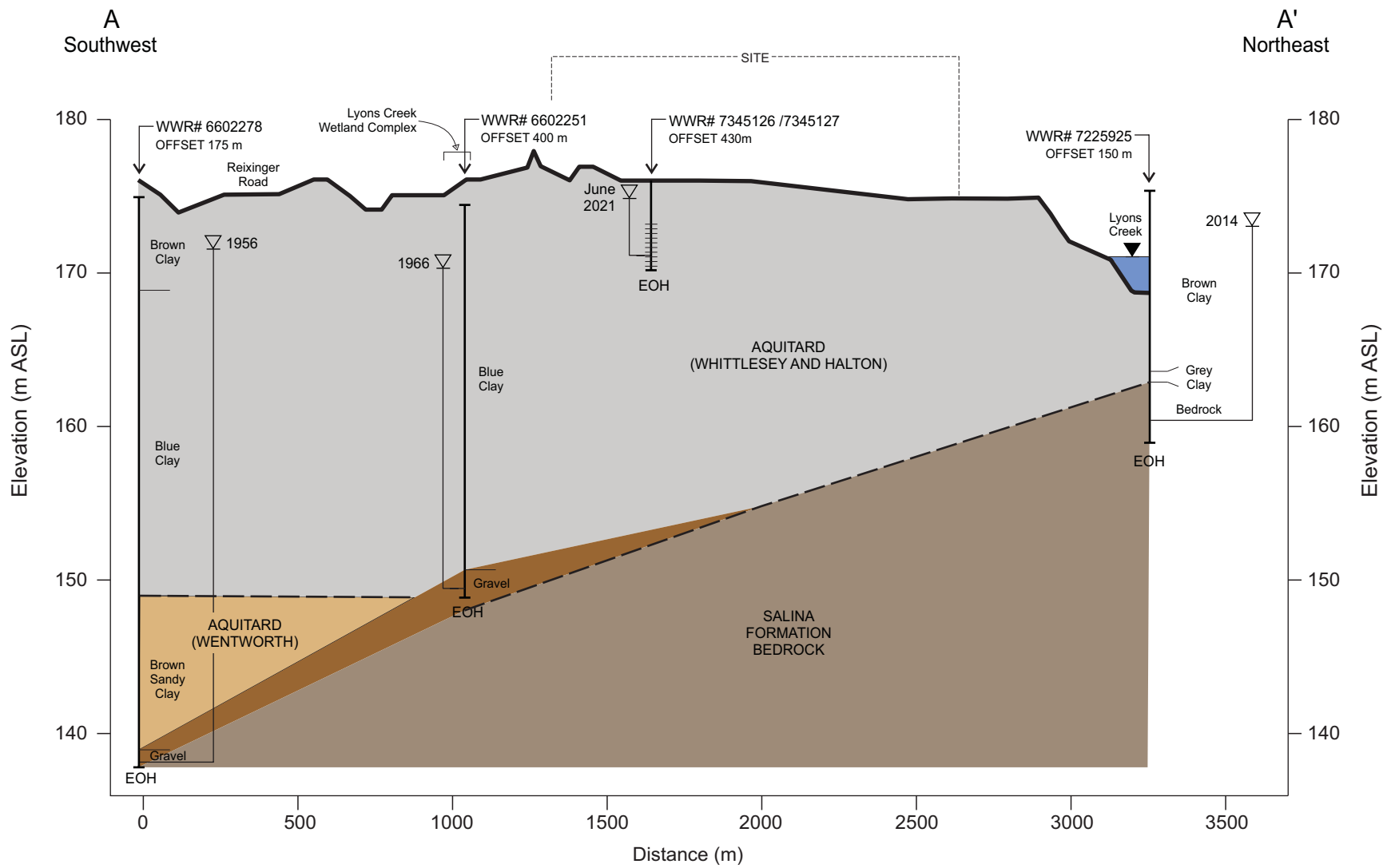
Former Golf Course, Lyons Narrows,
Irrigation Pond Hydrologic Evaluation,
Panoramic Properties Ltd.

TDC Terra-Dynamics Consulting Inc.

0 150 M
1:5,000

Figure 3

Path: H:\TERRA_DYNAMICS\9441 - TD ___ Lyons Narrows\gis\mxd\2023 03 28 Pond Hydrologic Evaluation\Figure 3 Former Irrigation Ponds.mxd Revised: March 28, 2023



▽ Water Level On Water Well Record and Year

▼ Surface Water Level

EOH End of Hole

Well Screen

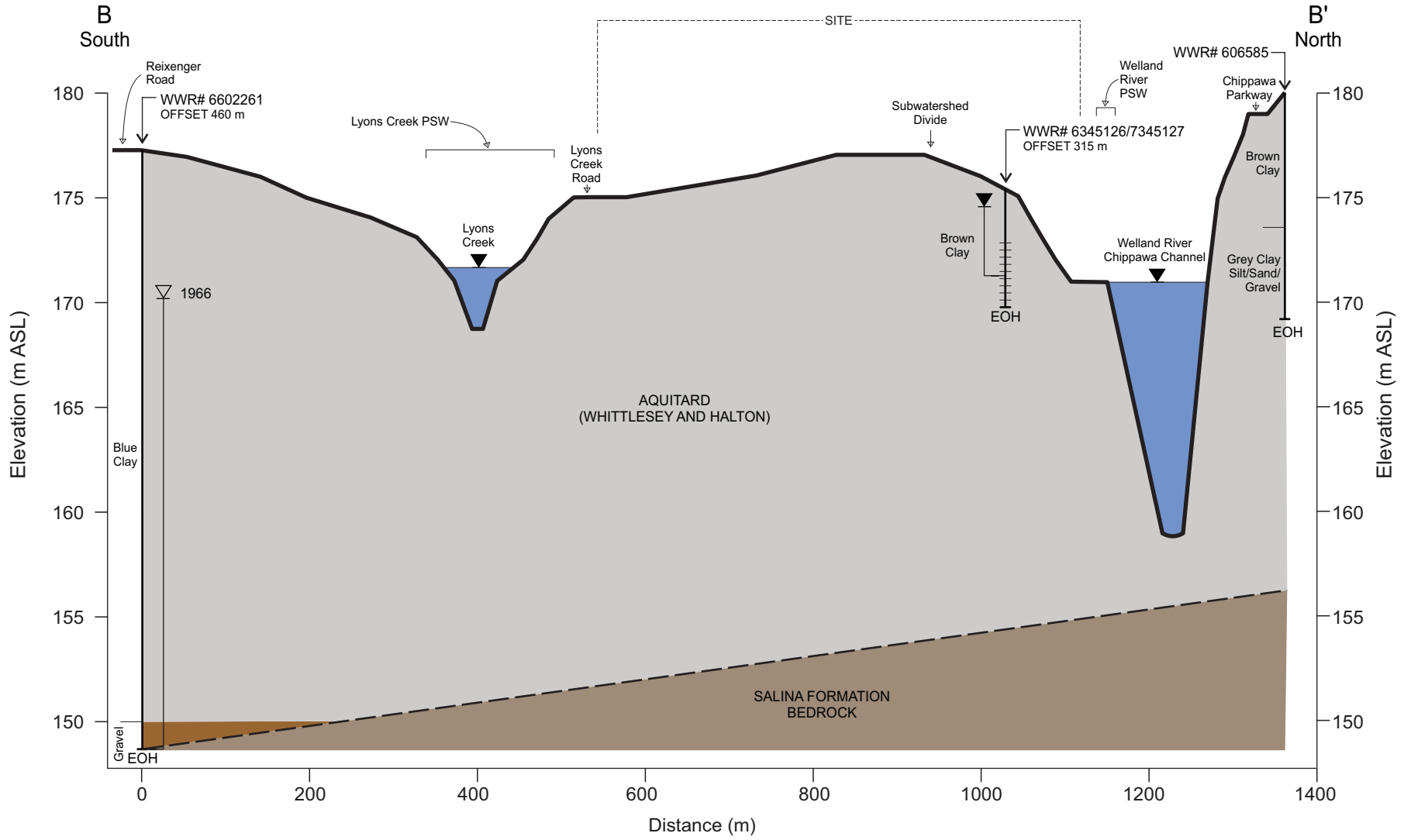
WWR# Water Well Record Number

Geologic Cross-section A-A'

Former Golf Course, Lyons Narrows,
Irrigation Pond Hydrologic Evaluation,
Panoramic Properties Ltd.

TDC Terra-Dynamics Consulting Inc.

Figure 4



▽ Water Level On Water Well Record and Year

▼ Surface Water Level

EOH End of Hole

Well Screen

WWR# Water Well Record Number

Geologic Cross-section B-B'

Former Golf Course, Lyons Narrows,
Irrigation Pond Hydrologic Evaluation,
Panoramic Properties Ltd.

TDC Terra-Dynamics Consulting Inc.

Figure 5

Appendix A

Curriculum Vitae

CURRICULUM VITAE

Jayme D. Campbell, P. Eng.
Senior Water Resources Engineer
Terra-Dynamics Consulting Inc.

432 Niagara Street, Unit 2
St. Catharines, Ontario L2P 2Y2
289-407-0915
jcampbell@terra-dynamics.com
www.terra-dynamics.com

EDUCATION

University of Waterloo, Waterloo, ON. B.A.Sc., Geological Engineering, Water Resources, 1997.
University of Waterloo, Waterloo, ON. Isotope Hydrology & Geochemistry Course, 2001.
Mohawk College, Hamilton, ON. Deterministic Surface Water Modelling Course, 2007-2008.

PROFESSIONAL LICENSE

Professional Engineer, Ontario, License No. 100011845

PROFESSIONAL HISTORY

Terra-Dynamics Consulting Inc., St. Catharines, ON
Senior Water Resources Engineer, 2018 to present

Niagara Peninsula Conservation Authority (NPCA), Welland, ON
Source Water Protection Project Manager, 2016 to 2018
Special Projects Supervisor, 2014 to 2018
Source Protection Engineer / Hydrogeologist, 2006 to 2013

Jagger Hims Limited, St. Catharines, ON – Project Engineer, 2002 to 2006

Stantec Consulting Limited, Kitchener, ON – Project Engineer, 1999 to 2002

Conestoga-Rovers & Associates, Waterloo – Engineer-in-Training, 1997 to 1999

REPRESENTATIVE EXPERIENCE

For over twenty-five years, Mr. Campbell, P. Eng., has been practising water resources management focussing on hydrogeology, with most of that time focussed on the Niagara Peninsula. Mr. Campbell's professional experience has included twelve years as a governmental representative and over thirteen years as an environmental consultant. His projects have included: drinking water protection studies (e.g. intake protection zones, water budgets, source protection planning), rural servicing assessments, policy development and stakeholder consultation, groundwater supply construction, testing, permitting and contract administration, landfill water monitoring compliance, Permit to Take Water reporting, wetland water balances, and contaminant and dewatering assessments.

Other professional experience has included:

- presentations to municipal councils, committees, the public, and technical gatherings;
- project management: request for proposals, proposal submissions, health and safety plans, budgeting, tendering, contract award, and provincial funding negotiations; and
- student training and lecturing (e.g. Niagara College and Brock University) as well as hosting student interns of Niagara College, Brock University and the University of Waterloo.

DETAILED WORK EXPERIENCE

TERRA-DYNAMICS CONSULTING INC.

2018 – PRESENT SENIOR WATER RESOURCES ENGINEER

Project responsibilities have included:

- Consulting Source Water Protection Project Manager services;
- Hydrogeological Assessments, including peer review, of privately serviced rural developments, including on highly vulnerable aquifers and hydrogeologically sensitive areas;
- Permit to Take Water (PTTW) studies for surface and groundwater takings;
- Environmental Compliance Approvals, including (i) sewage system performance reporting and (ii) groundwater impact assessments;
- Water balance assessments of hydrologic impacts to Wetlands;
- Dewatering hydrogeological assessment for new building construction;
- Landfill leachate collection system evaluations, Regional Municipality of Niagara;
- Advising municipalities about rural development on Highly Vulnerable Aquifers;
- Ambient geochemical sampling for the NPCA Niagara Regional Aquifer Study;
- Baseline hydrologic and water quality reporting for Jefferson Salamander protection
- Niagara-on-the-Lake Irrigation System Strategy Consultant Team Member;
- Expert testimony at the Local Planning Appeal Tribunal (LPAT);
- Construction administration; and
- Water well quality baseline and construction monitoring.

NIAGARA PENINSULA CONSERVATION AUTHORITY (NPCA)

2016 – 2018	SOURCE WATER PROTECTION PROJECT MANAGER
2014 – 2018	SPECIAL PROJECTS, SUPERVISOR
2006 – 2013	SOURCE PROTECTION ENGINEER / HYDROGEOLOGIST

Responsibilities included:

- Management of the Source Water Protection program at the NPCA. Duties for the Ministry of the Environment, Climate and Parks (MECP) included annual reporting on source protection plan implementation, workplan and budget submissions, the Source Protection Committee, and assisting plan implementers.
  - In Fall 2017, following stakeholder consultation, under Mr. Campbell's leadership, the first source protection authority workplan to update a Source Protection Plan was submitted to the Province. Implementation of this update involves working with various levels of government (municipal, provincial and federal), agencies (MECP, MNRF, OGS, MMAH, Health Units, Public Health Ontario) and other local stakeholders.
  - Co-authored the Niagara Peninsula Source Protection Plan and Assessment Report.
  - Principal author of the Niagara Peninsula Source Protection Water Budget.
- Highly Vulnerable Aquifer reviews for Niagara municipalities, e.g. ~100 reviews per year were completed in 2016 and 2017. Reviews largely completed during pre-consultation to advise planning and Part 8 Building Code staff if hydrogeological assessment reports were recommended, or to provide development conditions such as increased set-backs on hydrogeologically sensitive areas or nitrogen effluent reduction technology.
- Special Projects to address hydrologic data gaps, including:
  - Ontario Geological Survey Niagara Regional Aquifer Study: co-author of original proposal, procured multi-year grant funding for capital construction of four regional flow system monitoring well networks (28 monitoring wells), procured annual operational and capital budgets for sampling, monitoring and datalogging installations, facilitated annual sampling with the provincial ambient groundwater monitoring program, and partnered in geochemistry research projects with the University of Waterloo, MacMaster University and Environment Canada.
  - Advised municipal planners on: development near Provincially significant wetlands (e.g. near aggregate operations), municipal subwatershed studies, class environmental assessments, PTTWs and Niagara Escarpment Commission permits.
  - Advised NPCA on master planning, e.g. completion of a Water Resource Assessment of the Cave Springs Conservation Area, a karst area along the Niagara Escarpment.

2002-2006	PROJECT ENGINEER, JAGGER HIMS LIMITED

Mr. Campbell was responsible for various tasks including project management, budgeting, reporting and field investigations. He provided a broad range of services including Safe

Drinking Water Act compliance, Permit to Take Water and Waste Management investigations. Projects included:

- Landfill characterization or annual compliance reporting for open, closed and closing landfills (Thorold, Niagara Region, Abitibi-Consolidated Inc.);
- PTTW annual reporting for aggregate operations and municipal takings;
- Class Environmental Assessments: Groundwater Exploration (Whitchurch-Stouffville - York), Water and Wastewater Servicing Plan (Wainfleet – Niagara Region);
- Land development water resource assessment in a significant groundwater recharge area, baseline and construction monitoring (Walker Community Development Corporation);
- Metals-impacted environmentally sensitive area soil remediation and monitoring;
- Microbial Contamination Control Plans (Durham, Halton, Peel, Midland and Tweed);
- Municipal well construction contract administration, aquifer testing and PTTW (Uxbridge, Region of Durham);
- Water works sanitary assessment, industrial waste facility (Clean Harbours);
- Hydrogeological services, Provincial groundwater monitoring network (NPCA);
- Aquifer wellfield testing – Freelton and Carlisle (City of Hamilton).

1999-2002 PROJECT ENGINEER
STANTEC CONSULTING LIMITED (Kitchener)

Mr. Campbell was primarily responsible for field investigations (e.g. monitoring well construction, testing and sampling), data analysis, annual reporting and training of clients. Projects included:

- Well construction, aquifer and well testing, Groundwater Under the Direct Influence of Surface Water (GUDI) assessment, reporting and PTTWs (Thames Centre);
- Hydrogeologic assessments for subsurface sewage disposal facilities, PTTW and water quality (various Provincial Parks, Conservation Authorities);
- Safe Drinking Water Act Compliance assessments, including water quality monitoring training, inspections, and reporting (municipalities, corporations & conservation authorities);
- Phase I and II Environmental Site Assessments, and monitoring of remediation programs for gasoline, diesel and metals impacted sites.

1997-1999 ENGINEER-IN-TRAINING
CONESTOGA-ROVERS & ASSOCIATES (now GHD, Waterloo)

Mr.Campbell provided hydrogeologic communications services for understanding of complex physical settings by non-hydrogeologists. Computer models were created using EVS™ /MVS™ of topography, buildings, geology, groundwater flow, and soil/water chemistry for the public, regulatory authorities and clients. For example, an Ohio buried-valley aquifer system was visualized to evaluate contaminant risk to municipal wells. Indicator krigging was used to determine till aquitard distribution protecting the drinking water aquifer from contamination.

AUTHORED PUBLICATIONS or CONFERENCE/WORKSHOP PROCEEDINGS

Fitzpatrick, K. and Campbell, J.D. (2021)
Hydrogeological Tour of the Niagara Escarpment. Technical Tour for the 74th Canadian Geotechnical Conference (Joint CGS-IAH) 2021 Conference, Niagara Falls, Ontario.

Burt, A.K., and Campbell, J.D. (2021)
The Niagara Peninsula goes 3D. Proceedings, 74th Canadian Geotechnical Conference (Joint CGS-IAH).

Post, R. and Campbell, J.D. (2018)
Use of Provincial Data by Conservation Authorities. Regional-scale Groundwater Geoscience in Southern Ontario: an Ontario Geological Survey (OGS), Geological Survey of Canada, and Conservation Ontario Geoscientists Open House.

Campbell, J.D. (2018)
Rural development review from a conservation authority perspective. Ontario Onsite Wastewater Association Annual Convention.

Campbell, J.D. and Burt, A.K. (2015)
Addressing Niagara Decision Making Groundwater Gaps. OGS Open File Report 13-108.

Radman, M., M^{c}Innes, S. and Campbell, J.D. (2013)
Understanding and Protecting Groundwater. Workshop for Niagara Region area planners, Centre for Conservation, Balls Falls, Vineland, ON.

Fitzpatrick, K. and Campbell, J.D. (2012)
Technical Tour Book for: (i) Lake Erie to Lake Ontario, (ii) Spills, Mills and Landfills and, (iii) GW-SW Glacial Geology. Prepared for the International Association of Hydrogeologists 2012 Congress, Niagara Falls, Ontario.

Campbell, J.D. and Lee, J. (2012)
Source Water Sewage System Analysis. Proceedings, ESRI Canada Conference, Toronto.

Campbell, J.D., Golas, B., and Hendy, G. (2006)
Region of Durham Microbial Contaminant Control Plans. Proceedings, Joint Annual Conference (OWWA – OMWA).

Sarwar, G., Rudolph, D.L., Campbell, J.D. and Johnston, C.T. (2002)
Field Characterization of Road Salt Impacts on Groundwater Resources in an Urban Setting: Kitchener, Ontario. Proceedings, 55th Canadian Geotechnical Conference (Joint CGS-IAH).

PROFESSIONAL AFFILIATIONS

Professional Engineers Ontario (2000)
National Ground Water Association (2002)

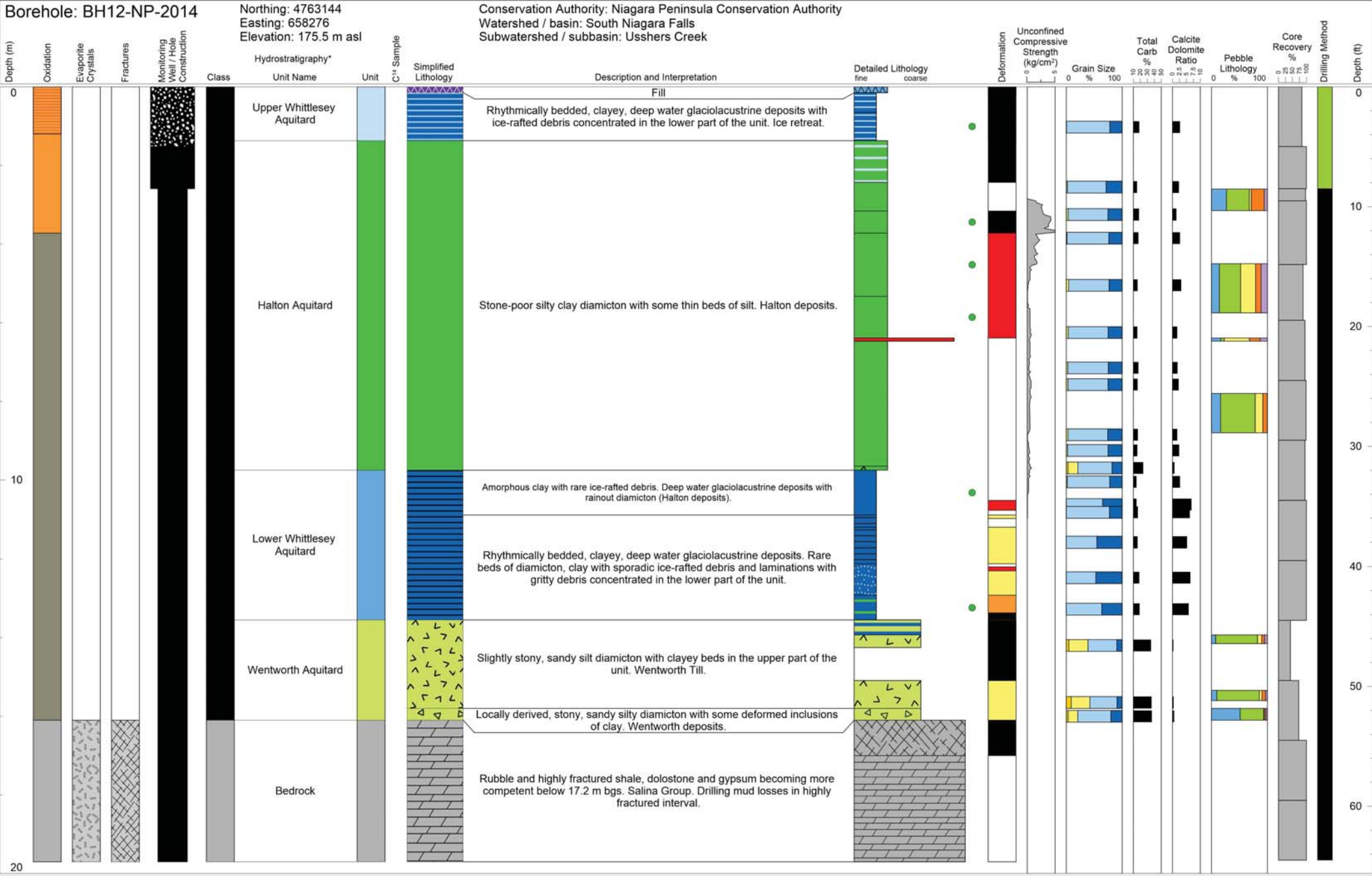
Appendix B

Supporting Information

Borehole: BH12-NP-2014

Northing: 4763144
Easting: 658276
Elevation: 175.5 m asl

Conservation Authority: Niagara Peninsula Conservation Authority
Watershed / basin: South Niagara Falls
Subwatershed / subbasin: Usshers Creek



Oxidation
- Fill
- Oxidized
- Reduced
- Coarse layers oxidized
- Fracture planes oxidized
- Bedrock

Evaporite Crystals
- Macroscopic crystals in sediment
- Macroscopic crystals in bedrock
- Not observed

Fractures
- Fractures/desiccation cracks in sediment
- Fractures in bedrock
- Not observed

Well Construction
- Riser
- Screen
- Benseal - bentonite
- Concrete
- Quickgrout - bentonite grout
- Holeplug - bentonite chips
- Sand pack

Class
- Aquifer / potential Aquifer
- Aquitard
- Bedrock

*Hydrostratigraphic units are intended to reflect regional-scale sediment packages that will be modeled in three dimensions. The units are time-transgressive and may group lithologic packages.

Lithology
- No recovery
- Clay
- Clayey silt, silty clay
- Silt
- Fine sand to silt
- Fine to medium sand
- Medium to coarse sand
- Sand and gravel
- Gravel
- Sand and gravel with some silt/clay in matrix
- Clayey silt to clayey diamicton
- Sandy to silty diamicton
- Fill

- Fill
- Rhythmically bedded
- Interbedded
- Fragmented beds, intraclasts
- Ripples
- Cross-beds
- Grit
- Slightly to somewhat stony
- Stony to very stony
- Diamicton and other debris

- Rubble, fractured rock
- Ordovician bedrock
- Silurian bedrock
- Devonian bedrock

Symbols
- Rare ice-rafted debris
- Striated bedrock
- Polished bedrock
- Organic material
- Cold core
- Trace fossils
- Radiocarbon (C^{14}) date

Deformation
- Disturbed or low recovery intervals
- Not observed
- Slight
- Moderate
- High

Grain Size
- Coarse to medium sand
- Fine to very fine sand
- Silt
- Clay

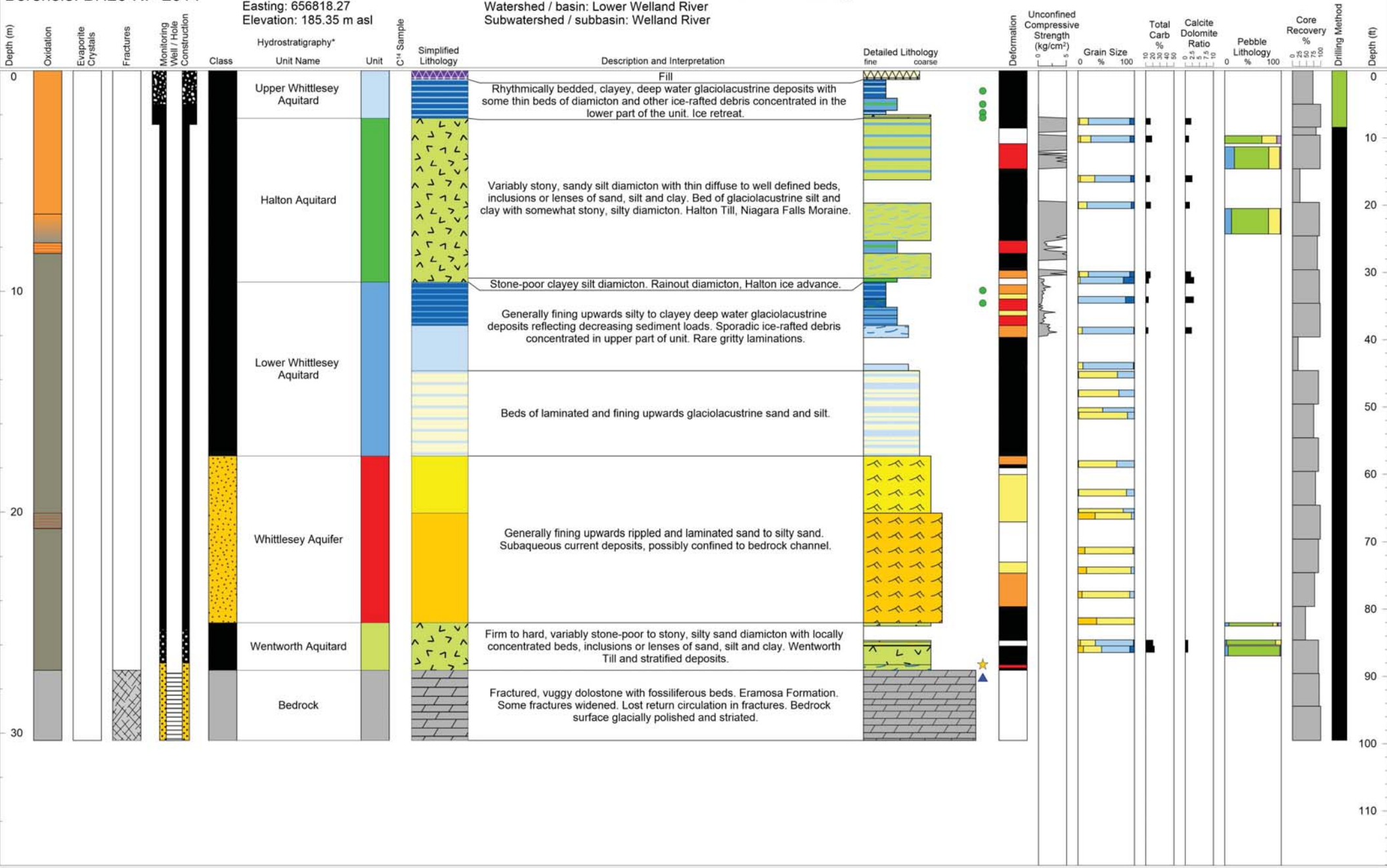
Pebble Lithology
- Limestone
- Dolostone
- Sandstone
- Shale
- Chert, evaporite
- Precambrian

Drilling Method
- Hollow-stem auger
- PQ coring
- Split spoon
- Tricone
- Hydrovac

Borehole: BH26-NP-2014

Northing: 4770080.1
Easting: 656818.27
Elevation: 185.35 m asl

Conservation Authority: Niagara Peninsula Conservation Authority
Watershed / basin: Lower Welland River
Subwatershed / subbasin: Welland River



Oxidation
- Fill
- Oxidized
- Reduced
- Coarse layers oxidized
- Fracture planes oxidized
- Bedrock

Evaporite Crystals
- Macroscopic crystals in sediment
- Macroscopic crystals in bedrock
- Not observed

Fractures
- Fractures/desiccation cracks in sediment
- Fractures in bedrock
- Not observed

Well Construction
- Riser
- Screen
- Benseal - bentonite
- Concrete
- Quickgrout - bentonite grout
- Holeplug - bentonite chips
- Sand pack

Class
- Aquifer / potential Aquifer
- Aquitard
- Bedrock

Lithology
- No recovery
- Clay
- Clayey silt, silty clay
- Silt
- Fine sand to silt
- Fine to medium sand
- Medium to coarse sand
- Sand and gravel
- Gravel
- Sand and gravel with some silt/clay in matrix
- Clayey silt to clayey diamicton
- Sandy to silty diamicton
- Fill

- Fill
- Rhythmically bedded
- Interbedded
- Fragmented beds, intraclasts
- Ripples
- Cross-beds
- Grit
- Slightly to somewhat stony
- Stony to very stony
- Diamicton and other debris

- Rubble, fractured rock
- Ordovician bedrock
- Silurian bedrock
- Devonian bedrock

Symbols
- Rare ice-rafted debris
- Striated bedrock
- Polished bedrock
- Organic material
- Cold core
- Trace fossils
- Radiocarbon (C^{14}) date

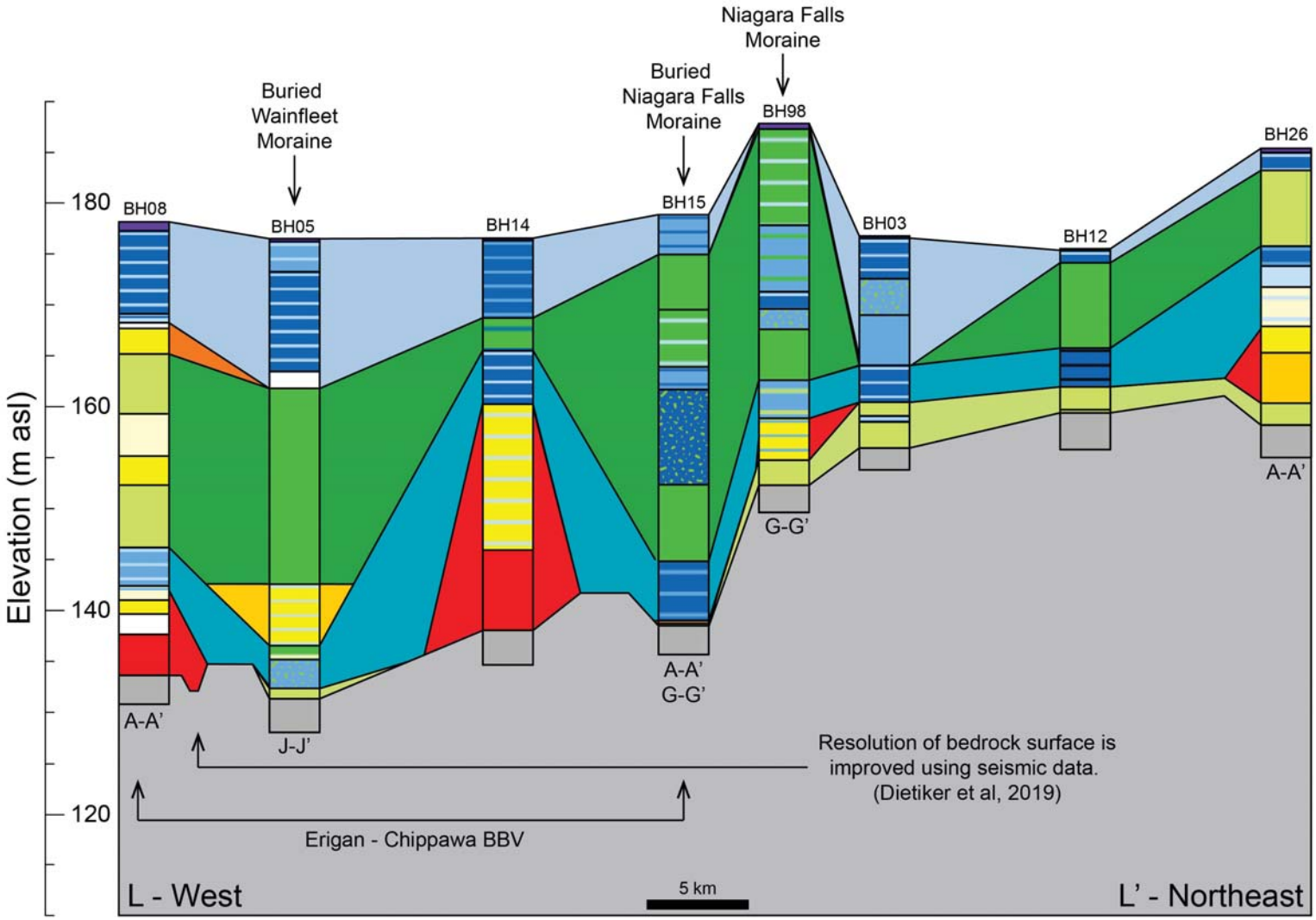
Deformation
- Disturbed or low recovery intervals
- Not observed
- Slight
- Moderate
- High

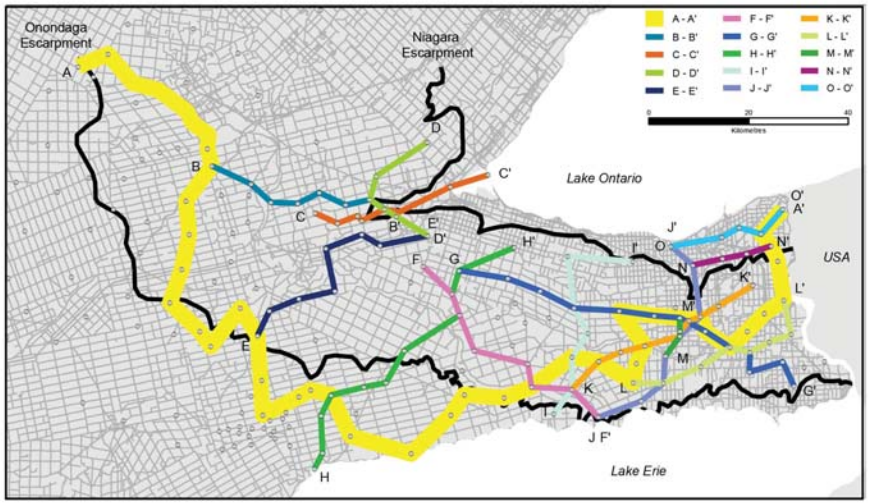
Grain Size
- Coarse to medium sand
- Fine to very fine sand
- Silt
- Clay

Pebble Lithology
- Limestone
- Dolostone
- Sandstone
- Shale
- Chert, evaporite
- Precambrian

Drilling Method
- Hollow-stem auger
- PQ coring
- Split spoon
- Tricone
- Hydrovac

*Hydrostratigraphic units are intended to reflect regional-scale sediment packages that will be modeled in three dimensions. The units are time-transgressive and may group lithologic packages.





Hydrostratigraphic Units

- Regressive aquifer
- Upper Whittlesey aquitard
- Upper Halton aquitard
- Halton aquifer
- Lower Halton aquitard
- Pre-Halton aquifer
- Lower Whittlesey aquitard
- Whittlesey / Ypsilanti Low aquifer
- Wentworth Till aquitard
- Maumee-Arkona aquitard
- Caledon - Grand River Outwash aquifer
- Upper Till / Port Bruce Phase aquitard
- Waterloo / Orangeville moraines aquifer
- Maryhill Diamicton / Erie Phase aquitard
- Lower Erie Phase aquifer
- Catfish Creek aquitard
- Pre-Catfish aquifer
- Pre-Catfish aquitard
- Lower Pre-Catfish aquifer
- Canning / Older Drift aquitard
- Pre-Canning / Older Drift aquifer
- Pre-Canning aquitard
- Paleozoic Bedrock

Lithology

- Silt / clay diamicton
- Sand / silt diamicton
- Dirty gravel
- Gravel
- Coarse sand
- Fine sand
- Sandy silt
- Silt
- Silty clay
- Clay
- Ice-rafted debris
- Rhythmic bedding
- Bedrock
- Fill
- No recovery

Appendix G

Significant Wildlife Habitat Summary

Appendix G. Assessment of potential Significant Wildlife Habitat on the Subject Properties.

Significant Wildlife Habitat (SWH) Type	Known or Candidate SWH present/absent	Rationale
SEASONAL CONCENTRATION AREAS OF ANIMALS		
Waterfowl Stopover and Staging Areas	Absent	Suitable habitat not present on Subject Properties
Shorebird Migratory Stopover Area	Absent	Significant potential habitat not present on Subject Properties
Raptor Wintering Area	Absent	Suitable habitat not present on Subject Properties
Bat Hibernacula	Absent	Suitable overwintering habitat not present on Subject Properties
Bat Maternity Colonies	Absent	Significant potential roost trees not present. Use not consistent with a maternal colony for Big Brown Bat or Silver-haired Bat
Turtle Wintering Areas	Absent	Potential overwintering habitat present in former irrigation ponds. These constructed ponds do not qualify as significant wildlife habitat. Potential overwintering habitat present in Welland River and Lyons Creek
Reptile Hibernaculum	Absent	Suitable overwintering habitat not observed on Subject Properties
Colonially -Nesting Bird Breeding Habitat (Bank and Cliff)	Absent	Not known to occur on Subject Properties
Colonially -Nesting Bird Breeding Habitat (Tree/Shrubs)	Absent	Not known to occur on Subject Properties
Colonially -Nesting Bird Breeding Habitat (Ground)	Absent	Not known to occur on Subject Properties
Migratory Butterfly Stopover Areas	Absent	Significant potential habitat not present on Subject Properties
Landbird Migratory Stopover Areas	Absent	Significant potential habitat not present on Subject Properties
Deer Winter Congregation Areas	Absent	Not known to occur on Subject Properties

RARE VEGETATION COMMUNITIES		
Cliffs and Talus Slopes	Absent	Habitat type not present on Subject Properties
Sand Barren	Absent	Habitat type not present on Subject Properties
Alvar	Absent	Habitat type not present on Subject Properties
Old Growth Forest	Absent	Habitat type not present on Subject Properties
Savannah	Absent	Habitat type not present on Subject Properties
Tallgrass Prairie	Absent	Habitat type not present on Subject Properties
Other Rare Vegetation Communities	Present	Provincially rare wetland vegetation community present in Lyons Creek. This community is too narrow (1-2m in width) to map at the scale of the study area.
SPECIALIZED HABITATS OF WILDLIFE CONSIDERED SWH		
Waterfowl Nesting Area	Absent	Suitable habitat not present on Subject Properties
Bald Eagle and Osprey Nesting, Foraging and Perching Habitat	Absent	Suitable habitat not present on Subject Properties
Woodland Raptor Nesting Habitat	Absent	Suitable habitat not present on Subject Properties
Turtle Nesting Areas	Absent	No evidence of turtle nesting observed on properties
Seeps and Springs	Absent	No seeps or springs present on Subject Properties
Amphibian Breeding Habitat (Woodland)	Absent	Amphibian breeding in portion of Lyons Creek PSW on Property 1, but use on consistent with SWH. Suitable amphibian breeding habitat not present in woodland associated with Welland River and Lyons Creek.
Amphibian Breeding Habitat (Wetlands)	Absent	Amphibian breeding documented in PSWs associated with Welland River and Lyons Creek. Use not consistent with SWH. Amphibian breeding confirmed in constructed ponds on golf course property. Habitat type not considered SWH.
Woodland Area-Sensitive Bird Breeding Habitat	Absent	Suitable habitat not present on Subject Properties

HABITATS OF SPECIES OF CONSERVATION CONCERN CONSIDERED SWH		
Marsh Breeding Bird Habitat	Absent	Suitable habitat not present on Subject Properties. Marsh vegetation associated with Lyons Creek assessed as part of breeding bird surveys.
Open Country Bird Breeding Habitat	Absent	Indicator species not present on Subject Properties
Shrub/Early Successional Bird Breeding Habitat	Absent	Indicator species not present on Subject Properties
Terrestrial Crayfish	Absent	Suitable habitat not present on Subject Properties
Special Concern and Rare Wildlife Species	Absent	Eastern Wood-pewee and Monarch documented using the property, however use was not sufficient to be deemed significant.
ANIMAL MOVEMENT CORRIDORS		
Amphibian Movement Corridors	Present	Potential corridors present adjacent to Welland River and Lyons Creek
Bat Migratory Stopover Area	Absent	Suitable habitat not present on Subject Properties

Please note the above SWH criteria are based on guidance provided by the Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E and modified to be specific for the Subject Property.