Starwood Drive, Guelph ON, Scoped Environmental Impact Study for a Proposed Mixed Residential/Commercial Development

Prepared for:
Coletara Development
c/o Starwood-Watson Holdings Inc.
966 Pantera Drive, Suite 22
Mississauga, Ontario
L4W 2S1

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NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

225 Labrador Drive, Unit 1, Waterloo, Ontario, N2K 4M8 **Tel:** (519) 725-2227 **Web:** www.nrsi.on.ca **Email:** info@nrsi.on.ca

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Project Team:

Staff	Role
Dave Stephenson	Project Manager, Senior Terrestrial and Wetland Biologist
Ryan Archer	Terrestrial and Wetland Biologist
Pat Deacon	Terrestrial and Wetland Biologist
Tyler Bradley	Certified Arborist
Gerry Schaus	GIS Technician
Katie Roth	GIS Technician

Report submitted on May 9, 2014

Ryan Archer, M.Sc.

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1.0 Introduction

Natural Resource Solutions Inc. (NRSI) was retained by Coletara Development to complete a scoped Environmental Impact Study (EIS) for a proposed mixed use residential and commercial development on lands located southwest of the Starwood Drive and Watson Parkway intersection in the City of Guelph (herein, 'subject property'; Figure 1). The landowner is proposing to develop the subject property with condominium buildings, a retirement residence, a common amenity building, associated above- and below-ground parking, commercial space, roadways, and landscaped areas. Four single-detached residential lots are also proposed for a small, triangular parcel of land within the northwest end of the subject property.

The subject property contains few existing natural features, being dominated by disturbed, open lands that have historically experienced topsoil removal, and more recently fill deposits. A row of mature deciduous trees occurs along the western property boundary. The subject property is also located within 120m of a portion of the Clythe Creek Provincially Significant Wetland (PSW). Any proposed development within 120m of the wetland boundary requires the preparation of a scoped EIS to demonstrate that no negative impacts to the features will occur as a result of the proposed undertaking (GRCA 2012, City of Guelph 2012a).

The subject property is located adjacent to two properties that are also currently undergoing development application processes, and for which EISs have been drafted. NRSI is currently completing an EIS for the proposed residential development on the property to the west, known as the 55 & 75 Cityview Drive property (herein, 'Cityview Drive property') (NRSI 2013). Additionally, an EIS has been drafted by North-South Environmental Ltd. (NSE) for the property located immediately southwest of the subject property, known as Cityview Ridge (NSE 2012). Due to the close proximity of both properties, results from these studies have been included and/or referenced in this report to supplement NRSI field data collected for the subject property. Results from these studies will be used to more fully characterize and assess the ecological significance of the surrounding natural features.

This report provides a characterization of existing natural features and functions within and adjacent to the subject property based on desktop and field survey information. It also identifies natural heritage-related constraints as well as opportunities for development. An impact

analysis has also been completed based on the comparison of the on-site natural feature characterization results with details of the proposed development.

In support of this report, geotechnical investigations of the subject property were completed by exp Services Inc. (exp Services 2011) and V.A. Wood (Guelph) Inc. (V.A. Wood (Guelph) Inc. 2013). Gamsby and Mannerow has provided a functional servicing report (Gamsby and Mannerow 2014a), which details the proposed water supply, storm sewer, and sanitary services. A Hydrogeological Study Report (2014b) has also been prepared by Gamsby and Mannerow.

An initial version of this EIS was submitted to the City of Guelph and GRCA in November 2013. Following the initial submission, comments were provided by the following review agencies/groups:

- Grand River Conservation Authority (GRCA) on February 7, 2014
- Nature Guelph on February 17, 2014
- City of Guelph Environmental Advisory Committee (EAC) on March 12, 2014
- City of Guelph Parks and Open Space Division on April 3, 2014
- City of Guelph Engineering Services Department on April 9, 2014

These comments and original correspondence from the owner and its consultants are provided in Appendix I.

The City of Guelph has recommended that the EIS be updated to address various review comments made by the above review agencies/groups. This report therefore represents an update to, and supersession of, the November 2013 EIS. It incorporates additional information and clarification regarding stormwater management and infiltration, recommended pedestrian trail location, and the function of the 30m area surrounding the PSW, among other points.

1.1 Study Area

For the purposes of this report, the term ‘subject property’ refers to the lands where the development is proposed to occur (Figure 1). The term ‘study area’ refers to the subject property plus lands within the surrounding 120m. Biological surveys were undertaken by NRSI

on the subject property while legacy data collected from agencies encompassed the entire study area to ensure that all surrounding natural features were considered.

The subject property is approximately 2.71ha in size and is bounded by Starwood Drive to the north, shrub thicket, swamp and plantation to the west and to the south, and Watson Parkway to the east (Figure 1). The subject property is predominantly comprised of open, disturbed lands while a row of deciduous trees lines the western property boundary. The subject property also contains a temporary sediment basin in the southern portion of the property where sediments carried from surface water runoff are allowed to settle prior to runoff entering the storm sewer system to the south. A low (approximately 1m) berm and large partially vegetated swale run parallel to the western property boundary (approximately 5m from the boundary) along the majority of its length. This swale enters the triangular northwest parcel from the west, and turns south to follow along the west subject property boundary. The swale is narrowly channelized with gabion baskets located in the northwest and bends around the subject property boundary to flow southward to the existing stormwater management pond located south of Watson Parkway North.

1.2 Project Scoping

In order to determine a study approach for the Starwood EIS, existing natural heritage information was first gathered and reviewed to identify key natural heritage features and species that are known or have potential to occur within the study area. Sources of existing natural heritage information for this project were obtained from the draft EIS for the adjacent Cityview Drive property (NRSI 2013) as well as from the draft EIS completed for the adjacent Cityview Ridge property to the south (NSE 2012). Detailed characterizations of the natural features and ecological functions of each property have been carried out through their respective EISs, both of which were initiated in support of residential development applications. Furthermore, existing available information from these assessments was utilized to the fullest extent for the purposes of this study. Details of the field surveys completed by NRSI as part of the Cityview Drive EIS are summarized in the Starwood Drive EIS Terms of Reference (TOR) provided in Appendix II. Further details of the surveys completed within the Cityview Ridge property are available in the draft Cityview Ridge EIS Report (NSE 2012).

Figure 1

Watson-Starwood EIS

Subject Property

Legend

- Subject Property
- 55 & 75 Cityview Lands
- Provincially Significant Wetland (PSW) & OPA 42 - Significant Natural Area

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Project: 1367 Date: July 22, 2013	NAD83 - UTM Zone 17 Size: 11x17" **1:1,750**

0 25 50 75 100 Metres

Path: X:\1367_StarwoodEIS\NRSI_1367_Fig1_ProjectArea_2K_2013_07_21_KEB.mxd

Additional sources of existing information on natural features and species are listed below. A full list of sources is provided in Section 7.0 of this report.

- GRCA;
- Ontario Ministry of Natural Resources (Normington 2013), Guelph District;
- OMNR Natural Heritage Information Centre (NHIC) Biodiversity Explorer (OMNR 2010a);
- City of Guelph Official Plan (2011);
- Guelph Natural Heritage Strategy (Dougan & Associates 2009);
- Clythe Creek Overview Study (Ecologistics 1998);
- Digital air photos; and,
- Land Information Ontario (LIO) spatial data.

Based on preliminary review of existing information, natural features were identified as occurring within and adjacent to (within 120m) the subject property. These features include:

Woodlands – Natural Area/Cultural Woodlands as defined by the City of Guelph OPA 42 (currently under appeal) (City of Guelph 2012);

Wetland - Clythe Creek PSW complex, which is currently designated as Core Greenlands under the City of Guelph Official Plan, a Significant Natural Area under OPA 42, and as regulated lands under GRCA's Ontario Regulation 150/06 *Regulation of Development, Interface with Wetlands and Alterations to Shorelines and Watercourses*; and

Watercourse - a tributary of Clythe Creek has been identified as traversing the subject property, as mapped by the GRCA and OMNR; however, aerial imagery and ground surveys indicates that that the feature no longer exists.

To further identify wildlife species potentially occurring within the study area, initial species lists were compiled to provide information on species reported from the vicinity of the study area (1km radius) using various atlases, including the Ontario Mammal Atlas (Dobbyn 1994), the Ontario Butterfly Atlas (Toronto Entomological Association (TEA) 2013), and the Ontario Reptile and Amphibian Atlas (Ontario Nature 2013). Data on breeding birds in the area was extracted from the Ontario Breeding Bird Atlas (Bird Studies Canada (BSC) *et al.* 2008). As this atlas provides data based on 10x10km survey squares, information on breeding birds from the square that overlaps the study area (square #17NJ62) was compiled. These initial species lists were used to guide the scope and type of wildlife field surveys required.

Based on these initial species lists, a total of 12 Species at Risk (SAR), 14 Species of Conservation Concern (SCC), and 46 regionally significant species were identified as having records from within the vicinity of study area. For the purposes of this report, SAR are defined as species listed as Threatened or Endangered provincially. Species designated as Special

Concern provincially, or designated as Threatened or Endangered under the federal *Species at Risk Act,* are considered SCC and are discussed further within the context of Significant Wildlife Habitat (SWH) (Section 5.3). A preliminary screening exercise was conducted on these species to identify which species have suitable habitat within the study area. This involved cross-referencing the preferred habitat for reported SAR and SCC (OMNR 2000) against habitats known to occur on the subject property or adjacent lands. This was completed to ensure that the potential presence of all SAR and SCC within the study area was adequately assessed in this EIS. Suitable habitat for one SAR (barn swallow (*Hirundo rustica*)) and six SCC (red-headed woodpecker (*Melanerpes erythrocephalus*), golden-winged warbler (*Vermivora chrysoptera*), common nighthawk (*Chordeiles minor*), eastern milksnake (*Lampropeltis triangulum*), eastern ribbonsnake (*Thamnophis sauritus sauritus*), and western chorus frog (*Pseudacris triseriata*)), were found to exist within the study area. Potential habitat for these species is primarily constrained to the existing row of trees and associated regenerating woody vegetation, and the off-site wetland and woodland located on the Cityview Drive property within 120m of the subject property boundary. These species are discussed in Section 4.3 of this report under their respective biota subsections (e.g., Birds). Full results of the SAR and SCC screening exercise are provided in Appendix III.

A preliminary screening for the presence of SWH was also completed for the study area (Appendix IV). The Significant Wildlife Habitat Technical Guide (SWHTG) is a guideline document that outlines the types of habitats that the OMNR considers significant in Ontario as well as criteria to identify these habitats (OMNR 2000, OMNR 2012a). The SWHTG groups SWH into four broad categories: seasonal concentration areas, rare vegetation communities and specialized wildlife habitat, habitats of species of conservation concern, and animal movement corridors. Based on the results of this preliminary screening exercise, there is potential for snake hibernacula to occur within the subject property, as well as habitat for the species of conservation concern red-headed woodpecker (west property trees) and common nighthawk (open lands of the subject property adjacent to nearby woodland). These habitats are discussed further in Section 5.3 of this report. Full results of the SWH screening are provided in Appendix IV.

Based on the findings described above, a Terms of Reference (TOR) for the EIS was developed by NRSI and submitted to the City of Guelph and GRCA for their review and approval. The City of Guelph's EAC reviewed the study TOR, and on February 8, 2013 provided comment to NRSI

on the study approach (see Appendix II). One of the comments made was that the EIS was to address the recommendations made in the Clythe Creek Overview Study (Ecologistics 1998).

The key recommendations of the Clythe Creek Overview Study have been summarized in Table 1.

Table 1. Summary of Clythe Creek Overview Study recommendations

Study Recommendation	Context/Details of Recommendation
#1- Upland woodland areas are to be retained where possible	a) Historical clearing of vegetation has impacted the Clythe Creek subwatershed resulting in reduced forest cover, reduced wildlife habitat, degradation of wetlands, degradation of aquatic habitat and water quality within Clythe Creek and its tributaries. b) Retention of existing woodlands and natural vegetation is important to help conserve diversity c) The restoration of natural areas is recommended to increase woodland cover.
#2- Natural Areas/Wildlife	a) Restoration of natural areas is recommended to increase woodland cover, including planting native trees and plants b) Detailed plant and wildlife surveys are recommended as part of subsequent EIS. Opportunities for enhancement of natural vegetation areas should be examined. Planting native tree and plants is recommended to increase wildlife habitat.
#3- Wetlands and Other Sensitive Habitats	a) A complete OWES evaluation should be conducted on associated wetlands b) Wetlands are to be maintained c) Appropriate width buffers of natural vegetation are to be retained or created along wetland areas for the protection of sensitive habitats
#4- Preservation and Enhancement of Aquatic Habitat	a) Removal of existing on-line ponds b) Use of dry or wet ponds with modified subsurface discharges to help lower water temperatures c) Preservation and augmentation of tree cover along creeks to mediate stream temperature d) The use of natural channel design techniques and bioengineering methods to increase quality of aquatic habitat
#5- Groundwater	a) Groundwater inputs to watercourses are to be maintained b) Existing groundwater recharge conditions must be maintained c) Any groundwater takings (dewatering) must be evaluated to ensure local aquatic and terrestrial functions are maintained d) Groundwater quality degradation from road salting, fertilizer, spills, septic systems, etc is to be controlled

Each of the Clythe Creek Overview Study recommendations presented in Table 1 are addressed in Section 8.0 of this report to demonstrate how they are met through avoidance of direct impact by the proposed development, recommended mitigation measures including ecological restoration opportunities, or if particular Overview Study recommendations are not applicable to the subject property.

The GRCA approved the study TOR on February 13, 2013, pending updates addressing comments raised by EAC. Following revision and re-submission of the TOR to the City and GRCA, the finalized TOR was approved on June 27, 2013 and is provided in Appendix II.

2.0 Relevant Policies, Legislation, and Planning Studies

With respect to the natural environment, conformance to all applicable municipal, provincial and federal policies and guidelines is considered throughout all phases of the project. A summary of policies, legislation, and guidelines pertinent to this project are summarized below.

These relevant policies, legislation, guidelines and planning studies are used to define what are known as 'significant' natural areas, features, and habitats. They are further used to guide the layout of the proposed development by establishing boundaries and protective development setbacks from any identified significant areas, features, or habitats.

Section 5.0 of this report provides a summary of significant natural areas, features and habitats identified within the study area as it relates to the policies, legislation, guidelines and planning studies discussed in this section.

2.1 Provincial Policy Statement

The Provincial Policy Statement (PPS) (OMMAH 2014) is issued under the authority of Section 3 of the Planning Act and came into effect on April 30, 2014, replacing the 2005 PPS. Section 3 requires that decisions affecting planning matters shall be consistent with policy statements under the Act. Section 4.4 of the PPS establishes that the PPS is to be read in its entirety and all relevant policies are to be applied to each situation. In this context, Section 2.1 of the PPS – Natural Heritage, establishes clear direction on the adoption of an ecosystem approach and the protection of resources that have been identified as 'significant.' These features are broadly defined within the PPS and rely on the Ontario Ministry of Natural Resources (OMNR) and the municipality to identify and delineate specific natural features. The Natural Heritage Reference Manual (OMNR 2012) and the Significant Wildlife Habitat Technical Guide (OMNR 2000) were prepared by the OMNR to provide guidance on identifying natural features and in interpreting the Natural Heritage sections of the PPS. These features include:

a) Significant wetlands in Ecoregion 5E, 6E and 7E;
b) Significant and other coastal wetlands in Ecoregions 5E, 6E and 7E;
c) Fish habitat;
d) Significant woodlands in Ecoregion 6E and 7E;
e) Significant valleylands in Ecoregion 6E and 7E;

f) Habitat of Endangered species and Threatened species;
g) Significant Wildlife Habitat;
h) Significant Areas of Natural and Scientific Interest (ANSI)

Based on a review of background information and mapping, none of the above-listed features were identified as occurring within the subject property. However, the Gilholm-Salisbury PSW occurs adjacent to the subject property on its south and west sides, while Barrie's Lake ESPA and PSW occurs adjacent to the north of the subject property (Figure 1). NRSI biologists completed background reviews, desktop assessments and on-site investigations of the natural features within the study area to address the potential for Significant Wildlife Habitat (SWH) and Habitat of Endangered or Threatened Species; the results of these assessments are reported in Section 5.0.

Section 2.1.4 of the PPS states that development and site alteration shall not be permitted in significant wetlands in Ecoregions 5E, 6E, and 7E, or significant coastal wetlands.

Section 2.1.5.of the PPS states that development or site alteration shall not be permitted in Significant Wildlife Habitat, or other types of significant habitat unless it has been demonstrated that there will be no negative impacts on the features or their ecological functions.

Section 2.1.6.of the PPS states that development and site alteration shall not be permitted in fish habitat except in accordance with provincial and federal requirements.

Section 2.1.7 of the PPS states that development or site alteration shall not be permitted in habitat of Endangered or Threatened species except in accordance with provincial or federal requirements.

Development and site alteration may be permitted within and adjacent to significant natural heritage features if the ecological function has been evaluated and it has been demonstrated through an EIS that there will be no negative impacts on the natural features or on their ecological functions (OMMAH 2014).

Based on a preliminary analysis of the natural features present, PSW is known to occur adjacent to the subject property. Significant wildlife habitat and habitat of endangered and

threatened species are potentially located within the study area, as defined by the PPS (OMMAH 2005).

2.1.1 Natural Heritage Reference Manual

The OMNR Natural Heritage Reference Manual (OMNR 2010b) provides technical guidance for implementing the natural heritage policies of the PPS. The manual presents the Province's recommended technical criteria and approaches for being consistent with the PPS in protecting natural heritage features and areas and natural heritage systems in Ontario.

This manual was consulted in the completion of this EIS when evaluating the presence of natural heritage features protected under the PPS within the study area.

2.1.2 Significant Wildlife Habitat Technical Guide

The OMNR SWHTG was prepared to assist planning authorities and other participants in the land use planning system (OMNR 2000) to adequately protect SWH features to ensure their continued existence and functional value within the planning district and province in general. The SWGHTG is a detailed technical manual that provides information on the identification, description, and prioritization of SWH. The manual is intended for use in the municipal policy and development process under the Planning Act. A series of SWHTG addenda have been prepared by the OMNR that provide further details on characterizing and identifying significant wildlife habitat for Ecoregions 5E, 6E, and 7E (OMNR 2012a).

This technical guide was consulted in completing this EIS when evaluating presence of SWH as defined under the PPS within the study area.

2.2 Endangered Species Act, 2007

Species designated as Threatened or Endangered in Ontario automatically receive legal protection under the *Endangered Species Act* (ESA) (Government of Ontario 2007) and their habitats are protected generally under the Act (i.e. areas essential for breeding, rearing, feeding, hibernation and migration). The ESA (Subsection 9(1)) states that:

"No person shall,

(a) kill, harm, harass, capture or take a living member of a species that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species;

(b) possess, transport, collect, buy, sell, lease, trade or offer to buy, sell, lease or trade,

(i) a living or dead member of a species that is listed on the Species at Risk in Ontario List as an extirpated, endangered or threatened species,

(ii) any part of a living or dead member of a species referred to in subclause (i),

(iii) anything derived from a living or dead member of a species referred to in subclause (i); or

(c) sell, lease, trade or offer to sell, lease or trade anything that the person represents to be a thing described in subclause (b) (i), (ii) or (iii).

Clause 10(1)(a) of the ESA states that:

"No person shall damage or destroy the habitat of a species that is listed on the Species at Risk in Ontario list as an endangered or threatened species"

In order to balance social and economic considerations with protection and recovery goals, the ESA also enables the Minister of Natural Resources to issue permits or enter into agreements with proponents in order to authorize activities that would otherwise be prohibited by subsections 9(1) or 10(1) of the Act provided the legal requirements of the Act are met.

The ESA is of relevance to this EIS given the potential presence of habitat for one species regulated under this Act (barn swallow) within the study area. This species and its habitat is afforded protection under the ESA and as such, requires the establishment of development setbacks as well as obtaining approvals for any works occurring with the identified regulated area. Further assessments, including field-based studies, were completed to determine the potential presence and significance of this species to the subject property (Section 4.0).

2.3 Migratory Birds Convention Act, 1994

The federal *Migratory Birds Convention Act* (MBCA) (Government of Canada 1994) is applied through *The Regulations Respecting the Protection of Migratory Birds* that states that *"[…] no person shall disturb, destroy or take a nest, egg […] of a migratory bird.*" This law protects all birds aside from the introduced species European starling, house sparrow, and rock pigeon. Bird nests that are destroyed during the course of construction and other related activities are referred to as "incidental take" and this is illegal except under the authority of a permit obtained through the Canadian Wildlife Service.

Implications of the MBCA have potential to occur during the construction phase of the project when the subject property is cleared and grubbed of vegetation.

2.4 City of Guelph Official Plan, 2012

The City of Guelph Official Plan (OP) designates PSWs, such as the Clythe Creek PSW located west of the subject property, and its adjacent lands (i.e., within 120m), part of the City's 'Greenlands System' (City of Guelph 2012b). More specifically, these lands are defined as 'Core Greenlands' (City of Guelph 2012b).

The Core Greenlands land use designation recognizes areas of the Greenlands System that have greater sensitivity or significance. Development is not permitted within a PSW, and the City encourages that all development proposals minimize impacts on PSW and their ecological value and function (City of Guelph 2012b).

Although development is prohibited within PSWs, development may be permitted within adjacent lands if the proponent completes an EIS that meets City requirements and demonstrates that the proposed development will not:

a) Result in a loss of the wetland's ecological function;
b) Create subsequent demand for future development which will negatively impact on the wetland's ecological function;
c) Conflict with existing site-specific wetland management practices; and
d) Result in loss of contiguous wetland.

Although the Clythe Creek PSW does not extend onto the subject property, the subject property is considered 'adjacent land' to the PSW as it falls within 120m of the boundary. For this reason, this EIS addresses potential impacts to the adjacent PSW that may be caused by the proposed development.

2.4.1 City of Guelph Official Plan Amendment 42 (OPA 42) (currently under appeal)

In 2010, OP Amendment 42 (OPA 42) was brought forth to City of Guelph Council. This amendment focuses on defining a Natural Heritage System under the OP that would replace the

existing 'Core and non-Core Greenland' policies, as described in Section 2.4. The purpose of the Natural Heritage System would be to establish a sustainable greenspace network throughout the City (City of Guelph 2012a). OPA 42 was adopted by Council on July 27, 2010, with an Official Plan Consolidation released in December 2012. As OPA 42 requires consistency with the PPS, review and approval from the Minister of Municipal Affairs and Housing (OMMAH) is required. A decision was made by the OMMAH on February 2011 but has since been appealed to the Ontario Municipal Board. With regard to this project, consideration has been made to OPA 42 as it will be the upcoming strategy for protecting natural heritage features within the City of Guelph.

The subject property is located within 120m of woodlands on the Cityview Drive property that are designated as Natural Area – Cultural Woodlands under OPA 42 (City of Guelph 2012a). However, the row of trees lining the west subject property boundary is not considered to be an edge of the nearby woodland.

Clythe Creek PSW, located on the adjacent Cityview Drive property, is designated as a Significant Natural Area under OPA 42. As the subject property is located within 120m of the PSW, it is considered an 'adjacent land' under the City of Guelph's Official Plan (City of Guelph 2012a). As described in Section 6.1.3 of OPA 42, development or site alteration may be permitted within 'adjacent lands' to Significant Natural Areas provided that it has been demonstrated through an EIS that there will be no negative impacts on the feature or its ecological functions (City of Guelph 2012a). In addition, portions of the 30m area surrounding the confirmed PSW boundary extend onto the subject property from the adjacent Cityview Drive property. Development or site alteration is not permitted within 30m of a PSW, except as permitted under Section 6.1.4 of OPA 42 (City of Guelph 2012a).

2.5 Regulation 150/06 – Development, Interference with Wetlands and Alterations to Watercourses and Shorelines

The *Regulation of Development, Interface with Wetlands and Alterations to Shorelines and Watercourses* (Ontario Regulation 150/06), is a regulation issued under *Conservation Authorities Act,* R.S.O. 1990. Through this regulation, the GRCA has the responsibility to regulate activities in natural and hazardous areas (i.e., areas in and near rivers, streams, floodplains, wetlands, slopes and the Lake Erie shoreline).

As portions of the subject property have been identified within GRCA regulated lands, a permit will be required from the GRCA under the Reg. 150/06 to proceed with development within these areas. In addition, as the development is proposed within 120m of these features, a scoped EIS is required to evaluate and demonstrate that there will be no negative impacts on the identified natural feature or its ecological functions as described under Reg. 150/06 (GRCA 2013).

2.6 Municipal Tree By-law

The City of Guelph *Tree By-Law 19058* (City of Guelph 2010) states that […] "*no person may destroy or injure, or cause or permit the destruction or injuring of a regulated tree* […]". Exemptions apply to this clause and are described in Section 4 of the by-law.

A regulated tree is defined as […] "*a specimen of any species including deciduous or coniferous growing woody perennial plant, supported by a single root system, which has reached, or could have reached a height at least 4.5m from the ground at physiological maturity, is located on a lot that is greater than 0.2 hectares (0.5 acres) in size and has a DBH of 10cm"* […].

When applying for a permit to destroy or injure a regulated tree, a Tree Protection Plan is required to demonstrate how the remaining trees will be protected from injury. This plan is provided in Appendix V of this report.

3.0 Field Methods

3.1 Terrestrial Field Surveys

Terrestrial field surveys were undertaken within the subject property to characterize natural features and identify significant wildlife habitats and/or significant plant and animal species that have potential to be adversely affected by the proposed development. Due to the close proximity of the adjacent Cityview Drive property, field data collected in support of the EIS for that property have been included in this report to supplement data collected within the Starwood Drive subject property as necessary.

3.1.1 Vegetation Surveys

3.1.1.1 Vascular Flora Inventory

All species of vascular flora observed within the subject property were recorded during all site visits (November 9, 2012, March 5, 6 and 26, 2013, May 3, 2013). Vegetation within 120m of the subject property on the Cityview Drive property was also inventoried during site visits completed on May 13, 2009, June 23, 2009, and October 4, 2012, as well as a tree inventory completed on March 13, 2013. Due to the degree of human disturbance of the site, multi-season vegetation surveys were not completed within the subject property.

3.1.1.2 Tree Inventory, Health Assessment and Dripline Delineation

A comprehensive inventory of all trees ≥10cm in diameter at breast height (DBH) within the proposed development footprint was completed by NRSI Certified Arborists on March 5 and 6, 2013, and May 3, 2013 (see Appendix I of the Tree Protection Plan for the full inventory). An additional tree inventory specific to the triangular northwest parcel was also completed on October 31, 2013. Because the inventories were conducted during the leaf-off period, tree assessments were based on the structural condition of each tree, but not the foliar health characteristics. Each tree was tagged with a pre-numbered aluminum forestry tag, and the following information was recorded for each:

- species;
- diameter at breast height measurement (DBH);
- crown radius (metres);
- general health (good, fair, poor, very poor);
- potential for structural failure (low, medium, high);
- tree location (lot or block number); and,

- general comments (i.e. disease, aesthetic quality, development constraints, sensitivity to development).

General health characteristics and potential for failure were assessed for each inventoried tree. The details of the criteria used to evaluate each tree are outlined in Table 1 of the Tree Protection Plan (Appendix V).

The dripline of the row of trees located along the west property boundary was delineated and flagged by an NRSI Certified Arborist in March 2013. A site visit was completed with City of Guelph staff on March 26, 2013 to review and confirm the flagged dripline boundary.

3.1.2 Other Wildlife Surveys

All incidental observations of mammals (as well as evidence such as tracks, scats, dens, etc.), reptiles, amphibians, birds, butterflies and dragonflies were documented on all field visits.

3.1.3 Assessment of Proposed Trail Alignment

On April 2, 2014, NRSI staff completed a coarse-level field assessment of the existing natural features along the route of a segment of pedestrian trail suggested by staff of the City of Guelph (based on correspondence provided on March 18, 2014, Appendix VI) in conjunction with the OPA 48 Trail Network. The alignment of this segment is predominantly off-site, on the property to the west. The proposed linear trail segment was evaluated by following along the west property boundary of the subject property. See Section 7.3.3 for additional detailed analysis of this proposed trail route.

In assessing the City-suggested trail route, NRSI biologists field-mapped a possible alignment that would attempt to minimize impacts to the surrounding natural features. In doing so, existing tree species within and adjacent to the proposed alignment were identified and coarsely evaluated for health and hazard rating. The preliminary alignment was field-mapped to avoid driplines of fair to good quality trees while making use of existing open spaces or in locations where high hazard trees would require removal.

3.2 Aquatic Field Surveys

Site surface water drainage characteristics were documented within the subject property during the November 9, 2012 site visit. This field work was completed to verify the presence or absence of a watercourse that GRCA and OMNR mapping showed traversing the property, but was not readily visible in recent (2010) aerial photography.

4.0 Existing Conditions

4.1 Physiography, Geology, Soils and Drainage

The subject property generally slopes from the northwest to the southeast with an average gradient of 2% toward the temporary sediment basin in the southeast corner (Gamsby and Mannerow 2014b). The topography of the site is stepped (exp Services Inc. 2011) as a result of historic fill deposition. Subsurface soils within the property have been described as "*sandy silt till, comprising sandy silt, trace gravel, and scattered with seams of wet silt and sand*" (Gamsby and Mannerow 2014b).

As described above, GRCA and OMNR watercourse mapping indicated that a tributary of Clythe Creek traverses the subject property. A site visit was conducted by an NRSI aquatic biologist on November 9, 2012, to verify the presence or absence of this watercourse, which was not apparent from recent (2010) aerial photography of the subject property.

NRSI aquatic biologists did not observe any surface water features within the subject property. Therefore, the watercourse identified on GRCA and OMNR mapping as traversing the subject property was confirmed to no longer exist on or within 30m of the subject property. Documentation of the absence of this feature was provided by NRSI to GRCA (Nathan Garland) and the City (Adele Labbe) for review in February 2013. This included 360 degree video as well as photographic documentation. A map with all the locations in which documentation was obtained was also provided (Appendix VII).

Rear-yard drainage from residential properties located west of the subject property (Silurian Drive) discharge into a vegetated swale within the triangular northwest parcel. Stormwater then drains via overland flow through this swale through the gabion-lined channel that exists at the property corner between the triangular northwest parcel and the main subject property land parcel. Another partially vegetated swale then directs the surface runoff parallel to the west property boundary toward the temporary sediment basin at the south end of the property. From there, stormwater is conveyed via stormsewer under Watson Parkway North toward the existing stormwater management pond located just east of Watson Parkway North (Gamsby and Mannerow 2014b). This stormwater management pond was designed to accommodate drainage from future development located on the subject property, and is an approved and constructed feature. The stormwater management pond ultimately discharges to Clythe Creek.

The berm that parallels the west property boundary effectively acts as a barrier preventing overland stormwater flow from travelling between the subject property and the PSW (Gamsby and Mannerow 2014b). The berm extends parallel to the majority of the length of the west subject property boundary. Where the berm doesn't currently exist within the north and south ends of the property, historic topsoil removal has left the western end of the subject property below the grade of the adjacent property, including PSW, to the west. Photographs of the berm are provided in Appendix VIII.

Local shallow groundwater flow within the subject property is inferred to move in a primarily southerly direction toward Clythe Creek. Groundwater flow in the shallow overburden substrates is estimated to flow southeasterly, toward the stormwater management facility across Watson Parkway South and Clythe Creek beyond (Gamsby and Mannerow 2014b).

A hydrogeological report prepared for the Cityview Drive property (Anderson GeoLogic Ltd. 2011) reported relatively saturated conditions within the vertical profile of the soil, with the water table likely occurring at a depth of no greater than 2m, and occurring at shallower depths toward the PSW until the water table essentially meets or occurs just below the ground surface at the PSW. A downward hydraulic gradient was measured at all wells within the property, suggesting that "*there is not a strong upward hydraulic gradient in the area approaching the PSW*". Together with findings that a small watercourse entering the PSW was ephemeral and not groundwater fed, the report concluded that "*the PSW located at the northwest end of the property is fed directly by surface water runoff*". Further, the report stated "*there is no apparent upwelling or discharge of groundwater to the PSW*" (Anderson GeoLogic Ltd. 2011). Furthermore, an update to this report (Anderson GeoLogic Ltd. 2013) *"…concluded that the northeastern wetland is fed directly by surface water runoff and interflow. There is no apparent upwelling or discharge of groundwater to the wetland, although shallow groundwater undoubtedly passes laterally beneath it and some of the surface water reaching it undoubtedly infiltrates to the water table*." Both studies demonstrated that areas to the west and northwest of the PSW provided surface water contributions to the feature. Measures to maintain surface water inputs to the PSW were recommended.

Groundwater flow throughout the majority of the subject property does not appear to be directed toward the PSW. However, a component of groundwater flow from low-lying areas along the

west end of the subject property toward the PSW likely exists under high water table conditions (i.e., during spring). This shallow groundwater flow toward the PSW is considered minor and due to localized mounding of surface water within the west property swale (Gamsby and Mannerow 2014b). This flow is only considered to occur during wet periods and following major rain events, while the majority of stormwater is directed toward the temporary sediment basin in the south end of the subject property. Site investigations revealed no evidence of groundwater seepage or springs within the subject property (Gamsby and Mannerow 2014b).

The subject property is located within the overall capture zone for several municipal supply wells, including the City's Clythe Well, which is located approximately 400m of the subject property (Gamsby and Mannerow 2014b). It is inferred that the site is in an area of groundwater recharge. A vulnerability assessment completed by Gamsby and Mannerow (2014b) concluded that the subject property falls within a zone classified as Wellhead Protection Area (WHPA)-B.

A historic buried bedrock valley is believed to generally orient with Clythe Creek in the vicinity of the subject property, and that it branches northwesterly approximately 500-700m northeast of the property (Gamsby and Mannerow 2014b). The location of the buried valley was approximated based on correlation with bedrock well yield, with the increase in well yield thought to relate to paleo-karst or increased secondary porosity, which are features associated with buried bedrock valleys (Gamsby and Mannerow 2014b).

4.2 Designated Natural Areas

A portion of the Clythe Creek PSW Complex, considered a Significant Natural Area under OPA 42 (under appeal) (City of Guelph 2012a) occurs in proximity to (within 120m of) the subject property on the adjacent Cityview Drive property to the west. Approximately 1.5ha of the Cythe Creek PSW complex exists on the adjacent Cityview Drive property. This wetland was originally mapped by the OMNR by air photo interpretation; however its boundaries were delineated in the field by NRSI biologists and confirmed by GRCA staff on June 8, 2009. In total, the wetland complex is 103.35ha in area and is comprised of two wetland types - swamp and marsh. Within the Cityview Drive property this wetland is made up of deciduous swamp, dominated by poplars (SWDM4-5) and swamp thicket dominated by red-osier dogwood (SWTM2-1) (NRSI 2013).

4.3 Terrestrial Environment

4.3.1 Vegetation

4.3.1.1 Vegetation Communities

The majority of the subject property consists of open, disturbed lands that have been stripped of topsoil and have had fill deposited. A row of large deciduous trees was found growing along the property boundary, with small, surrounding areas of young, regenerating trees and shrubs. The triangular northwest parcel also consists of disturbed lands on which fill has been deposited. The triangular parcel is primarily open with scarce tree or shrub cover, and occurs adjacent to a buckthorn-dominated thicket located on the Cityview Drive property immediately to the south. No other natural features were documented within the subject property. Figure 2 identifies the location of trees inventoried within the subject property.

Six vegetation communities have been identified that occur adjacent to (within 120m of) the subject property within the Cityview Drive property (see Figure 3 of NRSI (2013)). These include the following:

<u>Scotch Pine Coniferous Plantation (TAGM1)</u>

One small coniferous plantation dominated by scotch pine (*Pinus sylvestris*) occurs within the Cityview Drive property within 120m of the subject property boundary. The trees in this plantation are in good health and appear to be young to mid-aged.

<u>Mineral Cultural Savannah (SVDM3)</u>

This small vegetation community is dominated by a high proportion of non-native species such as common buckthorn (*Rhamnus cathartica*), yarrow (*Achillea millefolium*), common dandelion (*Taraxacum officinale*), barnyard grass (*Echinochloa crusgalli*), Canada thistle (*Cirsium arvense*), butter-and-eggs (*Linaria vulgaris*), black medick (*Medicago lupulina*), and common plantain (*Plantago major*). Scattered trees including Manitoba maple (*Acer negundo*), bur oak (*Quercus macrocarpa*), hawthorn (*Crataegus* spp.), and scotch pine.

<u>Chokecherry Cultural Thicket (THDM2-3)</u>

This thicket community is dominated by chokecherry (*Prunus virginiana*) but a variety of other small trees and shrubs such as common buckthorn, white cedar (*Thuja*

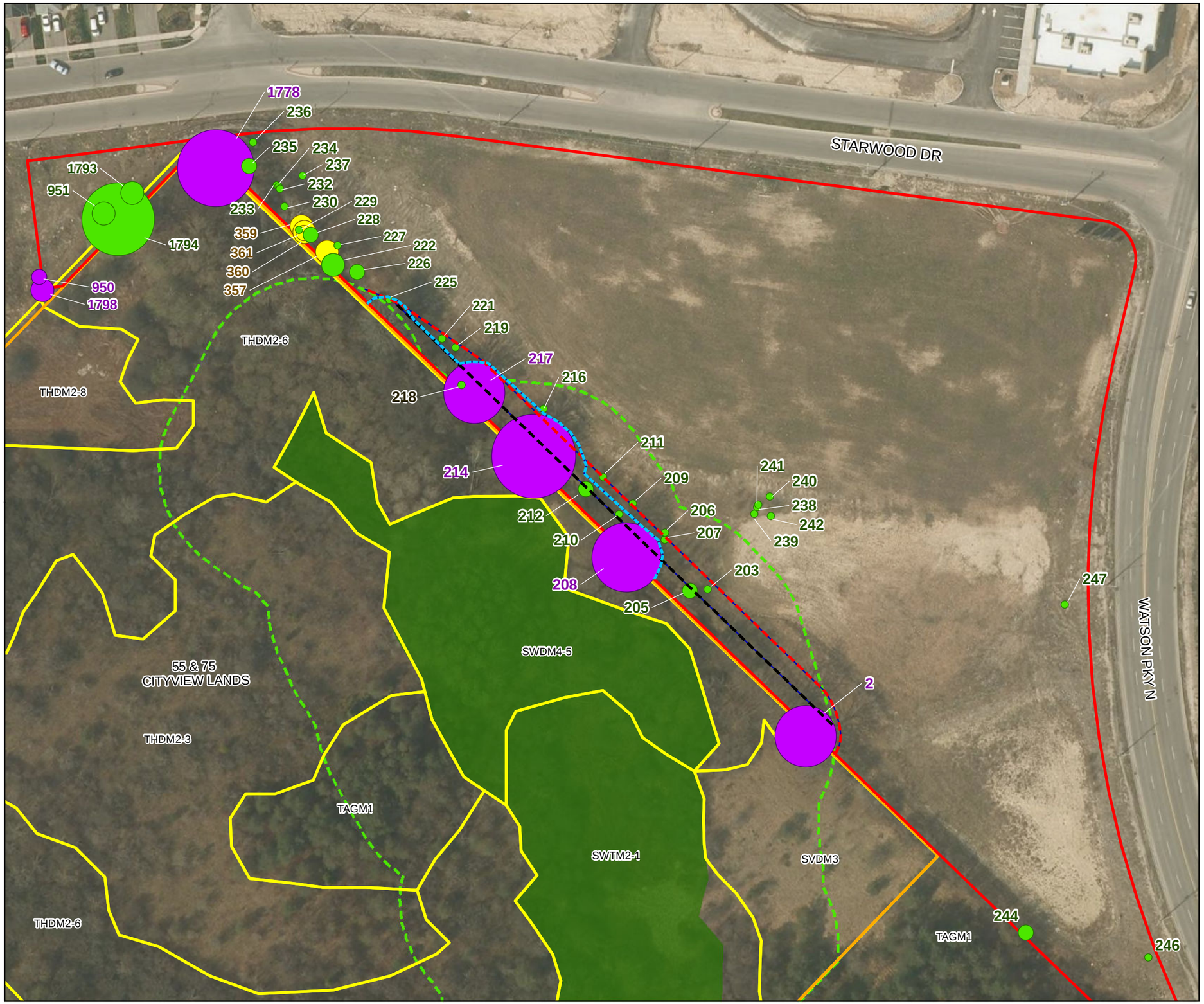


Figure 2

Watson-Starwood EIS

Inventoried Tree Locations, Adjacent Vegetation Communities, and Natural Feature Constraints

Legend

- Subject Property
- 55 & 75 Citview Lands
- Development Limit (10m)
- Grading Limit (5m)
- Dripline
- Limit of Lands within 30m of PSW Boundary
- Provincially Significant Wetland (PSW) & OPA 42 - Significant Natural Area

Tree Inventory (size based on radius)

- Shared Trees
- NRSI Tagged Trees
- Previously Tagged Trees
- Ecological Land Classification (ELC)

(SWDM4-5) Poplar Mineral Deciduous Swamp Type
(SWTM2-1) Red-osier Dogwood Mineral Deciduous Thicket Swamp Type
(TAGM1) Coniferous Plantation
(THDM2-3) Chokecherry Deciduous Shrub Thicket Type
(THDM2-6) Buckthorn Deciduous Shrub Thicket Type
(THDM2-8) Raspberry Deciduous Shrub Thicket Type
(WOD) Deciduous Woodland

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 1367 Date: November 6, 2013	NAD83 - UTM Zone 17 Size: 11x17" **1:1,000**

0 25 50 75 Metres

Path: X:\1367_StarwoodEIS\NRSI_1367_Fig2_InventoriedTrees_ELC_1K_2013_11_06_KEB.mxd

occidentalis), white ash (*Fraxinus americana*), scotch pine, tartarian honeysuckle (*Lonicera tatarica*), common crabapple (*Malus pumila*), downy serviceberry (*Amelanchier arborea*), red cedar (*Juniperus virginiana*), nannyberry (*Viburnum lentago*), bending wayfaring tree (*Viburnum lantana*), and red-osier dogwood (*Cornus stolonifera*). Groundcover is dominated by grasses but common meadow species such as yarrow, black-eyed Susan (*Rudbeckia hirta*), dandelion, Canada goldenrod (*Solidago canadensis*), and New England aster (*Symphyotrichum novae-angliae*) are also abundant.

Mineral Deciduous Swamp (SWDM4-5)

This wetland vegetation community, which forms part of the PSW, is dominated by trembling aspen with smaller numbers of Manitoba maple, green ash (*Fraxinus pennsylvanica var. subintegerrina*), and white elm (*Ulmus americana*). The subcanopy is dominated by trembling aspen and Manitoba maple, while the understorey is comprised of red-osier dogwood, glossy buckthorn (*Rhamnus frangula*), and Virginia creeper (*Parthenocissus quinquefolia*). Groundcover consists of species common to wet areas such as ostrich fern (*Matteuccia struthiopteris*), tall white aster (*Symphyotrichum lanceolatum*), jewelweed (*Impatiens capensis*), and reed canary grass (*Phalaris arundinacea*) This wetland was previously not mapped by the GRCA or MNR but due to its high proportion of wetland plants (>60%) and its soil characteristics (abundant mottling in the upper soil layers) it was classified as wetland.

Red-osier Dogwood Mineral Swamp Thicket (SWTM2-1)

This wetland community type was previously mapped by the GRCA and OMNR and is included in the Cylthe Creek PSW complex. The PSW is dominated by red-osier dogwood, glossy buckthorn, reed canary grass, and tall white aster.

Buckthorn Deciduous Shrub Thicket (THDM2-6)

This is the largest vegetation community found on the Cityview Drive property. It is identified in the OPA 42 (2010) as ‘cultural woodland’. The canopy, subcanopy and understory are dominated by a thick, impenetrable stand of common buckthorn, an exotic and highly invasive species. Scotch pine, chokecherry, hawthorns, and riverbank grape (*Vitis riparia*) are also present within these layers in smaller numbers. Groundcover is only prevalent in areas where the canopy allows light penetration and

consists of dandelion, avens species (*Geum* spp.), common mullein (*Verbascum thapsus*), field horsetail (*Equisetum arvense*), and sedges (*Carex stipata and C.pellita*). Within this vegetation community there are two small inclusions which are characterized by a Scotch pine plantation (TAGM1) and a red-raspberry (*Rubus idaeus*) thicket (THDM2-8).

One additional vegetation community was identified adjacent to (within 120m of) the subject property, within the Cityview Ridge property (NSE 2012):

<u>Scotch Pine Coniferous Forest (TAGM1)</u>

The following description of this vegetation community has been extracted from NSE (2012):

*"The canopy and sub-canopy are dominated by scots pine (*Pinus sylvestris*). The canopy is 10-25 m high and the sub-canopy is 2-10 m in height. The canopy vegetation covers 35-60% while the sub-canopy vegetation covers greater than 60% of the community. In addition to the scots pine in the sub-canopy, occasional black walnut (*Juglans nigra*) and white spruce (*Picea glauca*) are found in this layer. The understory (1-2 m) contains an abundance of European buckthorn (*Rhamnus cathartica*), as well as occasional black walnut and green ash saplings, and riverbank grapevine (*Vitis riparia*), all of which cover greater than 60% of the community. The ground layer (0.2-0.5 m high, 25-35% cover) contains a variety of floral species which grow in scattered patches. Typical species in the ground layer include enchanter's nightshade (*Circaea lutietana*), European buckthorn seedlings, kentucky bluegrass (*Poa pratensis*), and wild strawberry (*Fragaria virginiana*). It appears that this community is transforming into a buckthorn thicket and as the relatively short-lived scots pine die off, the buckthorn will likely take its place."*

Note that this ELC community type (CUP3-3) is now classified as TAGM1 (Coniferous Plantation) under the 2008 ELC classification codes (Lee 2008).

4.3.1.2 Vascular Flora

A total of 47 vascular flora species were identified within the subject property. A complete list of these species is appended to this report (Appendix IX). The vegetation present within the subject property is a mixture of native and non-native species, predominantly forbs and cold season grasses with young trees and willow saplings establishing along the western property boundary. Vegetation coverage within the subject property is sparse due to disturbances caused by topsoil removal and fill deposition.

No vascular plant SAR or SCC were observed within the subject property. In addition, no vascular plant species considered to be regionally significant were observed. Areas along the west property boundary can be described as early successional habitat with numerous pioneer species including a number of non-native grasses and forbs.

4.3.1.3 Tree Inventory

In total, 57 trees were inventoried, of which 46 (80.7%) are native species and 11 (19.3%) are non-native. Nine tree species were identified. A complete list of trees inventoried is provided in Appendix I of the Tree Protection Plan (Appendix V) and tree locations within the subject property are shown on Figure 2. The majority of the trees inventoried are located along the western property boundary, including many that are growing on the boundary.

Table 2 provides a list of trees inventoried, whether they are native or non-native and their overall condition.

Table 2. Summary of inventoried trees

Common Name	Scientific Name	Good	Fair	Poor	Very Poor	Total
Native Species						
American Basswood	*Tilia americana*		2	1		3
Balsam Poplar	*Populus balsamifera*	9	11			20
Bur Oak	*Quercus macrocarpa*	1	5	1	1	8
Trembling Aspen	*Populus tremuloides*	2				2
Peach-leaved Willow	*Salix amygdaloides*	1				1
Willows	*Salix* ssp.	7	3			10
Poplar	*Populus* sp.	1				1
Total		**21**	**21**	**2**	**1**	**45**
Non-Native Species						
Manitoba Maple	*Acer negundo*		6	4		10
Siberian Elm	*Ulmus pumila*		1			1
White Willow	*Salix alba*	1				1
Total		**1**	**7**	**4**		**12**
Overall Total		**22**	**28**	**6**	**1**	**57**

In total, seven trees were identified as being in poor or very poor condition, three of which were found to have a high risk of structural failure.

For more information about the tree inventory completed for the subject property, the reader is referred to the Tree Protection Plan (Appendix V).

4.3.2 Wildlife

4.3.2.1 Birds

A total of 113 breeding bird species are reported from the vicinity of the study area (10x10km range) (BSC *et al.* 2006). Twenty-nine of these species were observed by NRSI biologists during surveys completed on the adjacent Cityview Drive property in completion of the EIS for that property. Twenty-four of these species displayed some evidence of breeding. It should be noted that despite the close proximity of the Cityview breeding bird surveys to the subject property, notable differences in habitat composition are evident as the subject property is dominated by open, disturbed lands with minimal natural cover present. However, no federally,

provincially, or locally significant species are anticipated to occur in the subject property that would not also occur within the less disturbed features of the Cityview Drive property.

Five bird species were incidentally observed within the subject property during the November 2012 and May 2013 site visits, including American goldfinch (*Spinus tristis*), house sparrow (*Passer domesticus*), black-capped chickadee (*Poecile atricapillus*), blue jay (*Cyanocitta cristata*) and northern cardinal (*Cardinalis cardinalis*). A complete list of all bird species known to occur in the vicinity of the study area, including species observed within the subject property, is provided in Appendix X.

Based on a review of background information sources (OBBA, NHIC), 14 federally and/or provincially-significant bird species are known from the vicinity of the study area. However, the subject property does not contain suitable habitat for any of these species. Table 2 provides a summary of significant species (SAR and SCC) known to occur or observed in the subject property, their current status ranks, and preferred habitats.

Additionally, 48 species known from the 10x10km OBBA square that overlaps with the study area are considered regionally significant in Wellington County, 23 of which are also considered regionally rare (Dougan & Associates 2009). None of these species were observed within the subject property.

Table 3. Bird Species at Risk and Species of Conservation Concern observed within the subject property or known from the subject property vicinity

Scientific Name	Common Name	SRANK[1]	COSEWIC[2]	COSSARO[3]	SARA	Background Source	Habitat Preference[4,5,6,7]	Suitable Habitat within Subject Property	NRSI Observed
Cardellina canadensis	Canada Warbler	S4B	T	SC	Schedule 1	BSC et al. 2006	Interior forest habitats with a dense, well-developed shrub and vegetation understory; along riparian zones or wet bottomland habitat. require tracts of land which are >30ha	No	No
Chaetura pelagica	Chimney Swift	S4B, S4N	T	THR	Schedule 1	BSC et al. 2006	Commonly found in urban areas near buildings; nests in hollow trees, crevices of rock cliffs, chimneys; highly gregarious; feeds over open water	No	No
Chordeiles minor	Common Nighthawk	S4B	T	SC	Schedule 1	BSC et al. 2006	Open ground; clearings in dense forests; ploughed fields; gravel beaches or barren areas with rocky soils; open woodlands; flat gravel roofs	Yes	No
Dolichonyx oryzivorus	Bobolink	S4B	T	THR		BSC et al. 2006	Large, open expansive grasslands with dense ground cover; hayfields, meadows or fallow fields; marshes; requires tracts of grassland >50ha.	No	No
Hirundo rustica	Barn Swallow	S4B	T	THR		BSC et al. 2006	Farmlands or rural areas; cliffs, caves, rock niches; buildings or other man-made structures for nesting; open country near body of water.	No	No

Ixobrychus exilis	Least Bittern	S4B	THR	T	Schedule 1	BSC et al. 2006	The least bittern breeds specifically in dense marshes dominated by emergent growth such as cattails. The bittern requires large marshes with a stable water level as the nests are usually built within 10cm of open waters. This open water is also needed for the bittern to forage as it is an ambush forager (Gov't of Canada 2012) .	No	No
Melanerpes erythrocephalus	Red-headed Woodpecker	S4B	THR	SC	Schedule 1	BSC et al. 2006	Red-headed woodpecker is known as a habitat generalist that may use deciduous forests, wooded swamps, fields, or pastures, but typically requires a territory of about 4 ha in size. Red-headed woodpeckers prefer to nest in the cavities of trees that are at least 40cm diameter at breast height (dbh) (OMNR 2000).	No	No
Haliaeetus leucocephalus	Bald Eagle	S2N, S4B	SC	NAR		Normington 2013	Bald eagle habitat tends to consist of large continuous areas of mature, old growth deciduous or mixed woods around large lakes or rivers (OMNR 2000). This species requires large (>255 ha) areas of open woodlands with tall trees for nesting, shelter, feeding as well as roosting (OMNR 2000).	No	No
Icteria virens	Yellow-breasted Chat	S2B	END	E	Schedule 1	Normington 2013	Yellow-breasted chat prefers dense thickets on forest edges, riparian areasor within overgrown clearings. (Gov't of Canada 2012). Yellow-breasted chats nest above the ground in bushes, vines, etc. (OMNR 2000).	No	No

Sturnella magna	Eastern Meadowlark	S4B	T	THR		BSC et al. 2006	Open, grassy meadows, farmland, pastures, hayfields or grasslands with elevated singing perches; cultivated land and weedy areas with trees; old orchards with adjacent, open grassy areas >10 ha in size.	No	No
Vermivora chrysoptera	Golden-winged Warbler	S4B	T	SC	Schedule 1	BSC et al. 2006	Early successional habitat; shrubby, grassy abandoned fields with small deciduous trees bordered by low woodland and wooded swamps; alder bogs; deciduous, damp woods; shrubbery clearings in deciduous woods with saplings and grasses; brier-woodland edges; requires >10 ha	No	No
Riparia riparia	Bank Swallow	S4B	T	THR		BSC et al. 2006	Sand, clay or gravel river banks or steep riverbank cliffs; lakeshore bluffs of easily crumbled sand or gravel; gravel pits, road-cuts, grassland or cultivated fields that are close to water.	No	No
Contopus virens	Eastern Wood-Pewee	S4B	SC	SC		BSC et al. 2006	Open, deciduous, mixed, or coniferous forest; predominated by oak with little understory; forest clearings, edges; farm woodlots; parks.	No	No

Hylocichla mustelina	Wood Thrush	S4B	T	SC		BSC et al. 2006	Carolinian and Great Lakes-St. Lawrence forest zones; undisturbed moist, mature deciduous or mixed forest with deciduous sapling growth; near pond or swamp; hardwood forest edges; must have trees higher than 12 m.	No	No

[1]OMNR 2013, [2]COSEWIC 2012, [3]OMNR 2012b, [4]OMNR 2000, [5]Layberry et al. 1998, [6]COSEWIC 2003 ,[7]COSEWIC 2010

Legend

S1- Critically Imperiled	E/END- Endangered
S2- Imperiled	T/THR- Threatened
S3- Vulnerable	SC- Special Concern
S4- Apparently Secure	NAR- Not at Risk

4.3.2.2 Herpetofauna

Twenty-nine species of herpetofauna are known to occur within the vicinity of the subject property (Ontario Nature 2013). A complete list of herpetofauna known from the subject property vicinity, including their current status rankings, is shown in Appendix XI. Of species known from the subject property vicinity, seven are federally or provincially-listed SAR. Suitable habitat for one of these species (eastern milksnake) occurs within the subject property. While eastern milksnake may occur within the subject property (e.g., for basking, foraging), its significant habitat is considered the hibernaculum; no potential hibernaculum features were observed within the subject property (see Section 5.3). Table 3 provides a summary of significant herpetofauna species known to occur or observed in the study area, their current status ranks, and preferred habitats.

No reptile species were observed within the subject property or the Cityview Drive property, while only one amphibian species, the American toad (*Bufo americanus*), was observed within the Cityview Drive property. No amphibians were observed within the subject property. No significant herpetofauna species were documented within the Cityview Ridge property (NSE 2012).

4.3.2.3 Mammals

Thirty-three mammal species are known from the vicinity of the subject property (Dobbyn 1994). Of these, three species are considered provincially significant: little brown myotis (*Myotis lucifugus*), northern myotis (*Myotis septentrionalis*), and eastern small-footed bat (*Myotis leibii*). Table 4 provides a summary of significant mammal species known to occur in the subject property vicinity, their current status ranks, and preferred habitats.

NRSI biologists observed evidence of one mammal species (raccoon (*Procyon lotor*) tracks) during the November 2012 site visit. No mammal SAR or SCC were observed within the subject property. A complete list of mammal species known from the subject property vicinity and their current status can be seen in Appendix XII.

Table 4. Herpetofauna Species at Risk and Species of Conservation Concern observed within the subject property or known from the subject property vicinity

Scientific Name	Common Name	SRANK[1]	COSEWIC[2]	COSSARO[3]	SARA	Background Source	Habitat Preference[4,5,6,7]	Suitable Habitat within Subject Property	NRSI Observed
Graptemys geographica	Northern Map Turtle	S3	SC	SC	Schedule 1	Ontario Nature 2013; NHIC 2013	Large bodies of water with soft bottoms, and aquatic vegetation; basks on logs or rocks or on beaches and grassy edges, will bask in groups; uses soft soil or clean dry sand for nest sites; may nest at some distance from water.	No	No
Chelydra serpentina serpentina	Common Snapping Turtle	S3	SC	SC	Schedule 1	Ontario Nature 2013; NHIC 2013, Normington 2013	Permanent or semi-permanent fresh water; marshes, swamps or bogs; rivers and streams with soft muddybanks or bottoms. The species often uses soft soil or clean dry sand on south-facing slopes for nest sites and may nest at some distance from water.	No	No
Emydoidea blandingii	Blanding's Turtle (Great Lakes/St Lawrence population)	S3	T	THR	Schedule 1	Ontario Nature 2013; NHIC 2013, Normingont 2012	Shallow water marshes, bogs, ponds or swamps, or coves in larger lakes with soft muddy bottoms and aquatic vegetation; basks on logs, stumps or banks; surrounding natural habitat is important in summer as they frequently move from aquatic habitat to terrestrial habitats; hibernates in bogs; not readily observed.	No	No

Lampropeltis t. triangulum	Eastern Milksnake	S3	SC	SC	Schedule 1	Ontario Nature 2013; NHIC 2013, Normington 2013	Farmlands, meadows, hardwood or aspen stands; pine forest with brushy or woody cover; river bottoms or bog woods; hides under logs, stones, or boards or in outbuildings; often uses communal nest sites.	No (hibernacula)	No
Thamnophis sauritus septentrionalis	Eastern Ribbonsnake (Great Lakes population)	S3	SC	SC	Schedule 1	Ontario Nature 2013; NHIC 2013, Normington 2013	Sunny grassy areas with low dense vegetation near bodies of shallow permanent quiet water; wet meadows grassy marshes or sphagnum bogs; borders of ponds, lakes or streams; hibernates in groups	No	No
Ambystoma jeffersonianum	Jefferson Salamander	S2	E	THR	Schedule 1	Normington 2013	Damp shady deciduous forest, swamps, moist pasture, lakeshores; temporary woodland pools for breeding; hides under leaf litter, stones or in decomposing logs	No	No
Pseudacris triseriata	Western Chorus Frog	S3	T	NAR	Schedule 1	Ontario Nature 2013; NHIC 2013	Roadside ditches or temporary ponds in fields; swamps or wet meadows; woodland or open country with cover and moisture; small ponds and temporary pools ponds and temporary pools	No	No

[1]OMNR 2013, [2]COSEWIC 2012, [3]OMNR 2012b, [4]OMNR 2000, [5]Layberry et al. 1998, [6]COSEWIC 2003 ,[7]COSEWIC 2010

Legend

S1- Critically Imperiled
S2- Imperiled
S3- Vulnerable
S4- Apparently Secure

E/END- Endangered
T/THR- Threatened
SC- Special Concern
NAR- Not at Risk

Table 5. Mammal Species at Risk and Species of Conservation Concern observed within the subject property or known from the subject property vicinity

Scientific Name	Common Name	SRANK[1]	COSEWIC[2]	COSSARO[3]	SARA	Background Source	Habitat Preference[4,5,6,7]	Suitable Habitat within Subject Property	NRSI Observed
Myotis lucifugus	Little Brown Myotis	S5	E	END		Normington 2013	Uses caves, quarries, tunnels, hollow trees or buildings for roosting; winters in humid caves; maternity sites in dark warm areas such as attics and barns; feeds primarily in wetlands, forest edges.	No	No
Myotis septentrionalis	Northern Myotis	S3?	E	END		Normington 2013	Hibernates during winter in mines or caves; roosts in houses, manmade structures but prefers hollow trees or under loose bark.	No	No
Myotis leibii	Eastern Small-footed Bat	S2S3		END		Dobbyn 1994	Roosts in caves, mine shafts, crevices, or buildings that are in or near woodland; hibernates in cold dry caves or mines; maternity colonies in caves or buildings; hunts in forests.	No	No

[1]OMNR 2013, [2]COSEWIC 2012, [3]OMNR 2012b, [4]OMNR 2000, [5]Layberry et al. 1998, [6]COSEWIC 2003 ,[7]COSEWIC 2010

Legend

S1- Critically Imperiled	E/END- Endangered
S2- Imperiled	T/THR- Threatened
S3- Vulnerable	SC- Special Concern
S4- Apparently Secure	NAR- Not at Risk

4.3.2.4 Butterflies and Odonata

A total of 64 butterfly species is known to occur within the vicinity of the study area (Layberry *et al.* 1998). NRSI biologists observed 12 butterfly species within the adjacent Cityview Drive property, including the monarch (*Danaus plexippus*), a SCC. However, none of these species were identified within the subject property or identified as occurring in areas within 120m of the subject property. A complete list of butterflies known from the study area and their current status rankings can be seen in Appendix XIII.

Four dragonfly species were identified within the Cityview Drive property, including the ebony jewelwing (*Calopteryx maculata*), lance-tipped darner (*Aeshna constricta*), Halloween pennant (*Celithemis eponina*), and widow skimmer (*Libellula luctuosa*). All of these species are common in Ontario, although the Halloween pennant is considered a regionally significant species (Dougan & Associates 2009). However, none of these species were identified within the subject property or identified as occurring in areas within 120m of the subject property. A complete list of odonates (dragonflies and damselflies) known from the study area and their current status rankings can be seen in Appendix XIII.

4.4 Aquatic Environment

As described in Section 4.1, a stormwater management swale has been constructed that enters the west side of the triangular northwest parcel, turns southeast at the north corner of the subject property, and runs southeasterly adjacent to the west property boundary. Within the triangular parcel the naturally vegetated swale ranges up to approximately 7m in width and is contained within constructed earthen berms. The swale banks are reinforced with gabion baskets where it bends around the north corner of the property, turning southeast. Downstream of the gabion banks, the swale widens to approximately 7-10m where it occurs alongside a low (approximately 1m) earth berm along its southern side. The swale acts as a settling area during periods of increased precipitation. It was observed to be dry during all site visits except on the October 31, 2013 site visit, when small pools of standing water were observed where the swale occurs within the triangular northwest parcel. The swale feature was determined to provide neither direct nor indirect fish habitat.

5.0 Significance and Sensitivity of Natural Features

Findings of the background review and field surveys were utilized to assess the presence of any provincially or locally significant natural heritage features within the study area. A summary of the results of this assessment is discussed in Sections 5.1 through 5.4.

5.1 Clythe Creek Provincially Significant Wetland/Guelph OP Core Greenlands/OPA 42 Significant Natural Area

As discussed in Sections 1.2 and 4.2, a portion of the Cythe Creek PSW complex occurs west of the subject property, in the adjacent Cityview Drive property (Figure 1). This wetland has also been designated as Core Greenland within the current City of Guelph Official Plan (City of Guelph 2012b), and has been mapped as a Significant Natural Area under OPA 42 (City of Guelph 2012a). Adjacent lands to the PSW (defined as 120m (City of Guelph 2012a,b)) extend onto the subject property. See Section 2.0 for constraints to development within PSWs, City of Guelph Core Greenlands, Significant Natural Areas under OPA 42 (under appeal) and their adjacent lands.

5.2 Cultural Woodland/OPA 42 Natural Area

The discussion of woodlands in this section is in reference to the wooded area west of but within 120m of the subject property boundary and excludes portions that have been designated as PSW and Significant Natural Area under OPA 42. Cultural woodland that occurs west of the subject property does not exist immediately adjacent to the west subject property boundary. The row of mature trees along the west subject property boundary is therefore not considered to be a woodland edge.

Under the existing City of Guelph Official Plan, the woodlands that occur west of the subject property are not designated as Significant Woodlands (City of Guelph 2012b). The woodlands also do not meet the criteria of Significant Woodlands under OPA 42 (under appeal) as they can be largely characterized as ‘cultural’ with a high proportion of non-native, invasive tree and shrub species such as common buckthorn dominating the canopy, sub-canopy, and understory. The large proportion of common buckthorn, as well as occasional Manitoba maple, scotch pine, tartarian honeysuckle, common crabapple and a variety of cold season grasses and non-native forbs indicates a high level of disturbance historically. Given the number of successional

species and non-native invasive species present, and the relatively low number of mature trees found within this area, it is quite likely that the existing feature has regenerated from an abandoned agricultural field or pasture. OPA 42 defines 'cultural woodlands' as the following:

> "*a woodland with tree cover between 35% and 60% originating from, or maintained by, anthropogenic influences and culturally based disturbances (e.g., planting or agriculture, clearing, recreation, grazing or mowing); often having a large proportion of introduced (i.e., non-native) species (as per the Ecological Land Classification System for southern Ontario) and with shrubs, grasses, and/or herbaceous ground cover. These may be second or third growth woodlands that occur on land that has been significantly altered by human disturbance where the original forest was completely or mostly removed at various points in time (e.g., from agriculture, grazing, gravel extraction) and may include a small proportion of planted trees but has undergone natural succession to the point where tree cover is between 35% and 60%, with grass and herbaceous ground covers, and possibly shrubs as well.* "

5.3 Significant Wildlife Habitat

One candidate SWH type, Snake Hibernacula, was identified for the subject property Snakes overwinter individually or communally within specialized subterranean environments that are returned to across multiple years. Snake hibernacula are situated below the frost line and must feature sufficient moisture to avoid desiccation. Snake hibernacula are commonly associated with old crumbling building foundations and stone walls. They may also make use of animal burrows.

No potential snake hibernaculum features were observed within the subject property following field investigations.

Red-headed woodpeckers are known to use habitats that include open, deciduous woodlands with little understory, field with scattered large trees, wooded swamps, and small woodlots and forest edges. They typically require at least 4ha of habitat (OMNR 2000). Further, common nighthawk habitat includes open ground and open woodlands (OMNR 2000). However, neither of these species was observed during breeding bird surveys completed for the Cityview Drive property, as well as during other site visits made to the subject property. These species were therefore considered not present within the study area.

No other SWH types were confirmed to be present within the subject property. See Appendix IV for the complete SWH screening tables for seasonal concentration areas, rare vegetation communities, specialized wildlife habitat, habitat for species of conservation concern, and animal movement corridors.

6.0 Opportunities and Constraints Analysis

As discussed in Section 2.0, development setbacks from PSW boundaries are required as per the PPS (OMMAH 2005), GRCA Wetland Policy (GRCA 2003) and City of Guelph OP (City of Guelph 2012b) and OPA 42 (City of Guelph 2012a) (currently under appeal). Naturally vegetated buffers are required for natural heritage features such as wetlands to protect their form and ecological function, as well as to mitigate against negative effects from a proposed development.

Typically, a 30m buffer beyond the boundary of a PSW is recommended by the GRCA (GRCA 2003), and 30m has been listed as a minimum buffer width from a PSW in OPA 42 (currently under appeal), with exceptions for stormwater management infrastructure as described in Section 6.1.5.3.3 (City of Guelph 2012a). A 30m buffer would extend onto the subject property as shown on Figure 2. Accordingly, the site concept has been designed such that all impervious surfaces (e.g., buildings, driveways) occur entirely outside of lands within 30m of the confirmed PSW boundary, although site grading, placement of SWM systems, and pervious amenity space would occur within this area as described in Section 7.0 (see Figure 3).

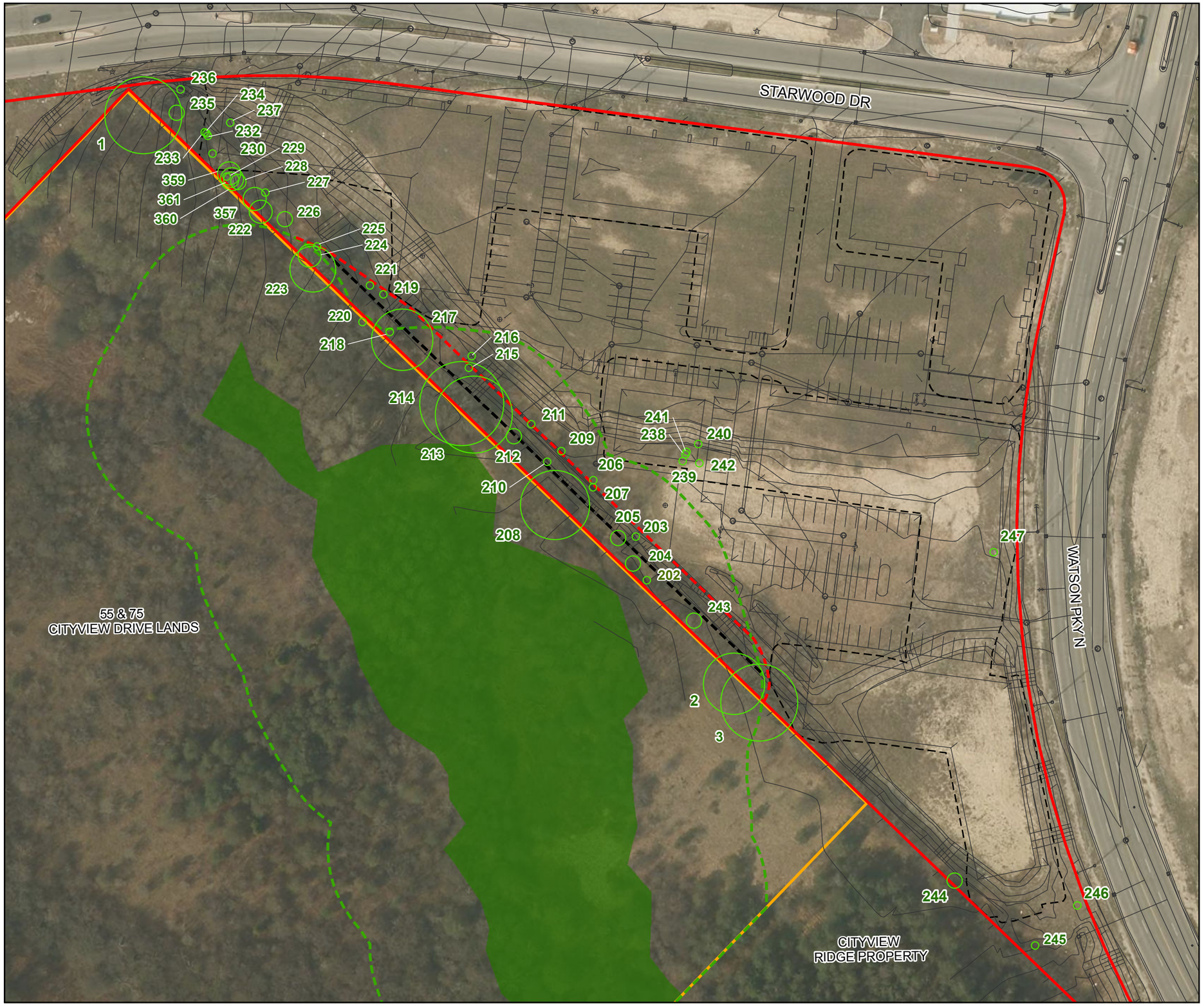
The 30m setback of structures and impervious surfaces on the subject property is based on recognition that maintenance of areas surrounding the wetland feature within this zone as open, pervious surface areas limits impacts associated with land developments. Typically, retention of this surrounding 30m zone may also maintain important wetland functions, including but not limited to hydrological inputs, water quality improvement (e.g., through surface, subsurface sediment filtration), and as wildlife habitat. As benefits to wildlife, 30m upland surrounding areas may provide terrestrial habitat for wetland-breeding amphibians, bird breeding habitat, or wildlife movement corridors.

However, within the subject property, this 30m zone from the surveyed PSW boundaries has been highly disturbed and modified through previous human activity. As described in Section 4.1, construction of the berm and historical fill removal that has resulted in lower elevations elsewhere along the subject property side of the property boundary acting as a swale prevents overland flow between the subject property and the PSW. These lands therefore do not provide surface water input or water quality improvement functions for the wetland. As described further in Section 7.4.2, the only potential groundwater inputs from the subject

Figure 3

Watson-Starwood EIS

Proposed Development



Legend

- Subject Property
- 55 & 75 Citview Lands
- Tree (scaled to crown)
- Development
- Excavation Limit
- Development Limit (10m)
- Grading Limit (5m)
- Limit of Lands within 30m of PSW Boundary
- Provincially Significant Wetland (PSW) & OPA 42 - Significant Natural Area

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Project: 1367 Date: May 9, 2014	NAD83 - UTM Zone 17 Size: 11x17" **1:1,000**

0 20 40 60 Metres

N

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property toward the PSW originate from the dug swale along the west property boundary on a seasonal (spring-time) basis. As a result, the vast majority of lands within the 30m zone do not contribute groundwater input functions for the wetland.

Currently, within the 30m zone, habitat potential is marginal and limited to the row of mature property boundary trees and adjacent narrow band of young, regenerating trees. The majority of this zone has been cleared of natural vegetation through previous fill removal and placement. As described in Section 4.3.2.1, the existing row of trees may provide bird nesting habitat; however, much higher quality bird breeding habitat is located within the adjacent Cityview Drive and Cityview Ridge properties. Due to the historical disturbances, lack of woodland cover, and the modified topography (e.g., berm), the 30m zone within the subject property does not provide suitable terrestrial amphibian habitat to benefit potential wetland breeding activity within the PSW. This area also does not provide potential as a wildlife movement corridor due to the paucity of natural vegetation cover and the presence of more suitable habitat within the adjacent Cityview Drive and Cityview Ridge properties.

Despite the limited capacity of the subject property 30m zone to support the function of the adjacent PSW, a 30m setback for placement of apartment buildings and associated impervious surfaces (e.g., parking lots) has been proposed to spatially separate and mitigate disturbances to the PSW from the proposed development. Moreover, the proposed development will result in the establishment of active amenity space that includes sodded groundcover and increased tree density with planting of native species (see Section 7.0) which will collectively improve the capacity of the 30m zone to support adjacent PSW function through enhanced habitat and ecology..

A common practice is that retained trees be buffered by at least the tree dripline to provide those trees adequate rooting zones to survive and maintain their structural integrity. NRSI biologists delineated the dripline of the large property-shared bur oaks that run along the west subject property boundary and this dripline was reviewed and confirmed in the field by City of Guelph staff. A 10m area along the west property boundary was found to capture the outer limit of the confirmed dripline. This line generally encompasses the tree dripline, and has been mapped as the Development Limit (Figure 2). However, as outlined below, tree roots in this area do not extend to the dripline due to site conditions. Structures, internal roads/driveways or other impervious surfaces should be excluded from within this 10m setback from the property

boundary. Additionally, it is recommended that lands within this Development Limit setback be restored as described in Section 7.6.

The existing berm functions to prevent surface hydrological connections between the main (large) parcel of the subject property and the PSW. As described in Section 4.3, the PSW is fed directly by surface water runoff originating from the Cityview Drive property (Anderson GeoLogic Ltd. 2013).

It is recommended that this berm be retained as shown within the Grading Plan (Figure 3) in order to maintain the surface hydrological separation between the subject property and the adjacent PSW. In doing so, site grading would occur up to the berm, while maintaining the lip of the berm above the surrounding grade. Stormwater runoff will therefore be contained within the subject property, as it is currently, by means of a bioswale and discharged to the adjacent municipal stormwater pond across Watson Blvd. N (a limited amount of stormwater drainage will sheet flow across flat-graded, grassed areas toward the PSW as a result of proposed site grading at the north and south ends of the property as discussed further in Section 7.4.2). Accordingly, a linear setback, parallel to and 5m from the west subject property boundary, was defined to capture land from the top of the berm to the property boundary. This setback would be considered the Grading Limit as shown on Figure 2. This 5m buffer should be left naturalized. Lands within the 5m Grading Limit should be considered no-touch during and post-construction, with the exception of the recommended native species restorations.

Subject property lands within 30m of the PSW boundary are currently highly disturbed due to historic topsoil removal and fill placement. A consequence of this topsoil removal is that the roots of the mature row of trees along the west property boundary do not extend to their east-facing driplines where a swale was historically cut. Existence of the berm, and maintenance of this function within the proposed development plan, contains surface drainage to within the subject property, thereby not significantly influencing the hydrologic balance of the adjacent PSW. Any minor, seasonal groundwater influences on the PSW water balance originate within the dug swale located within the 10m zone from the subject property boundary. For these reasons, a 10m Development Limit is considered a suitable setback to buffer the PSW from the proposed development, within which will be a 5m Grading Limit to protect berm functionality and allow continued natural regeneration. Further, subject property lands within 30m of the PSW

boundary, outside of the 10m Development Limit, will be designed as pervious property amenity space representing an enhancement over current ecological conditions.

See Figure 4 for a conceptual cross-section drawing showing the proposed 5m, and 10m setbacks from the subject property boundary, and the 30m impervious surface setback from the off-site PSW boundary. Figure 4 also shows proposed grading to maintain functionality of the existing swale and berm. The cross-section is based on the location of the cross-section line illustrated on Figure 3.

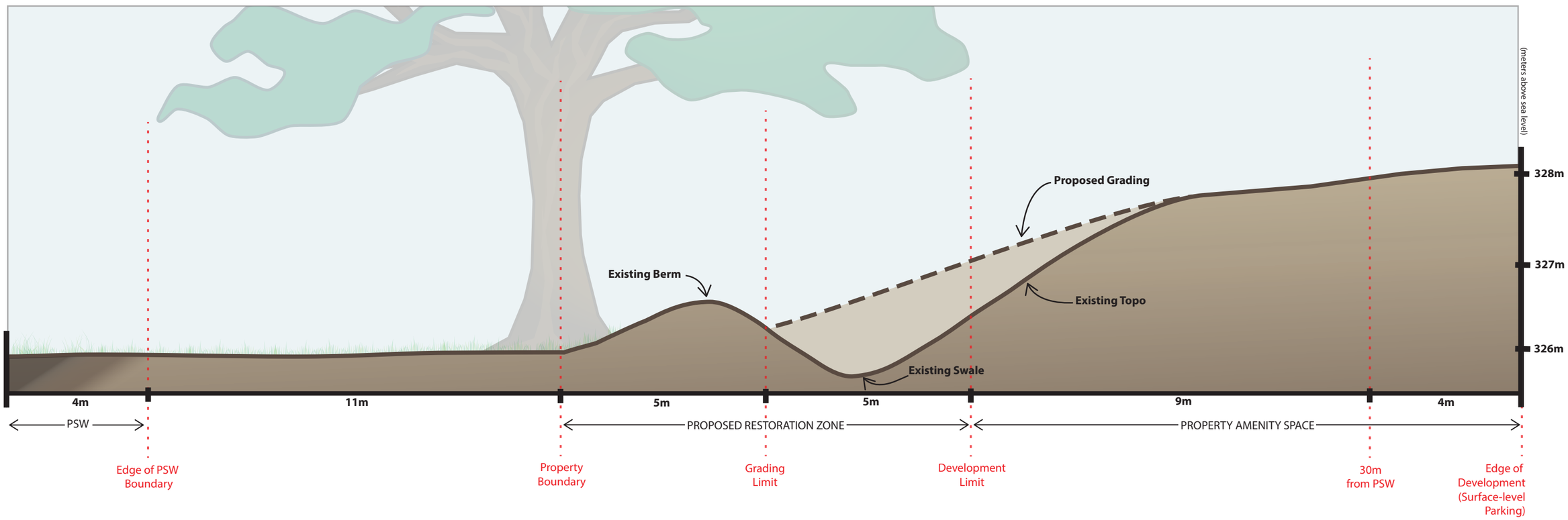
The site grading plan for the adjacent Cityview Drive property requires the removal of all inventoried trees that occur just south of the triangular northwest parcel. The details of the proposed tree removal are described in the Tree Protection Plan appended to the draft Cityview Drive EIS (NRSI 2013, Appendix IV). The woody species to be removed are primarily non-native, invasive common buckthorn and fast-growing, disturbance tolerant species such as Manitoba maple and trembling aspen. These species are located within a community described as Buckthorn Deciduous Shrub Thicket (THDM2-6; see Figure 2). Consequently, no natural feature constraints occur within or adjacent to the north property triangular parcel.

Opportunity for development lies within the remaining open and disturbed areas of the subject property so as to limit or avoid potential impacts to natural heritage features, habitats and species and ultimately enhance the area with redevelopment as amenity space.

Figure 4

Watson-Starwood EIS

Conceptual Cross-Section of Proposed Development Setbacks



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7.0 Impact Analysis and Recommendations

7.1 Description of the Proposed Undertaking

The client proposes to develop the subject property to accommodate four residential condominium buildings, one retirement residence, and one common amenity building, with associated below-ground and surface parking areas, driveways and parking access ramps, and landscaped areas including gardens and open amenity space (see Functional Servicing Report (Gamsby and Mannerow 2014a), Hydrogeology Study Report (Gamsby and Mannerow 2014b), Grading Plan (Appendix XIV)).

The condominium buildings will front onto Starwood Drive and Watson Parkway North. Four of the five condominium buildings will be four storeys high, while one (proposed Building E (the retirement residence)) will be six to eight storeys high. The condominium buildings will collectively contain 300 units, while the retirement residence will contain 105 units. All condominium/residence buildings will contain below-ground parking garages with access ramps at ground level. A total of 453 parking spaces will be provided across surface and below-ground parking areas. Gardens will be situated variously throughout the subject property, but predominantly along the west end of the property between Buildings A and C.

Four single-detached residential lots are proposed for development within the triangular northwest parcel, fronting Starwood Drive (see Appendix XIV). The lot fabric for these proposed residential lots is currently shared between the subject property and the adjacent Cityview Drive property.

Details on the proposed stormwater management facility for the proposed residential lot development can be found within the Functional Servicing Report (Gamsby and Mannerow 2014a) in Appendix I.

7.2 Approach to Impact Analysis

Potential impacts arising from the proposed undertaking were determined by comparing the details of the proposed undertaking with the characteristics of the existing natural features and their functions. The following is a description of the types of impacts that are discussed.

- Direct impacts to the natural features on the subject lands associated with disruption or displacement caused by the actual proposed 'footprint' of the undertaking.
- Indirect impacts associated with changes in site conditions such as drainage and water quantity/quality.
- Induced impacts associated with impacts after the development is constructed such as subsequent demand on the resources created by increased habitation/use of the area and vicinity.
- Cumulative impacts associated with the spatial and temporal implications of this proposal in conjunction with other undertakings in the area.

7.3 Direct Impacts and Mitigations

7.3.1 Site Grading and Vegetation Removal

The approach to identifying and delineating the natural features and appropriate buffers was aimed at avoiding direct impacts from development on important natural features. Within the subject property, the locations and driplines of trees along the west property boundary were mapped and delineated. Although located on the adjacent Cityview Drive property, the PSW was delineated by NRSI (as part of the EIS for that property), thus identifying the extent of the 30m development setback within the subject property. The delineation of these natural features and appropriate buffers/setbacks (Figure 2) have informed the development layout; therefore, direct impacts to these natural features have been avoided. Figure 3 presents the proposed development layout overlaid onto the existing natural features and appropriate buffers/setbacks. A digital drawing of the proposed residential lot layout for the triangular northwest parcel was not available for mapping purposes at the time of report preparation and is therefore not shown on Figure 3.

Direct impacts to existing vegetation communities and species are expected to be insignificant as the proposed development footprint is located within lands that are heavily disturbed (e.g., through historic topsoil removal and fill deposition) and thus dominated by common, non-native species (e.g., yellow rocket (*Barbarea vulgaris*) and thistles (*Cirsium* spp.)). The proposed development will entirely replace the existing disturbed lands and represents an enhancement over current conditions. The row of mature trees along the west property boundary (Figure 2) will be retained. As described in Section 6.0, it is recommended that a development setback of

10m from and paralleling a portion of the west property boundary (Figure 2) be established, which generally encompasses the driplines of trees to be retained. This development setback, within which buildings and other impervious surfaces should be excluded, will effectively maintain the health and integrity of the retained trees from the proposed development.

Lands within 30m of the PSW boundary are shown on Figure 2. As shown on Figure 3, the proposed development will encroach into lands within 30m of the PSW boundary. However, the development has been planned such that all impervious surfaces are located outside of this 30m zone, and such that lands within the 30m zone, outside of the 10m development setback, are pervious-surface property amenity space, consisting of sodded grounds, gardens, and gravel walking paths. As described in Section 6.0, the proposed conversion of this land to property amenity space will not impact the functional capacity of the adjacent PSW due to the existing disturbed state of these lands, its sparsity of natural features, and its surface hydrological disconnect with the PSW. This represents an ecological enhancement to the 30m zone, as described herein.

As shown on Figure 3 and the site grading plan (Appendix XIV), the existing berm will be retained. A naturalized drainage swale at the foot of the berm will also be maintained and/or enhanced to continue to collect and convey water for discharge to the existing SWM pond across Watson Pkwy N. The height and configuration of a section of the berm will be modified, as shown on the grading plan, to properly accommodate the swale at that location.

Where the berm exists parallel to the west property boundary, site grading will occur up to but short of the lip of the berm in order to maintain the topographical rise needed to prevent overland stormwater discharge to the adjacent PSW. In all cases, grading will not extend past the Grading Limit as shown on Figure 3. No vegetation removal will occur beyond the grading limit to the property boundary other than as recommended to enhance the ecological quality of the feature as described in Section 7.7. Although the property is to be developed in phases across multiple years, it is recommended that the entirety of berm grading occur at one time to ensure that berm functionality to inhibit surface water drainage to the adjacent property be maintained across years of site development.

Where the berm does not currently exist at the north and south ends of the west property boundary, and outside of lands within 30m of the PSW boundary, grading will occur up to the

property boundary in order to optimize the site grades for the proposed land use. Grading at these locations will require the removal of 20 inventoried trees (excluding trees to be removed due to poor condition and/or high hazard state) and various shrubs that occur along and adjacent to the west subject property boundary. See the Tree Protection Plan for more details about proposed tree removals and retention as a result of the proposed development (Appendix VI). No shared-property trees, which straddle the subject property boundary, will be removed without the consent of the neighbouring property owner. Shared-property trees are identified on Figure 2.

Land will be graded and removed of vegetation within the Development Limit (10m from property boundary) up to a maximum of the Grading Limit (5m from property boundary). Vegetation to be removed in this zone will include regenerating young trees and shrubs, as well as 13 inventoried trees as shown in the Tree Protection Plan (7 of which will be removed due to poor condition/hazard state). Grading will therefore occur within the driplines of hedgerow trees to be retained along the property boundary. However, because a swale was cut several years ago, which exists within the 10m Development Limit, the roots of these trees do not extend to the driplines along their east-facing sides. Therefore, no impact to these trees is anticipated as a result of site grading past the 10m Development Limit, provided that no grading extends past the 5m Grading Limit and other protective measures are followed as detailed in the Tree Protection Plan. It is recommended that land west of the 10m Development Limit be restored with native vegetation plantings, as described in Section 7.7, to enhance the value of this area.

As shown on Figure 3, the development plan shows an underground parking garage ramp to Building C occurring in close proximity to the southeast end of the Development Limit where it extends around the dripline of the southernmost large tree to be retained (Tree # 2 (bur oak)). However, as described above, the roots of this tree do not extend to the dripline where the swale is located. Therefore, construction of the underground parking garage ramp at this location is not anticipated to impact the adjacent retained tree provided that protective measures are implemented as described in the Tree Protection Plan.

Additional areas of land will be excavated, beyond the building footprints themselves, for construction of the buildings including underground structures (e.g., parking areas), as shown on Figure 3. None of the excavation areas encroach into the 10m Development Limit or the 5m Grading Limit, with only a very small encroachment into the 30m setback from the PSW

anticipated near the proposed Building F (Figure 3). As such, excavation required for on-site construction is not anticipated to negatively impact existing natural features within development setbacks. No excavation or other site works will occur outside of the defined property boundaries.

The vegetation species to be removed within the subject property are all species common to the surrounding landscape, including non-native species such as common buckthorn and glossy buckthorn. No significant species are to be removed within the subject property.

Twenty of the inventoried trees are anticipated to be removed based on the extent of the proposed site grading and/or excavation for construction of underground structures. Of these trees, all are in fair to good condition with medium to low risk of structural failure. All are <5cm dbh (except one 19cm dbh willow), and most are close to the 10cm dbh size. Many are located on fill that has been deposited on-site and consist of pioneer tree species. Half (10) are non-native willows, the remainder are aspen. No off-property trees will be affected.

It is assumed that the triangular northwest parcel will be entirely graded for development. As with the main subject property parcel, the small triangular parcel has been heavily disturbed due to the historic removal of topsoil and placement of fill. Consequently, no significant natural features will be directly impacted by the proposed development at this location. As described in Section 6.0, the existing buckthorn-dominated shrub thicket on the adjacent Cityview Drive property is to be removed according to the site grading plan for that property (NRSI 2013). The proposed development will require the removal of five inventoried trees within the north property triangular parcel, as well as a relatively small number of regenerating young trees and shrubs.

As discussed in Section 6.2 of the Tree Protection Plan (Appendix VI), City of Guelph Tree By-law Number (2010)-19058 requires that native or non-native trees in fair to good condition must be replaced at a compensation ratio of 3:1. A list of trees exempt from compensation is provided in the same section of the Tree Protection Plan. Twenty-eight native/non-native trees that are in fair to good condition will require removal due to the proposed grading and/or excavation for the underground parking (this does not include Trees # 1778, #236, #950 or #1798 that will require removal due to the neighbouring Cityview Drive development). Permission from the adjacent Cityview Drive property landowner will be required as these trees are shared. Application of the 3:1 ratio used by the City requires that 84 compensation tree

plantings would be required. Naturalization of the lands within the 10m Development Limit to the west property boundary, as discussed in Section 7.6, will provide ample space for these 84 compensation tree plantings, and it is therefore recommended that most of the compensation tree plantings be established within this development setback zone. It is also recommended that some of these compensation tree plantings be established within the property amenity space, in conjunction with native shrub and herbaceous plantings in this area, to enhance its ecological value (e.g., as bird nesting habitat) and its aesthetic appeal to condominium residents. These compensation plantings, which will actively restore the ecological value of the 10m development setback zone, do not include the additional native tree plantings that will be established as part of the landscaping requirements for the condominium development.

7.3.2 Impacts to Wildlife and Their Habitats

As the current condition of the property provides relatively little ecological value, removal of existing vegetation as planned (e.g., see Tree Protection Plan) is not expected to cause any significant impact to local wildlife populations or to the ecological functions collectively provided by the natural features on the local landscape. The final landscape plan will be an enhancement to the area.

Vegetation clearing should occur outside the bird nesting season (May 1-July 31) so as to avoid disruption to nesting activities of birds in the vicinity, and to avoid destruction of active nests. The destruction of migratory birds and their nests is prohibited under the federal *Migratory Birds Convention Act*, 1994. If vegetation clearing cannot be avoided during the bird breeding season, a qualified avian biologist must be retained to carry out a nest search ahead of clearing activities.

7.4 Indirect Impacts and Mitigations

Construction-phase activities of the proposed development have potential to cause indirect impacts on the surrounding terrestrial natural features and functions, if not mitigated appropriately. Recommended mitigation measures are provided for each potential impact.

7.4.1 Disturbance to Protected Natural Features and Wildlife Habitats

Vegetation clearing, grading, and other construction activities have the potential to inadvertently destroy, damage and degrade the edges of adjacent protected natural features unless the

boundaries of these features are clearly marked. For example, construction activities can cause scarring and decreased health of adjacent trees whose branches or root systems have been damaged by machinery or affected by construction-related dust and sedimentation. Damage to trees and other vegetation can also be caused by the compaction of soils within tree rooting zones along woodland edges.

Direct damage and indirect disturbances can cause stresses on the natural features that weaken their ecological integrity. In these states, natural features are more prone to establishment and proliferation of invasive, non-native species such as common buckthorn. Proliferation of invasive, non-native species within natural communities decreases their ecological value such as by suppressing native species, diminishing biodiversity and reducing habitat suitability.

As a general means to limit ecological impacts during construction, efforts should be made to clearly demarcate the limits of development, including vegetation cutting and grading boundaries, so as to prevent unnecessary encroachment into the surrounding natural features. These boundaries should be clearly marked using either bright-coloured snow fencing, or silt fencing erected for the purposes of on-site stormwater runoff control. A design plan should be selected that minimizes clearing of natural features to the extent possible.

The Grading Limit should be clearly marked using snow fencing and silt fencing to ensure no inadvertent encroachments into or disturbances to the adjacent vegetation. The 5m Grading Limit zone to the property boundary is considered to be a no-touch area during all construction operations. Where no Grading Limit has been defined adjacent to the west property boundary, the property boundary itself should be similarly delineated with silt fencing to ensure no encroachment or erosion and sedimentation impacts to the natural features on the adjacent properties.

Protection measures for retained trees should be followed as recommended in the Tree Protection Plan. In order to achieve grading within the 5 to 10m zone, the tree protection fencing (and associated silt fencing) is recommended to be installed at the 5m Grading Limit line. Although this is within the dripline, there will be no disruption of root zones nor overhead branches. Once this grading is completed, the area should be reviewed by an arborist and the feasibility and effectiveness of moving the fence out to the 10m line should be determined

(construction sequencing has not been detailed at the time of preparing this report, as such final grading may occur later in the construction sequence making the fence relocation less effective).

All vehicle access and parking, equipment and materials storage, and fill stockpiling, should occur outside of both the 5m Grading Limit and 10m Development Limit during construction with the exception of activities necessary for site grading within the 5-10m setback zone and excavation. Grading activities within the 5-10m setback zone should be planned such that disturbances to this zone are minimized to the extent possible (e.g., completing all site grading within this zone at once, if feasible, rather than requiring multiple entries into this zone across the construction period).

Increased disturbance caused by excessive noise, dust, vibrations, artificial night-time lighting, and proximity of human presence during construction may cause certain wildlife species to abandon or avoid the area for travel, nesting, roosting or foraging. However, these impacts are anticipated to be minimal, localized, and temporary, and it is expected that displaced wildlife species will return to the vicinity of the subject property following construction.

Excessive noise caused by site preparation and construction activities may cause wildlife to temporarily avoid the area. These noise impacts can be mitigated by restricting the daily timing of construction activities to between 7:00 am and 7:00 pm.

Any lighting equipment associated with construction activities should be turned off following cessation of daily construction activities, or at least turned away from the adjacent natural features so as to prevent ‘lightwash’ of these areas.

Impacts due to dust should be mitigated for by moistening areas of bare, dry soil with water as needed during construction activities to reduce the amount of dust produced.

7.4.2 Changes to Hydrologic Regime

Changes to the hydrologic regime to areas within and surrounding the subject property, such as through increases or decreases in the quantity of groundwater and/or surface water inputs to natural features, can cause stress and die-back of vegetation adapted to the current hydrologic regime. Over long-term periods this can lead to changes in ecological community composition.

As described in Section 4.3 and 4.4, the hydrologic regime of the subject property does not influence the PSW and surrounding natural features on the adjacent properties. The PSW was observed to be fed directly by surface water runoff derived from areas west and northwest of the wetland, with no apparent upwelling or discharge to the wetland (Anderson GeoLogic 2013). Minor, intermittent groundwater flow from the western end of the subject property (see Section 4.1) therefore does not influence the hydrological regime of the PSW. Furthermore, existence of the berm currently prevents overland flow of surface water from the subject property to the PSW, and retention of this feature as part of this development will ensure continuation of this function. Therefore, the PSW is not believed to be directly influenced by surface water or groundwater flow from the subject property. Consequently, no hydrological impacts to the PSW or surrounding woodlands west of the subject property are anticipated due to the proposed development (Gamsby and Mannerow 2014b).

Following a vulnerability assessment and review of potential Drinking Water Threats given the site's location within a WHPA-B zone, it was determined that the proposed development does not create any Significant Threats to municipal wells (Gamsby and Mannerow 2014b).

Due to the continued presence of overburden soils post-development, providing a level of protection to groundwater resources, and because of the relatively limited size of the subject property, no impacts to the local groundwater system are anticipated as a result of the proposed development (Gamsby and Mannerow 2014b).

The proposed development is expected to result in a decrease in recharge of 17% and an increase in run-off of 27% (see Gamsby and Mannerow (2014b) for additional details). However, the existing SWM pond, which on-site surface run-off is directed to, has been designed to allow infiltration and overflow to Clythe Creek. Further, stormwater directed toward the SWM pond is susceptible to infiltration and/or overflow to Clythe Creek. The combined recharge and run-off from the subject property will continue to be captured within the same local area and the same watershed. Therefore, stormwater flow to the SWM pond is expected to maintain the overall water balance within the Clythe Creek subwatershed (Gamsby and Mannerow 2014b).

As described in Gamsby and Mannerow (2014b), studies have identified the presence of buried bedrock valleys in the general vicinity of the subject property. However, studies completed by Gamsby and Mannerow showed no evidence that the shallow groundwater system at the subject property is affected by the presence of a buried valley in the subject property vicinity, or from paleo-karst features that may exist within the bedrock system. The shallow groundwater system in the overburden soils is believed to provide a level of separation from these features. These findings are further detailed in Gamsby and Mannerow (2014b).

Field investigations completed by Gamsby and Mannerow did not yield evidence of direct surface water connections between the north end of the subject property and the PSW. Further, no evident surface water channels were observed entering the north end of the PSW (M. Nelson, Gamsby and Mannerow, pers. comm. May 2013). Because site grading is planned to extend to the west property boundary north of the northern terminus of the berm and associated Grading Limit (see Figure 3), outside of the 30m zone from the PSW boundary, stormwater drainage from the rear half roof of Building A, including the associated gardens, is expected to sheet flow into the adjacent property and ultimately the PSW (M. Nelson, Gamsby and Mannerow, pers. comm. May 2013). However, the amount of water to be discharged at this location is expected to be relatively minimal, particularly in relation to the overall catchment area for the PSW. This hydrologic input to the PSW is therefore not anticipated to negatively affect the form or ecological functioning of the wetland or its surrounding natural features, provided that measures are installed to ensure sheet flow dispersal and avoid flow channelization. The provision of grassed/vegetated areas, with relatively flat grading, will increase the likelihood that dispersed water will be conveyed via sheet flow. Energy dissipation structures should be installed in sloped areas as required.

Although no impacts to the groundwater system are anticipated as a result of the proposed development, recommendations have been made in Gamsby and Mannerow (2014b) to mitigate potential impacts should limited de-watering be required during construction activities.

7.4.3 Water Quality Impairments

Decreases in water quality, such as through discharge of deleterious substances in stormwater runoff, can cause both acute and chronic toxicity impacts within biological communities. These impacts include increased mortality rates, impaired health conditions, decreased reproductive productivity and other reproductive impairments. Environmental contaminants are also known

to biomagnify ‘up the food chain’, where higher-level predators are particularly susceptible to impacts. Water quality impairments can also pose health risks to humans wherever there is potential to come into contact with untreated or inadequately treated water discharge.

As described in the Hydrogeological Study (Gamsby and Mannerow 2014b), an assessment was completed to evaluate potential threats to drinking water sources given the subject property’s location within an area designated as WHPA-B. Three main categories of potential drinking water threat were identified associated with the proposed development:

- Road salt application;
- Snow storage; and,
- The establishment, operation or maintenance of a system that collects, stores, transmits, treats, or disposes of sewage including:
    - Sewage system or sewage works – discharge of untreated stormwater from a stormwater retention pond); and,
    - Sewage system or sewage works – sanitary sewers and related pipes.

Road salt application was considered to be a “moderate” threat to drinking water sources. It is recommended that the proposed development maintain an impervious surface area of less than 80% to ensure the threat level does not elevate to “significant” (Gamsby and Mannerow 2014b).

The threat of snow storage run-off to drinking water sources was determined to be low to moderate for the proposed development. No significant threats were identified as snow storage areas will be less than 0.5ha (Gamsby and Mannerow 2014b).

The drinking water threat imposed by specific chemicals associated with SWM systems (e.g., aluminum, cadmium, lead) was determined to be low to moderate. No significant threats were therefore identified with respect to the proposed SWM system (Gamsby and Mannerow 2013b). This conclusion was based in part on the SWM facility being designed to discharge to land or surface water, with a drainage area of 1-10ha, and the predominant area land use being high density residential (Gamsby and Mannerow 2014b).

7.4.4 Erosion and Sedimentation

During construction, areas of bare soil will be exposed which have the potential to erode during rainfall events. In the event of a heavy rainfall, sediment-laden runoff can enter adjacent natural

areas by way of overland flow. Currently, stormwater drainage is primarily contained within the subject property due to the existing gradient toward the sediment basin and the west property berm. However, as the site is graded, particularly along the west end north and south of the retained berm, conditions may arise that would permit overland flow to adjacent properties if not sufficiently controlled.

Soil compaction also has potential to occur as a result of heavy machinery and the stockpiling of heavy materials in the area of development. Soil compaction can greatly reduce the permeability of soils and affect their ability to retain water during rain/snow melt events. This will result in an increase in surface water run-off which will ultimately increase the erosion potential and the amount of sediment being transported into adjacent natural areas and features.

In order to protect on-site and off-site natural features from potential impacts due to sediment, a Sediment and Erosion Control Plan must be implemented prior to any construction activities on the site. As described in the Functional Site Servicing Report (Gamsby and Mannerow 2013a), a Sediment and Erosion Control Plan has been developed for use during construction of the proposed development. This plan includes the following recommendations:

- Installation of silt fencing along the property boundary in all locations where runoff may discharge to adjacent lands;
- Wrapping the grates of catch basins with filter cloth, to be maintained until all building and landscaping activities have been completed;
- Inspection and maintenance of all silt fencing on a weekly basis by site staff during active construction or after a rainfall event of 13mm or greater, with maintenance to be carried out within 48 hours; and,
- Removal of silt fencing only after construction and landscaping has been substantially completed, including removal of any accumulated sediment.

Provided these recommendations are implemented, erosion and sedimentation impacts to adjacent natural features are not anticipated (Gamsby and Mannerow 2014b).

7.5 Induced Impacts and Mitigations

Induced impacts are described as those that are not directly related to the construction or operation of the facilities in question, but rather arise from the use of the natural areas as a

result of the development. Given the proposed land use as a high density residential development as well as four single-detached residential houses, the increased human proximity may present ecological stresses on the adjacent natural features if not appropriately controlled or mitigated.

Uncontrolled public access into the adjacent natural features may result in vegetation trampling and unauthorized trail creation, as well as littering, garbage deposition, and vegetation damage through vandalism. These activities can subsequently cause proliferation of non-native invasive vegetation species such as common buckthorn and garlic mustard (*Alliaria petiolata*).

As the adjacent PSW and woodlands are located on separate, privately-owned properties, permanent chain-link fencing should be installed along subject property boundary. "No Trespassing" signage should be installed at selected locations along this property boundary fencing. Native restoration plantings, to be established within the 5m and 10m setback zones from the west property boundary, should be designed using densely spaced woody species to discourage human access and use of the areas beyond the 10m Development Limit.

Altogether, these measures should substantially reduce the amount of public trespassing into the adjacent natural features from the subject property.

Increased human population in the area will also increase the potential for domestic animal (e.g. cat (*Felis catus*)) and other development-tolerant predatory mammal (e.g. raccoon) access to adjacent natural areas. Easier access provided to these animal groups may impact nesting success and direct mortality among certain small-size wildlife, such as passerine birds. Education of condominium residents with respect to the values and significance of the neighbouring natural areas is one tool that can be used, including the negative implications of permitting cats to roam outdoors near these sensitive areas. This information can be presented in the form of a Condominium Owner's Guide.

Post-construction lighting designs within the subject property have the potential to cause 'lightwash' within the adjacent natural features if lighting systems are not directional. Lightwash within adjacent natural features may cause certain species of wildlife to avoid using the area due to the disturbance that light may cause for roosting. Lighting designs will be provided at the

detailed design stage. Lighting designs should therefore include directional lighting for all areas within the residential development to eliminate lightwash.

7.6 Impacts Associated with a Pedestrian Trail

As described in the approved TOR (Appendix III), opportunity for construction of a public walking trail within the subject property is to be explored for feasibility and potential impact to adjacent natural features. A public walking trail is assumed to be 3m wide with a surface of crushed limestone screenings. In their February 6, 2013 response to the draft TOR, the City of Guelph Parks Planning and Development department provided a map showing a proposed linear trail alignment along the west subject property boundary, as shown in Appendix III. This trail would constitute a northwest-southeast connection between Starwood Drive and Watson Parkway North, and potentially link to other existing trails in the immediate vicinity. The suitability of this trail alignment was discussed in the originally submitted November 2013 EIS for the subject property and is further described below.

On March 18, 2014, the City of Guelph Parks Department forwarded a new preferred trail alignment to be considered within the EIS (see Appendix IV). The trail alignment, a majority of which features a linear northwest-southeast orientation outside of the subject property, would connect a proposed trail system on the Cityview Drive property, west of the PSW, with a proposed sidewalk-based pedestrian route along Watson Parkway North, between its north and south limits along the subject property. From its north end, this trail route traverses within the northeast boundary of the Cityview Drive property, immediately adjacent to the PSW, before crossing into the southwestern end of the subject property and connecting to Watson Parkway North along a short east-west oriented section.

As described in Section 3.1.3, this March 18, 2014 proposed trail segment was coarsely evaluated in the field to assess the potential for natural feature impacts. A revised alignment was field-mapped that would aim to minimize impacts to existing natural features by avoiding fair to good health trees, making use of existing open areas or areas dominated by common buckthorn, and maximizing spatial setbacks from the adjacent PSW. The revised alignment also includes a lateral trail segment across the subject property that connects with Watson Parkway North. This cross-property segment was situated to occur south of the southernmost proposed condominium building. It is this NRSI-mapped alignment for which impacts have been assessed, as described below. Figure 5 shows the locations of proposed trail routes within and

adjacent to the subject property.

The February 6, 2013 City-proposed trail route occurs within the 5m Grading Limit. As described in Section 6.0, the land west of the 5m Grading Limit is intended to be left for continued natural regeneration of vegetation, supplemented by plantings of native restoration species as described in Section 7.7. This zone is intended to provide a natural buffer to the PSW and woodland located on the Cityview Drive property, and following recommended restoration work, should be considered “no touch” in terms of future property use. A walking trail would require a minimum width of 3m of the existing 5m within this no-touch natural regeneration zone. Consequently, the natural functioning of this zone as a protective and enhanced buffer to the adjacent PSW would be significantly diminished. Construction of the trail in this location would also necessarily occur immediately adjacent to, and well within the driplines of the retained row of mature trees along the property boundary. Construction of the trail would therefore require removal of vegetation within the majority of the 5m Grading Limit setback, with potential for adverse impacts to the immediately adjacent mature tree row. This route would also occur within the swale along the western property boundary and would interfere with surface water drainage from the site and vice versa. Trail construction would also represent potential for indirect impacts to the PSW given its close proximity and cause security and privacy concerns for condominium owners and users of the property’s common amenity space. The City-proposed February 6, 2013 trail alignment within the subject property is therefore not recommended.

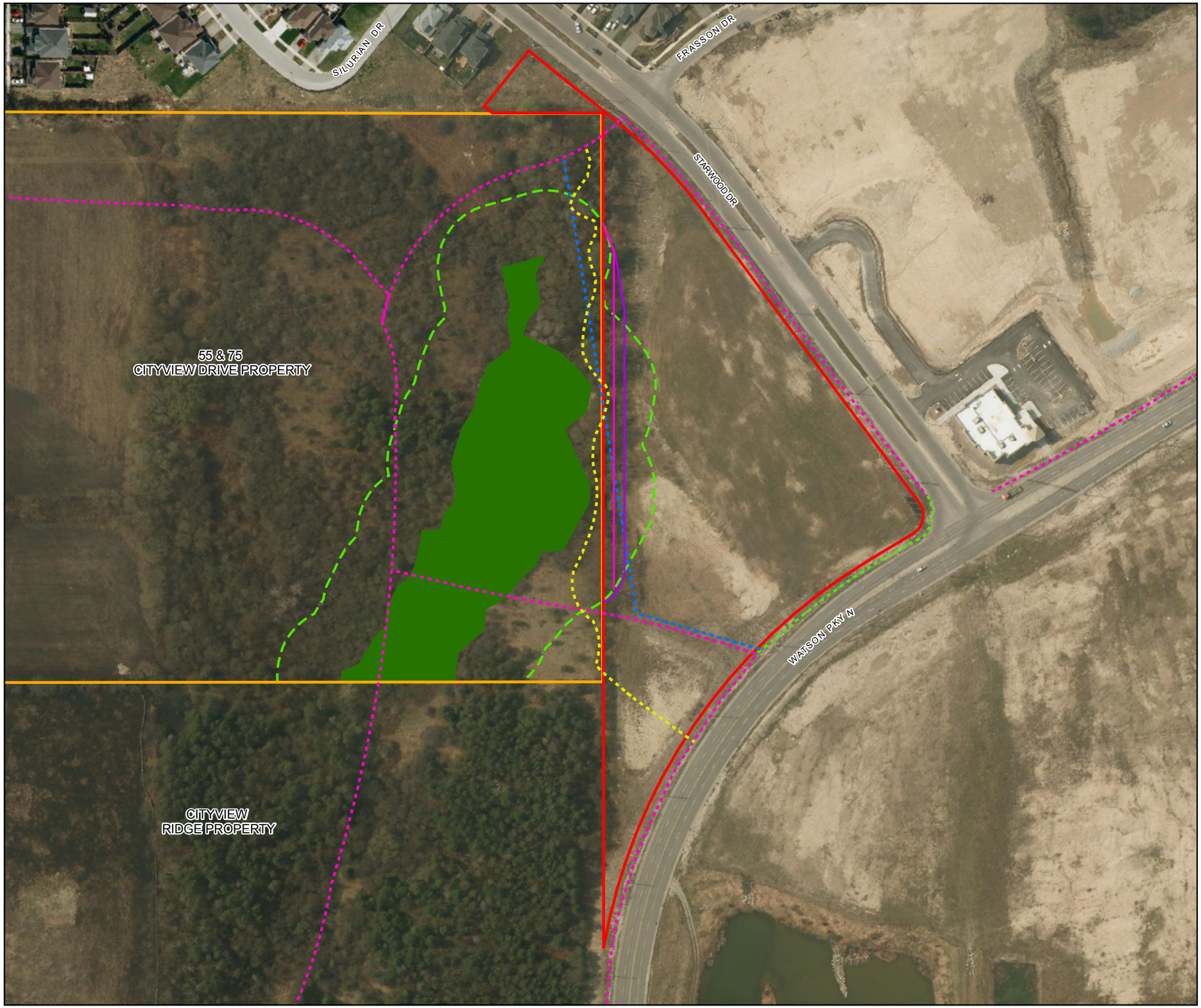

Figure 5a

Watson-Starwood EIS

Proposed Trail Alignment Alternatives

Legend

- Subject Property
- 55 & 75 Cityview Lands
- Provincially Significant Wetland (PSW) & OPA 42 - Significant Natural Area
- Provincially Significant Wetland Buffer (30m)
- Development Limit (10m)
- Development Setback (5m)
- Approximate City-Proposed Route (March 18, 2014 OPA 48 Revision)
- OPA 48 Proposed Trail Route
- NRSI-Assessed Trail Route (April 2, 2014)
- NRSI-Proposed Extention of Sidewalk Route

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 1367 Date: April 21, 2014	NAD83 - UTM Zone 17 Size: 11x17" **1:1,800**

0 50 100 Metres

Path: X:\1367_StarwoodEIS\NRSI_1367_Fig5a_ProposedTrailAlignment_2K_2014_04_21_KEB.mxd

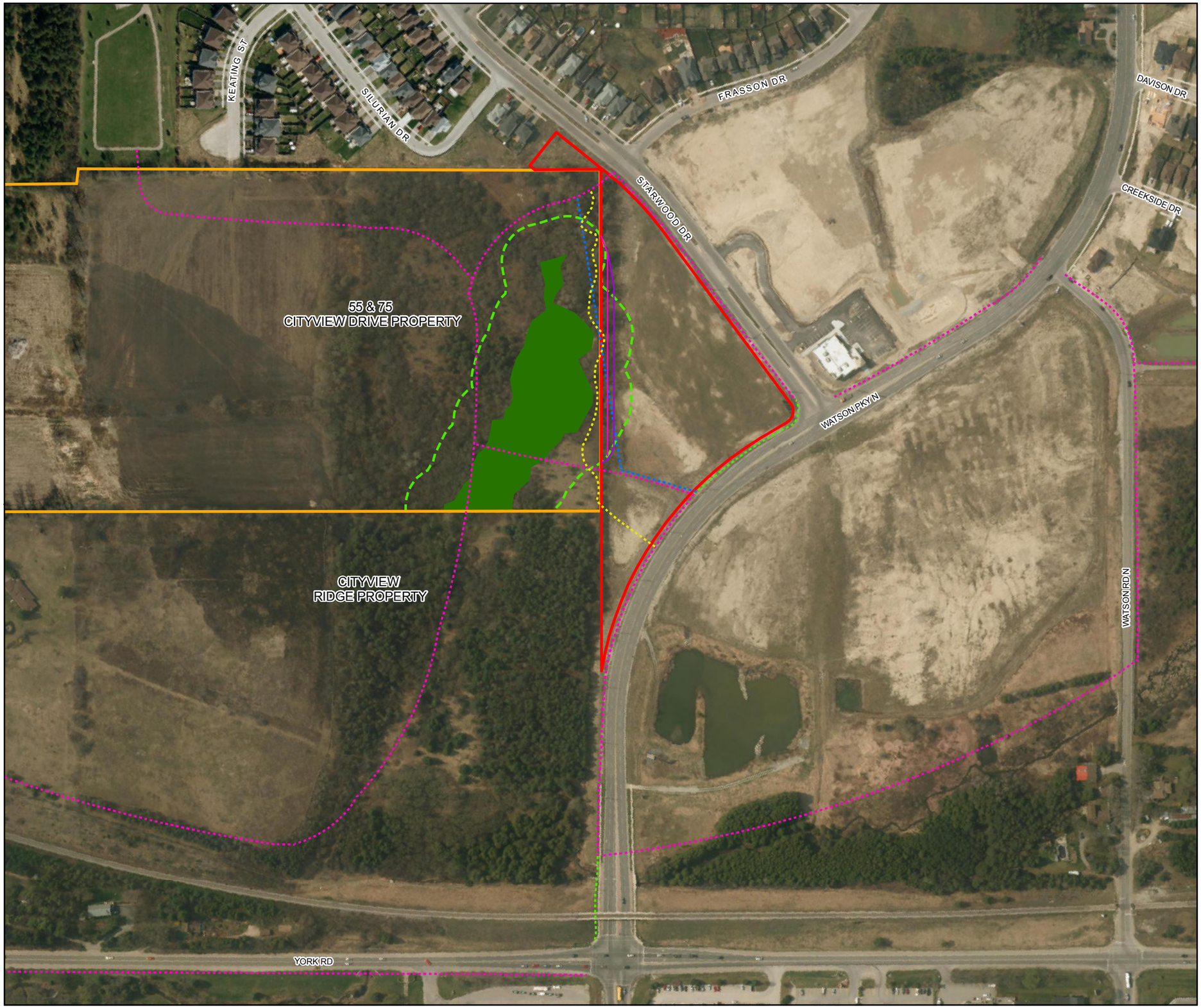

Figure 5b

Watson-Starwood EIS

Proposed Trail Alignment Alternatives

Legend

- Subject Property
- 55 & 75 Cityview Lands
- Provincially Significant Wetland (PSW) & OPA 42 - Significant Natural Area
- Provincially Significant Wetland Buffer (30m)
- Development Limit (10m)
- Development Setback (5m)
- Approximate City-Proposed Route (March 18, 2014 OPA 48 Revision)
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NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 1367 Date: April 21, 2014	NAD83 - UTM Zone 17 Size: 11x17" **1:3,000**

0 50 100 150 200 Metres

Path: X:\1367_StarwoodEIS\NRSI_1367_Fig5b_ProposedTrailAlignment_3K_2014_04_21_KEB.mxd

The NRSI-assessed trail route, which is based on the conceptual March 18, 2014 City-proposed trail route (Figure 5) requires the alignment to pass between the PSW and the subject property boundary on the Cityview Drive property for the majority of its length. Despite efforts to field-map the proposed trail route to minimize impacts to adjacent natural features, the proposed trail would unavoidably occur immediately adjacent to the surveyed PSW boundary in two locations, while occurring substantially within 15m of the PSW for the majority of its length. The construction of a trail immediately adjacent to the PSW would result in heightened risks of indirect, construction-stage impacts to the wetland (e.g., sedimentation and erosion, inadvertent damage to vegetation due to trampling and equipment access). Post-construction use of the trail by local residents may cause degradation of the PSW due to its close proximity, such as caused by off-trail vegetation trampling, garbage and litter deposition. The trail would also need to pass within the driplines of some of the mature property boundary trees where it occurs in close proximity to the wetland boundary.

Based on NRSI field assessments, the March 18, 2014 City-proposed trail route would most likely require a slight encroachment into the subject property where the trail closely follows the perimeter of the PSW as shown on Figure 5. As described in Section 7.5, it is recommended that the subject property boundary be demarcated with permanent fencing to inhibit resident access into the adjacent PSW and limit the potential for impact. The requirement of a small area of trail passage onto the subject property conflicts with this recommendation for property boundary fencing, while introducing concerns regarding condominium resident privacy and security as discussed above.

Furthermore, it is understood from the City of Guelph Parks Planning comments of April 3, 2014 (Appendix VI) that two conceptual trail segments that were proposed to occur on the Cityview Ridge property were deemed unfeasible due to the close proximity of PSW. Because the above proposed routes also occur adjacent to PSW, and based on the potential impacts described above, a pedestrian trail is not recommended along either of the City-proposed routes identified on February 6, 2013 or March 18, 2014.

Figure 5 illustrates an alternative sidewalk-based pedestrian route that integrates with a City-proposed trail system as identified in OPA48. This route provides a direct connection between Starwood Drive at the north end of the subject property to Watson Parkway North, and beyond that to Cityview Drive via a City-proposed sidewalk route along York Road (Figure 5). The north

end of the trail would connect to a proposed trail system to be located on the Cityview Drive property, to the west of the PSW, as per OPA48. This proposed route would make use of existing and proposed sidewalks that will not occur within or immediately adjacent to significant natural features (woodland, wetland). Consequently, this proposed route is not anticipated to cause any direct, indirect, or induced impacts on nearby natural features, while achieving the City's objective of establishing a linkage between Starwood Drive and Watson Parkway North, and to Cityview Drive beyond. In combination with proposed measures to restrict public access to the PSW from the subject property (e.g., property line fence, dense restoration zone plantings) and allow for enhanced ecological function of 10m Development Limit, the routing of pedestrians along this sidewalk-based route will minimize potential for induced impacts to the PSW.

7.7 Cumulative Impacts

The subject property has historically undergone considerable modification resulting from agricultural uses and more recently topsoil removal and fill placement. Further modification of the landscape is anticipated due to further residential development to the west (i.e., within the Cityview Drive and Cityview Ridge properties). In order to evaluate the potential for cumulative impacts resulting from this development, it is necessary to look beyond the boundaries of the subject property to the neighbouring lands, particularly to the west of the property. This approach looks at the character and potential changes that are occurring or may occur in the future on surrounding lands within the neighbouring properties.

Cumulative impacts may arise as a result of the following:

- Spatial crowding
- Temporal crowding
- Spatial lags
- Temporal lags
- Shared impact linkages

The following provides a brief discussion on each of these potential sources of cumulative impacts.

Spatial Crowding

Spatial crowding occurs when a development proposal occurs in close proximity to others, such that there is potential for relatively minor impacts from each undertaking to add up (or combine) since they overlap in space. The subject property is designated for residential development in the City's Official Plan and is within a highly urbanized area. The off-site ponds that will receive stormwater from the subject property have been designed to accommodate and treat this additional stormwater. Based on this analysis no cumulative impacts to Clythe Creek are anticipated.

Although much of the PSW is situated within the neighbouring 55 & 75 Cityview Drive property, where residential development is proposed, as well as on the Cityview Ridge properties to the southwest. The development of these sites will encircle the PSW and associated natural area, leading to potential spatial crowding over-time. The Draft Plans for each of these developments have made recommendations for retention of natural features, plus suitable setbacks to minimize direct and indirect impacts to the greatest extent possible.

Temporal Crowding

Temporal crowding can occur when phases of a development or different developments overlap in time. Although it is anticipated that development of the lands within the study area will occur over time, as demands arise and landowners progress through the subdivision, the current study has been completed to guide these developments in terms of environmental concerns and impact mitigation. Adherence to the design/layout guidelines recommended in this report should avoid significant impacts from temporal crowding.

The stormwater management strategy for the property utilizes services that are already constructed and functioning. Therefore, the potential for temporal crowding is not seen as significant for this proposal.

Spatial Lags

Spatial lags occur in cases where potential impacts are not found for some distance from the proposed undertaking. An example of this is when wetland or aquatic features are affected due to changes in infiltration patterns some distance away. Maintenance of on-site surface flow and infiltration patterns as recommended by Gamsby & Mannerow is important to control off-site impacts.

Temporal Lags

Cumulative impacts that arise from temporal lags are those that occur after time has elapsed between the source of the impact and the possible effect. An example of this is when compounds released change to some more problematic compound after some time of exposure to the environment.

No cumulative impacts from temporal lags are anticipated to result from this development.

Shared Impact Linkages

Shared impact linkages are similar to spatial and temporal crowding, but focus on cases where more than one development that may not actually overlap in time or space, affects the same component of the ecosystem. An example of this is when one land use change affects the breeding grounds of a species, while a second development affects the over-wintering habitat of the same species. The proposed undertaking does not impact natural habitats nor affect wildlife movement patterns, and as such are not anticipated to result in impacts.

7.8 Preservation, Restoration and Enhancement of Natural Features

The Tree Preservation Plan has identified trees that overlap with the proposed development and site grading; it is anticipated that these trees will require removal to accommodate the proposed development. However, efforts should be made to retain and incorporate native, non-invasive trees and shrubs into the development plan where feasible. Where trees require removal, transferrable individuals (e.g., saplings) should be transplanted to areas of the property outside of the development footprint. Protection fencing, in the form of silt fencing or hoarding, should be used to prevent unnecessary damage or disturbance to the root systems of retained vegetation as described in the Tree Preservation Plan.

Lands within the 5m Grading Limit should be left to naturally regenerate (with the exception of recommended removal of hazard trees and restorations described below) and should be left in a natural state. It is anticipated that lands west of the subject property boundary, on the Cityview Drive property, will continue to naturally regenerate into more mature woodland with the remaining row of mature trees along the property boundary eventually forming its eastern edge. The integrity of this future woodland edge can be actively enhanced through removal of non-native species, and plantings of native, non-invasive tree and shrub species to supplement the

existing stand. It is also recommended that land between the 5m Grading Limit and the 10m Development Limit be restored with vegetation plantings to enhance the ecological value of this development setback. This would include increasing the number and diversity of tree and shrub species within this zone. Selected species should be native to the region. As described in Section 7.3.1 and the Tree Protection Plan, it is recommended that the majority of the 84 required compensation trees be established within this restoration zone, while a smaller proportion be established within the adjacent property amenity space to enhance its ecological value (e.g., as bird nesting habitat). Restoration plantings can be selected to ensure a more dense coverage within the 10m development setback zone, including along the subject property boundary, further mitigating human intrusion into areas of active restoration and natural regeneration, and natural features located west of the subject property. Opportunities to establish compensation tree plantings within the off-site SWM facility should also be explored during the detailed design stage. Compensation tree plantings should be located where increased canopy coverage is anticipated to provide a cooling effect on discharged stormwater, thereby mitigating impacts associated with thermal loading of receiving waters (i.e., Clythe Creek). A Restoration Planting Plan is recommended to detail aspects of these plantings, such as species, numbers of individuals, and specific locations within the subject property, and if feasible, the SWM facility.

The Landscape Plan for the subject property should incorporate native trees or shrubs, and preferentially species that are found within the surrounding region. Trees that are highly susceptible to disease (e.g. ash, affected by emerald ash borer (*Agrilus planipennis*)) should be avoided. The establishment of woody vegetation within the subject property as a component of site development is anticipated to enhance the ecological quality of the property (e.g., through provision of additional bird nesting habitat) relative to the current site condition, which is largely devoid of trees, highly disturbed and dominated by invasive vegetation species.

7.9 Impact Assessment and Mitigations Summary

A summary of potential impacts associated with the proposed development, recommended mitigations and the significance of impacts once mitigated, are presented in Table 5.

Table 6. Summary of potential development impacts, recommended mitigation measures and resulting significance of impact

Potential Impact	Recommended Mitigation Measure(s)	Resulting Impact Significance
	Design and Construction Phase	
Vegetation/habitat removal along the subject property west boundary	• Limit unnecessary vegetation removal and degradation by clearly demarcating the boundaries of construction zones and any other areas required for construction of the proposed development; • Development limits for built structures and impervious surfaces (with the exception of the underground parking ramp to Building C) will respect the dripline plus 1m of all retained hedgerow trees, represented by the Development Limit boundary, in order to limit disturbance to these trees and associated edge habitat; • A 5m zone between the west property boundary and Grading Limit will be left as a no-touch zone within the site development (with the exception of recommended vegetation restoration), in order to buffer the adjacent row of mature trees, facilitate natural vegetation regeneration, and preserve the existing berm; • Root zones of the retained row of trees along the property boundary will not be impacted where grading is to occur up to the Grading Limit due to the historic removal of topsoil in the location of the swale immediately east of the Grading Limit; • Areas within 30m of the PSW boundary, outside of the 10m Development Limit, are to be considered amenity space for the proposed development, including pervious surfaces (sod, gravel walking paths) and will entirely comprise pervious surfaces; • Tree removal will be individuals of fair to poor condition and/or representing a hazard and individuals within the proposed graded areas as shown in the Tree Protection Plan; removal of trees in fair-good condition should be minimized to the extent possible; • Existing lands within the subject property are not of high ecological quality and their removal is not considered to cause a significant impact to wildlife populations on the surrounding landscape;	Not Significant
Bird nesting disruption and avoidance, and active nest destruction	• Time vegetation removal activities to occur outside the typical bird breeding season (May 1 – July 31); • If vegetation removal must occur during the bird breeding season, retain an avian biologist to survey for active nests just prior to vegetation removal activities.	Not Significant
Damage or other disturbance to the adjacent protected natural features and their vegetated buffers	• Clearly demarcate the limits of construction with brightly coloured snow fencing or silt fencing following the recommended buffer setbacks (along Grading Limit; otherwise, property boundary); • Tree protection fencing with signage is to be installed around retained trees as described in the Tree Protection Plan; • Designated areas for construction lay-down, vehicle access and parking, equipment storage, materials stockpiling, and any on-site construction offices should be located entirely outside of the PSW buffer, and preferably not adjacent to the buffer;	Not Significant

Potential Impact	Recommended Mitigation Measure(s)	Resulting Impact Significance
Wildlife avoidance of the area, and other impacts associated with dust, excessive noise, vibration, artificial lighting and proximity of human presence	• Moisten areas of bare, dry soil with water as needed during construction activities to reduce the amount of dust produced in areas of construction; • Restrict the daily timing of construction activities to between 7:00hr and 19:00hr; • Lighting associated with construction activities should be turned off following daily cessation of activities or directed away from adjacent natural features; • These construction-related impacts are expected to be temporary, minimal and localized.	Not Significant
Impacts to hydrologic regime within and adjacent to the subject property	• As described in Section 7.4.2, the proposed development is not anticipated to alter the hydrological regime within or outside of the subject property; • A 60m infiltration gallery is proposed along the west end of the subject property to mimic existing stormwater infiltration within the swale; • If short-term de-watering is required during construction, de-watering should be subject to re-introduction to the system through re-infiltration or surface flow to the existing west property swale as described in Gamsby and Mannerow (2014b).	Not Significant
Water Quality Impairment	• Implement erosion and sediment control measures; • The development should be planned so that no more than 80% of the property comprises impervious surface in order to mitigate risk to drinking water resources from road salt application; • Implement Spill Response Plan.	Not Significant
Erosion and sedimentation	• Install erosion and sedimentation facilities prior to any area grading operations • Inspect and monitor all erosion control measures, with repairs completed as required • Operate and store all materials and equipment in a manner that prevents any deleterious substance from leaving the site • Re-vegetate completed areas as soon as possible following construction	Not Significant
Soil Compaction	• Construction vehicles and equipment are to be kept outside of the Grading Limit boundary, and their presence/use within the Development Limit and PSW buffer should be minimized; • Stockpiles are to be located away from the natural features and PSW buffer.	Not Significant
Post-Construction Operations		
Human entry into the adjacent natural features and setbacks, with associated disturbances (e.g., vegetation trampling, trail formation, litter)	• Lands within the 10m Development Limit, including the 5m Grading Limit, should be actively restored during the landscaping phase to remove non-native vegetation and to discourage human intrusion through establishment of dense vegetation plantings. A Restoration Planting Plan is recommended to further detail these recommendations. • Permanent fencing should be installed along the subject property boundary, with signage warning of “no trespassing” within the adjacent natural features on the Cityview Drive property. • A Condominium Owner’s Guide should be distributed to educate/inform residents about the importance of the adjacent natural features and how to mitigate impacts (e.g., such as caused by roaming cats).	Not Significant
Impacts to wildlife in adjacent natural areas due to artificial lighting	• Install directional lighting to prevent lightwash of adjacent natural features	Not Significant

8.0 Summary

NRSI was retained by Coletara Development to conduct an EIS for a proposed condominium and residential lot development at a property located southwest of the intersection of Starwood Drive and Watson Parkway South in Guelph, Ontario. This report provides a summary of the natural features within the study area and provides an analysis of impacts based on details of the proposed development provided by the project team (e.g., grading plan, hydrogeological and stormwater management study).

The subject property is currently dominated by disturbed lands historically removed of topsoil and deposited with fill. Natural features within the subject property are limited to an existing row of mature trees (predominantly bur oaks) along the west property boundary, which is surrounded by younger regenerating trees and shrubs along and immediately adjacent to the property boundary. A small number of young trees and shrubs occur within the largely open and disturbed land of the triangular northwest parcel. The main subject property parcel features a raised berm, with associated swale on its east side, which run parallel to the west property boundary for much of its length. Consequently, the roots of trees located along the west property boundary do not extend out to their east-facing driplines due to the presence of the cut swale. The subject property is situated immediately east of 55 and 75 Cityview Drive, for which NRSI is currently completing a separate EIS for a development proposal (NRSI 2013), and is located northeast of a property referred to as “Cityview Ridge” for which an EIS was recently drafted by North-South Environmental (NSE 2012). As per the accepted TOR, data from these studies was utilized where applicable, in combination with original field data, to fully characterize the existing natural features and species located in the subject property and adjacent lands within 120m.

A portion of the Clythe Creek PSW occurs just west of the subject property boundary, within the Cityview Drive property. An area of land 30m from the confirmed PSW boundary extends onto the west end of the subject property. The proposed development layout has been designed such that all impervious surfaces (e.g., buildings, roads) are located outside of this 30m zone from the PSW boundary. Lands within this 30m zone on the subject property were determined to not provide important ecological

connectivity or function to support the adjacent PSW due to the existing disturbed nature of the lands and the functioning of the berm as a barrier to surface water flow. Lands within this 30m zone are planned to consist solely of pervious surface amenity space (e.g., sod, gardens, permeable surface walking paths).

A hydrogeological study completed for the subject property (Gamsby and Mannerow 2014b) concluded that the existing berm contains surface stormwater flow to within the property, preventing drainage to the adjacent Cityview Drive property and PSW. Stormwater drainage within the subject property currently flows along a southeast gradient toward an existing sediment basin prior to discharging water via storm sewer under Watson Parkway North to a stormwater management pond.

A hydrogeological assessment of the PSW concluded that it is surface water-fed, receiving drainage from lands outside of the subject property, and is not influenced by groundwater upwelling (Anderson GeoLogic Ltd. 2013). Further, groundwater flow through a majority of the subject property doesn't appear to be directed toward the PSW. Minor, intermittent shallow groundwater flow may be directed toward the PSW from the west property swale under wet conditions. Based on the observed downward hydrological gradients observed at the PSW (Anderson GeoLogic 2013), this minor groundwater flow is not expected to influence the hydrological regime of the wetland. As such, no hydrological impacts to the PSW or surrounding woodlands west of the subject property are anticipated due to the proposed development (Gamsby and Mannerow 2014b).

Based on these findings, a Development Limit, parallel to and 10m from the west property boundary, was delineated and considered sufficient to buffer the PSW from development. Built structures and impervious surfaces are to be generally excluded from the 10m development setback. Within that, a Grading Limit 5m from the west property boundary was delineated to define an area of natural regeneration and to retain and protect the existing berm and its surface hydrological separation of the abutting properties. These setbacks represent the primary constraints to development within the subject property.

The areas to be directly impacted by the proposed development are highly disturbed and therefore of low ecological quality. No significant natural features, or provincially significant plant or wildlife species will be directly impacted by the proposed development. The proposed development plan shows no structures or impervious surfaces, other than for stormwater management purposes, within the 10m Development Limit. The proposed development will result in an ecological enhancement to the lands within 30m of the PSW through their use as permeable surface amenity space.

No habitat for federally, provincially or locally significant wildlife species will be directly impacted by the proposed development. One SWH type initially identified as having potential to occur within the subject property (snake hibernacula) was determined not to be present within the study area.

A Restoration Plan, as part of a Landscape Plan, is recommended to guide restoration of the existing vegetation within the 10m development setback, including removal of non-native species and directed plantings of native, non-invasive tree and shrub species selected as appropriate for the local conditions (e.g., soils, topography). Similarly, establishment of a diverse assemblage of native landscape tree species within the proposed development, as directed by a Landscape Plan, will represent an improvement in tree cover and habitat opportunities (e.g., by providing additional bird nesting habitat) relative to the existing conditions. The majority of required native tree compensation plantings should be established within the proposed restoration zone within the 10m setback, while a smaller proportion should be established within the proposed property amenity space. The feasibility of native tree compensation plantings within the SWM facility, to provide a cooling effect to discharged stormwater through increased tree canopy coverage, should also be explored.

Recommendations are provided to minimize impacts and ensure that mitigation measures are installed and functioning. These include recommendations to mitigate direct, indirect, induced, and cumulative impacts that may arise during the proposed development. If these recommendations are implemented, negative impacts arising from this development are not anticipated.

Table 6 summarizes how the recommendations of the Clythe Creek Overview Study are met through a combination of avoidance of direct impact, and recommendations of mitigation measures, and restoration and enhancement opportunities.

Table 7. Summary of Clythe Creek Overview Study recommendations with associated comments and proposed mitigations related to the proposed development.

Study Recommendation	Context/Details of Recommendation	Suggested Measure of how to Address Recommendation
#1- Upland woodland areas are to be retained where possible	a) Historical clearing of vegetation has impacted the Clythe Creek subwatershed resulting in reduced forest cover, reduced wildlife habitat, degradation of wetlands, degradation of aquatic habitat and water quality within Clythe Creek and its tributaries. b) Retention of existing woodlands and natural vegetation is important to help conserve diversity c) The restoration of natural areas is recommended to increase woodland cover.	The proposed development will not require removal of woodland.
#2- Natural Areas/Wildlife	a) Restoration of natural areas is recommended to increase woodland cover, including planting native trees and plants b) Detailed plant and wildlife surveys are recommended as part of subsequent EIS. Opportunities for enhancement of natural vegetation areas should be examined. Planting native tree and plants is recommended to increase wildlife habitat.	a) Native plantings within the defined development setbacks will enhance existing woody vegetation cover and wildlife habitat, and will eventually form an enhanced woodland edge as the lands immediately west of the subject property continue to naturally regenerate. b) Detailed plant and wildlife surveys were undertaken as part of the EIS in combination with the EIS work completed for the adjacent properties.
#3- Wetlands and Other Sensitive Habitats	a) A complete OWES evaluation should be conducted on associated wetlands b) Wetlands are to be maintained c) Appropriate width buffers of natural vegetation are to be retained or created along wetland areas for the protection of sensitive habitats	a) This evaluation has been completed by OMNR b) The proposed development will not encroach upon the wetland c) Lands within 30m of the PSW boundary have been identified on the subject property; however, due to the lack of functional capacity of these lands to support the ecological integrity of the PSW (e.g., presence of berm separating surface drainage between properties, lack of substantial vegetative cover and wildlife habitat), alternative setbacks to the PSW have been proposed as described in Section 6.0
#4- Preservation and	a) Removal of existing on-line ponds	a) Not applicable to the study area

Enhancement of Aquatic Habitat	b) Use of dry or wet ponds with modified subsurface discharges to help lower water temperatures c) Preservation and augmentation of tree cover along creeks to mediate stream temperature d) The use of natural channel design techniques and bioengineering methods to increase quality of aquatic habitat	b) Not applicable as SWM pond (wet pond) already exists east of Watson Pkwy S. Modifications to this pond is outside the scope of this project c) Not applicable as no watercourses are present within the subject property d) Not applicable as no watercourses are present within the subject property
#5- Groundwater	a) Groundwater inputs to watercourses are to be maintained b) Existing groundwater recharge conditions must be maintained c) Any groundwater takings (dewatering) must be evaluated to ensure local aquatic and terrestrial functions are maintained d) Groundwater quality degradation from road salting, fertilizer, spills, septic systems, etc is to be controlled	a) At its closest point, the subject property is approximately 220 m from Clythe Creek with no watercourses on the subject property. Based on the limited size of the subject property compared to the overall catchment area and distance from the creek, impacts to the groundwater system beyond the local scale are not expected. Groundwater flow patterns are expected to be maintained as part of development with no impacts to the adjacent PSW. Consequently, groundwater inputs to the Clythe Creek system are not expected to be impacted. b) Pre-development, stormwater run-off is collected in a temporary stormwater pond/sediment basin with overflow via a catch-basin to the municipal stormwater pond, on the opposite (i.e. east side) of Watson Parkway. Recharge occurs through the filled and vegetated areas of the property. Post-development, a portion of recharge will be maintained by surface discharge of stormwater from the roof for sheet flow and infiltration. The remaining stormwater run-off from impermeable areas will be directed to the municipal stormwater pond via catch basins and piping, where water will be subject to infiltration and/or overflow to Clythe Creek. The municipal stormwater pond has been designed to promote infiltration, with overflow to Clythe Creek. Combined recharge and run-off from the subject property will continue to be captured within the same local area and within the same subwatershed. Therefore, the proposed

		development is not anticipated to affect the water balance in the Clythe Creek subwatershed. c) No groundwater dewatering is currently planned as part of the development, with structures proposed to be completed above the high water table. Should some structural works (such as footings or foundations) extend below the water table, temporary dewatering may be required. Dewatering over 50,000L per day will require a Permit to Take Water from the MOE, with review and evaluation of the potential to impact local resources under that process. Should dewatering be required as part of construction, it is recommended that it be discharged on-site for overland flow and recharge. d) Based on the proposed development, impacts to groundwater quality are not anticipated. Run-off water quality is designed to be controlled within the municipal stormwater pond.

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APPENDIX I

Review Agency Comments on First EIS Submission

INTERNAL MEMO

DATE	April 3, 2014
TO	**Adele Labbe**
FROM	Jyoti Pathak
DIVISION	Parks and Open Space
DEPARTMENT	Parks and Recreation Community and Social Services
SUBJECT	**78 Starwood Drive (OP1304/ZC1315)** **Environmental Impact Study (EIS) by Natural Resource Solutions Inc.**

Parks Planning and Development has reviewed the scoped EIS associated with the proposed development on 78 Starwood Drive (dated November 06, 2013) and offers the following comments:

TRAIL NETWORK:
Background:
The 'Guelph Trail Network' identifies two desirable/ proposed off road trail connections from the Watson Parkway North to the Cityview Drive North. (*Trail routes A and B on Appendix-1*)

The proposed trail route A, parallel to the CN railway track, was assessed for its impact to the environment through the scoped EIS prepared for 20-37 Cityview Drive North property. The trail route A was determined to be unfeasible due to the presence of provincially significant wetlands just north of railway track.

The proposed trail route B doesn't meet City's accessibility standards due to the presence of steep slopes west of Watson Parkway North.

Staff has proposed an alternative to the trail routes A and B (Appendix 1). The alternative potential trail route will follow the edge of the natural heritage feature to route people away from environmentally sensitive feature. Development of a formal signed trail is essential to protect the natural heritage feature from any further damage due to creation of new ad-hoc trails through the feature in absence of a formal trail.

Comments:
Refer to the Guelph Trail Network Schedule 7, which is an updated version of the Guelph Trail Master Plan Map 4 and *Appendix-1- Conceptual trail alignment and* revise the scoped EIS dated November 2013 to address the following:

- Assess the impacts of proposed 'alternative' trail route (Appendix-1 conceptual trail alignment) or propose another alternative route to provide a pedestrian connection from Watson Parkway North to Cityview Drive.

- Provide recommendations on appropriate measures to mitigate environmental impacts from trail development.

- Provide recommendations on measures such as fencing and screen planting to mitigate encroachment, unauthorized public access, privacy and security concerns.

- Provide recommendation on the desirable locations and content of interpretive signage. The environmental interpretive signage will be proposed along trail route adjacent to natural heritage feature to educate residents about the environmental sensitivity of the existing natural Heritage features and procedures residents can follow to protect and/or enhance these areas.

- Provide recommendation on the desirable locations and content of trail rules signage to educate the users on expected behaviours while using the trails. Their locations, design and details will be shown on the EIR trail plans.

Environmental Implementation Report:

Prepare an Environmental Implementation Report to address the recommendations related to trail system and natural open space system, including detail design of the trail system; preparation of Landscape Plans and details to address removal of hazard trees along the trail system and residential properties; clean-up of debris and waste; restoration; compensation and enhancement planting for buffers; invasive species management; design of education and stewardship materials/ signage.

Detailed trail layout, grading and drainage plans showing trail design details such as signage, trail gates, structures, etc. will be provided in the Environmental Implementation Report. The trail design will be consistent with Guelph Trail standards as appropriate to the site conditions and other City Guidelines i.e. Facility Accessibility Design Manual etc. The trail plan, design and construction will comply with all relevant regulations applicable to trail management made under the Accessibility for Ontarians with Disabilities Act, 2005.

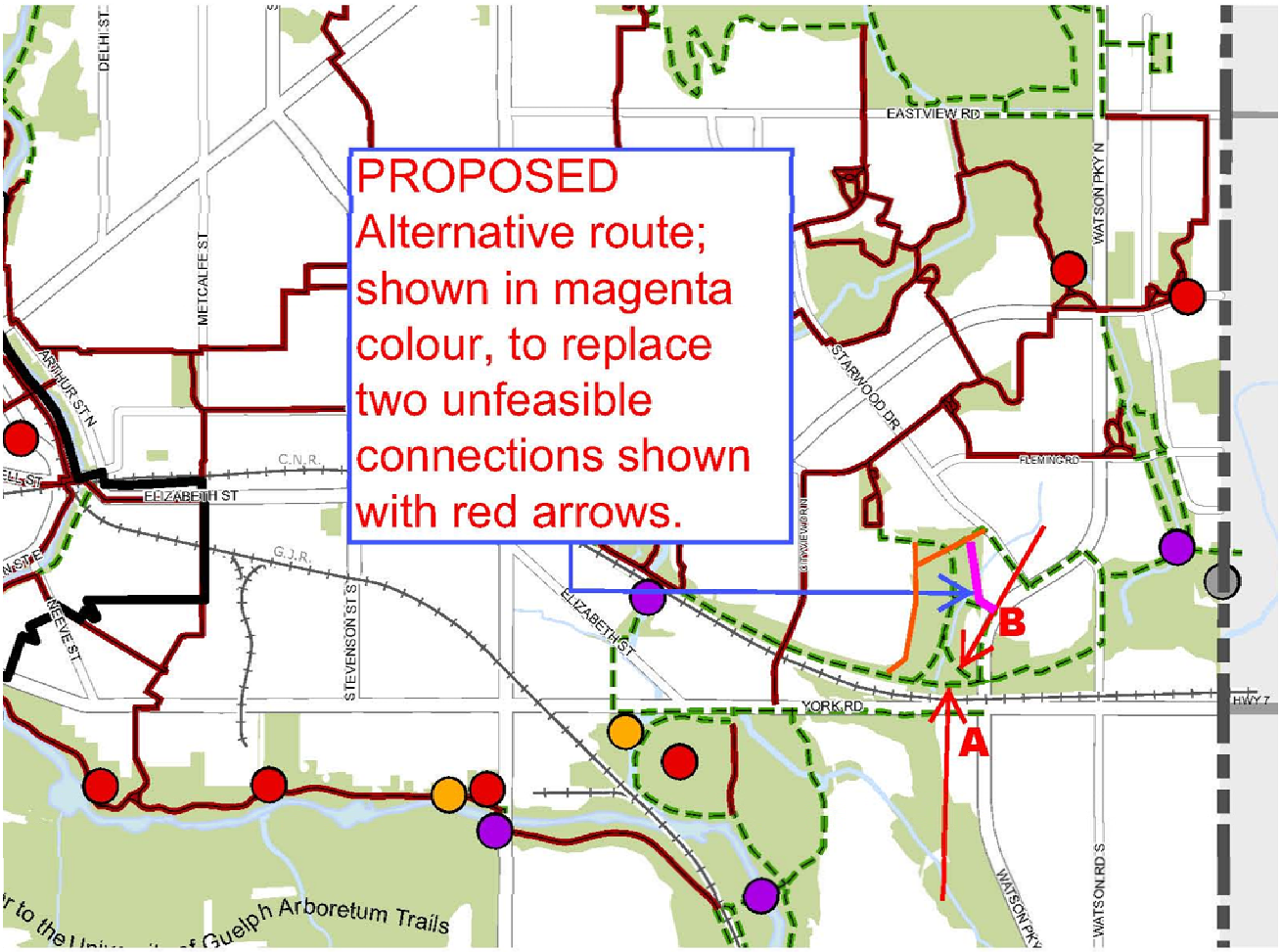
Please call me if you have any questions.

Sincerely,

Jyoti Pathak OALA CSLA MCIP RPP | Parks Planner
Community & Social Services | **Parks & Recreation**
City of Guelph

T 519-822-1260 x 2431 | F 519-822-1751
E jyoti.pathak@guelph.ca

APPENDIX-1



Conceptual trail alignment

March 12, 2014
Environmental Advisory Committee

Item 1 **78 Starwood Drive**
OP1304/ZC1315

Environmental Impact Study (EIS) by Natural Resource Solutions Inc.
Functional Servicing Report by Gamsby Mannerow Ltd., Nov. 2013

Proposal This EIS is written to assess and address potential impacts to the environment associated with the development of approximately 405 residential apartment units (in the form of condominium units and a retirement residence, including above- and below-ground parking) and ground level commercial uses, as well as four single-detached residential lots to the northwest.

The purpose of the OPA is to add a site-specific policy to the Official Plan to permit a maximum residential density of 155 units per hectares (currently it is 150 units per ha). The purpose of the rezoning is to change the zoning from the existing B.1 (industrial) Zone and UR (Urban Reserve) Zone to a R.4B (Specialized High Density Residential) Zone and the R.1D (Single Detached Residential) Zone. Specialized zoning is requested in order to include additional uses (live/work units, office, etc.).

The subject lands are currently vacant and consist of 2.71 hectares.

Location The subject property is found in the southeastern quadrant of the Starwood Drive and Watson Parkway intersection (see Location Map).

Background

- The property is identified as a Mixed Use Node in Schedule 1 of the current Official Plan and lands adjacent to the west are designated Open Space. The site is currently zoned Specialized B.1.
- The property is identified as Community Mixed-Use Centre in Schedule 2: Land Use Plan of OPA 42. Lands adjacent to the west are identified as Significant Natural Area and Natural Area.
- The site lies within the catchment identified as S10 in the Clythe Creek Subwatershed Study.
- The site consists largely of an agricultural field. The west edge of the site includes a drainage swale directly adjacent to the neighbouring woodland, which drains to a temporary basin located in the south portion of the site.
- A portion of the Clythe Creek Provincially Significant Wetland Complex is located on lands adjacent to the site. The PSW is surrounded by a woodland feature. Clythe Creek is found further south, flowing in a westerly direction.
- The site is immediately adjacent to two other properties for which EIS have been recently submitted proposing subdivision developments (i.e., 55 / 75 Cityview and 22 / 37 Cityview). These two adjacent sites contain a Provincially Significant Wetland (PSW). All three sites are within 200 m or less of the Clythe

Creek riparian corridor that runs southwest of the properties.

- Comments from Parks and/or Engineering Departments are not yet available.

Comments Beacon Environmental has reviewed the EIS on behalf of the City and provide the following feedback and comments.

Overall, it was found that the EIS has thoroughly addressed issues related to natural heritage features and areas on site. However, the EIS has not adequately addressed protection of the off-site PSW or of the on-site groundwater recharge functions, and has also made several recommendations which are not consistent with current City policy and/or practice. Key comments that need to be addressed are as follows:

- PROTECTION OF THE PSW: It should be understood that the groundwater-surface water interactions in the Clythe Creek Subwatershed area are recognized as being complex, highly heterogeneous, and challenging to assess (see the University of Guelph M.Sc. Thesis by Hailey Ashworth, 2012, which is cited in the reports reviewed). The EIS and supporting hydrogeology study (appended to the EIS) indicate that groundwater flow through the majority of the site does not appear to be directed towards the off-site PSW, but that surface water from the site is likely directed towards the PSW during periods of high flow (e.g., during spring). It also states that the existing berm is currently functioning as a barrier to overland flow. These latter two statements indicate that the subject property does indeed contribute at least surface flows to the off-site PSW, if not groundwater.

  Therefore, the proposal and related design / mitigation measures need to ensure (a) that this flow (even if it is seasonal) is maintained, and (b) that it is receiving adequate water quality treatment prior to entry to the PSW. As stated in the GRCA comments (Feb. 7, 2014), the EIS should be revised to remove references to there being a hydrologic disconnect between the subject property and the adjacent off-site PSW (e.g., p. 52).

- PROTECTION OF THE PSW BUFFER: Although the EIS states all buildings and pervious surfaces (i.e., parking areas, roadways) are outside the 30 m buffer to the PSW, Figure 3 appears to show some parking area extending into the buffer and the report (p. 46) indicates one of the underground parking garage ramps will be within this buffer zone. This is not considered an acceptable land use in this zone as it presents a permanent impervious surface. Additional pervious surface within the PSW buffer is of particular concern on this site because so much of the property (almost 80%) is to be covered in pervious surfaces. Maintaining more of this buffer in a naturalized state on this site is important for (a) maintenance of water inputs to the PSW, and (b) maintenance of on-site groundwater recharge.

  In addition, in the current proposal there would be a pool, extensive grading extending well into the buffer, and placement of storm water management systems within this zone. A pool is not considered an appropriate land use in this zone, as it creates a permanent impervious area with potential for unwanted chemical inputs (i.e., draining of pool water).

  The EIS should be revised to recommend all grading and construction-related activities (e.g., vehicle access, parking, material stockpiling) be outside the first

15 m of the buffer, and outside the 30 m limit where possible (see p. 62) as to limit compromising the effectiveness of the buffer performing important functions (e.g., hydrologic).

- GROUNDWATER INFILTRATION: The EIS and supporting hydrogeology study (appended to the EIS) indicate the site is an area of groundwater recharge, but conclude that no impacts to the groundwater on site will occur as a result of this development (i.e., p. 53). Furthermore, the EIS states no cumulative impacts to Clythe Creek are anticipated as part of the development on these lands. However, even if the site does not have "high" levels of recharge, the introduction of almost 80% pervious surfaces to a previously open site will significantly reduce the amount of on-site infiltration (as , particularly if much of the collected surface water is taken off-site to the nearby municipal SWM pond).

  The current surface and groundwater infiltration function provided by this site does not appear to be adequately considered as part of the EIS. This oversight needs to be addressed in order to ensure that Clythe Creek to the south is adequately sustained in terms of both the quantity and quality of water being directed to it in a post-development scenario.

  One of the key recommendations in the Clythe Creek Overview Study is that groundwater inputs to watercourses and existing groundwater recharge conditions be maintained (#5). The EIS acknowledges that the proposed development will result in a net loss of groundwater recharge on site. The development proposal, and related mitigation measures, need to be revised to ensure this does not occur (i.e., through more on-site infiltration of clean water). Currently, Clythe Creek is still considered a cold/cool water watercourse, although is evidence that it is shifting towards more of a cool/warm water habitat (Ashworth M. Sc. Thesis, 2012). Therefore any potential impacts associated with this proposed development that may contribute to additional thermal loading (i.e., warming) of Clythe Creek need to be addressed.

  Notably, this EIS also relies on findings of the hydrogeology study completed by Anderson GeoLogic (2001) for the adjacent 55 / 75 Cityview property for its conclusions. However, the author of this study has acknowledged that the local hydrogeology focussed on inputs to the PSW and was not fully considered in the broader context of Clythe Creek, and is in the process of revising this study in response to comments received from the City. This revised report should be considered as part of the updated EIS for this site.

- TREE PROTECTION: The City recognizes and appreciates that the EIS has identified a number of healthy, native trees along the western boundary for protection, however allowing grading to within the dripline of may of these trees, including the larger trees shared with the adjacent property, is not supportive of their long term protection. Although some deviation from the City's current standard 10 m buffer to protected woodlands may be warranted given the disturbed nature of the site and the presence of a berm in such close proximity to the dripline of the protected trees, a minimum "no development zone (including no grading)" of 5 m should be established to support protection of these trees, and closer to 10 m should be targeted wherever possible. Furthermore, restoration / naturalization of this zone will more fully

address recommendations #1 and #2 of the Clythe Creek Overview study.

The EIS should be revised to recommend all construction-related activities (e.g., vehicle access, parking, material stockpiling) be outside this tree protection zone (see p. 61).

- TRAIL: The City's Parks Planning and Development Division indicated that a potential trail connection, as per the conceptual trail identified through the Guelph Trail Network, should be considered and assessed through this EIS (see the memo included in Appendix III of the EIS). The EIS provides an assessment (p. 49-50) and concludes in the context of the current development proposal that there is no suitable route for a trail.

  The City's Parks Planner has yet to comment on this EIS, however from an environmental perspective given the approximate number of units proposed, a carefully designed and managed trail network will be needed in the area, to avoid the profusion of informal trails. If a trail along the edge of the protected natural area on this site is not suitable due to potential environmental impacts, then an alternate route should be identified and recommended (e.g., on road or elsewhere) to mitigate potential impacts of informal trails.

  Management of trail access should be combined with the measures already identified in the EIS (e.g. signs, an educational guide – p. 56-57), and potentially permanent fencing to discourage inappropriate access (as suggested by GRCA).

- ENHANCEMENT AND RESTORATION: The extent of restoration and enhancement identified with this site does not adequately address recommendations in the Clythe Creek Overview Study (recommendations #1 and #2). Although the EIS recommends restoration and naturalization with native species, and the retention of some of the healthy, mature trees along the western boundary of the site, in effect this amounts to restoration / naturalization of a narrow band of about 5 to 10 m from the property line along a portion of the property's western edge.

Additional more minor issues identified within the EIS are as follows:

- TREE PRESERVATION: The tree preservation plan will need to be revised in consideration of pending revisions to the 55 & 75 Cityview property as there are a number of shared trees.

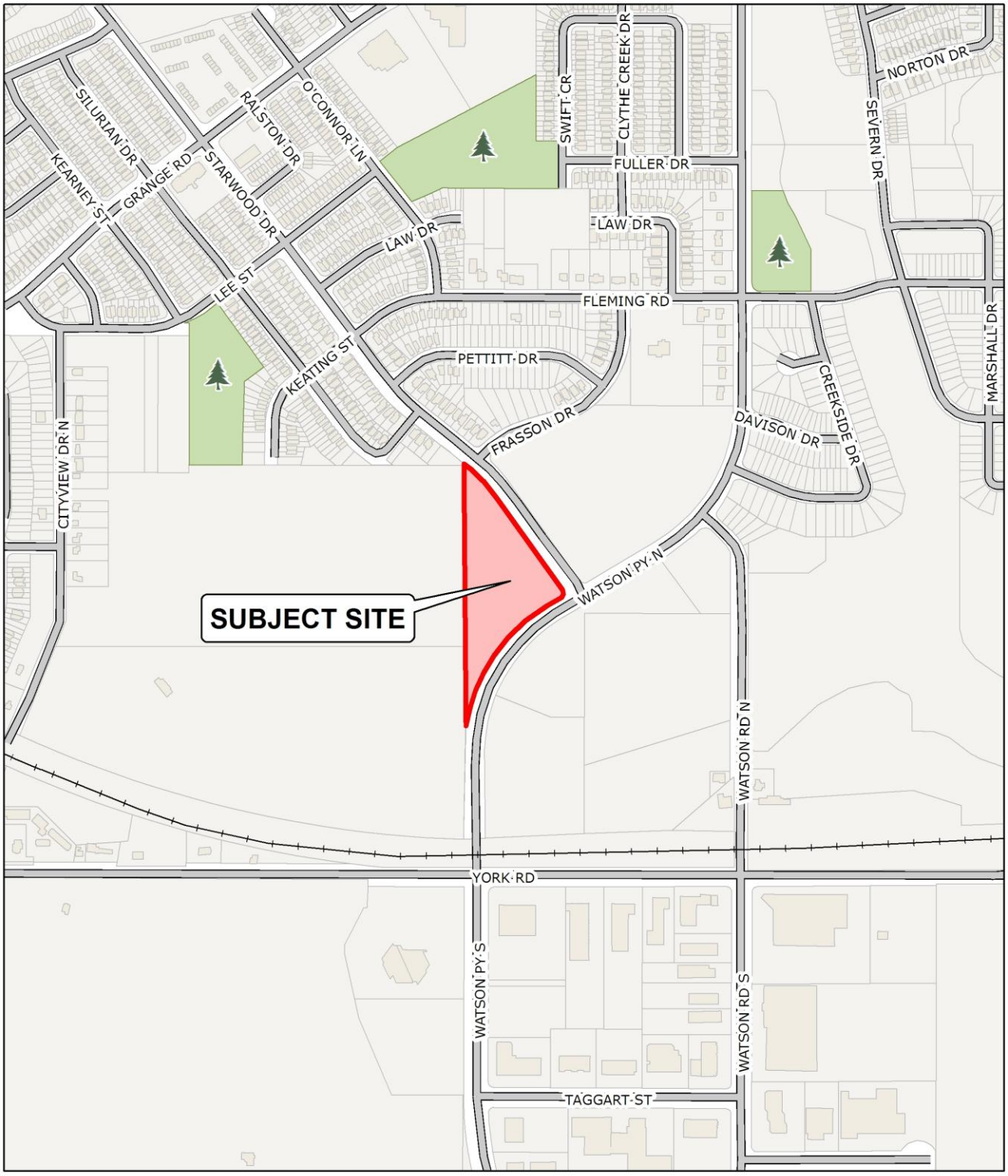
- TREE COMPENSATION: (p. 17 of the Tree Protection Plan) Please note that planting native species that are locally significant is supported by the City, and should not be discouraged. However, it is understood that planting provincially significant species that are endangered or threatened can be problematic because of the legislation that applies to them, and therefore we support avoiding planting of these species outside of formal agreements with OMNR.

- TREE COMPENSATION: The EIS suggests (p. 48) that compensation for the 28 healthy trees proposed for removal be at 3:1, which is consistent with the City's current practices. Compensation trees should be identified above and beyond standard landscape requirements and on this site should be targeted towards restoration areas within the PSW 30 m buffer.

Suggested Motion	***Staff recommend that the Environmental Advisory Committee defer the EIS prepared by NRSI for 78 Starwood with the following direction:***

THAT a revised EIS be prepared to address:

a) ***Any revisions to the development plan;***
b) ***Environmental Planning comments from the City as well as comments from the GRCA;***
c) ***Forthcoming comments from City Engineering and Parks Departments;***
d) ***The protection of the PSW and buffer;***
e) ***A more comprehensive consideration of the recommendations from the Clythe Creek Overview Study;***
f) ***Revisions to tree protection; and***
g) ***Provision of tree compensation within the Enhancement and Restoration Areas.***



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Produced by the City of Guelph
Planning, Building, Engineering and Environment, Development Planning
February 2013

Watson / Starwood Node
LOCATION MAP

Figure provided by Parks Planner

400 Clyde Road, P.O. Box 729, Cambridge, ON N1R 5W6
Phone: 519-621-2761 Toll free: 866-900-4722 www.grandriver.ca

February 7th, 2014

City of Guelph
1 Carden Street
Guelph, Ontario N1H 3A1

ATTN: Mr. Chris DeVriendt, Senior Development Planner

Re: GRCA Comments on Environmental Impact Study
Watson-Starwood Proposed Residential Development, Guelph, ON
Proposed Official Plan Amendment – OP1304
Proposed Zoning Bylaw Amendment – ZC1315

The Grand River Conservation Authority (GRCA) has reviewed the scoped Environmental Impact Study (EIS) in support of the proposed rezoning and official plan amendment applications. At this time the GRCA would recommend a decision be deferred until such time as comments below can be addressed.

Scoped Environmental Impact Study (Ecology Comments)

1. The EIS recommended the need for a 30m buffer of no development from the Provincially Significant Wetland (PSW). They propose the exception of impervious areas, such as a large swimming pool and walking paths. GRCA staff do not accept the proposed pool within the 30m buffer (it appears to be within approximately 10m of the PSW) based on ecological and hydrological hindrance to the efficacy of the buffer. This pool can very likely be placed elsewhere on the subject property without being in the recommended 30m buffer from the PSW.

2. The hydrology report, especially Figure 3, indicates that the groundwater from the subject property flows to the PSW. Therefore, the proponent needs to ensure that appropriate on-site infiltration is utilized to allow for appropriate groundwater inputs since the subject property is hydrologically connected with the PSW. Furthermore, S4.3, S4.4, S7.3.1 and S7.4.2 of the EIS should be corrected where it states that there is a hydrological disconnect between the subject property and the PSW, as this is incorrect.

3. The anthropogenic berm appears to be short-lived compared to the adjacent wetland and its associated hydrology. The berm may be impacting the natural and historical hydrology of the wetland. We recommend that maintaining the hydrology of the wetland which existed prior to the creation of the berm would be the most appropriate water balance to achieve. Maintenance of the berm is proposed in the EIS and we would suggest that as part of this maintenance, notches or another measures be designed into this berm to allow for surface water to freely pass and feed into the PSW. This water should be from a cleaner source, such as roof top water or surface water from vegetated areas.

4. It is unclear where the proposed trail is to be located. The trail should not be placed within an area that it could negatively impact the PSW.

5. The EIS states that the proposed development will result in a reduction of groundwater recharge. Information provided states that all water originating onsite will be redirected offsite. Groundwater should be recharged to ensure that there is no reduction of groundwater inputs post development.

Functional Servicing Report comments

6. S.3.4 indicates that the runoff from rooftops of proposed buildings will be discharged directly to the onsite storm sewer system. This should be explored to take advantage of recharging groundwater on the subject property and surface water inputs to the PSW.

HydroGeological Study

7. S6.3 should be congruent with Figures 3 and 4, and speak to the flow of groundwater from the subject property to the PSW.

Advisory Comments

1. According to literature and the recorded suitable habitat within the PSW, the nationally threatened and therefore locally significant species Western Chorus Frog is likely present. It is advised that consideration for this species be incorporated where feasible into the development plans.

2. S7.3.1 indicates that portions of the dripline may be impacted by the proposed development. A minimum 5m setback from the woodland dripline is advised to protect this feature.

Comments to be addressed in an Environmental Implementation Report (EIR)

1. A site grading plan is needed. Specifically, what amount of cut and fill is proposed within the 30m buffer of the PSW? What mitigations measures are they implementing to ensure there won't be negative impacts to the wetland, specific to infiltration of surface water?

2. We support the use of chain linked fencing along the property boundary to prevent unwanted induced impacts, such as adhoc trails in the PSW.

3. Information should be provided to implement ways of reducing the potential velocity of the stormwater discharge within the swale and therefore erosion. Measures to maximize infiltration of water are also recommended in swales.

4. Trails within the 30m buffer should be composed of pervious material (as directed by EIS) and ensure that compaction rates do not prevent infiltration.

Engineering Comments:

We find that there are some discrepancies between the sites surficial geology revealed in its three boreholes drilled by EXP Services in November 2011 and those drilled in nearby locations by V.A. Wood in April 2013. The former indicates a uniform distribution of sandy silt till in each borehole whilst the latter indicates about 3m of silty sand and gravel fill over gravel and sand deposits. Given the existence of granular material on the site, which is consistent with mapped surficial geology of the general area, we suggest that opportunities to infiltrate clean runoff be investigated in order to maintain hydrologic inputs to the adjacent provincially significant wetland. Figure 3 of the hydrogeological study is indicative of such inputs.

To assist with the design of infiltration measures we suggest that either on-site permeameter tests be carried out in appropriate locations or that grading plans enable connection to granular deposits that are known to exist on the site.

Based on the current grading plan, in which the parking building floor is above high groundwater levels, the possibility of some temporary groundwater mounding around infiltration galleries is not expected to adversely impact future buildings or infrastructure on the site.

Municipal Advisory:

We understand that an existing off-site stormwater pond was designed to accommodate runoff from the subject lands and support its use as such. Based on past observations of this pond and monitoring of its cooling trench we are aware of deficiencies that need to be addressed.

1. The forebay is completely filled with sediment and now appears to be more like a naturalized water course with a low flow channel and riparian vegetation. As such sediment is now filling the main pond cell and gradually reducing the level of quality treatment. This accumulated sediment was also seen to partially restrict the pond's inlet pipe
2. Unless it has been subsequently corrected, the recent University of Guelph temperature mitigation study of this pond revealed that flow through the cooling trench is conveyed through one of its pipes without passing through the surrounding stone media. If this is still the case we ask that inlet and outlet piping at the trench ends be restored to the original design configuration.

Should you have any questions or comments please feel free to contact the undersigned at 519-621-2763 ext. 2236

Yours truly,

Nathan Garland
Resource Planner
Grand River Conservation Authority

cc: Coletara Development c/o Starwood-Watson Holdings Inc., 966 Pantera Drive, Suite 22, Missassauga, ON L4W 2S1
Ryan Archer, NRSI, 225 Labrador Drive, Unit 1, Waterloo, ON N2K 4M8
Angela Kroetsch, 330 Trillium Drive, Unit D, Kitchener, ON N2E 2K6
Adèle Labbé, City of Guelph

NATURE GUELPH

P.O. Box 1401, Guelph, ON N1H 6N8
www.natureguelph.ca

Chris DeVriendt, February 17, 2014
Planning, Building, Engineering and Environment
City of Guelph

Re: 78 Starwood Drive - Proposed Official Plan & Zoning By-law Amendments

We have reviewed the Scoped Environmental Impact Study for the above property written by Natural Resources Solutions Inc. Nov. 2013 and offer the following comments:

We support this study and its conclusions with respect to the anticipated impacts and mitigation measures for the proposed development of this property.

We do want to point out that two errors we identified in the Environmental Impact Study prepared by Natural Resource Solutions Inc. for the planning application for 55 and 75 Cityview Drive (Cityview Drive Property) are repeated in this Scoped EIS. These include:

- On page 21, under Mineral Cultural Savannah (SVDM3), the scientific name given for the species Butter-and-Eggs is *Commandra umbellata*. However, the correct name is *Linaria vulgaris*.

- On page 22, under Buckthorn Deciduous Shrub Thicket (THDM2-6), two sedge species are listed which are almost certainly incorrect. These are: *Carex alopecoidea* and *Carex houghtoniana*. *C. alopecoidea* is known from only a few locations in the county in undisturbed wetlands while *C. houghtoniana* is a more northern species not found in Wellington County.

Thank you for the opportunity to comment.

Sincerely,

Pete Kelly, President
Charles Cecile, Environment Comm.
Nature Guelph

Project Team Responses to Review Comments Provided for Starwood Drive, Guelph

Grand River Conservation Authority Comments (February 7, 2014)

NB: Many of the responses below are taken from the original correspondence with commenting agencies. Any responses for which status has changed (i.e. removal of swimming pool from site plan) are noted in *italics*.

Comment Number	Comment	Response
Scoped Environmental Impact Study (Ecology Comments)		
1.	The EIS recommended the need for a 30m buffer of no development from the Provincially Significant Wetland (PSW).	The EIS acknowledges that a 30m buffer from the boundary of a PSW is typically recommended by the GRCA; however, the EIS does not recommend a "30m buffer of no development" for a number of ecological and topographical reasons. As further detailed in Section 6.0 of the study, a 30m setback for placement of apartment buildings and associated impervious surfaces (e.g. parking lots), a development limit set back 10m from the western property boundary and a 5m grading limit based on the berm which runs parallel to the western property boundary are recommended to maintain the form and function of the PSW. Lands within the 10m Development Limit would form passive amenity natural restoration area while lands from the 10m Development Limit to the 30m set back would form active amenity space. As lands within 30m of the PSW boundary are currently highly disturbed and the existing berm which coincides with the recommended 5m grading limit imposes a barrier to surface water flow into the PSW from the subject property *(although grading may be required within this 5m zone per GRCA comment 3 below)*, a 10m Development Limit is considered a suitable setback to buffer the PSW from the proposed development. The 10m Development Limit proposed as a passive amenity natural restoration area represents an improvement over existing ecological quality, provided that EIS recommended mitigation measures are applied. Therefore, this is to clarify that the EIS recommends that a 10m wide naturally restored area is considered suitable given the existing ecological conditions and topographic features of the subject property. We request GRCA confirmation of this point.

2.	They propose the exception of impervious areas, such as a large swimming pool and walking paths. GRCA staff do not accept the proposed pool within the 30m buffer (it appears to be within approximately 10m of the PSW) based on ecological and hydrological hindrance to the efficacy of the buffer. This pool can very likely be placed elsewhere on the subject property without being in the recommended 30m buffer from the PSW.	As stated within the EIS, no impervious walking paths are proposed within 30m of the PSW. *The footprint of the pool feature is approximately 80m^2, in relation to the approximate total of 19,208m^2 for lands within 30m of the PSW, including those outside the subject property. This amounts to 0.4% of the total area within 30m of the PSW. Provided that post-construction mitigation recommendations are applied (e.g., permanent fencing to exclude resident access into the adjacent PSW, restoration plantings within the 10m Development Limit), the presence of a pool within the 30m zone, but outside the 10m Development Limit, is not anticipated to cause any impacts to the PSW.* The 30m setback of major proposed developments is anticipated to maintain the form and function of the adjacent PSW in conjunction with other recommended measures in the EIS.
3.	The hydrology report, especially Figure 3, indicates that the groundwater from the subject property flows to the PSW. Therefore, the proponent needs to ensure that appropriate on-site infiltration is utilized to allow for appropriate groundwater inputs since the subject property is hydrologically connected with the PSW. Furthermore, S4.3, S4.4, S7.3.1 and S7.4.2 of the EIS should be corrected where it states that there is a hydrological disconnect between the subject property and the PSW, as this is incorrect.	The Hydrogeological Report has been revised to include discussion regarding the groundwater contributions from the subject property to the PSW. As identified in Section 6.3 of the Hydrogeological Study (Gamsby and Mannerow Limited, dated October 2013), the groundwater flow direction was determined based on the groundwater elevations in the on-site monitoring wells. Based on these elevations of the groundwater flow direction in the shallow overburden appears to be in a southeasterly direction towards the existing stormwater management pond on the east side of Watson Parkway and Clythe Creek. Over the majority of the property, groundwater flow does not appear to be directed to the wetland feature, which is considered to be cross-gradient to the subject property. Based on shallow piezometer installations, a component of groundwater flow from the low-lying westerly portion of the subject property towards the vegetated and PSW areas may exist under high watertable conditions (i.e., in Spring). The component of groundwater flow is considered to be minor and due to localized mounding of surface water along the westerly swale. The component of groundwater flow that may be towards the wetland flow is inferred to extend radially from the centerline of the existing swale, or approximately a 5 m width of the subject property, and only during the wet or heavy rainfall conditions, when the majority of stormwater is directed towards the temporary stormwater pond, at the southerly extent of the subject property. Since downward gradients are reported to exist within the wetland feature (i.e., groundwater is not discharging or supporting the wetland feature), this intermittent and limited component of flow is not expected to have an influence on water conditions within the wetland. However, as a contingency measure, approximately 60 m of infiltration gallery associated with stormwater collection along the westerly property boundary is

		proposed. The gallery is to be located along the westerly property boundary, approximately where the wetland boundary is closest to the property boundary (as shown on the General Plan associated with the FSR).
4.	The anthropogenic berm appears to be short-lived compared to the adjacent wetland and its associated hydrology. The berm may be impacting the natural and historical hydrology of the wetland. We recommend that maintaining the hydrology of the wetland which existed prior to the creation of the berm would be the most appropriate water balance to achieve. Maintenance of the berm is proposed in the EIS and we would suggest that as part of this maintenance, notches or another measure be designed into this berm to allow for surface water to freely pass and feed into the PSW. This water should be from a cleaner source, such as roof top water or surface water from vegetated areas.	As identified in Section 6.4 of the Hydrogeological Study (Gamsby and Mannerow Limited, dated October 2013), the existing wetland is maintained primarily by surface runoff. Section 6.4 of the Hydrogeolgoical Study also identifies that external lands to the west and northwest of the subject site contribute surface runoff to the existing wetland feature. *As part of the final site grading design, to be completed in support of site plan approval, the conveyance of "clean" runoff from the development to the existing wetland will be investigated and considered.*
5.	It is unclear where the proposed trail is to be located. The trail should not be placed within an area that it could negatively impact the PSW.	As described in Section 7.3.3 of the EIS, a trail through the subject property is not recommended.
6.	The EIS states that the proposed development will result in a reduction of groundwater recharge. Information provided states that all water originating onsite will be redirected offsite. Groundwater should be recharged to ensure that there is no reduction of groundwater inputs post development.	Based on the results of the Geotechnical Investigation (exp Services Inc., dated November 2011), as well as the Preliminary Geotechnical Investigation Report (V.A. Wood (Guelph) Inc,, dated May 2013), the native underlying soils are described as sandy silt till, sand and gravel, gravel sand and silt and sand till. Due to the depth of the sand and gravel and gravel sand and the high groundwater elevation across the site (ranges from approximately 4.1m to 6.4m below ground surface), the use of on-site infiltration structures is not recommended as the minimum 1.0m separation from high groundwater cannot be achieved. A copy of the Geotechnical Investigation (exp Services Inc., dated November 2011), and the Preliminary Geotechnical Investigation Report (V.A. Wood (Guelph) Inc., dated May 2013), have been appended.
Functional Servicing Report Comments		

1.	S.3.4 indicates that the runoff from rooftops of proposed buildings will be discharged directly into the onsite storm sewer system. This should be explored to take advantage of recharging groundwater on the subject property and surface water inputs to the PSW.	In the Geotechnical Investigation (exp Services Inc., dated November 2011), the native underlying soils are described as sandy silt till, complete with a local deposit of sand and gravel. Based on the depth of the local sand and gravel deposit (approximately 6.0m below ground surface) and the groundwater depth across the site (ranges from approximately 5.0m to 5.8m below ground surface), the use of on-site infiltration structures is not recommended as the minimum 1.0m separation from high groundwater cannot be achieved. In the Preliminary Geotechnical Investigation Report (V.A. Wood (Guelph) Inc., dated May 2013), the native underlying soils are described as silty sand, gravel sand and silt and sand till, with groundwater elevations ranging from 4.1m to 6.4m below ground surface. Based on the depth of the gravel sand in BH.3 (located 3.0m to 6.1m below ground surface) and the high groundwater elevation of 4.1m in BH.3, the use of on-site infiltration structures is not feasible as the minimum 1.0m separation from high groundwater level cannot be achieved. Therefore, based on the geotechnical investigations completed for the site, the use of on-site infiltration measures is not recommended.
Hydrogeological Study Comments		
1.	S6.3 should be congruent with Figures 3 and 4, and speak to the flow of groundwater from the subject property to the PSW.	The Hydrogeological Report has been revised to include discussion regarding the groundwater contributions from the subject property to the PSW. As identified in Section 6.3 of the Hydrogeological Study (Gamsby and Mannerow Limited, dated October 2013), the groundwater flow direction was determined based on the groundwater elevations in the on-site monitoring wells. Based on these elevations of the groundwater flow direction in the shallow overburden appears to be in a southeasterly direction towards the existing stormwater management pond on the east side of Watson Parkway and Clythe Creek. Over the majority of the property, groundwater flow does not appear to be directed to the wetland feature, which is considered to be cross-gradient to the subject property. Based on shallow piezometer installations, a component of groundwater flow from the low-lying westerly portion of the subject property towards the vegetated and PSW areas may exist under high watertable conditions (i.e., in Spring). The component of groundwater flow is considered to be minor and due to localized mounding of surface water along the westerly swale. The component of groundwater flow that may be towards the wetland flow is inferred to extend radially from the centerline of the existing swale, or approximately a 5 m width of the subject property, and only during the wet or heavy rainfall conditions, when the

		majority of stormwater is directed towards the temporary stormwater pond, at the southerly extent of the subject property. Since downward gradients are reported to exist within the wetland feature (i.e., groundwater is not discharging or supporting the wetland feature), this intermittent and limited component of flow is not expected to have an influence on water conditions within the wetland. However, as a contingency measure, approximately 60 m of infiltration gallery associated with stormwater collection along the westerly property boundary is proposed. The gallery is to be located along the westerly property boundary, approximately where the wetland boundary is closest to the property boundary (as shown on the General Plan associated with the FSR).
Advisory Comments		
1.	According to the literature and the recorded suitable habitat within the PSW, the nationally threatened and therefore locally significant species Western Chorus Frog is likely present. It is advised that consideration for this species be incorporated where feasible into the development plans.	The PSW was surveyed for the presence of anuran (frog and toad) species as part of the EIS completed for the adjacent Cityview Drive property. Two amphibian call surveys were completed on April 21, 2009 and May 22, 2009 following the Marsh Monitoring Program protocol (Bird Studies Canada 2009). A third June survey was not completed due to the lack of standing water within the PSW. No western chorus frogs were detected during these surveys. It was therefore determined that this species was likely absent from the PSW in 2009. Nonetheless, the proposed native species restorations and addition of greenspace within the subject property will represent an improvement in existing ecological conditions adjacent to the PSW. In combination with proposed construction- and post-construction stage mitigation measures (e.g., clear delineation of grading and vegetation removal limits, public access restrictions to the wetland via permanent fencing and dense restoration plantings), the proposed undertaking is expected to result in an overall improvement to the ecological quality of the wetland through increases in adjacent wildlife habitat, increased setback from area disturbance, increased capacity for water quality improvement via natural filtration of surface stormwater flows through grasses and vegetation, and removal of non-native and invasive species.
2.	S7.3.1 indicates that portions of the dripline may be impacted by the proposed development. A minimum 5m setback from the woodland dripline is advised to protect this feature.	The EIS describes the trees along the west property boundary as a row of trees as opposed to a woodland edge. The row of trees along the west property boundary is spatially separated from discrete woodland areas located further within the Cityview Drive property, and in fact represent the remnant of a historical hedgerow. As described in Section 6.0 of the EIS, due to historic fill removal undertaken in creation of the swale, the root zones of the row trees do not

		fully extend to their dripline limits along their east-facing sides. Therefore, the 10m Development Limit, which incorporates the dripline of these trees, is considered a sufficient setback to avoid impact to the west property boundary trees.

Nature Guelph Comments (February 17, 2014)

Comment Number	Comment	Response
1.	On page 21, under Mineral Cultural Savannah (SVDM3), the scientific name given for the species Butter-and-Eggs is *Commandra umbellata*. However, the correct name is *Linaria vulgaris*.	This error has been corrected.
2.	On page 22, under Buckthorn Deciduous Shrub Thicket (THDM2-6), two sedge species are listed which are almost certainly incorrect. These are: *Carex alopecoidea* and *Carex houghtoniana*. *C. alopecoidea* is known from only a few locations in the county in undisturbed wetlands while *C. houghtoniana* is a more northern species not found in Wellington County.	Both species were identified by an NRSI biologist on May 13, 2009 within the THDM2-6 community as part of the Cityview Drive EIS. A separate NRSI biologist who is highly skilled in botanical identification (Pat Deacon) reviewed these species identifications and concluded that they were incorrectly identified through use of a field identification key. As this error was originally reported to NRSI following Nature Guelph's review of the Cityview Drive EIS, Pat responded to Nature Guelph on this matter in an email dated November 21, 2013. In that email, Pat indicated that he would infer that *C. alopecoidea* may actually be *C. stipata*, and *C. houghtoniana* may actually be *C. pellita* (which was recorded on the adjacent Cityview Ridge property by North-South Environmental). The report has been updated to replace *C. alopecoidea* with *C. stipata*, and *C. houghtoniana* with *C. pellita*.

City of Guelph Environmental Advisory Committee Comments (March 12, 2014)

Comment Number	Comment	Response
1.	<u>Protection of the PSW</u> It should be understood that the groundwater-surface water interactions in the Clythe Creek Subwatershed area are recognized as being complex, highly	Based on our review and experience with groundwater systems, the complexity referenced within the Ashworth Thesis relates to the local scale groundwater flow patterns and corresponding discharge to the Clythe Creek (and systems along its reaches). The heterogeneity relates

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	heterogeneous, and challenging to assess (see the University of Guelph M.Sc. Thesis by Hailey Ashworth, 2012, which is cited in the reports reviewed). The EIS and supporting hydrogeology study (appended to the EIS) indicate that groundwater flow through the majority of the site does not appear to be directed towards the off-site PSW, but that surface water from the site is likely directed towards the PSW during periods of high flow (e.g., during spring). It also states that the existing berm is currently functioning as a barrier to overland flow. These latter two statements indicate that the subject property does indeed contribute at least surface flows to the off-site PSW, if not groundwater. Therefore, the proposal and related design/mitigation measures need to ensure (a) that this flow (even if it is seasonal) is maintained, and (b) that it is receiving adequate water quality treatment prior to entry to the PSW. As stated in the GRCA comments (Feb. 7, 2014), the EIS should be revised to remove references to there being a hydrologic disconnect between the subject property and the adjacent off-site PSW (e.g., p. 52).	to the measurement on the scale of centimetres to metres. Such complexities for creeks and rivers is documented in several publications. In summary, in many environments groundwater discharge to streams will vary along its length and can occur in discrete areas. The stream/river can be “gaining” or “losing” at various portions of its reach. We do not dispute such heterogeneity or the difficulty of implementing discrete measurement to assess groundwater-surface water interaction. Such complexity would relate to the eventual discharges occurring to Clythe Creek. The Hydrogeological Report reviews the site conditions with respect to the larger scale (area-wide) potential for impacts to water budget. In particular, no portions of the property are considered to be in groundwater discharge areas. As noted, the PSW is also considered to be supported by surface water, reducing the issue of more complex groundwater-surface water interactions. Downwards gradients have been noted adjacent to, and within, the PSW in studies completed for the property where it exists. Thus, no impacts to the PSW are anticipated due to changes in groundwater conditions. However, in response to comment and as a mitigative measure, a 60 m long infiltration gallery has been added to the plans along the westerly property boundary where the swale now exists, stormwater from the westerly portion of the site will continue to be directed to the west portion of the property, and is expected to mimic existing conditions.
2.	<u>Protection of the PSW Buffer</u> Although the EIS states all buildings and pervious surfaces (i.e., parking areas, roadways) are outside the 30 m buffer to the PSW, Figure 3 appears to show some parking area extending into the buffer and the report (p. 46) indicates one of the underground parking garage ramps will be within this buffer zone. This is not considered an acceptable land use in this zone as it presents a permanent impervious surface. Additional pervious surface within the PSW buffer is of particular concern on this site because so much of the property (almost 80%) is to be covered in pervious surfaces.	• As described in Section 7.1 of the updated EIS, the proposed development no longer includes a swimming pool within the proposed property amenity space, which is located within 30m of the PSW boundary. With the removal of the pool from the proposed development plan, the on-site 30m zone from the PSW boundary does not contain any impervious surfaces and removes an intensive human use from this proposed amenity area. Removal of the pool is therefore intended to satisfy review agency concerns regarding impervious surface and active human use of the lands within 30m of the PSW. • As described in Section 6.0 of the EIS, the proposed development

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	Maintaining more of this buffer in a naturalized state on this site is important for (a) maintenance of water inputs to the PSW, and (b) maintenance of on-site groundwater recharge. In addition, in the current proposal there would be a pool, extensive grading extending well into the buffer, and placement of storm water management systems within this zone. A pool is not considered an appropriate land use in this zone, as it creates a permanent impervious area with potential for unwanted chemical inputs (i.e., draining of pool water). The EIS should be revised to recommend all grading and construction-related activities (e.g., vehicle access, parking, material stockpiling) be outside the first 15 m of the buffer, and outside the 30 m limit where possible (see p. 62) as to limit compromising the effectiveness of the buffer performing important functions (e.g., hydrologic).	layout and setbacks are considered suitable to protect the PSW and mitigate impacts associated with the proposed development, given the existing site topography, disturbance history, and lack of significant hydrological connection to the PSW. Altogether, the proposed development incorporates a 30m setback of buildings and impervious surfaces from the PSW, a 10m Development Limit from the west property boundary within which passive and active ecological restoration is proposed, and a 5m Grading Limit to protect the existing row of mature trees and the integrity of the existing berm. Section 6.0 of the EIS has been updated to more thoroughly evaluate the functional value of the lands 30m from the PSW boundary, where they occur on the subject property. As stated in the updated report, the lands within this 30m zone, outside of the 10m Development Setback, provide negligible value to the functioning of the PSW (e.g., through hydrological inputs, wildlife habitat). However, the proposed development will maintain this area as pervious surface and include native vegetation plantings as a passive amenity greenspace for enjoyment of the local condominium residents. The 10m Development Limit will protect the existing row of mature trees along the subject property boundary as well as the existing function of the berm to maintain surface water flow to within the subject property. The 10m Development Limit will also maintain the function of the existing swale to direct surface water runoff within the subject property, and as a source of limited, seasonal groundwater input to the PSW as described in Section 4.1 of the EIS. Lands within this 10m setback to the subject property boundary will be actively restored with native species plantings to enhance its ecological value. This area will also be considered off-limits to local condominium residents and will be allowed to passively naturalize, providing an enhanced ecological buffer to the off-site PSW. See Figure 4 of the updated EIS for a conceptual cross-section drawing showing the proposed setbacks and grading from the edge of proposed development to the west property boundary. • As described in Section 7.4.1 of the EIS, all grading and construction-

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		related activities are to be maintained outside of the 5m Grading Limit. Any necessary grading within the 5-10m zone (behind the 10m Development Limit) is to be completed so as to minimize disturbances to this zone (such as by completing all necessary grading within this zone at once to limit construction equipment entries). Once grading within this zone is completed, construction zone boundary fencing should be installed along the 10m Development Limit as soon as is feasible.
3.	<u>Groundwater Infiltration</u> The EIS and supporting hydrogeology study (appended to the EIS) indicate the site is an area of groundwater recharge, but conclude that no impacts to the groundwater on site will occur as a result of this development (i.e., p. 53). Furthermore, the EIS states no cumulative impacts to Clythe Creek are anticipated as part of the development on these lands. However, even if the site does not have "high" levels of recharge, the introduction of almost 80% (im)pervious surfaces to a previously open site will significantly reduce the amount of on-site infiltration (as, particularly if much of the collected surface water is taken off-site to the nearby municipal SWM pond). The current surface and groundwater infiltration provided by this site does not appear to be adequately considered as part of this EIS. This oversight needs to be addressed in order to ensure that Clythe Creek to the south is adequately sustained in terms of both the quantity and quality of water being directed to it in a post-development scenario. One of the key recommendations in the Clythe Creek Overview Study is that groundwater inputs to watercourses and existing groundwater recharge	Recharge to the overall system will primarily be maintained through the direction of stormwater to the municipal stormwater pond, which has been designed to accept it. The municipal stormwater pond has been designed to control water quality and quantity, with infiltration and overflow to Clythe Creek. No impacts are expected through the mitigative measures provided through the designed stormwater pond and the fact that the sum of the recharge and run-off continues to be directed toward Clythe Creek. • Water Quality, including thermal loading has been addressed through the approved design of the municipal stormwater pond. The Hydrogeological Study for this report used the information from the Anderson GeoLogic report only to comment on the PSW. The reports focus on the PSW feature provided more certainty regarding this feature, and was consistent with G&M's findings. G&M has made their own conclusions regarding the impacts to Clythe Creek and not relied on the Anderson Geologic Report for their assessment. The developable area on the adjacent property (reviewed by Anderson) has differing conditions and potential influences regarding Clythe Creek. In contrast, the water budget and influence to Clythe Creek in relation to the subject property is primarily influenced by the presence and design of the municipal stormwater pond Lastly, we are not privy to third party information that has not become public record. As such, review of additional documentation can only be

Comment Number	Comment	Response
	conditions be maintained (#5). The EIS acknowledges that the proposed development will result in a net loss of groundwater recharge on site. The development proposal, and related mitigation measures, need to be revised to ensure this does not occur (i.e., through more on-site infiltration of clean water). Currently, Clythe Creek is still considered a cold/cool water watercourse, although (there) is evidence that it is shifting towards more of a cool/warm water habitat (Ashworth M.Sc. Thesis, 2012). Therefore, any potential impacts associated with this proposed development that may contribute to additional thermal loading (i.e., warming) of Clythe Creek need to be addressed. Notably, this EIS also relies on findings of the hydrogeology study completed by Anderson GeoLogic (2001) for the adjacent 55/75 Cityview property for its conclusions. However, the author of this study has acknowledged that the local hydrogeology focused on inputs to the PSW and was not fully considered in the broader context of Clythe Creek, and is in the process of revising this study in response to comments received by the City. This revised report should be considered as part of the updated EIS for this site.	warranted where it is actually available. We believe it is unreasonable to wait an unspecified period of time for the release of a document.
4.	<u>Tree Protection</u> The City recognizes and appreciates that the EIS has identified a number of healthy, native trees along the western property boundary for protection, however allowing grading to within the dripline of (many) of these trees, including the larger trees shared with the adjacent property, is not supportive of their long term protection. Although some deviation from the City's current standard 10 m buffer to protected woodlands may be warranted given the disturbed nature of the site and the presence of a berm in such close proximity to the dripline of the protected trees, a minimum "no	• As indicated in the EIS (e.g., Section 5.2), the row of mature trees located along the subject property boundary is not considered part of a woodland; rather, this row of trees represents a historical agricultural hedgerow. Consequently, the City's minimum woodland buffer does not apply to these trees. • As described in Section 6.0 of the EIS, a swale was historically excavated within the driplines of the existing row of mature trees along the subject property boundary. As a result of this excavation, the root zones of these trees no longer extend to their driplines along their east-facing sides. Required site grading to a maximum of the 5m Grading Limit, which encompasses this row of mature trees, is therefore not anticipated to impact the root zones of these trees,

Comment Number	Comment	Response
	development zone (including no grading)" of 5 m should be established to support protection of these trees, and closer to 10 m should be targeted wherever possible. Furthermore, restoration/naturalization of this zone will more fully address recommendations #1 and #2 of the Clythe Creek Overview Study. The EIS should be revised to recommend all construction-related activities (e.g., vehicle access, parking, material stockpiling) be outside this tree protection zone (see p. 61).	provided that the tree protection measures and mitigation recommendations outlined in the Tree Protection Plan are followed. • As described in Section 7.7 of the EIS, lands within the 10m Development Limit will be actively restored with native species plantings. Furthermore, measures will be taken to prevent human access to this setback zone, and this area will be allowed to passively naturalize over time to serve as an enhanced buffer to the off-site PSW. Over the long-term, active restoration and natural regeneration within this zone will form an enhanced future woodland edge as lands to the immediate west of the tree row on the Cityview Drive property continue to naturally succeed to woodland. Natural restoration of this zone will therefore address recommendation #2 of the Clythe Creek Overview Study. • Recommendation #1 of the Clythe Creek Overview Study is not applicable to this proposed development as no removal of existing woodland is proposed. • As described in Section 7.4.1 of the EIS, and as detailed in the Tree Protection Plan, the 5m Grading Limit is to be clearly demarcated with bright coloured snow fencing to ensure no inadvertent removal or damage of vegetation beyond the Grading Limit during site construction. As described above, site grading up to a maximum of this Grading Limit is not anticipated to impact the existing row of mature trees due to their reduced east-facing root zones. Once grading within the 5-10m setback zone has been completed, it is recommended that snow fencing be installed along the 10m Development Limit, if feasible according to the site development sequencing (to be determined). Section 7.4.1 has been updated to clarify that construction-related activities (e.g., vehicle access and parking, equipment and materials storage, fill stockpiling) should occur outside of the 10m Development Limit, with the exception of any necessary grading required within the 5-10m setback zone.
5.	<u>Trail</u> The City's Parks Planning and Development Division indicated that a potential trail connection, as per the conceptual trail identified through the Guelph Trail Network, should be considered and assessed through	• Section 7.6 of the updated EIS assesses potential impacts associated with two City-proposed pedestrian trail routes: one located within the subject property adjacent to the west property boundary (included within February 6, 2013 City of Guelph Parks Planning and Development department comments on the EIS Terms of Reference

Comment Number	Comment	Response
	the EIS (see the memo included in Appendix III of the EIS). The EIS provides an assessment (p. 49-50) and concludes in the context of the current development proposal that there is no suitable route for a trail. The City's Parks Planner has yet to comment on this EIS, however from an environmental perspective given the approximate number of units proposed, a carefully designed and managed trail network will be needed in the area, to avoid the profusion of informal trails. If a trail along the edge of the protected natural area on this site is not suitable due to potential environmental impacts, then an alternate route should be identified and recommended (e.g., on road or elsewhere) to mitigate potential impacts of informal trails. Management of trail access should be combined with the measures already identified in the EIS (e.g., signs, an educational guide – p. 56-57), and potentially permanent fencing to discourage inappropriate access (as suggested by GRCA).	(Appendix III)), and one predominantly located between the PSW and the west subject property boundary within the Cityview Drive property, and traversing the south subject property to connect with Watson Parkway South (proposed in comments provided on March 18, 2014 (Appendix VI)). Based on the results of these assessments, pedestrian trail routes along the two City-proposed alignments was not recommended. An alternative, NRSI-proposed sidewalk-based route, which integrates with the proposed trail network presented in OPA 48, was instead recommended as a means to achieve local trail network connectivity while avoiding or minimizing impact to the adjacent natural features.
6.	<u>Enhancement and Restoration</u> The extent of restoration and enhancement identified with this site does not adequately address recommendations in the Clythe Creek Overview Study (recommendations #1 and #2). Although the EIS recommends restoration and naturalization with native species, and the retention of some of the healthy, mature trees along the western boundary of the site, in effect this amounts to restoration/naturalization of a narrow band of about 5 to 10 m from the property line along a portion of the property's western edge.	• Recommendation #1 of the Clythe Creek Overview Study is not applicable to this proposed development as no removal of existing woodland is proposed. • The updated EIS recommends that the majority of the 84 compensation tree plantings be established within the 10m development setback zone to the subject property boundary. A smaller proportion of these compensation plantings can be established within the property amenity space (within 30m of the PSW boundary), in conjunction with other native shrub and herbaceous species plantings. Additionally, the opportunity to establish compensation tree plantings within the off-site SWM pond should be explored. Shading provided by increased canopy coverage over areas of SWM discharge may mitigate potential thermal loading impacts to receiving waters. All compensation/restoration plantings within the property will comprise species that are local to Wellington County. A proposed garden for the property amenity area will

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		comprise species that are attractive to butterflies and general pollinators. Altogether, native species plantings within the property amenity space will enhance the ecological quality of the area over current conditions, and complement the active restoration proposed for the adjacent10m development setback zone. Collectively, these proposed restoration/enhancement activities address Recommendation #2 of the Clythe Creek Overview Study.
7.	Tree Preservation The tree preservation plan will need to be revised in consideration of pending revisions to the 55 & 75 Cityview property as there are a number of shared trees.	The Tree Protection Plan has been updated to acknowledge that pending revisions to the 55 & 75 Cityview Drive property site plan may require removal of certain shared property trees. As noted in the Tree Protection Plan, it is not currently known which of these shared property trees will require removal at this time.
8.	Tree Compensation (P. 17 of the Tree Protection Plan). Please note that planting native species that are locally significant is supported by the City, and should not be discouraged. However, it is understood that planting provincially significant species that are endangered or threatened can be problematic because of the legislation that applies to them, and therefore we support avoiding planting of these species outside of formal agreements with OMNR.	As stated in Section 6.5 of the Tree Protection Plan, species used for replacement/enhancement plantings should not include any species that are listed as introduced, or locally, provincially or federally significant.
9.	Tree Compensation The EIS suggests (p. 48) that compensation for the 28 healthy trees proposed for removal be at 3:1, which is consistent with the City's current practices. Compensation trees should be identified above and beyond standard landscape requirements and on this site should be targeted towards restoration areas within the PSW 30 m buffer.	Section 7.3.1 of the EIS has been updated to clarify that most of the required 84 compensation tree plantings be established within the 10m Development Limit zone to the west property boundary as a means of active ecological restoration of this area. A smaller proportion of these compensation plantings can be established within the property amenity space to increase its ecological value and complement the restored lands within the 10m development setback zone. As described above, a proportion of these restoration plantings can also be considered for establishment within the off-site SWM facility.

City of Guelph Parks and Open Space Division Comments (April 3, 2014)

Comment Number	Comment	Response
1.	Assess the impacts of proposed "alternative" trail route (Appendix-1 conceptual trail alignment) or propose another alternative route to provide a pedestrian connection from Watson Parkway North to Cityview Drive.	• Section 7.6 of the updated EIS assesses potential impacts associated with a City-proposed alternative trail route, predominantly located between the PSW and the west subject property boundary within the Cityview Drive property, and traversing the south subject property to connect with Watson Parkway South (Appendix-1 of April 3, 2014 comments and originally forwarded by the City as a proposed trail route on March 18, 2014). Based on the results of an impact assessment, this proposed pedestrian trail route is not recommended, primarily due to the potential for impacts to the immediately adjacent PSW. An alternative, NRSI-proposed sidewalk-based route, which integrates with the proposed trail network presented in OPA 48, was instead recommended as a means to achieve local trail network connectivity while avoiding or minimizing impact to the adjacent natural features. The alternative, sidewalk-based route is shown on Figure 5 of the updated EIS.
2.	Provide recommendations on appropriate measures to mitigate environmental impacts from trail development.	• The proposed alternative sidewalk-based pedestrian trail route will not occur within or immediately adjacent to significant natural features, and will use existing or proposed sidewalk infrastructure. Therefore, no significant direct, indirect, or induced impacts to natural features are anticipated.
3.	Provide recommendations on measures such as fencing and screen planting to mitigate encroachment, unauthorized public access, privacy and security concerns.	• As described in Section 7.5 of the EIS, permanent chain link fencing is recommended to be installed along the west subject property boundary to prevent unauthorized entry of local condominium residents into the adjacent PSW and surrounding natural features. Active restoration of the 10m development setback zone should include dense plantings of native tree and shrub species to discourage and minimize human intrusion into the restoration zone, as described in Section 7.8 of the EIS. These measures, in combination with the routing of pedestrians along the proposed sidewalk-based route and away from the sensitive

Comment Number	Comment	Response
		natural features, and anticipated to effectively mitigate potential induced impacts to these features.
4.	Provide recommendation on the desirable locations and content of interpretive signage. The environmental interpretive signage will be proposed along trail route adjacent to natural heritage feature to educate residents about the environmental sensitivity of the existing natural heritage features and procedures residents can follow to protect and/or enhance these areas.	• As described above, a pedestrian trail route immediately adjacent to the PSW, and within 15m of the PSW boundary for the majority of its length, is not recommended due to potential for direct, indirect and induced impacts to the feature. An alternative sidewalk-based pedestrian route has instead been proposed. Because the proposed trail route does not traverse a sensitive natural area, interpretive signage is not considered necessary.
5.	Provide recommendation on the desirable locations and content of trail rules signage to educate the users on expected behaviours while using the trails. Their locations, design and details will be shown on the EIR trail plans.	• Because the proposed sidewalk-based trail route does not traverse a sensitive natural area, trail rules signage is not considered necessary.

APPENDIX II

EIS Terms of Reference and Review Agency Comments

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

May 29, 2013 Project 1367

Nathan Garland
Resource Planner
Grand River Conservation Authority
400 Clyde Road,
Cambridge, Ontario
N1R 5W6

Adèle Labbé
Environmental Planner
City of Guelph
1 Carden Street
Guelph, Ontario
N1H 3A1

Dear Mr. Garland and Ms. Labbé,

Re: Scoped Environmental Impact Study (EIS)
Watson-Starwood Proposed Residential Development, Guelph Ontario
Terms of Reference

On behalf of Natural Resource Solutions Inc. (NRSI), I am pleased to provide the following Terms of Reference (TOR) for the completion of a Scoped Environmental Impact Study (EIS) for a proposed residential development. The subject property is located at the southwest corner of Watson Parkway North and Starwood Drive in Guelph, Ontario.

This TOR addresses comments put forth by the City of Guelph's Environmental Advisory Committee (EAC) on February 13, 2013, the City of Guelph's Parks Department on February 6, 2013, as well as the Grand River Conservation Authority (GRCA) on February 26, 2013. These comments have been appended for reference.

The subject property is predominately comprised of disturbed, open lands that have historically experienced topsoil removal, and more recently fill deposits. The western property boundary borders cultural woodland that occurs off-site. A row of larger deciduous trees is found growing along the property boundary. The subject property is also located within 120m of the Clythe Creek Provincially Significant Wetland (PSW). In addition to addressing the PPS, lands regulated under the GRCA Regulation 150/06 are present within the subject property. Any development within 120m of the wetland boundary requires the preparation of a scoped EIS to demonstrate that no negative impacts to the feature will occur as a result of the proposed undertaking.

Other features within the subject property include a low (approximately 1m) berm and large partially vegetated swale that follow along the western property boundary, and a temporary sediment basin in the southern portion of the subject property.

The following draft TOR outlines the steps required to complete the scoped EIS for the proposed development within the Watson-Starwood property in accordance with *Grand*

River Conservation Environmental Impact Study Guidelines and Submission Standards for Wetlands (GRCA 2005) and the City of Guelph's Official Plan Amendment (OPA) 42 (currently under appeal). Please do not hesitate to contact me if you have any questions or comments regarding the content of the following proposed draft TOR.

Sincerely,
Natural Resource Solutions Inc.

Ryan Archer
Terrestrial and Wetland Biologist
CC: Helmuth Strobel, Coletara Development

Watson-Starwood Proposed Residential Development, Guelph, Ontario
Scoped Environmental Impact Study
Terms of Reference
May 29, 2013

Introduction

The subject property is located at the southwest corner of Watson Parkway North and Starwood Drive in the City of Guelph (Figure 1). Field surveys conducted on November 9, 2012 as well as May 3, 2013 by NRSI staff characterized the subject property as being predominately disturbed open lands removed of topsoil, with scattered trees along the western property boundary, which represent an old hedgerow and the eastern limit of an off-site cultural woodland.

An EIS is currently being completed by NRSI on the adjacent property at 55 & 75 Cityview Drive, which is located southwest of the subject property. The Cityview Drive EIS is being carried out in support of a proposed residential development application. NRSI was retained to undertake the EIS in 2009. NRSI biologists recently (2009-2012) characterized the property's natural features and functions; existing available information from that assessment will be utilized to its fullest extent for the purposes of this scoped EIS. A draft EIS has also recently been prepared (2012) for the property immediately south of the subject property, known as the Cityview Ridge lands, by North-South Environmental. Certain information from the Cityview Ridge draft EIS, such as vegetation community classifications, will be utilized to more fully inform characterization of the lands adjacent to the subject property.

The subject property has experienced considerable disturbance over the past decade or more. As noted above, the lands have been historically stripped of topsoil and have been used to dump fill. Natural features within the subject property are virtually absent. Scattered trees are found along the western property boundary, which represent an old hedgerow and the eastern limit of an off-site cultural woodland. Portions of the Clythe Creek PSW complex are present within 120m to the southwest. within the 55 & 75 Cityview lands (see Figure 1). And it is these perimeter and off-site features that trigger the need for an EIS. Any development within 120m of the wetland boundary requires the preparation of a scoped EIS to demonstrate that no negative impacts to natural features occur as a result of the proposed undertaking.

Other features within the subject property include a low (approximately 1m) berm and large partially vegetated swale that follow along the western property boundary and a temporary sediment basin in the southern portion of the subject property.

The GRCA and Ontario Ministry of Natural Resources (OMNR) watercourse mapping indicates that a tributary of Clythe Creek traversed the subject property. During a site visit in November 2012, NRSI aquatic biologists confirmed the absence of any aquatic habitat/watercourse features on and within 30m of the Watson-Starwood subject property. Documentation of the absence of this feature was provided by NRSI to GRCA (Nathan Garland) and the City (Adele Labbe) for review in February 2013.

Proposed Undertaking

Coletara Development is currently proposing to develop the subject property as residential with multi-storey apartment buildings, parking areas, stormwater management controls, and associated amenity features.

Scoped Environmental Impact Study – Study Approach

The approach has been divided into four components:

1) Characterization of existing natural heritage features and functions within the subject property and adjacent lands (120m);
2) Identification of opportunities and constraints in relation to existing natural heritage features within the subject property and adjacent lands;
3) Impact analysis, including the identification of potential impacts from the proposed development and recommendation of mitigative measures to address potential impacts; and,
4) Reporting, including existing conditions characterization, identification of opportunities and constraints, impact analysis and recommended mitigation measures as well as opportunities for enhancement and restoration within the subject property.

Characterization of the Natural Environment

This component of the study will focus on characterizing the natural environment features within the subject property. Information from the natural heritage assessments, hydrogeological studies, and draft EIS prepared by NRSI for the 55 & 75 Cityview Drive properties, as well as the 2012 draft EIS for the Cityview Ridge property prepared by North-South Environmental, will be used where suitable for this scoped EIS. Other features such as the grassed drainage swale and temporary sediment basin will also be characterized in relation to the site's drainage function.

Additional supporting environmental information will be provided by separate stormwater management, geotechnical, and hydrogeological reports.

Collection and Review of Background Information

Existing background information on the biological features within the subject property is currently being collected and reviewed by NRSI and has assisted in guiding the study approach provided in this draft TOR. Background information sources will include the following:

- GRCA;
- OMNR, Guelph District;
- OMNR Natural Heritage Information Centre;
- City of Guelph Official Plan (2011);
- Guelph Natural Heritage Strategy (Dougan & Associates 2009);
- Clythe Creek Overview Study (Ecologistics 1998);
- Ontario Breeding Bird Atlas (Bird Studies Canada *et al.* 2006);
- Ontario Reptile and Amphibian Atlas (Ontario Nature 2013);
- Mammal Atlas of Ontario (Dobbyn 1994); and,
- Ontario Butterfly Atlas (Colin Jones et al. 2012).

NRSI will rely on background information, within input from the project engineers, to characterize the soils, hydrology and hydrogeological features for the subject property.

Field Surveys

Based on the paucity of natural features within the subject property and the availability of extensive natural heritage data recently collected on the adjacent Cityview Drive property, proposed field surveys have been scoped to include the following:

Vegetation Community Classification and Inventory
Vegetation communities within the subject property were described and mapped on November 9, 2012 by NRSI biologists using the standard Ecological Land Classification (ELC) System for Southern Ontario (Lee *et al.* 1998, Lee 2008). Details on the vegetation communities were recorded including species composition, dominance, uncommon species or features and evidence of human impact. All species of vascular flora observed were recorded.

Vegetation communities within the adjacent Cityview property were classified and mapped using ELC. Detailed vascular flora inventories were conducted on May 13, 2009 (spring), June 23, 2009 (summer), and October 4, 2012 (fall).

No further vegetation surveys are proposed on the adjacent lands.

Tree Inventory
Trees within and adjacent to the subject property which have the potential to be impacted by the proposed development were inventoried by a Certified Arborist according to the City of Guelph's Tree Protection Policies and Guidelines, Tree By-law, with consideration of OPA 42 on March 5-6, and May 3, 2013. This included recording the following for each tree ≥10cm Diameter at Breast Height (DBH) within 10m of the property line:

- species;
- DBH;
- crown radius (m);
- general health (good, fair, poor, very poor);
- potential for structural failure (low, medium, high);
- tree location (lot or block number); and,
- general comments (i.e. disease, aesthetic quality, development constraints, sensitivity to development).

Bird Surveys
NRSI biologists completed breeding bird surveys on the adjacent Cityview Drive property June 10 and June 23, 2009 in accordance with Ontario Breeding Bird Atlas methodology (Bird Studies Canada *et al.* 2006). Breeding bird evidence was recorded by habitat type found within the Cityview Drive property - woodland, wetland, thicket, and open field. In addition to breeding bird surveys, all birds observed within the Cityview Drive property during all field visits were documented.

Habitat of the only two bird Species at Risk (SAR) that have been recorded in the area, the least bittern (*Ixobrychus exilis*) and the red-headed woodpecker (*Melanerpes erythrocephalus*), was confirmed through surveys completed by NRSI to be absent within the subject lands.

NRSI biologists recorded incidental bird species observations during all visits to the Starwood Drive subject property. No further breeding bird surveys are proposed for the Watson-Starwood property due to the virtual absence of on-site natural features.

Herpetofauna Surveys

Two night-time amphibian call surveys were conducted using the Marsh Monitoring Program methodology (Bird Studies Canada 2009) on the adjacent Cityview Drive property. These surveys occurred on April 21, 2009 and May 22, 2009. By June 2009, no standing water was present in any of the wetlands; therefore, a third survey was deemed unnecessary due to the lack of suitable breeding habitat. Additionally, all incidental observations of amphibians during other field work were documented.

Suitable amphibian breeding habitat was not identified by NRSI staff within the Watson-Starwood property during the November 9 2012 site visit and again during the May 2, 2013 site visit.

During background data collection for the Cityview EIS, the OMNR indicated that two snake SAR, the eastern milksnake (*Lampropeltis t. triangulum*) and eastern ribbonsnake (*Thamnophis sauritus septentrionalis*), were known from the vicinity of the subject property. As such, a total of 8 snake cover boards were strategically placed throughout the Cityview Drive property on April 15 2009 to estimate snake species presence. Concurrently, NRSI biologists conducted area searches for snakes, which involved thorough visual scans of basking features and carefully checking under cover objects.

The Cityview property was also assessed for its potential to provide habitat for turtles. No suitable turtle habitat was identified within the Cityview or Watson-Starwood properties.

NRSI biologists recorded incidental herpetofauna species observations during all visits to the Starwood Drive subject property. No further herpetofauna surveys are proposed.

Other Wildlife
Area searches for butterflies, dragonflies, and damselflies occurred on June 23, 2009 within the Cityview Drive property. All observations of mammals, including direct observations, and any evidence, such as tracks, scats, dens, etc. were documented on all field visits carried out on the Cityview and Watson-Starwood properties. No species of mammal known from the subject property vicinity are considered SAR.

Aquatic Habitat
Although GRCA and OMNR watercourse mapping indicated that a tributary of Clythe Creek traverses the Watson-Starwood subject property, this feature was confirmed by NRSI staff to be absent. Site surface water drainage characteristics were documented within the subject property by NRSI during the November 9, 2012 and May 2, 2013 site visits. No further aquatic field surveys are proposed.

Wetland and Woodland Boundary Delineation
The Clythe Creek PSW boundary, located on the Cityview Drive property, was flagged in the field by NRSI and reviewed by GRCA staff (Tony Zammit) on June 8, 2009.

The limits of the canopies of trees that overlapped with the subject property was delineated and flagged by a NRSI certified arborist on March 5, 2013. This boundary was confirmed by City of Guelph staff (Adèle Labbé) on March 26, 2013.

Hydrogeological Assessment
Matthew Nelson, P.Eng., P.Geo., of Gamsby and Mannerow Limited has been retained to conduct a Hydrogeological Study for the subject property. The purpose of the assessment will be the following:

- To determine the hydrogeological setting of the site and hydraulic relationship with the identified wetland area including the importance of groundwater recharge or surface water discharge in maintaining the ecological function of the PSW;
- To determine the potential for impacts to the PSW due to the proposed development;
- To determine the potential for impacts to the groundwater resources and the Clythe municipal supply well due to the proposed development; and
- Recommend mitigative measures to prevent identified impacts (as required).

The scope of work to complete the study includes:

- Background review of existing information regarding hydrogeologic conditions, including existing available hydrogeologic and geotechnical reports for the area, geologic mapping, and groundwater studies (e.g., Cole *et al* (2009), Ashworth M.A.Sc. Thesis (2012));
- Review of the City of Guelph Wellhead Protection Areas and prescribed drinking water threats under the Clean Water Act;
- Site visit and review of topography to assess surface water flow directions, patterns, and evidence of groundwater discharge areas;
- Collection of geological and groundwater information from three (3) monitoring wells installed on-site (completed April 15, 2013);
- The installation of three (3) shallow piezometers (less than 3.0 m deep) to obtain additional soil and water level information and estimate the potential for groundwater discharge throughout in the vicinity of the wetland feature (Completed April 17, 2013);
- Water level measurement at the monitoring wells and piezometers during the wet period of the year (completed April 17 and 19, 2013); and,
- Analyses of site-specific and background information, and completion of a letter report describing the findings of the investigation.

Identification of Opportunities and Constraints
The analysis of constraints will be used to identify natural features and habitats that are sensitive to disturbance. This analysis will be based on site specific history and characteristics of the subject lands, in conjunction with relevant policies that direct protection of natural feature(s). This analysis will also be used to identify areas that have been previously disturbed or impacted or contain no natural features, which are identified as areas of 'opportunity' for development. These areas may also provide potential for habitat rehabilitation or enhancement. Results of this analysis are intended to provide input to the development plan in order to avoid and reduce impacts to natural features and their ecological functions.

Identified constraints will be mapped to clearly identify feature boundaries, as well as recommended measures, such as buffers, for the protection of natural features, resulting in an ultimate development limit line.

Implications of development within or adjacent to the identified natural features based on current Policies and Regulations will be identified, including the GRCA Wetlands Policy, the City of Guelph Official Plan, City of Guelph Tree Bylaw, the City of Guelph Natural Heritage Strategy – OPA 42 (currently under appeal), and the Provincial Policy Statement (PPS).

Impact Analysis, Mitigation and Enhancement

The details of the proposed undertaking, including the proposed Draft Plan, stormwater management strategy, and grading plans will be reviewed and compared to the existing conditions on the subject property and adjacent lands. Impacts will be determined based on the direct, indirect, and induced effects of the proposal.

> *Direct Impacts* - associated with disruption or displacement caused by the actual proposed 'footprint' of the undertaking, such as tree removal.
>
> *Indirect Impacts* - associated with changes in site conditions such as drainage and water quantity/quality.
>
> *Induced Impacts* - associated with impacts after the development is constructed such as subsequent demand on the resources created by habitation/use of the area and vicinity.

Recommendations with regard to mitigation of residual impacts will also be made and opportunities for enhancement will be highlighted. A Tree Protection Plan outlining which trees are recommended to be retained or removed will be prepared by a Certified Arborist. Details about tree protection, mitigation and recommendations will be included.

The landowner and City are currently in discussions about the feasibility of recreational trails on the subject property. If required, the EIS will address the feasibility and appropriateness of incorporating a public trail into the development as indicated in comments provided by the City of Guelph Parks Department (see appended comments).

Reporting

The scoped EIS report will include characterization of the existing natural features on and adjacent to the subject property, as well as a detailed impact analysis based on comparison of the proposed undertaking to these features. The report will include appendices, such as species lists and copies of the original field data sheets, and mapping of the natural features and recommended buffers on an air photo base. Opportunities for restoration and enhancement will also be discussed. In addition, opportunities for stewardship (i.e. signage) will be addressed. The report will incorporate and address recommendations provided in the Clythe Creek Overview Study (Ecologistics 1998).

The finalized report will be submitted to the City of Guelph and GRCA.

Figure 1

Watson-Starwood EIS

Subject Property

Legend

- Subject Property
- 55 & 75 Cityview Lands
- Provincially Significant Wetland (PSW) & OPA 42 - Significant Natural Area

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 1367 Date: May 29, 2013	NAD83 - UTM Zone 17 Size: 11x17" **1:1,750**

0 25 50 75 100 Metres

Path: X:\1367_StarwoodEIS\NRSI_1367_Fig1_ProjectArea_2K_2013_03_12_KEB.mxd

400 Clyde Road, P.O. Box 729 Cambridge, ON N1R 5W6

Phone: 519.621.2761 **Toll free:** 866.900.4722 **Fax:** 519.621.4844 **Online:** www.grandriver.ca

February 26th, 2013

Natural Resource Solutions Inc.
255 Labrador Drive, Unit 1
Waterloo, Ontario N2K 4M8

ATTN: Valerie Stevenson

Re: Scoped Terms of Reference for the Environmental Impact Study, Watson-Starwood Proposed Residential Development, Guelph, ON

We have reviewed the Draft Terms of Reference for the Scoped Environmental Impact Study (EIS) completed by Natural Resource Solutions dated January 9th, 2013. In general the ToR should include further information and comments with regards to the potential offset impacts and/or how those potential impacts will be addressed on site. Therefore at this time GRCA recommends updating the ToR to incorporate the comments provided below. Please note that the information characterized for the surrounding area as part of previous studies is considered valid and applicable as it has been completed within 5 years of the proposed report for the subject property.

- "Scoped Environmental Impact Study" – Study Approach
  - Under point 1), the EIS should include both information on the subject property *and adjacent area*. GRCA staff are satisfied with the comments provided in the ToR submitted that the Scoped EIS will included the existing available information from the adjacent property as a means to scope potential impacts and any required mitigation measures and monitoring off-site.
  - Under point 3), we recommend the removal of the word "offset impacts" and replace with "address and prevent potential impacts and/or incorporate appropriate mitigation".
  - Comments with regards to the incorporation of the adjacent area should be incorporated into points 2-4 as well.
- "Collection and Review of Background Information"
  - The list should include the Clythe Creek Sub-Watershed Plan.
- "Aquatic Habitat"
  - Staff have reviewed the information submitted by NRSI with regards to the potential watercourse on the subject property. The information submitted is limited to one location, therefore GRCA staff request a photo log along with GPS points of the feature location. Alternatively, GRCA staff could complete a site inspection with NRSI staff to review the location and provide further comments. The completion of this inspection with GRCA could be completed at the same time as the drip line survey, or alternatively can be completed at any time when the ground is free of snow cover.

- "Impact Analysis, Mitigation and Enhancement"
    - This section should include Impact Analysis, Mitigation and Enhancement of existing conditions on the subject property and adjacent to the subject property.

Should you have any questions or comments please feel free to contact Nathan Garland at 519-621-2763 ext. 2236

Yours truly,

Fred Natolochny MCIP RPP
Supervisor of Resource Planning
Grand River Conservation Authority

FN/ng

cc: Adele Labbe, City of Guelph

INTERNAL MEMO

DATE	February 6, 2013
TO	**Adele Labbe**
FROM	Jyoti Pathak
DIVISION	Parks Planning and Development
DEPARTMENT	Community and Social Services - Parks and Recreation
SUBJECT	**Watson-Starwood Proposed Residential Development Environmental Impact Study Draft TERMS OF REFERENCE**

Parks Planning and Development has reviewed the Draft Terms of Reference (TOR) for Scoped Environmental Impact Study (EIS) for Watson – Starwood Proposed Residential Development prepared by Natural Resource Solutions Inc for their client Coletara Development, dated January 9th, 2013 and offers the following comments:

1. Trail Route alignment

- Guelph Trail Network has identified trail routes within the existing natural open space adjacent to the proposed residential development at the south west corner of Watson Parkway North and Starwood Drive.

- Ensure potential trail connections are examined through EIS to assess their environmental impact (refer to sketch on page 3 for proposed location) and recommendations are included on trail design and development aspects.

- For the subject development approximately 400 metres long, accessible, secondary trail route has been proposed along the edge of the proposed development within or outside the buffers to existing natural heritage features as appropriate. The proposed trail route will be minimum 2.5 metre wide with stonedust/ limestone screenings surfacing. Asphalt surface will be used where slope exceeds 4% limit.

2. Trail development:

- The trail development will be carried out by the developer at the same time as part of the subdivision development rough grading operations and appropriate sediment and erosion control methods should be used to protect the adjacent natural features.

- The trail development should take place prior to implementation of Landscape Plans including restoration, compensation and enhancement planting within open space.

3. Public Education:

- EIS should recommend provision of public education through educational/ interpretive signage at the entry points to the storm water management and open space system. Public education should address the functional use of SWM area, the environmental sensitivity of natural Heritage features and procedures residents can follow to protect and/or enhance these areas.

- Parks will review and approve the design and locations of interpretive signage which will be installed as part of the implementation of landscape plans.

4. Open Space enhancement and restoration Planting/ SWM Planting:

- The EIS should recommend mitigation measures for the restoration and enhancement of open space system.

I hope the above comments are helpful. Please do not hesitate to contact me if you have further questions or concerns.

Regards

Jyoti Pathak OALA CSLA MCIP RPP | Parks Planner
Parks and Recreation | **Community and Social Services**
City of Guelph

T 519-822-1260 x 2431 | F 519-822-1751
E jyoti.pathak@guelph.ca

guelph.ca


HWY 7
WATSON PARKWAY
FLEMING RD
PROPOSED
TRAIL
STARWOOD DR
CITYVIEW DR
YORK RD
GRANGE RD
ELIZABETH ST

February 13th, 2013
Environmental Advisory Committee

Item 1 **Watson and Starwood Mixed Use Node**

Terms of Reference for the Environmental Impact Study (EIS) – prepared by Natural Resource Solutions Inc.

Proposal

There has not been a formal application submitted to date. City staff have had a pre-consultation meeting with the proponent to discuss a proposed concept plan and to outline the requirements for a complete application. It is anticipated that the application will include a Zoning By-law Amendment applications.

It was determined through pre-consultation that an EIS is required in support of a Zoning By-law Amendment as the site is within proximity to Provincially Significant Wetlands and Woodlands.

Total area of the subject property is approximately 2.56 hectares.

Location

The subject property is found in the southeastern quadrant of the Starwood Drive and Watson Parkway intersection (see Location Map).

Background

- The property is identified as a Mixed Use Node in Schedule 1 of the current Official Plan and lands adjacent to the west are designated Open Space. The site is currently zoned Specialized B.1.
- The property is identified as Community Mixed-Use Centre in Schedule 2: Land Use Plan of OPA 42. Lands adjacent to the west are identified as Significant Natural Area and Natural Area.
- The site lies within the catchment identified as S10 in the Clythe Creek Subwatershed Study.
- The site consists largely of an agricultural field. The west edge of the site includes a drainage swale directly adjacent to the neighbouring woodland, which drains to a temporary basin located in the south portion of the site.
- As identified by NRSI, the Grand River Conservation Authority mapping identifies a watercourse feature bisecting the site. The GRCA is reviewing the EIS ToR.
- A portion of the Clythe Creek Provincially Significant Wetland Complex is located on lands adjacent to the site. The PSW is surrounded by a woodland feature. Clythe Creek is found further south, flowing in a westerly direction.

Comments

1. Include pertinent information from the Clythe Creek Subwatershed Study as background information.
2. It is unclear what is being referred to as an inclusion along the western property boundary. Please clarify.

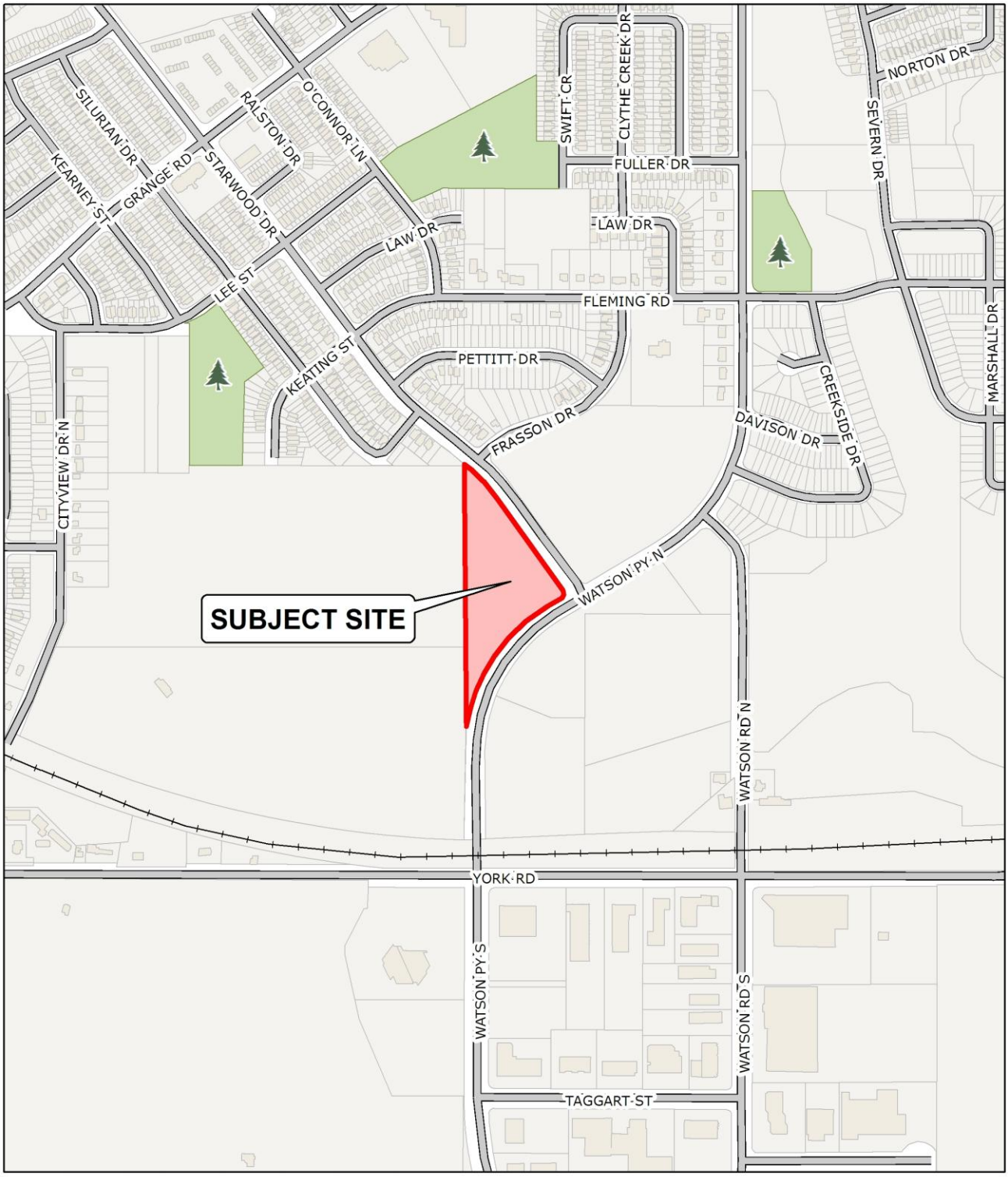
3. Under the heading "Scoped Environmental Impact Study – Study Approach", in bullet 3, please note that mitigation measures are utilized to prevent and/or reduce impacts to natural heritage features and functions as opposed to offsetting them.
4. The drainage swale and temporary basin need to be included in the EIS. Particularly, consideration of how they contribute to the function of the surrounding natural heritage system in terms of hydrologic function.
5. Restoration and enhancement opportunities should be highlighted Component 4) in the EIS ToR.
6. The woodland boundary is to be confirmed in the field with City staff.
7. The EIS will address the appropriateness and feasibility of incorporating trails into the development. Schedule 7 of OPA 42 includes a Trail Network (see attached Figure). Furthermore, the City's Parks Planner has identified a potential trail route, in red, on the attached Figure.
8. The EIS should consider any recommended stewardship items or activities (i.e., educational signage).

Suggested Motion

Staff recommend that the Environmental Advisory Committee support the EIS Terms of Reference prepared by NRSI for the Watson and Starwood Mixed-Use Node with the following:

That the EIS ToR shall be revised to the satisfaction of City Staff to include the following main items:

a) The Clythe Creek Subwatershed Study as background information;
b) Clarification as to what is being referred to as an inclusion;
c) Provision for the functional assessment of the drainage swale and system.
d) Confirmation of the woodland limit in the field by City staff;
e) Incorporation of comments from the GRCA.
f) An analysis of trail routes based on information provided by Parks Planning.
g) An additional Component: Restoration, Enhancement and Stewardship Opportunities.



0 40 80 160 240 320 m

Produced by the City of Guelph
Planning, Building, Engineering and Environment, Development Planning
February 2013

Watson / Starwood Node
LOCATION MAP

Figure provided by Parks Planner

APPENDIX III

Species at Risk/Species of Conservation Concern Screening Results

Scientific Name	Common Name	SRANK[1]	COSEWIC[2]	COSSARO[3]	SARA	Background Source	Habitat Preference[4,5,6,7]	Suitable Habitats within Study Area	NRSI Observed
Vascular Plants									
Arnoglossum plantagineum	Tuberous Indian-plantain	S3	SC	SC		Normington 2013	Marl fens, wet meadows, sandy shores and moist limestone flats.	No	No
Carex careyana	Carey's Sedge	S2				Normington 2013	Mesic to dry-mesic hardwood forests, floodplain woods.	No	No
Juglans cinerea	Butternut	S3?	END	E	Schedule 1	Normington 2013	Riparian habitats and rich, moist, well-drained loams, and well-drained gravels, especially those of limestone origin.	Yes	No
Birds									
Cardellina canadensis	Canada Warbler	S4B	T	SC	Schedule 1	BSC et al. 2006	Interior forest habitats with a dense, well-developed shrub and vegetation understory; along riparian zones or wet bottomland habitat. require tracts of land which are >30ha	No	No
Chaetura pelagica	Chimney Swift	S4B, S4N	T	THR	Schedule 1	BSC et al. 2006	Commonly found in urban areas near buildings; nests in hollow trees, crevices of rock cliffs, chimneys; highly gregarious; feeds over open water	No	No
Chordeiles minor	Common Nighthawk	S4B	T	SC	Schedule 1	BSC et al. 2006	Open ground; clearings in dense forests; ploughed fields; gravel beaches or barren areas with rocky soils; open woodlands; flat gravel roofs	Yes	No
Dolichonyx oryzivorus	Bobolink	S4B	T	THR		BSC et al. 2006	Large, open expansive grasslands with dense ground cover; hayfields, meadows or fallow fields; marshes; requires tracts of grassland >50ha.	No	No
Riparia riparia	Bank Swallow	S4B	T	THR		BSC et al. 2006	Sand, clay or gravel river banks or steep riverbank cliffs; lakeshore bluffs of easily crumbled sand or gravel; gravel pits, road-cuts, grassland or cultivated fields that are close to water.	No	No
Hirundo rustica	Barn Swallow	S4B	T	THR		BSC et al. 2006	Farmlands or rural areas; cliffs, caves, rock niches; buildings or other man-made structures for nesting; open country near body of water.	Yes	Yes
Ixobrychus exilis	Least Bittern	S4B	THR	T	Schedule 1	BSC et al. 2006	The least bittern breeds specifically in dense marshes dominated by emergent growth such as cattails. The bittern requires large marshes with a stable water level as the nests are usually built within 10cm of open waters. This open water is also needed for the bittern to forage as it is an ambush forager (Gov't of Canada 2012) .	No	No
Melanerpes erythrocephalus	Red-headed Woodpecker	S4B	THR	SC	Schedule 1	BSC et al. 2006	Red-headed woodpecker is known as a habitat generalist that may use deciduous forests, wooded swamps, fields, or pastures, but typically requires a territory of about 4 ha in size. Red-headed woodpeckers prefer to nest in the cavities of trees that are at least 40cm diameter at breast height (dbh) (OMNR 2000).	Yes	No

Scientific Name	Common Name	SRANK[1]	COSEWIC[2]	COSSARO[3]	SARA	Background Source	Habitat Preference[4,5,6,7]	Suitable Habitats within Study Area	NRSI Observed
Haliaeetus leucocephalus	Bald Eagle	S2N, S4B	SC	NAR		Normington 2013	Bald eagle habitat tends to consist of large continuous areas of mature, old growth deciduous or mixed woods around large lakes or rivers (OMNR 2000;). This species requires large (>255 ha) areas of open woodlands with tall trees for nesting, shelter, feeding as well as roosting (OMNR 2000).	No	No
Icteria virens	Yellow-breasted Chat	S2B	END	E	Schedule 1	Normington 2013	Yellow-breasted chat prefers dense thickets on forest edges, riparian areasor within overgrown clearings. (Gov't of Canada 2012). Yellow-breasted chats nest above the ground in bushes, vines, etc. (OMNR 2000).	No	No
Sturnella magna	Eastern Meadowlark	S4B	T	THR		BSC et al. 2006	Open, grassy meadows, farmland, pastures, hayfields or grasslands with elevated singing perches; cultivated land and weedy areas with trees; old orchards with adjacent, open grassy areas >10 ha in size.	No	No
Contopus virens	Eastern Wood-Pewee	S4B	SC	SC		BSC et al. 2006	Open, deciduous, mixed, or coniferous forest; predominated by oak with little understory; forest clearings, edges; farm woodlots; parks.	No	No
Hylocichla mustelina	Wood Thrush	S4B	T	SC		BSC et al. 2006	Carolinian and Great Lakes-St. Lawrence forest zones; undisturbed moist, mature deciduous or mixed forest with deciduous sapling growth; near pond or swamp; hardwood forest edges; must have trees higher than 12 m.	No	No
Vermivora chrysoptera	Golden-winged Warbler	S4B	T	SC	Schedule 1	BSC et al. 2006	Early successional habitat; shrubby, grassy abandoned fields with small deciduous trees bordered by low woodland and wooded swamps; alder bogs; deciduous, damp woods; shrubbery clearings in deciduous woods with saplings and grasses; brier-woodland edges; requires >10 ha	Yes	No
Mammals									
Myotis lucifugus	Little Brown Myotis	S5	E	END		Normington 2013	Uses caves, quarries, tunnels, hollow trees or buildings for roosting; winters in humid caves; maternity sites in dark warm areas such as attics and barns; feeds primarily in wetlands, forest edges.	No	No
Myotis leibii	Eastern Small-footed Bat	S2S3		END		Dobbyn 1994	Roosts in caves, mine shafts, crevices, or buildings that are in or near woodland; hibernates in cold dry caves or mines; maternity colonies in caves or buildings; hunts in forests.	No	No
Myotis septentrionalis	Northern Myotis	S3?	E	END		Normington 2013	Hibernates during winter in mines or caves; roosts in houses, manmade structures but prefers hollow trees or under loose bark.	No	No
Herpetofauna									
Graptemys geographica	Northern Map Turtle	S3	SC	SC	Schedule 1	Ontario Nature 2013; NHIC 2013	Large bodies of water with soft bottoms, and aquatic vegetation; basks on logs or rocks or on beaches and grassy edges, will bask in groups; uses soft soil or clean dry sand for nest sites; may nest at some distance from water.	No	No

Scientific Name	Common Name	SRANK[1]	COSEWIC[2]	COSSARO[3]	SARA	Background Source	Habitat Preference[4,5,6,7]	Suitable Habitats within Study Area	NRSI Observed
Chelydra serpentina serpentina	Common Snapping Turtle	S3	SC	SC	Schedule 1	Ontario Nature 2013; NHIC 2013, Normington 2013	Permanent or semi-permanent fresh water; marshes, swamps or bogs; rivers and streams with soft muddybanks or bottoms. The species often uses soft soil or clean dry sand on south-facing slopes for nest sites and may nest at some distance from water.	No	No
Emydoidea blandingii	Blanding's Turtle (Great Lakes/St Lawrence population)	S3	T	THR	Schedule 1	Ontario Nature 2013; NHIC 2013, Normingont 2012	Shallow water marshes, bogs, ponds or swamps, or coves in larger lakes with soft muddy bottoms and aquatic vegetation; basks on logs, stumps or banks; surrounding natural habitat is important in summer as they frequently move from aquatic habitat to terrestrial habitats; hibernates in bogs; not readily observed.	No	No
Lampropeltis t. triangulum	Eastern Milksnake	S3	SC	SC	Schedule 1	Ontario Nature 2013; NHIC 2013, Normington 2013	Farmlands, meadows, hardwood or aspen stands; pine forest with brushy or woody cover; river bottoms or bog woods; hides under logs, stones, or boards or in outbuildings; often uses communal nest sites.	Yes	No
Thamnophis sauritus septentrionalis	Eastern Ribbonsnake (Great Lakes population)	S3	SC	SC	Schedule 1	Ontario Nature 2013; NHIC 2013, Normington 2013	Sunny grassy areas with low dense vegetation near bodies of shallow permanent quiet water; wet meadows grassy marshes or sphagnum bogs; borders of ponds, lakes or streams; hibernates in groups	Yes	No
Ambystoma jeffersonianum	Jefferson Salamander	S2	E	THR	Schedule 1	Normington 2013	Damp shady deciduous forest, swamps, moist pasture, lakeshores; temporary woodland pools for breeding; hides under leaf litter, stones or in decomposing logs	No	No
Pseudacris triseriata	Western Chorus Frog	S3	T	NAR	Schedule 1	Ontario Nature 2013; NHIC 2013	Roadside ditches or temporary ponds in fields; swamps or wet meadows; woodland or open country with cover and moisture; small ponds and temporary pools ponds and temporary pools	Yes	No
Insects									
Pieris virginiensis	West Virginia White	S3	SC			Normington 2013	Moist, deciduous woodlands with toothwort (*Cardamine spp.*)	No	No
Danaus plexippus	Monarch	S4	SC	SC		TEA 2012	Open areas with milkweed species (*Asclepias spp.*).	Yes	Yes
Bombus affinis	Rusty-patched Bumble Bee	S1	END	END	Schedule 1	Normington 2013	A diversity of habitats including mixed farmland, sand dunes, marshes, urban and wooded areas. Usually nests underground in abandoned rodent burrows.	No	No

[1]OMNR 2013, [2]COSEWIC 2012, [3]OMNR 2012b, [4]OMNR 2000a, [5]Layberry et al. 1998, [6]COSEWIC 2003 ,[7]COSEWIC 2010

Legend

S1- Critically Imperiled	E/END- Endangered
S2- Imperiled	T/THR- Threatened
S3- Vulnerable	SC- Special Concern
S4- Apparently Secure	NAR- Not at Risk

APPENDIX IV
Significant Wildlife Habitat Screening Results

Appendix. Significant Wildlife Habitat Screening Tables

Table 1. Characteristics of Seasonal Concentration Areas for Ecoregion 6E.

Wildlife Species[1]	Candidate SWH		Confirmed SWH	Starwood
	ELC Ecosite Codes[1]	**Habitat Criteria and Information Sources[1]**	**Defining Criteria[1]**	**Assessment Details**
Wildlife Habitat: Waterfowl Stopover and Staging Areas (Terrestrial)				
American Black Duck Wood Duck Green-winged Teal Blue-winged Teal Mallard Northern Pintail Northern Shoveler American Wigeon Gadwall	CUM1 CUT1 - Plus evidence of annual spring flooding from melt water or run-off within these Ecosites.	Fields with sheet water during Spring (mid March to May). • Fields flooding during spring melt and run-off provide important invertebrate foraging habitat for migrating waterfowl. • Agricultural fields with waste grains are commonly used by waterfowl, these are not considered SWH. <u>Information Sources</u> • Anecdotal information from the landowner, adjacent landowners or local naturalist clubs may be good information in determining occurrence. • Reports and other information available from Conservation Authorities (CAs) • Sites documented through waterfowl planning processes (eg. EHJV implementation plan) • Naturalist Clubs • Ducks Unlimited Canada • Natural Heritage Information Centre (NHIC) Waterfowl Concentration Area	Studies carried out and verified presence of an annual concentration of any listed species, evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • Any mixed species aggregations of 100[Í] or more individuals required. • The area of the flooded field ecosite habitat plus a 100-300m radius buffer dependant on local site conditions and adjacent land use is the significant wildlife habitat [cxlviii]. • Annual use of habitat is documented from information sources or field studies (annual use can be based on studies or determined by past surveys with species numbers and dates). • SWHDSS[cxlix] Index #7 provides development effects and mitigation measures.	Suitable habitat not present within the study area **Not SWH**

Wildlife Species[1]	Candidate SWH		Confirmed SWH	Starwood
	ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Waterfowl Stopover and Staging Areas (Aquatic)				
Canada Goose Cackling Goose Snow Goose American Black Duck Northern Pintail Northern Shoveler American Wigeon Gadwall Green-winged Teal Blue-winged Teal Hooded Merganser Common Merganser Lesser Scaup Greater Scaup Long-tailed Duck Surf Scoter White-winged Scoter Black Scoter Ring-necked duck Common Goldeneye Bufflehead Redhead Ruddy Duck Red-breasted Merganser Brant Canvasback Ruddy Duck	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7	• Ponds, marshes, lakes, bays, coastal inlets, and watercourses used during migration. Sewage treatment ponds and storm water ponds do not qualify as a SWH, however a reservoir managed as a large wetland or pond/lake does qualify. • These habitats have an abundant food supply (mostly aquatic invertebrates and vegetation in shallow water); • Information Sources • Canadian Wildlife Service staff know the larger, most significant sites. Check website: http://wildspace.ec.gc.ca • Naturalist clubs often are aware of staging/stopover areas. • OMNR Wetland Evaluations indicate presence of locally and regionally significant waterfowl staging. • Sites documented through waterfowl planning processes (eg. EHJV implementation plan) • Ducks Unlimited projects • Element occurrence specification by Nature Serve: http://www.natureserve.org • NHIC Waterfowl Concentration Area	Studies carried out and verified presence of: • Aggregations of 100Í or more of listed species for 7 daysÍ, results in > 700 waterfowl use days. • Areas with annual staging of ruddy ducks, canvasbacks, and redheads are SWH [cxlix] • The combined area of the ELC ecosites and a 100m radius area is the SWH [cxlviii] • Wetland area and shorelines associated with sites identified within the SWHTG [cxlviii] Appendix K [cxlix] are significant wildlife habitat. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • Annual Use of Habitat is Documented from Information Sources or Field Studies (Annual can be based on completed studies or determined from past surveys with species numbers and dates recorded). • SWHDSS[cxlix] Index #7 provides development effects and mitigation measures.	Deciduous swamp occurs within the adjacent Cityview Drive property within 50 m of the Starwood property. Spring-time surveys completed within the Cityview Drive property did not result in the observation of significant numbers of waterfowl species. **Not SWH**

Wildlife Species[1]	Candidate SWH		Confirmed SWH	Starwood
	ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Shorebird Migratory Stopover Area				
Greater Yellowlegs Lesser Yellowlegs Marbled Godwit Hudsonian Godwit Black-bellied Plover American Golden-Plover Semipalmated Plover Solitary Sandpiper Spotted Sandpiper Semipalmated Sandpiper Pectoral Sandpiper White-rumped Sandpiper Baird's Sandpiper Least Sandpiper Purple Sandpiper Stilt Sandpiper Short-billed Dowitcher Red-necked Phalarope Whimbrel Ruddy Turnstone Sanderling Dunlin	BBO1 BBO2 BBS1 BBS2 BBT1 BBT2 SDO1 SDS2 SDT1 MAM1 MAM2 MAM3 MAM4 MAM5	Shorelines of lakes, rivers and wetlands, including beach areas, bars and seasonally flooded, muddy and un-vegetated shoreline habitats. Great Lakes coastal shorelines, including groynes and other forms of armour rock lakeshores, are extremely important for migratory shorebirds in May to mid-June and early July to October. Sewage treatment ponds and storm water ponds do not qualify as a SWH. <u>Information Sources</u> • Western hemisphere shorebird reserve network. • Canadian Wildlife Service (CWS) Ontario Shorebird Survey. • Bird Studies Canada • Ontario Nature • Local birders and naturalist clubs • NHIC Shorebird Migratory Concentration Area	Studies confirming: • Presence of 3 or more of listed species and > 1000Í shorebird use days during spring or fall migration period. (shorebird use days are the accumulated number of shorebirds counted per day over the course of the fall or spring migration period) • Whimbrel stop briefly (<24hrs) during spring migration, any site with >100Í Whimbrel used for 3 years or more is significant. • The area of significant shorebird habitat includes the mapped ELC shoreline ecosites plus a 100m radius area [cxlviii] • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHDSS[cxlix] Index #8 provides development effects and mitigation measures.	Suitable habitat not present within the study area. **Not SWH**

Wildlife Species[1]	Candidate SWH		Confirmed SWH	Starwood
	ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Raptor Wintering Area				
Rough-legged Hawk Red-tailed Hawk Northern Harrier American Kestrel Snowy Owl **<u>Special Concern:</u>** Short-eared Owl	Combination of ELC Community Series; need to have present one Community Series from each land class; Forest: FOD, FOM, FOC. Upland: CUM; CUT; CUS; CUW.	The habitat provides a combination of fields and woodlands that provide roosting, foraging and resting habitats for wintering raptors. Raptor wintering sites need to be > 20 ha [cxlviii, cxlix] with a combination of forest and upland.[xvi, xvii, xviii, xix, xx, xxi]. Least disturbed sites, idle/fallow or lightly grazed field/meadow with adjacent woodlands [cxlix] <u>Information Sources</u>: • OMNR Ecologist or Biologist may be aware of locations of wintering raptors. In addition, these staff may know local naturalists that may be aware of the locations of raptor wintering habitats. • NHIC Raptor Winter Concentration Area • Data from Bird Studies Canada, most notably for Short-eared Owls. • Reports and other information available from CAs.	Studies confirm the use of these habitats by: • One or more Short-eared Owls or; • At least 10 individuals and two listed spp [i]. • To be significant a site must be used regularly (3 in 5 years) [cxlix] for a minimum of 20 days by the above number of birds [i]. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHDSS[cxlix] Index #10 provides development effects and mitigation measures.	The subject property contains open field adjacent to woodland. However, the area of open field+ woodland is less than the required 20 ha to provide significant habitat. **Not SWH**

Wildlife Species[1]	Candidate SWH		Confirmed SWH	Starwood
	ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Bat Hibernacula				
Big Brown Bat Little Brown Myotis Eastern Pipistrelle/Tri-coloured Bat Northern Myotis Eastern Small-footed Myotis	Bat Hibernacula may be found in these ecosites: CCR1 CCR2 CCA1 CCA2 (Note: buildings are not considered to be SWH)	Hibernacula may be found in caves, mine shafts, underground foundations and Karsts. The locations of bat hibernacula are relatively poorly known. <u>Information Sources</u> • OMNR for possible locations and contact for local experts • NHIC Bat Hibernaculum/Nursery • Ministry of Northern Development and Mines for location of mine shafts. • Clubs that explore caves (eg. Sierra Club) • University Biology Departments with bat experts.	• All sites with confirmed hibernating bats are SWH Í. • The area includes 1000m radius around the entrance of the hibernaculum [cxlviii, ccvii, Í]. • Studies are to be conducted during the peak swarming period (Aug. – Sept.). Surveys should be conducted following methods outlined in the "Guideline for Wind Power Projects Potential Impacts to Bats and Bat Habitats"[ccv]. • SWHDSS[cxlix] Index #1 provides development effects and mitigation measures.	Suitable habitat not present within the study area. **Not SWH**

Wildlife Species[1]	Candidate SWH		Confirmed SWH	Starwood
	ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Bat Maternity Colonies				

Big Brown Bat
Little Brown Myotis
Silver-haired Bat
Northern Myotis
	Maternity colonies considered SWH are found in forested Ecosites.
	
	All ELC Ecosites in ELC Community Series:
	FOD
	FOM
		Maternity colonies can be found in tree cavities, vegetation and often in buildlings[xxii, xxv, xxvi, xxvii, xxxi] (buildings are not considered to be SWH). Maternity roosts are not found in caves and mines in Ontario[xxii].
		• Maternity colonies located in Mature deciduous or mixed forest stands[ccix, ccx] with >10/ha large diameter (>25cm dbh) wildlife trees[ccvii]
		• Female Bats prefer wildlife tree (snags) in early stages of decay, class 1-3 [ccxiv] or class 1 or 2 [ccxii].
		• Northern Myotis prefer contiguous tracts of older forest cover for foraging and roosting in snags and trees[ccix]
		• Silver-haired Bats prefer older mixed or deciduous forest and form maternity colonies in tree cavities and small hollows. Older forest areas with at least 21 snags/ha are preferred[ccx]
		
		<u>Information Sources</u>
		• OMNR for possible locations and contact for local experts
		• University Biology Departments with bat experts.
			• Maternity Colonies with confirmed use by;
			  • >20 Northern Myotis[cxlix]
			  • >10 Big Brown Bats[Í]
			  • >20 Little Brown Myotis[Í]
			  • >5 Adult Female Silver-haired Bats[Í]
			• The area of the habitat includes the entire woodland or the forest stand ELC Ecosite containing the maternity colonies[Í].
			• Evaluation methods for maternity colonies should be conducted following methods outlined in the "Guideline for Wind Power Projects Potential Impacts to Bats and Bat Habitats"[ccv].
			• SWHDSS[cxlix] Index #1 provides development effects and mitigation measures.
				Suitable habitat is not present on the subject property.
				
				Woodlands adjacent to the subject property do not contain a density of suitable cavity trees that would afford significance for this habitat type.
				
				Wooded areas within the subject property are not classified as mixed or deciduous forest.
				
				Not SWH

Wildlife Species[1]	Candidate SWH		Confirmed SWH	Starwood
	ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Bat Migratory Stopover Area				
Hoary Bat Eastern Red Bat Silver-haired Bat	No specific ELC types.	Long distance migratory bats typically migrate during late summer and early fall from summer breeding habitats throughout Ontario to southern wintering areas. Their annual fall migrations concentrate these species of bats at stopover areas. The location and characteristics of stopover habitats are generally unknown. <u>Information Sources</u> • OMNR for possible locations and contact for local experts • University of Waterloo, Biology Department	Long Point (42°35'N, 80°30'E, to 42°33'N, 80°03'E) has been identified as a significant stop-over habitat for fall migrating Silver-haired Bats, due to significant increases in abundance, activity and feeding that was documented during fall migration [ccxv]. • The confirmation criteria and habitat areas for this SWH are still being determined. • SWHDSS [cxlix] Index #38 provides development effects and mitigation measures	Criteria for this SWH type have not been defined by the OMNR. Category not assessed.

Wildlife Habitat: Turtle Wintering Areas				
Midland Painted Turtle **<u>Special Concern:</u>** Northern Map Turtle Snapping Turtle	Snapping and Midland Painted turtles, ELC Community Classes; SW, MA, OA and SA, ELC Community Series; FEO and BOO Northern Map Turtle - Open Water areas such as deeper rivers or streams and lakes with current can also be used as over-wintering habitat.	For most turtles, wintering areas are in the same general area as their core habitat. Water has to be deep enough not to freeze and have soft mud substrates. • Over-wintering sites are permanent water bodies, large wetlands, and bogs or fens with adequate Dissolved Oxygen. [cix], [cx], [cxi], [cxviii] <u>Information Sources</u> • EIS studies carried out by Conservation Authorities. • Local naturalists and experts, as well as university herpetologists may also know where to find some of these sites. • OMNR ecologist or biologist may be aware of locations of wintering turtles • NHIC	• Presence of 5 over-wintering Midland Painted Turtles is significant[i]. • One or more Northern Map Turtle or Snapping Turtle over-wintering within a wetland is significant[i]. • The mapped ELC ecosite area with the over wintering turtles is the SWH. If the hibernation site is within a stream or river, the deep-water pool where the turtles are over wintering is the SWH. • Over wintering areas may be identified by searching for congregations (Basking Areas) of turtles on warm, sunny days during the fall (Sept. – Oct.) or spring (Mar. – May) [cvii]. Congregation of turtles is more common where wintering areas are limited and therefore significant [cix, cx, cxi, cxii]. • SWHDSS[cxlix] Index #28 provides development effects and mitigation measures for turtle wintering habitat.	Deciduous and thicket swamp habitats occur adjacent to the subject property, within the Cityview Drive property. Suitable open water habitat is not present within these swamp features to provide significant turtle overwintering habitat. No turtle species were observed on-site during 2009 NRSI field surveys. **Not SWH**

Wildlife Species[1]	Candidate SWH		Confirmed SWH	Starwood
	ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Snake Hibernaculum				
<u>Snakes:</u> Eastern Gartersnake Northern Watersnake Northern Red-bellied Snake Northern Brownsnake Smooth Green Snake Northern Ring-necked Snake **<u>Special Concern:</u>** Milksnake Eastern Ribbonsnake <u>Lizard:</u> **<u>Special Concern</u> (Southern Shield population):** Five-lined Skink	For all snakes, habitat may be found in any ecosite in central Ontario other than very wet ones. Talus, Rock Barren, Crevice and Cave, and Alvar sites may be directly related to these habitats. Observations of congregations of snakes on sunny warm days in the spring or fall is a good indicator. The existence of rock piles or slopes, stone fences, and crumbling foundations assist in identifying candidate SWH. For Five-lined Skink, ELC Community Series of FOD and FOM and Ecosites: FOC1 FOC3	For snakes, hibernation takes place in sites located below frost lines in burrows, rock crevices and other natural locations. Areas of broken and fissured rock are particularly valuable since they provide access to subterranean sites below the frost line[xliv, l, li, lii, cxii]. Wetlands can also be important over-wintering habitat in conifer or shrub swamps and swales, poor fens, or depressions in bedrock terrain with sparse trees or shrubs with sphagnum moss or sedge hummock ground cover. <u>Information Sources</u> • In spring, local residents or landowners may have observed the emergence of snakes on their property (e.g.old dug wells). • Reports and other information available from CAs. • Local naturalists and experts, as well as university herpetologists may also know where to find some of these sites. • NHIC Five-lined skink prefer mixed forests with rock outcrop openings providing cover rock overlaying granite bedrock with fissures [cciii]. <u>Information Sources</u> • Reports and other information available from CAs. • Local naturalists and experts, as well as university herpetologists may also know where to find some of these sites. • OMNR ecologist or biologist may be aware of locations of wintering skinks • NHIC	Studies confirming: • Presence of snake hibernacula used by a minimum of five individuals of a snake sp. <u>or</u>; individuals of two or more snake spp. • Congregations of a minimum of five individuals of a snake sp. <u>or</u>; individuals of two or more snake spp. near potential hibernacula (eg. foundation or rocky slope) on sunny warm days in Spring (Apr/May) and Fall (Sept/Oct)Í . • <u>Note</u>: If there are Special Concern Species present, then site is SWH • <u>Note</u>: Sites for hibernation possess specific habitat parameters (e.g. temperature, humidity, etc.) and consequently are used annually, often by many of the same individuals of a local population [i.e. strong hibernation site fidelity.]. Other critical life processes (e.g. mating) often take place in close proximity to hibernacula. The the feature in which the hibernacula is located plus a 30 m buffer is the SWHÍ • SWHDSS[cxlix] Index #13 provides development effects and mitigation measures for snake hibernacula. • Presence of any active hibernaculum for skink is significant. • SWHDSS[cxlix] Index #37 provides development effects and mitigation measures for five-lined skink wintering habitat.	Snake hibernacula may be found within the study area where there is any physical feature that allows access to subterranean areas. **Candidate SWH**

Wildlife Species[1]	Candidate SWH		Confirmed SWH	Starwood
	ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Colonially – Nesting Bird Breeding Habitat (Bank and Cliff)				
Bank Swallow Cliff Swallow Northern Rough-winged Swallow	Eroding banks, sandy hills, borrow pits, steep slopes, and sand piles (Bank Swallow and N. Rough-winged Swallow). Cliff faces, bridge abutments, silos, barns (Cliff Swallows). Habitat found in the following ecosites: CUM1 CUT1 CUS1 BLO1 BLS1 BLT1 CLO1 CLS1 CLT1	• Any site or areas with exposed soil banks, undisturbed or naturally eroding that is not a licensed/permitted aggregate area. • Does not include man-made structures (bridges or buildings) or recently (2 years) disturbed soil areas, such as berms, embankments, soil or aggregate stockpiles. • Does not include a licensed/permitted Mineral Aggregate Operation. <u>Information Sources</u> • Reports and other information available from CAs • Ontario Breeding Bird Atlas [ccv]. • Bird Studies Canada; *NatureCounts* http://www.birdscanada.org/birdmon/ • Naturalist clubs.	Studies confirming: • Presence of 1 or more nesting sites with 8[cxlvix] or more cliff swallow pairs or 50Í bank swallow and rough-winged swallow pairs during the breeding season. • A colony identified as SWH will include a 50m radius habitat area from the peripheral nests[ccvii] • Field surveys to observe and count swallow nests are to be completed during the breeding season (May-June). Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHDSS[cxlix] Index #4 provides development effects and mitigation measures	Suitable habitat not present within the study area. **Not SWH**

Wildlife Species[1]	Candidate SWH		Confirmed SWH	Starwood
	ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Colonially – Nesting Bird Breeding Habitat (Tree/Shrubs)				
Great Blue Heron Black-crowned Night-Heron Great Egret Green Heron	SWM2 SWM3 SWM5 SWM6 SWD1 SWD2 SWD3 SWD4 SWD5 SWD6 SWD7 FET1	• Nests in live or dead standing trees in wetlands, lakes, islands, and peninsulas. Shrubs and occasionally emergent vegetation may also be used. • Most nests in trees are 11 to 15 m from ground, near the top of the tree. <u>Information Sources</u> • Ontario Breeding Bird Atlas [ccv], colonial nest records. • Ontario Heronry Inventory 1991 available from Bird Studies Canada or NHIC (OMNR). • NHIC Mixed Wader Nesting Colony • Aerial photographs can help identify large heronries. • Reports and other information available from CAs. • MNR District Offices. • Local naturalist clubs.	Studies confirming: • Presence of 5[Í] or more active nests of Great Blue Heron. • The edge of the colony and a minimum 300m area of habitat or extent of the Forest Ecosite containing the colony or any island <15.0ha with a colony is the SWH [cc, ccvii] • Confirmation of active heronries are to be achieved through site visits conducted during the nesting season (April to August) or by evidence such as the presence of fresh guano, dead young and/or eggshells • SWHDSS[cxlix] Index #5 provides development effects and mitigation measures.	Suitable habitat is not present within the subject property. Poplar Mineral Deciduous Swamp (SWDM4-5) occurs adjacent to the subject property, within the Cityview Drive property. However, NRSI field surveys completed within the Cityview Drive property did not document the presence of colonial bird nesting areas. **Not SWH**

Wildlife Species[1]	Candidate SWH		Confirmed SWH	Starwood
	ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Colonially – Nesting Bird Breeding Habitat (Ground)				
Herring Gull Great Black-backed Gull Little Gull Ring-billed Gull Common Tern Caspian Tern Brewer's Blackbird	Any rocky island or peninsula (natural or artificial) within a lake or large river (two-lined on a 1;50,000 NTS map). Close proximity to watercourses in open fields or pastures with scattered trees or shrubs (Brewer's Blackbird) MAM1 – 6; MAS1 – 3; CUM CUT CUS	• Nesting colonies of gulls and terns are on islands or peninsulas associated with open water or in marshy areas. • Brewers Blackbird colonies are found loosely on the ground in or in low bushes in close proximity to streams and irrigation ditches within farmlands. <u>Information Sources</u> • Ontario Breeding Bird Atlas [ccv], rare/colonial species records. • Canadian Wildlife Service • Reports and other information available from CAs. • NHIC Colonial Waterbird Nesting Area • MNR District Offices. • Local naturalist clubs.	Studies confirming: • Presence of > 25 active nests for Herring Gulls or Ring-billed Gulls, >5 active nests for Common Tern or >2 active nests for Caspian Tern[Í]. • Presence of 5 or more pairs for Brewer's Blackbird[Í]. • Any active nesting colony of one or more Little Gull, and Great Black-backed Gull is significant[Í]. • The edge of the colony and a minimum 150m area of habitat, or the extent of the ELC ecosites containing the colony or any island <3.0ha with a colony is the SWH [cc, ccvii] • Studies would be done during May/June when actively nesting. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHDSS[cxlix] Index #6 provides development effects and mitigation measures.	Suitable habitat not present within the subject property. **Not SWH**

Wildlife Species[1]	Candidate SWH		Confirmed SWH	Starwood
	ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Migratory Butterfly Stopover Areas				
Painted Lady White Admiral <u>Special Concern</u> Monarch	Combination of ELC Community Series; need to have present one Community Series from each landclass: <u>Field</u>: CUM CUT CUS <u>Forest</u>: FOC FOD FOM CUP Anecdotally, a candidate sight for butterfly stopover will have a history of butterflies being observed.	A butterfly stopover area will be a minimum of 10 ha in size with a combination of field and forest habitat present, and will be located within 5 km of Lake Ontario [cxlix]. • The habitat is typically a combination of field and forest, and provides the butterflies with a location to rest prior to their long migration south [xxxii, xxxiii, xxxiv, xxxv, xxxvi]. • The habitat should not be disturbed, fields/meadows with an abundance of preferred nectar plants and woodland edge providing shelter are requirements for this habitat [cxlviii, cxlix]. • Staging areas usually provide protection from the elements and are often spits of land or areas with the shortest distance to cross the Great Lakes [xxxvii, xxxviii, xxxix, xl, xli]. <u>Information Sources</u> • OMNR (NHIC) • Agriculture Canada in Ottawa may have list of butterfly experts. • Naturalist Clubs • Toronto Entomologists Association • Conservation Authorities	Studies confirm: • The presence of Monarch Use Days (MUD) during fall migration (Aug/Oct)[xliii]. MUD is based on the number of days a site is used by Monarchs, multiplied by the number of individuals using the site. Numbers of butterflies can range from 100-500/day[xxxvii], significant variation can occur between years and multiple years of sampling should occur [xl, xlii]. • MUD of >5000 **or** >3000 with the presence of Painted Ladies or White Admiral's is to be considered significant.[Í] • SWHDSS [cxlix] Index #16 provides development effects and mitigation measures.	The subject property is not within 5 km of Lake Ontario. **Not SWH**

Wildlife Species[1]	Candidate SWH		Confirmed SWH	Starwood
	ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Landbird Migratory Stopover Areas				
All migratory songbirds. Canadian Wildlife Service Ontario website: http://www.on.ec.gc.ca/wildlife_e.html All migrant raptors species: Ontario Ministry of Natural Resources: Fish and Wildlife Conservation Act, 1997. Schedule 7: Specially Protected Birds (Raptors)	All Ecosites associated with these ELC Community Series; FOC FOM FOD SWC SWM SWD	Woodlots need to be >10 ha[Í] in size and within 5 km [iv, v, vi, vii, viii, ix, x, xi, xii, xiii, xiv, xv] of Lake Ontario. • Woodlands <2km from Lake Ontario are more significant [cxlix] • Sites have a variety of habitats; forest, grassland and wetland complexes [cxlix]. • The largest sites are more significant [cxlix] • Woodlots and forest fragments are important habitats to migrating birds[ccxviii], these features located along the shore and located within 5km of Lake Ontario are Candidate SWH [cxlviii]. Information Sources • Bird Studies Canada • Ontario Nature • Local birders and naturalist club • Ontario Important Bird Areas (IBA) Program	Studies confirm: • Use of the woodlot by >200 birds/day and with >35 spp with at least 10 bird spp. recorded on at least 5 different survey dates[Í]. This abundance and diversity of migrant bird species is considered above average and significant. • Studies should be completed during spring (Apr./May) and fall (Aug/Oct) migration using standardized assessment techniques. Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHDSS [cxlix] Index #9 provides development effects and mitigation measures.	The subject property is not within 5 km of Lake Ontario. **Not SWH**

Wildlife Habitat: Deer Yarding Areas				
White-tailed Deer	Note: OMNR to determine this habitat. ELC Community Series providing a thermal cover component for a deer yard would include; FOM, FOC, SWM and SWC. Or these ELC Ecosites; CUP2 CUP3 FOD3 CUT	• Deer yarding areas or winter concentration areas (yards) are areas deer move to in response to the onset of winter snow and cold. This is a behavioural response and deer will establish traditional use areas. The yard is composed of two areas referred to as Stratum I and Stratum II. Stratum II covers the entire winter yard area and is usually a mixed or deciduous forest with plenty of browse available for food. Agricultural lands can also be included in this area. Deer move to these areas in early winter and generally, when snow depths reach 20 cm, most of the deer will have moved here. If the snow is light and fluffy, deer may continue to use this area until 30 cm snow depth. In mild winters, deer may remain in the Stratum II area the entire winter. • The Core of a deer yard (Stratum I) is located within the Stratum II area and is critical for deer survival in areas where winters become severe. It is primarily composed of coniferous trees (pine, hemlock, cedar, spruce) with a canopy cover of more than 60%[cxciv]. • OMNR determines deer yards following methods outlined in “Selected Wildlife and Habitat Features: Inventory Manual" [cxcv] • Woodlots with high densities of deer due to artificial feeding are not significant[Í].	No Studies Required: • Snow depth and temperature are the greatest influence on deer use of winter yards. Snow depths > 40cm for more than 60 days in a typically winter are minimum criteria for a deer yard to be considered as SWH. [lvi, lvii, lviii, lix, lx, Í] • Deer Yards are mapped by OMNR District offices. Locations of Core or Stratum 1 and Stratum 2 Deer yards considered significant by OMNR will be available at local MNR offices or via Land Information Ontario (LIO). • Field investigations that record deer tracks in winter are done to confirm use (best done from an aircraft). Preferably, this is done over a series of winters to establish the boundary of the Stratum I and Stratum II yard in an "average" winter. MNR will complete these field investigations. [cxcv] • If a SWH is determined for Deer Wintering Area or if a proposed development is within Stratum II yarding area then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. • SWHDSS[cxlix] Index #2 provides development effects and mitigation measures.	There are no OMNR records of deer overwintering habitat within the subject property, or within 120 m of the study area. **Not SWH**

Wildlife Species[1]	Candidate SWH		Confirmed SWH	Starwood
	ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Deer Winter Congregation Areas				
White-tailed Deer	All Forested Ecosites with these ELC Community Series; FOC FOM FOD SWC SWM SWD Conifer plantations much smaller than 50 ha may also be used.	• Woodlots will typically be >100 ha in size[Í]. Woodlots <100ha may be considered as significant based on MNR studies or assessment. • Deer movement during winter in the southern areas of Eco-region 6E are not constrained by snow depth, however deer will annually congregate in large numbers in suitable woodlands [cxlviii]. • If deer are constrained by snow depth refer to the Deer Yarding Area habitat within Table 1.1 of this Schedule. • Large woodlots > 100ha and up to 1500 ha are known to be used annually by densities of deer that range from 0.1-1.5 deer/ha [ccxxiv]. • Woodlots with high densities of deer due to artificial feeding are not significant[Í]. <u>Information Sources</u> • MNR District Offices. • LIO/NRVIS	Studies confirm: • Deer management is an MNR responsibility, deer winter congregation areas considered significant will be mapped by MNR [cxlviii]. • Use of the woodlot by white-tailed deer will be determined by MNR, all woodlots exceeding the area criteria are significant, unless determined not to be significant by MNR [Í].. • Studies should be completed during winter (Jan/Feb) when >20cm of snow is on the ground using aerial survey techniques[ccxxiv] , ground or road surveys. or a pellet count deer density survey[ccxxv]. • SWHDSS [cxlix] Index #2 provides development effects and mitigation measures.	There are no OMNR records of deer overwintering habitat within the subject property, or within 120 m of the study area. **Not SWH**

Table 2: Characteristics of Rare Vegetation Communities in Ecoregion 6E

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Starwood
	ELC Ecosite Code[1]	**Habitat Description[1]**	**Detailed Information and Sources**	**Defining Criteria[1]**	**Assessment Details**
Cliffs and Talus Slopes **<u>Rationale;</u>** Cliffs and Talus Slopes are extremely rare habitats in Ontario.	Any ELC Ecosite within Community Series: TAO CLO TAS CLS TAT CLT	A Cliff is vertical to near vertical bedrock >3m in height. A Talus Slope is rock rubble at the base of a cliff made up of coarse rocky debris	Most cliff and talus slopes occur along the Niagara Escarpment. <u>Information Sources</u> • The Niagara Escarpment Commission has detailed information on location of these habitats. • OMNR Planner, Forester, Ecologist or Biologist • NHIC has location information on some cliff and talus occurrences, this information is available on their website (Biodiversity Explorer). • Local naturalist clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Cliffs or Talus Slopes [lxxviii] • SWHDSS[cxlix] Index #21 provides development effects and mitigation measures.	Vegetation community not present within the subject property. **Not SWH**

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Starwood
	ELC Ecosite Code[1]	**Habitat Description[1]**	**Detailed Information and Sources**	**Defining Criteria[1]**	**Assessment Details**
Sand Barren **<u>Rationale;</u>** Sand barrens are rare in Ontario and support rare species. Most Sand Barrens have been lost due to cottage development and forestry	SBO1 SBS1 SBT1 Vegetation cover varies from patchy and barren to continuous meadow (SBO1), thicket-like (SBS1), or more closed and treed (SBT1). Tree cover always ≤ 60%.	Sand Barrens typically are exposed sand, generally sparsely vegetated and caused by lack of moisture, periodic fires and erosion. They have little or no soil and the underlying rock protrudes through the surface. Usually located within other types of natural habitat such as forest or savannah. Vegetation can vary from patchy and barren to tree covered but less than 60%.	No minimum size for sand barren area. • Sand Barrens support rare species such as provincially Endangered Forked Three-awned Grass and American Badger [lxxxv], [lxxxvi]. By extension, sand barren sites that could support these rare species (close proximity to other populations), historically or currently should be considered for higher priority conservation. <u>Information Sources</u> • OMNR Planner, Forester, Ecologist or Biologist • NHIC has location information on some sand barren occurrences, this information is available on their website (Biodiversity Explorer). • Local naturalist clubs • Conservation Authorities	• Confirm any ELC Vegetation Type for Sand Barrens [lxxviii] • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics)[l]. • SWHDSS[cxlix] Index #20 provides development effects and mitigation measures.	Vegetation community not present within the subject property. **Not SWH**

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Starwood
	ELC Ecosite Code[1]	Habitat Description[1]	Detailed Information and Sources	Defining Criteria[1]	Assessment Details
Alvar **<u>Rationale;</u>** Alvars are extremely rare habitats in Ontario.	ALO1 ALS1 ALT1	An alvar is typically a level, mostly unfractured calcareous bedrock feature with a mosaic of rock pavements and bedrock overlain by a thin veneer of soil. The hydrology of alvars is complex, with alternating periods of inundation and drought. Vegetation cover varies from sparse lichen-moss associations to grasslands and shrublands and comprising a number of characteristic or indicator plant. Undisturbed alvars can be phyto- and zoogeographically diverse, supporting many uncommon or are relict plant and animals species. Vegetation cover varies from patchy to barren with a less than 60% tree cover [lxxviii].	An Alvar site > 0.5 ha in size [lxxv]. Alvar is particularly rare in ecoregion 7E where the only known sites are found in the western islands of Lake Erie.[cxcix] <u>Information Sources</u> • Alvars of Ontario (2000), Federation of Ontario Naturalists [lxxvi]. • Ontario Nature – Conserving Great Lakes Alvars[ccviii]. • NHIC has location information on many alvar occurrences, this information is available on their website (Biodiversity Explorer). • OMNR Ecologists or Biologists. • Local Naturalist clubs. • Conservation Authorities.	Field studies identify three or more of the Alvar indicator species [lxxv] listed in OMNR (2000b) [cxlix] Appendix N should be present. Note: Alvar plant spp. list from Eco-region 7E should be used. • Confirm and map ELC Vegetation Type polygons for Alvars lxxviii • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics). • The alvar must be in excellent condition and fit in with surrounding landscape with few conflicting land uses [lxxv]. • SWHDSS[cxlix] Index #17 provides development effects and mitigation measures.	Vegetation community not present within the subject property. **Not SWH**

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Starwood
	ELC Ecosite Code[1]	**Habitat Description[1]**	**Detailed Information and Sources**	**Defining Criteria[1]**	**Assessment Details**
Old Growth Forest **<u>Rationale;</u>** Old Growth forest stands are rare in S. Ontario	Forest Community Series: FOD FOC FOM	Old-growth forests tend to be relatively undisturbed, structurally complex, and contain a wide variety of trees and shrubs in various age classes. These habitats usually support a high diversity of wildlife species.	• No minimum size to site[l]. <u>Information Sources</u> • OMNR Forest Resource Inventory mapping • OMNR Forester, Ecologist or Biologist. • Local naturalist clubs • Conservation Authorities • Municipal forestry departments	Field Studies will determine: • If dominant trees species of the ecosite are >140 years old, then stand is Significant Wildlife Habitat [cxlviii]. • The stand will have experienced no recognizable forestry activities [cxlviii] • Determine ELC Vegetation Type for forest stand [lxxviii]. • SWHDSS[cxlix] Index #23 provides development effects and mitigation measures.	Vegetation community not present within the subject property. **Not SWH**

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Starwood
	ELC Ecosite Code[1]	**Habitat Description[1]**	**Detailed Information and Sources**	**Defining Criteria[1]**	**Assessment Details**
Savannah **<u>Rationale:</u>** Savannahs are extremely rare habitats in Ontario.	TPS1 TPS2 TPW1 TPW2 CUS2	A Savannah is a tallgrass prairie habitat that has tree cover between 25 – 60%. Tallgrass Prairie (TGP) and savannah were historically common in the near-shore areas of the Great Lakes. In ecoregion 7E, known Tallgrass Prairie and savannah remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in Brantford and in the Toronto area (north of Lake Ontario). cc	No minimum size to site [Í] Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH. <u>Information Sources</u> • OMNR Forester, Ecologist or Biologist. • NHIC has location information on many savannah occurrences, this information is available on their website (Biodiversity Explorer). • Local naturalists clubs. • Conservation Authorities.	Field studies confirm one or more of the Savannah indicator species listed in [lxxv] Appendix N should be present [Í]. Note: Savannah plant spp. list from Ecoregion 7E should be used • Area of the ELC Vegetaion type is the SWH [lxxviii]. • Site must be dominated by exotic or introduced species (<50% vegetative cover exotics). • SWHDSS[cxlix] Index #18 provides development effects and mitigation measures.	Vegetation community not present within the subject property. **Not SWH**

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Starwood
	ELC Ecosite Code[1]	Habitat Description[1]	Detailed Information and Sources	Defining Criteria[1]	Assessment Details
Tallgrass Prairie **<u>Rationale:</u>** Tallgrass Prairies are extremely rare habitats in Ontario.	TPO1 TPO2	A Tallgrass Prairie has ground cover dominated by prairie grasses. An open Tallgrass Prairie habitat has < 25% tree cover. Tallgrass Prairie (TGP) and savannah were historically common in the near-shore areas of the Great Lakes In ecoregion 7E, known Tallgrass Prairie and savannah remnants are scattered between Lake Huron and Lake Erie, near Lake St. Clair, north of and along the Lake Erie shoreline, in Brantford and in the Toronto area (north of Lake Ontario).[cc]	No minimum size to site [Í]. Site must be restored or a natural site. Remnant sites such as railway right of ways are not considered to be SWH. <u>Information Sources</u> • NHIC has location information on some tallgrass prairie occurrences, this information is available on their website (Biodiversity Explorer). • OMNR Ecologists and Biologists. • Local naturalists clubs. • Conservation Authorities.	Field studies confirm one or more of the Prairie indicator species listed in [lxxv] Appendix N should be present [Í]. Note: Prairie plant spp. list from Ecoregion 7E should be used • Area of the ELC Vegetation Type is the SWH [lxxviii]. • Site must not be dominated by exotic or introduced species (<50% vegetative cover exotics). • SWHDSS[cxlix] Index #19 provides development effects and mitigation measures.	Vegetation community not present within the subject property. **Not SWH**

Rare Vegetation Community[1]	Candidate SWH			Confirmed SWH	Starwood
	ELC Ecosite Code[1]	**Habitat Description[1]**	**Detailed Information and Sources**	**Defining Criteria[1]**	**Assessment Details**
Other Rare Vegetation Communities **<u>Rationale:</u>** Plant communities that often contain rare species which depend on the habitat for survival.	Provincially Rare S1, S2 and S3 vegetation communities are listed in Appendix M of the SWHTG[cxlviii] . Any ELC Ecosite Code that has a possible ELC Vegetation Type that is Provincially Rare is Candidate SWH.	Rare Vegetation Communities may include beaches, fens, forest, marsh, barrens, dunes and swamps.	ELC Ecosite codes that have the potential to be a rare ELC Vegetation Type as outlined in appendix M [cxlviii] The OMNR/NHIC will have up to date listing for rare vegetation communities. <u>Information Sources</u> • NHIC has location information on other rare vegetation types, this information is available on their website (Biodiversity Explorer) • OMNR Ecologists and Biologists. • Local naturalists clubs. • Conservation Authorities.	Field studies should confirm if an ELC Vegetation Type is a rare vegetation community based on listing within Appendix M of SWHTG[cxlviii] . • Area of the ELC Vegetation Type polygon is the SWH. • SWHDSS [cxlix] Index #37 provides development effects and mitigation measures.	Other rare vegetation communities not present within the subject property. **Not SWH**

Table 3. Characteristics of Specialized Wildlife Habitat for Ecoregion 6E

Wildlife Species[1]	Candidate SWH		Confirmed SWH	Starwood
	ELC Ecosite Codes[1]	**Habitat Criteria and Information Sources[1]**	**Defining Criteria[1]**	**Assessment Details**
Wildlife Habitat: Waterfowl Nesting Area				
American Black Duck Northern Pintail Northern Shoveler Gadwall Blue-winged Teal Green-winged Teal Wood Duck Hooded Merganser Mallard	All upland habitats located adjacent to these wetland ELC Ecosites are Candidate SWH: MAS1 MAS2 MAS3 SAS1 SAM1 SAF1 MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SWT1 SWT2 SWD1 SWD2 SWD3 SWD4 **Note: includes adjacency to Provincially Significant Wetlands**	A waterfowl nesting area extends 120 m [cxlix] from a wetland (> 0.5 ha) or a wetland (>0.5 ha) with small wetlands (<0.5ha) within 120m or a cluster of 3 or more small (<0.5 ha) wetlands within 120 m of each individual wetland where waterfowl nesting is known to occur [cxlix]. • Upland areas should be at least 120m wide so that predators such as racoons, skunks, and foxes have difficulty finding nests. • Wood Ducks and Hooded Mergansers utilize large diameter trees (>40cm dbh) in woodlands for cavity nest sites. <u>Information Sources</u> • Ducks Unlimited staff may know the locations of particularly productive nesting sites. • OMNR Wetland Evaluations for indication of significant waterfowl nesting habitat. • Reports and other information available from CAs	Studies confirmed: • Presence of 3 or more nesting pairs for listed species excluding Mallards[Í], or; • Presence of 10 or more nesting pairs for listed species including Mallards[Í]. • Any active nesting site of an American Black Duck is considered significant. • Nesting studies should be completed during the spring breeding season (April - June). Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • A field study confirming waterfowl nesting habitat will determine the boundary of the waterfowl nesting habitat for the SWH, this may be greater or less than 120 m [cxlviii] from the wetland and will provide enough habitat for waterfowl to successfully nest. • SWHDSS[cxlix] Index #25 provides development effects and mitigation measures.	Suitable habitat is not present within the subject property. Deciduous and thicket swamp habitat is present adjacent to the subject property, within the Cityview Drive property. However, NRSI field studies completed within the Cityview Drive property have not identified waterfowl nesting habitat. **Not SWH**

Wildlife Species[1]	Candidate SWH		Confirmed SWH	Starwood
	ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Bald Eagle and Osprey Nesting Habitat				
Osprey **Special Concern** Bald Eagle	ELC Forest Community Series: FOD, FOM, FOC, SWD, SWM and SWC directly adjacent to riparian areas – rivers, lakes, ponds and wetlands	Nests are associated with lakes, ponds, rivers or wetlands along forested shorelines, islands, or on structures over water. Osprey nests are usually at the top a tree whereas Bald Eagle nests are typically in super canopy trees in a notch within the tree's canopy. Nests located on man-made objects are not to be included as SWH (e.g. telephone poles and constructed nesting platforms). <u>Information Sources</u> • NHIC compiles all known nesting sites for Bald Eagles in Ontario. • MNR values information (LIO/NRVIS) will list known nesting locations. Note: data from NRVIS is provided as a point and does not represent all the habitat. • Nature Counts, Ontario Nest Records Scheme data. • OMNR Ecologist or Biologist may be aware of locations of nesting raptors. In addition, these staff may know local naturalists that may be aware of the locations of raptor nests. • Sustainable Forestry Licence (SFL) companies will identify additional nesting locations through field operations. • Check the Ontario Breeding Bird Atlas [ccv] or Rare Breeding Birds in Ontario for species documented • Reports and other information available from CAs.	Studies confirm the use of these nests by: • One or more active Osprey or Bald Eagle nests in an area[cxlviii] . • Some species have more than one nest in a given area and priority is given to the primary nest with alternate nests included within the area of the SWH. • For an Osprey, the active nest and a 300 m radius around the nest or the contiguous woodland stand is the SWH [ccvii], maintaining undisturbed shorelines with large trees within this area is important [cxlviii]. • For a Bald Eagle the active nest and a 400-800 m radius around the nest is the SWH. [cvi, ccvii] Area of the habitat from 400-800m is dependant on site lines from the nest to the development and inclusion of perching and foraging habitat [cvi] • To be significant a site must be used annually. When found inactive, the site must be known to be inactive for $\geq$ 3 years or suspected of not being used for >5 years before being considered not significant. [ccvii]	Suitable habitat not present within the study area. No Ospreys or Bald Eagles were identified during previous NRSI field surveys within the Cityview Drive property. **Not SWH**

Wildlife Species[1]	Candidate SWH		Confirmed SWH	Starwood
	ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
		• Local naturalists may know of other locations. • Use maps and aerial photographs to identify forests with few roads that tend to have less human disturbance.	• Observational studies to determine nest site use, perching sites and foraging areas need to be done from mid March to mid August. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHDSS[cxlix] Index #26 provides development effects and mitigation measures	
Wildlife Habitat: Woodland Raptor Nesting Habitat				
Northern Goshawk Cooper's Hawk Sharp-shinned Hawk Red-shouldered Hawk Barred Owl Broad-winged Hawk	May be found in all forested ELC Ecosites. May also be found in SWC, SWM, SWD and CUP3	All natural or conifer plantation woodland/forest stands >30ha with >10ha of interior habitat [lxxxviiii, lxxxix, xc, xci, xciii, xciv, xcv,xcvi, cxxxiii]. Interior habitat determined with a 200m buffer[cxlviii] • Stick nests found in a variety of intermediate-aged to mature conifer, deciduous or mixed forests within tops or crotches of trees. Species such as Coopers hawk nest along forest edges sometimes on peninsulas or small off-shore islands. • In disturbed sites, nests may be used again, or a new nest will be in close proximity to old nest. <u>Information Sources</u> • OMNR Ecologist or Biologist may be aware of locations of nesting raptors. • Sustainable Forestry Licence (SFL) companies will identify additional nesting locations through field operations.	Studies confirm: • Presence of 1 or more active nests from species list is considered significant[cxlviii]. • Red-shouldered Hawk and Northern Goshawk – A 400m radius around the nest or 28 ha of suitable habitat is the SWH [ccvii]. • Barred Owl – A 200m radius around the nest is the SWH [ccvii]. • Broad-winged Hawk and Coopers Hawk,– A 100m radius around the nest is the SWH[ccvii]. • Sharp-Shinned Hawk – A 50m radius around the nest is the SWH[ccvii]. • Conduct field investigations from mid-March to end of May. The use of call broadcasts can help in locating territorial	Suitable habitat is not present within the subject property. Forest and swamp communities are present within the adjacent Cityview Drive and Cityview Ridge properties. However, wooded habitats within the adjacent properties are not large enough (<30 ha) to provide significant raptor nesting habitat. **Not SWH**

Wildlife Species[1]	Candidate SWH		Confirmed SWH	Starwood
	ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
		• Check the Ontario Breeding Bird Atlas [ccv] or Rare Breeding Birds in Ontario for species documented. • Check data from Bird Studies Canada. • Reports and other information available from CAs. • Use maps and aerial photographs to identify forests with few roads that tend to have less human disturbance.	(courting/nesting) raptors and facilitate the discovery of nests by narrowing down the search area. • SWHDSS [cxlix] Index #27 provides development effects and mitigation measures.	
Wildlife Habitat: Turtle Nesting Areas				
Midland Painted Turtle <u>Special Concern Species</u> Northern Map Turtle Snapping Turtle	Exposed mineral soil (sand or gravel) areas adjacent (<100m) [cxlviii] or within the following ELC Ecosites: MAM2 MAM3 MAM4 MAM5 MAM6 MAM1 MAM2 MAM3 SAS1 SAM1 SAF1 BOO1 FEO1	• Best nesting habitat for turtles are close to water and away from roads and sites less prone to loss of eggs by predation from skunks, raccoons or other animals. • For an area to function as a turtle-nesting area, it must provide sand and gravel that turtles are able to dig in and are located in open, sunny areas. Nesting areas on the sides of municipal or provincial road embankments and shoulders are not SWH. • Sand and gravel beaches adjacent to undisturbed shallow weedy areas of marshes, lakes, and rivers are most frequently used. <u>Information Sources</u> • Use Ontario Soil Survey reports and maps to help find suitable substrate for nesting turtles (well-drained sands and fine gravels). • Check the Ontario Herpetofaunal Summary Atlas records or other similar atlases for uncommon turtles; location information may	Studies confirm: • Presence of 5 or more nesting Midland Painted Turtles[l] • One or more Northern Map Turtle or Snapping Turtle nesting is a SWH[l]. • The area or collection of sites within an area of exposed mineral soils where the turtles nest, plus a radius of 30-100m around the nesting area dependant on slope, riparian vegetation and adjacent land use is the SWH.[cxlviii] • Travel routes from wetland to nesting area are to be considered within the SWH.[cxlix] • Field investigations should be conducted in prime nesting season typically late spring to early summer. • SWHDSS [cxlix] Index #28	Suitable habitat not present within the study area. **Not SWH**

Wildlife Species[1]	Candidate SWH		Confirmed SWH	Starwood
	ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
		help to find potential nesting habitat for them. • NHIC • Use aerial photographs and maps to narrow the search for prime nesting areas including shoreline beaches located near weedy areas of wetlands, lake and river shorelines, road embankments near turtle habitat, and stream crossings/culverts. • Skinks will nest under logs, in stumps or under loose rock in partially wooded areas • Reports and other information available from CAs. • Sightings by local Naturalist groups	provides development effects and mitigation measures for turtle nesting habitat.	

Wildlife Species[1]	Candidate SWH		Confirmed SWH	Starwood
	ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Seeps and Springs				
Wild Turkey Ruffed Grouse Spruce Grouse White-tailed Deer Salamander spp.	Seeps/Springs are areas where ground water comes to the surface. Often they are found within headwater areas within forested habitats. Any forested Ecosite within the headwater areas of a stream could have seeps/springs.	Any forested area (with <25% meadow/field/pasture) within the headwaters of a stream or river system [cxvii, cxlix]. • Seeps and springs are important feeding and drinking areas especially in the winter will typically support a variety of plant and animal species [cxix, cxx, cxxi, cxxii, cxiii, cxiv]. <u>Information Sources</u> • Topographical Map. • Thermography. • Hydrological surveys conducted by CAs and MOE. • Local naturalists and landowners may know some locations. • Municipalities and Conservation Authorities may have drainage maps and headwater areas mapped.	Field Studies confirm: • Presence of a site with 2 or more seeps/springs should be considered SWH. • The area of a ELC forest ecosite containing the seeps/springs is the SWH. The protection of the recharge area considering the slope, vegetation, height of trees and groundwater condition need to be considered in delineation the habitat [cxlviii]. • SWHDSS [cxlix] Index #30 provides development effects and mitigation measures	Suitable habitat is not present within the subject property. Previous studies within the forested areas of the adjacent Cityview Drive and Cityview Ridge properties did not document seeps or springs within 120 m of the subject property. **Not SWH**

Wildlife Species[1]	Candidate SWH		Confirmed SWH	Starwood
	ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Amphibian Breeding Habitat (Woodland)				
Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Wood Frog	All Ecosites associated with these ELC Community Series; FOC FOM FOD SWC SWM SWD Breeding pools within the woodland or the shortest distance from forest habitat are more significant because they are more likely to be used due to reduced risk to migrating amphibians	• Presence of a wetland, lake, or pond within or adjacent (within 120m) to a woodland (no minimum size).[clxxxii, lxiii, lxv, lxvi, lxvii, lxviii, lxix, lxx] Some small wetlands may not be mapped and may be important breeding pools for amphibians. • Woodlands with permanent ponds or those containing water in most years until mid-July are more likely to be used as breeding habitat [cxlviii] <u>Information Sources</u> • Ontario Herpetofaunal Summary Atlas (or other similar atlases) for records • Local landowners may also provide assistance as they may hear spring-time choruses of amphibians on their property. • Local OMNR Ecologist • OMNR wetland evaluations • Local field naturalist clubs • Canadian Wildlife Service Amphibian Road Call Survey • Ontario Vernal Pool Association: http://www.ontariovernalpools.org	Studies confirm; • Presence of breeding population of 1 or more of the listed species with at least 20 individuals (adults, juveniles, eggs/larval masses) [lxxi]. • An observational study to determine breeding/larval stages will be required during the spring (Apr-June) when amphibians are concentrated around suitable breeding habitat within or near the woodland. • The habitat is the woodland (ELC polygons) and wetland (ELC polygons) combined. A travel corridor connecting the woodland and wetland polygons is to be included within the habitat. • SWHDSS [cxlix] Index #14 provides development effects and mitigation measures.	Suitable habitat is not present within the subject property. Deciduous swamp habitat exists within the adjacent Cityview Drive property. However, previous NRSI field surveys within the Cityview Drive property, including amphibian call surveys, resulted in only one species being recorded. **Not SWH**

Wildlife Species[1]	Candidate SWH		Confirmed SWH	Starwood
	ELC Ecosite Codes[1]	Habitat Criteria and Information Sources[1]	Defining Criteria[1]	Assessment Details
Wildlife Habitat: Amphibian Breeding Habitat (Wetlands)				
Eastern Newt American Toad Spotted Salamander Four-toed Salamander Blue-spotted Salamander Gray Treefrog Western Chorus Frog Northern Leopard Frog Pickerel Frog Green Frog Mink Frog Bullfrog	ELC Community Classes SW, MA, FE, BO, OA and SA.	• Wetlands and pools (including vernal pools) >500m^2 (about 25m diameter) [ccvii] isolated from woodlands (>120m), supporting high species diversity are significant; some small or ephemeral habitats may not be identified on MNR mapping and could be important amphibian breeding habitats [clxxxiv]. • Presence of shrubs and logs increase significance of pond for some amphibian species because of available structure for calling, foraging, escape and concealment from predators. • Bullfrogs require permanent water bodies with abundant emergent vegetation. <u>Information Sources</u> • Ontario Herpetofaunal Summary Atlas (or other similar atlases) • Canadian Wildlife Service Amphibian Road Surveys and Backyard Amphibian Call Count. • OMNR Ecologist or Biologist may know of populations, wetland evaluations may be a good source of information.. • Use maps or aerial photography to locate marsh habitat. • Reports and other information available from CAs.	Studies confirm: • Presence of breeding population of 1or more of the listed salamander species or 3 or more of the listed frog or toad species and with at least 20 breeding individuals (adults, juveniles, eggs/larval masses) [lxxi, lxxiii] **or;** • Wetland with confirmed breeding Bullfrogs are significantÍ. • The ELC ecosite wetland area and the shoreline are the SWH. • Surveys to confirm breeding to be completed during spring (Apr to June) when amphibians are migrating, calling and breeding within the wetland habitats. • If a SWH is determined for Amphibian Breeding Habitat (Wetlands) then Movement Corridors are to be considered as outlined in Table 1.4.1 of this Schedule. • SWHDSS [cxlix] Index #15 provides development effects and mitigation measures.	Suitable habitat not present within the study area. **Not SWH**

Table 4. Characteristics of Habitat for Species of Conservation Concern for Ecoregion 6E

Wildlife Species	Candidate SWH		Confirmed SWH	Starwood
	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Assessment Details
Wildlife Habitat: Marsh Bird Breeding Habitat				
American Bittern Virginia Rail Sora Common Moorhen American Coot Pied-billed Grebe Marsh Wren Sedge Wren Common Loon Sandhill Crane Green Heron Trumpeter Swan **Special Concern:** Black Tern Yellow Rail	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 SAS1 SAM1 SAF1 FEO1 BOO1 For Green Heron: All SW, MA and CUM1 sites.	• Nesting occurs in wetlands. • All wetland habitat is to be considered as long as there is shallow water with emergent aquatic vegetation present [cxxiv]. • For Green Heron, habitat is at the edge of water such as sluggish streams, ponds and marshes sheltered by shrubs and trees. Less frequently, it may be found in upland shrubs or forest a considerable distance from water. <u>Information Sources</u> • Contact OMNR, wetland evaluations are a good source of information. • Local naturalist clubs • NHIC Records. • Reports and other information available from CAs. • Ontario Breeding Bird Atlas [ccv].	Studies confirm: • Presence of 5 or more nesting pairs of Sedge Wren or Marsh Wren or **or** 1 pair of Sandhill Cranes; **or** breeding by any combination of 5 or more of the listed species Í. • Note: any wetland with breeding of 1 or more Black Terns, Trumpeter Swan, Green Heron or Yellow Rail is SWH Í. • Area of the ELC ecosite is the SWH. • Breeding surveys should be done in May/June when these species are actively nesting in wetland habitats. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHDSS [cxlix] Index #35 provides development effects and mitigation measures	Suitable habitat not present within the study area. **Not SWH**

Wildlife Species	Candidate SWH		Confirmed SWH	Starwood
	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Assessment Details
Wildlife Habitat: Woodland Area-Sensitive Bird Breeding Habitat Wildlife				
Yellow-bellied Sapsucker Red-breasted Nuthatch Veery Blue-headed Vireo Northern Parula Black-throated Green Warbler Blackburnian Warbler Black-throated Blue Warbler Ovenbird Scarlet Tanager Winter Wren <u>Special Concern:</u> Cerulean Warbler Canada Warbler	All Ecosites associated with these ELC Community Series; FOC FOM FOD SWC SWM SWD	• Habitats where interior forest breeding birds are breeding, typically large mature (>60 yrs old) forest stands or woodlots >30 ha. [cv], [cxxxi], [cxxxii], [cxxxiii], [cxxxiv], [cxxxv], [cxxxvi], [cxxxvii], [cxxxviii], [cxxxix], [cxl], [cxli], [cxlii], [cxliii], [cxliv], [cxlv], [cxlvi], [cl], [cli], [clii], [cliii], [cliv], [clv], [clvi], [clvii], [clviii], [clix], • Interior forest habitat is at least 200 m from forest edge habitat. [clxiv] <u>Information Sources</u> • Ask local birders for local forests that support abundant and species-rich populations of area-sensitive species. • Canadian Wildlife Service (CWS) for the location of forest bird monitoring sites and names of volunteers who might assist the planning authority in locating important areas. • Bird Studies Canada conducted a 3-year study of 287 woodlands to determine the effects of forest fragmentation on forest birds and to determine what forests were of greatest value to interior species • Reports and other information available from CAs.	Studies confirm: • Presence of nesting or breeding pairs of 3 or more of the listed wildlife species. [Í] • <u>Note:</u> any site with breeding Cerulean Warblers or Canada Warblers is to be considered SWH.[Í] • Conduct field investigations in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHDSS [cxlix] Index #34 provides development effects and mitigation measures.	Suitable habitat is not present within the subject property. Deciduous swamp occurs within the adjacent Cityview Drive property. However, the area of this habitat is too small (<30ha) to support significant area-sensitive breeding bird habitat. **Not SWH**

Wildlife Species	Candidate SWH		Confirmed SWH	Starwood
	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Assessment Details
Wildlife Habitat: Open Country Bird Breeding Habitat				
Upland Sandpiper Grasshopper Sparrow Vesper Sparrow Northern Harrier Savannah Sparrow **Special Concern** Short-eared Owl	CUM1 CUM2	Large grassland areas (includes natural and cultural fields and meadows) >30 ha [clx, clxi, clxii, clxiii, clxiv, clxv, clxvi, clxvii, clxviii, clxix]. Grasslands not Class 1 or 2 agricultural lands, and not being actively used for farming (i.e. no row cropping or intensive hay or livestock pasturing in the last 5 years) [Í]. Grassland sites considered significant should have a history of longevity, either abandoned fields, mature hayfields and pasturelands that are at least 5 years or older. The Indicator bird species are area sensitive requiring larger grassland areas than the common grassland species. <u>Information Sources</u> • Use Agricultural land classification maps with aerial photographs to determine the potential grasslands that might be candidate sites. • Ask local birders for location of grasslands that support abundant and species rich populations of area-sensitive species. • Ontario Breeding Bird Atlas [ccv] • Reports and other information available from CAs.	Field Studies confirm: • Presence of nesting or breeding of 2 or more of the listed species.[Í] • A field with 1 or more breeding Short-eared Owls is to be considered SWH. • The area of SWH is the contiguous ELC ecosite field areas. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories. • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHDSS [cxlix] Index #32 provides development effects and mitigation measures	Suitable habitat not present within the study area. **Not SWH**

Wildlife Species	Candidate SWH		Confirmed SWH	Starwood
	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Assessment Details
Wildlife Habitat: Shrub/Early Successional Bird Breeding Habitat				
Indicator Spp: Brown Thrasher Clay-coloured Sparrow Common Spp. Field Sparrow Black-billed Cuckoo Eastern Towhee Willow Flycatcher **Special Concern:** Yellow-breasted Chat Golden-winged Warbler	CUT1 CUT2 CUS1 CUS2 CUW1 CUW2 Patches of shrub ecosites can be complexed into a larger habitat for some bird species	Large field areas succeeding to shrub and thicket habitats>10ha[clxiv] in size. Shrub land or early successional fields, not class 1 or 2 agricultural lands, not being actively used for farming (i.e. no row-cropping, haying or live-stock pasturing in the last 5 years) Í. Shrub thicket habitats (>10 ha) are most likely to support and sustain a diversity of these species [clxxiii]. Shrub and thicket habitat sites considered significant should have a history of longevity, either abandoned fields or pasturelands. Information Sources • Use agricultural land classification maps and recent aerial photographs to determine the amount of potential shrub and thicket habitats. • Ask local birders for location of shrub and thicket habitats that support abundant and species rich populations of area-sensitive species. • Ontario Breeding Bird Atlas [ccv] • Reports and other information available from CAs.	Field Studies confirm: • Presence of nesting or breeding of 1 of the indicator species and at least 2 of the common species.Í • A field with breeding Yellow-breasted Chat or Golden-winged Warbler is to be considered as Significant Wildlife Habitat. Í • The area of the SWH is the contiguous ELC ecosite field/thicket area. • Conduct field investigations of the most likely areas in spring and early summer when birds are singing and defending their territories • Evaluation methods to follow "Bird and Bird Habitats: Guidelines for Wind Power Projects"[ccxi] • SWHDSS [cxlix] Index #33 provides development effects and mitigation measures.	Suitable habitat not present within the study area. **Not SWH**

Wildlife Species	Candidate SWH		Confirmed SWH	Starwood
	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Assessment Details
Wildlife Habitat: Terrestrial Crayfish				
Chimney or Digger Crayfish; (*Fallicambarus fodiens*) Devil Crawfish or Meadow Crayfish; (*Cambarus Diogenes*)	MAM1 MAM2 MAM3 MAM4 MAM5 MAM6 MAS1 MAS2 MAS3	Meadow and edges of shallow marshes (no minimum size) identified should be surveyed for terrestrial crayfish. • Constructs burrows in marshes, mudflats, meadows, the ground can't be too moist. Can often be found far from water. • Both species are a semi-terrestrial burrower which spends most of its life within burrows consisting of a network of tunnels. Usually the soil is not too moist so that the tunnel is well formed. Information Sources • Information sources from "Conservation Status of Freshwater Crayfishes" by Dr. Premek Hamr for the WWF and CNF March 1998	Studies Confirm: • Presence of 1 or more individuals of species listed or their chimneys (burrows) in suitable marsh meadow or terrestrial sites [cci] • Area of ELC Ecosite polygon is the SWH • Surveys should be done during adult breeding season (April to late June) and in late summer-early August in nearby temporary or permanent water for juveniles. Note the presence of burrows or chimneys are often the only indicator of presence, observance or collection of individuals is very difficult [cci] SWHDSS [cxlix] Index #36 provides development effects and mitigation measures.	Suitable habitat not present within the study area. **Not SWH**

Table 5. Characteristics of Animal Movement Corridors for Ecoregion 6E

Wildlife Species	Candidate SWH		Confirmed SWH	Starwood
	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Assessment Details
Wildlife Habitat: Amphibian Movement Corridors				
Eastern Newt Blue-spotted Salamander Spotted Salamander Gray Treefrog Spring Peeper Western Chorus Frog Wood Frog	Corridors may be found in all ecosites associated with water. • Corridors will be determined based on identifying the significant breeding habitat for these species in Table 1.1	Movement corridors between breeding habitat and summer habitat [clxxiv, clxxv, clxxvi, clxxvii, clxxviii, clxxix, clxxx, clxxxi]. Movement corridors must be determined when Amphibian breeding habitat is confirmed as SWH from Table 1.2.2 (**Amphibian Breeding Habitat –Wetland)** of this Schedule [Í]. <u>Information Sources</u> • MNR District Office. • NHIC. • Reports and other information available from CAs. • Naturalist Clubs.	• Field Studies must be conducted at the time of year when species are expected to be migrating or entering breeding sites. • Corridors should consist of native vegetation, roadless area, no gaps such as fields, waterways or bodies, and undeveloped areas are most significant[cxlix] • Corridors should be at least 200m wide[cxlix] with gaps <20m[cxlix] and if following riparian area with at least 15m of vegetation on both sides of waterway[cxlix]. Shorter corridors are more significant than longer corridors, however amphibians must be able to get to and from their summer and breeding habitat[cxlix]. • SWHDSS [cxlix] Index #40 provides development effects and mitigation measures	The study area does not provide significant amphibian breeding habitat. **Not SWH**

Wildlife Species	Candidate SWH		Confirmed SWH	Starwood
	ELC Ecosite Codes	Habitat Criteria and Information Sources	Defining Criteria	Assessment Details
Wildlife Habitat: Deer Movement Corridors				
White-tailed Deer	Corridors may be found in all forested ecosites. A Project Proposal in Stratum II Deer Wintering Area has potential to contain corridors.	Movement corridor must be determined when **Deer Wintering Habitat** is confirmed as SWH from Table 1.1 from Table 1.2.2 of this schedule. Í • A deer wintering habitat identified by the OMNR as SWH in Table 1.1 of this Schedule will have corridors that the deer use during fall migration and spring dispersion [clxxxii, clxxxiii, cxlix, cxciv]. • Corridors typically follow riparian areas, woodlots, areas of physical geography (ravines, or ridges). <u>Information Sources</u> • MNR District Office. • NHIC. • Reports and other information available from CAs. • Naturalist Clubs.	• Studies must be conducted at the time of year when deer are migrating or moving to and from winter concentration areas . • Corridors that lead to a deer wintering yard should be unbroken by roads and residential areas. • Corridors should be at least 200m wide[cxlix] with gaps <20m[cxlix] and if following riparian area with at least 15m of vegetation on both sides of waterway[cxlix] . Shorter corridors are more significant than longer corridors, [cxlix]. • SWHDSS [cxlix] Index #39 provides development effects and mitigation measures	The study area does not provide significant deer overwintering habitat. **Not SWH**

APPENDIX V
Tree Protection Plan

Watson - Starwood Drive, Guelph Ontario
Tree Protection Plan

Prepared for:
Coletara Development
966 Pantera Drive, Suite 22
Mississauga, Ontario
L4W 2S1

Project No. 1367 Date: May 8, 2014

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Watson - Starwood Drive, Guelph Ontario
Tree Protection Plan

Project Team:

Staff	Role
David Stephenson	Project Manager, Senior Biologist/Certified Arborist
Ryan Archer	Terrestrial and Wetland Biologist
Tyler Bradley	Certified Arborist
Katie Roth	GIS Technician
Kaitlin Boddaert	GIS Technician

Report submitted on May 8, 2014

David Stephenson, Project Manager

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1.0 Introduction

Natural Resource Solutions Inc. (NRSI) was retained by Coletara Development to undertake a Tree Protection Plan (TPP) for a proposed residential development at Starwood Drive in the City of Guelph (herein, the City). The landowner is proposing to develop the Watson - Starwood Drive property with condominium buildings, a common amenity building, associated above- and below-ground parking, roadways, and landscaped areas. The landowner also proposes to construct four single-detached residential lots within a triangular parcel at the north end of the subject property.

The subject property contains few existing natural features, being dominated by disturbed, open lands that have historically experienced topsoil removal, and more recently fill deposits. The western property boundary borders cultural woodland that occurs off-site. A row of larger deciduous trees is found growing along the west boundary of the main (large) subject property parcel. A few trees are also found along the Watson Parkway South right-of-way, in the southern corner of the property, and in the triangular northwest parcel.

The reader is referred to the Environmental Impact Study (EIS) completed by Natural Resource Solutions Inc. (NRSI) in April 2014.

The Tree Protection Plan was conducted in accordance with City of Guelph By-law (2010) -19058. This by-law states that if an owner wishes to destroy or injure a tree and if none of the exemptions set out in this by-law are applicable, then the owner shall submit the information required in Part 5 of the by-law. Within the By-law, a regulated tree is defined as

> "*a specimen of any species of deciduous or coniferous growing woody perennial plant, supported by a single root system, which has reached, or could have reached a height at least 4.5m from the ground at physiological maturity, is located on a lot that is greater than 0.2 hectares (0.5 acres) in size and has a DBH of 10cm".*

The City of Guelph's Official Plan Amendment Number 42: Natural Heritage System (July 2010b – currently under appeal) also requires that a Tree Inventory and Preservation Plan be required for the replacement of all healthy indigenous trees measuring over 10cm DBH. Although OPA 42 is currently under appeal, the tree inventory was conducted to satisfy relevant policies.

Section 6.2.5 Tree Inventory and Tree Preservation Plan within OPA 42 notes:

1. *"Tree Inventory and Tree Preservation Plans shall as a minimum include:*
   - *i) A Tree Inventory measuring all trees over 10cm diameter at breast height (dbh), including the size, species composition and health, and indigenous shrubs in accordance with the City's tree inventory guidelines,*
   - *ii) A Tree Preservation Plan identifying healthy indigenous and non-invasive trees to be protected, including those that may be transplanted (e.g. small specimens),*
   - *iii) The protective measures required for tree protection during construction, and*
   - *iv) Measures for avoiding disturbance to any breeding birds during construction"*

This report summarizes the following:

- findings of the tree inventory;
- assessment of existing health and/or structural integrity of inventoried trees;
- tree retention analysis based on details of the proposed development;
- protection measures for trees to be retained; and,
- recommended mitigation and compensation measures.

A TPP for the adjacent property to the west was prepared for 55 & 75 Cityview Drive property coincident with this work (NRSI 2013), and as such shared trees and trees within 5 to 10m of the property boundary are considered in both studies.

2.0 Tree Inventory and Methodology

A comprehensive inventory of all trees ≥10cm in Diameter at Breast Height (DBH) on the subject property, as well as trees growing off-site that have canopies overlapping with the property was completed by NRSI Certified Arborists on March 5 and 6, and May 3, 2013 (see Appendix I for inventory results). An inventory specific to the triangular northwest parcel was completed on October 31, 2013. A number of trees in the area had previously been tagged. Trees tagged as # 2, 3 and 1778 were used in those cases (see Figure 1 and Appendix I). Otherwise, each on-site tree was tagged with a pre-numbered aluminum forestry tag, and the following information was recorded for each:

- species;
- Diameter at Breast Height measurement (DBH);
- crown radius (metres);
- general health (excellent, good, fair, poor, very poor);
- potential for structural failure (low, medium, high);
- tree location (lot or block number); and,
- general comments (i.e. disease, aesthetic quality, development constraints, sensitivity to development).

The general health and potential for failure of each tree was assessed based on the criteria outlined in Table 1. Figure 1 shows the location of the inventoried trees in relation to the proposed grading plan, lot and road layout as prepared by Gamsby and Mannerow Engineers (May 2014). The completed tree inventory mapping, with associated tree condition data, was compared to the layout of the proposed site development layout and grading plan to assess the best opportunities for tree retention. A digital drawing of the proposed residential lot layout was not available for mapping purposes at the time of report preparation and is therefore not shown on Figure 1.

As part of the tree health assessment, NRSI biologists who are trained and experienced in the OMNR bat habitat assessment protocol visually scanned all trees ≥10cm dbh for the presence of cavities that may provide bat maternity colony habitat. Although the OMNR's guidance document; *Bats and Bat Habitats: Guidelines for Wind Power Projects, July 2011* (OMNR 2011) specifies trees ≥25cm dbh, all trees ≥10cm dbh were

scanned for cavities as a means of thoroughly searching for any potential habitat for bats.

Table 1. Tree Assessment Criteria

Assessment Criteria	Definition[1]
Health Rating*	
Excellent	Represents a tree in near perfect form, health, and vigor. This tree would exhibit no deadwood, no decline, and no visible defects.
Good	Represents a tree ranging from a generally healthy tree to a near perfect tree in terms of health, vigor and structure. This tree exhibits a complete, balanced crown structure with little to no deadwood and minimal defects as well as a properly formed root flare.
Fair	Represents a tree with minor health, balance or structural issues with minimal to moderate deadwood. Branching structure shows signs of included bark or minor rot within the branch connections or trunk wood. The root flare shows minimal signs of mechanical injury, decay, poor callusing, or girdling roots. Trees in the category require minor remedial actions to improve the vigor and structure of the tree.
Poor	Represents a tree that exhibits a poor vigor, reduced crown size (<30% of crown typical of species caused by overcrowding or decline), extreme crown unbalance, or extensive rot in the branching and trunk wood. Fungus could be seen from these rotting areas, suggesting further decay. These trees have extensive crown die back with a large amount of deadwood, and possibly dead sections. These weakened areas can lead to a potential failure of tree sections. Rooting zones show signs of extensive root decay or damage (fruiting bodies or mechanical damage) or girdling roots. Trees in this category require more extensive actions to prevent failure. A tree identified as poor would be a candidate for removal in the near future.
Very Poor	Represents a tree that exhibits major health and structural defects. Quite often the defects or diseases affecting this tree will be fatal. Large quantities of fungus, large dead sections with possible cavities and bark falling off all are signs that a tree is in a major state of decline and would be identified as very poor. These trees have a high potential for structural failure. These trees should be identified for removal.
Potential for Structural Failure Rating*	
Low	Trees that show good vigor and structure and show little to no signs of decline or structural issues.
Medium	Trees with some structural issues that are forming which could lead to failure if not addressed and properly treated (i.e. pruned). Symptoms of these structural issues include cavity openings/stem damage <30% of the circumference of the tree, poor branching union within the scaffold branches (signs of canker or decay within branch union), signs of historic branch failure throughout the crown, or advanced signs of included bark within the branch unions throughout the tree (water staining, tight angled branch unions, noticeable gap in branch union).
High	Trees with a large number of structural issues (i.e. poor branch union, decay) which could lead to the failure of large scaffold branches or major sections. Major defects include: large cavities within stem or branch wood, historic crown damage of the majority of the canopy, extensive lean due to recent or historic root damage/decay, or large dead crown limbs with fruiting bodies present. If trees identified as a High Risk for Structural Failure are located within striking distance of a target (high traffic place, person, or high value thing), the tree should be identified for removal as soon as possible.

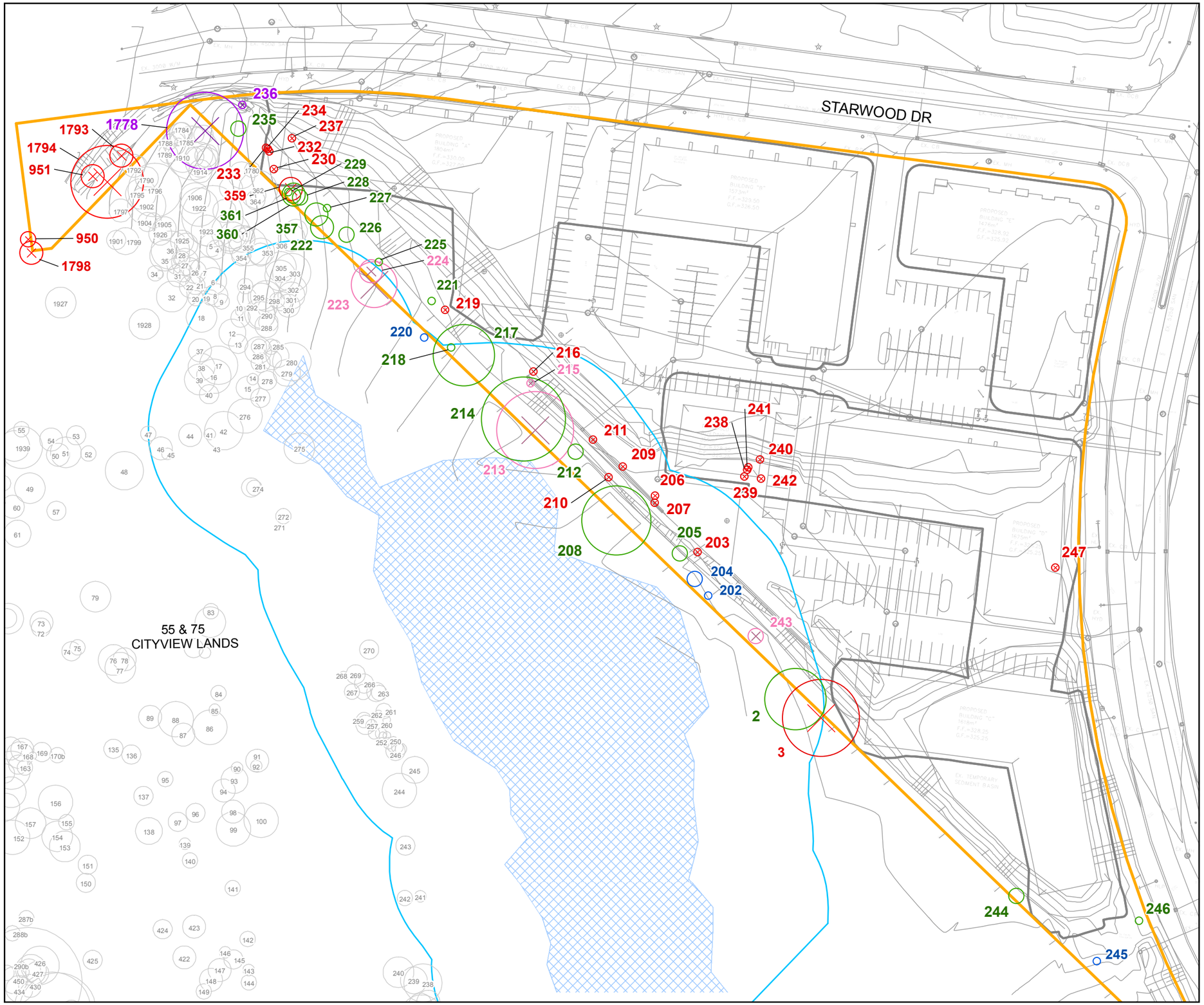
* Trees which are located within dense groupings are evaluated as individual specimens. Trees within these stands quite often have a reduced crown size (<30% of crown typical of species), off balanced crowns, and prioritized upward growth (i.e. low trunk taper and few lateral branches). As such, these trees would be considered to have poor vigour. As well, these trees pose a high risk for structural failure when newly exposed edges or individual trees are isolated through removal of surrounding trees. This is often the case with overstocked plantations. Individual trees which meet the above criteria will be identified as poor or high potential for structural failure.

[1]Dunster, J. 2009

Figure 1

Watson-Starwood

Tree Inventory and Preservation Plan



Legend

- Subject Property
- Tree to be removed due to layout & grading (scaled to crown)
- Tree to be removed due to 55&75 Cityview Drive grading (scaled to crown)
- Tree in poor/very poor condition to be removed due to hazard (scaled to crown)
- Tree in poor condition to be retained and monitored (scaled to crown)
- Tree to be retained (scaled to crown)
- 55 & 75 Cityview Tree Inventory
- Development Layout
- Excavation Limit
- Provincially Significant Wetland Buffer (30m)
- Provincially Significant Wetland (PSW) & OPA 42 - Significant Natural Area

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 1367
Date: May 9, 2014

NAD83 - UTM Zone 17
Size: 11x17"
1:1,000

0 20 40 60 Metres

N

Path: X:\1367_StarwoodEIS\NRSI_1367_Fig1_TreeInventoryPreservationPlan_1K_2014_05_09_KEB.mxd

3.0 Summary of Tree Inventory

In total, 57 trees were inventoried, of which 46 (80.7%) are native species and 11 (19.3%) are non-native. Nine tree species were identified. A complete list of trees inventoried is provided in Appendix I and tree locations within the subject property are shown on Figure 1. The majority of the trees inventoried are located along the western boundary of the main subject property parcel, including many that are growing on the boundary (see Photo 1 in Appendix II). Figure 1 also identifies trees off-site, to the west that were inventoried as part of the 55 & 75 Cityview Drive project (NRSI 2013). With the exception of Tree #1778, and #236, the characteristics of those trees are not included in this report. The reader is referred to the TPP associated with the 55 & 75 Cityview Drive (NRSI 2013) for additional details.

Table 2 provides a list of trees inventoried, whether they are native or non-native and their overall condition.

Table 2. Summary of Inventoried Trees

Common Name	Scientific Name	Good	Fair	Poor	Very Poor	Total
Native Species						
American Basswood	*Tilia americana*		2	1		3
Balsam Poplar	*Populus balsamifera*	9	11			20
Bur Oak	*Quercus macrocarpa*	1	5	1	1	8
Trembling Aspen	*Populus tremuloides*	2				2
Peach-leaved Willow	*Salix amygdaloides*	1				1
Willows	*Salix* ssp.	7	3			10
Poplar	*Populus* sp.	1				1
Total		**21**	**21**	**2**	**1**	**45**
Non-Native Species						
Manitoba Maple	*Acer negundo*		6	4		10
Siberian Elm	*Ulmus pumila*		1			1
White Willow	*Salix alba*	1				1
Total		**1**	**7**	**4**		**12**
Overall Total		**22**	**28**	**6**	**1**	**57**

Table 3 provides a summary of the overall condition of trees inventoried within the subject property, along with their structural failure rating. A large proportion of trees were found to be in fair to good condition.

Table 3. Overall Condition of Trees Inventoried

Structural Failure Rating	Overall Condition				Total
	Good	Fair	Poor	Very Poor	
Low	20	14	1		35
Medium	1	13	3		17
High	1	1	2	1	5
Total	**22**	**28**	**6**	**1**	**57**

As discussed in the Watson – Starwood EIS (NRSI 2014), the large trees (predominantly bur oaks) are growing on the west property boundary. There is an old rock fenceline in this location (see Photos 2 – 4 in Appendix II). Approximately 5m in from the property boundary is a berm approximately 1 to 1.5m in height bordered by an excavated ditch (see Photos 2 and 3 in Appendix II). All of the lands to the east of the berm have been historically stripped of topsoil and in many locations fill has been placed. Based on this history, the root zones of the larger trees along the western property boundary do not extend beyond the berm.

The berm does not extend the full length of the western property boundary. In the southern portion of the site, the subject lands are considerably lower than neighbouring lands to the west as a result of the historic topsoil removal.

4.0 Tree Removal and Retention Analysis

Tree removal and retention was based on two considerations:

1. Trees identified as having a high potential for structural failure or poor condition. The removal of these trees would be recommended for safety etc., especially if they are located within striking distance of a component of the proposed development, or existing off-site sidewalks, roads or buildings. They would be given a rating of high potential for structural failure. For the purpose of this report, trees which fall into this category are identified for removal.
2. Trees that require removal based on the extent of proposed site grading. This was determined by comparing the location of the trees to the location of the components of the development proposal as shown on Figure 2. As described in Section 2.0, a digital copy of the proposed residential lot development could not be overlaid onto tree inventory mapping for the north property triangular parcel. However, it was assumed that the entirety of this land parcel would be graded for development.

Of the 57 trees inventoried, 9 were identified as being in poor or very poor condition, and/or high risk of structural failure. All of these trees are in locations where they could otherwise be retained. Of these 9 trees, 5 have a high risk of structural failure; 3 of which are small to medium in size (1 willow, 2 Manitoba maples), with 2 large bur oaks. Despite the fact that the locations of these 5 trees could allow their retention, since they are located close to the amenity areas in the plan, they are recommended for removal. Two large bur oaks (Tree #213 and #223), one poplar sp. (Tree #950) and one peach-leaved willow (*Salix amygdaloides*) (Tree #1798) are shared trees (i.e., straddle the boundary with the adjacent 55 & 75 Cityview Drive property); removal of these trees will therefore require the permission of the adjacent property landowner.

The remaining 4 trees that are in poor condition, but not high risk, are recommended for retention and monitoring.

Trees that would require removal due to grading were reviewed in terms of their health and feasibility of relocation. As part of the analysis, the approximate extent of the

excavation required for the underground parking was also considered (see Figure 1). Twenty-eight of the inventoried trees are anticipated to be removed based on the extent of the proposed site grading and/or excavation. Of these trees, all are in fair to good condition with medium to low risk of structural failure (see Appendix I). A majority of these trees are <15cm DBH, with only 3 willows (*Salix ssp*.), 1 balsam poplar (*Populus balsamifera*), 1 Manitoba maple (*Acer negundo*) and 1 bur oak (*Quercus macrocarpa* – discussed below) >15cm.

Five additional trees are proposed for removal due to safety; 2 large bur oaks (53 and 95cm DBH), 1 willow ssp. (16cm DBH) and 2 Manitoba maples (26 and 19cm DBH). Many of these trees are situated on fill that has been deposited on-site and consist of pioneer tree species. Refer to Appendix I.

One large bur oak (Tree #3; 60cm DBH) is located close to proposed building 'C' and the extent of excavation required for the underground parking, as well as the ramp that overlaps considerably with the dripline of the tree (see Figure 1). Little impact to the roots of this tree from excavation are anticipated as they do not currently extend beyond the berm. However, due to the proximity of this tree to the proposed excavation it is recommended that this tree be removed. This tree is a shared tree and removal of will require the permission of the adjacent property landowner.

No additional off-site trees will be affected by the Watson – Starwood Drive development.

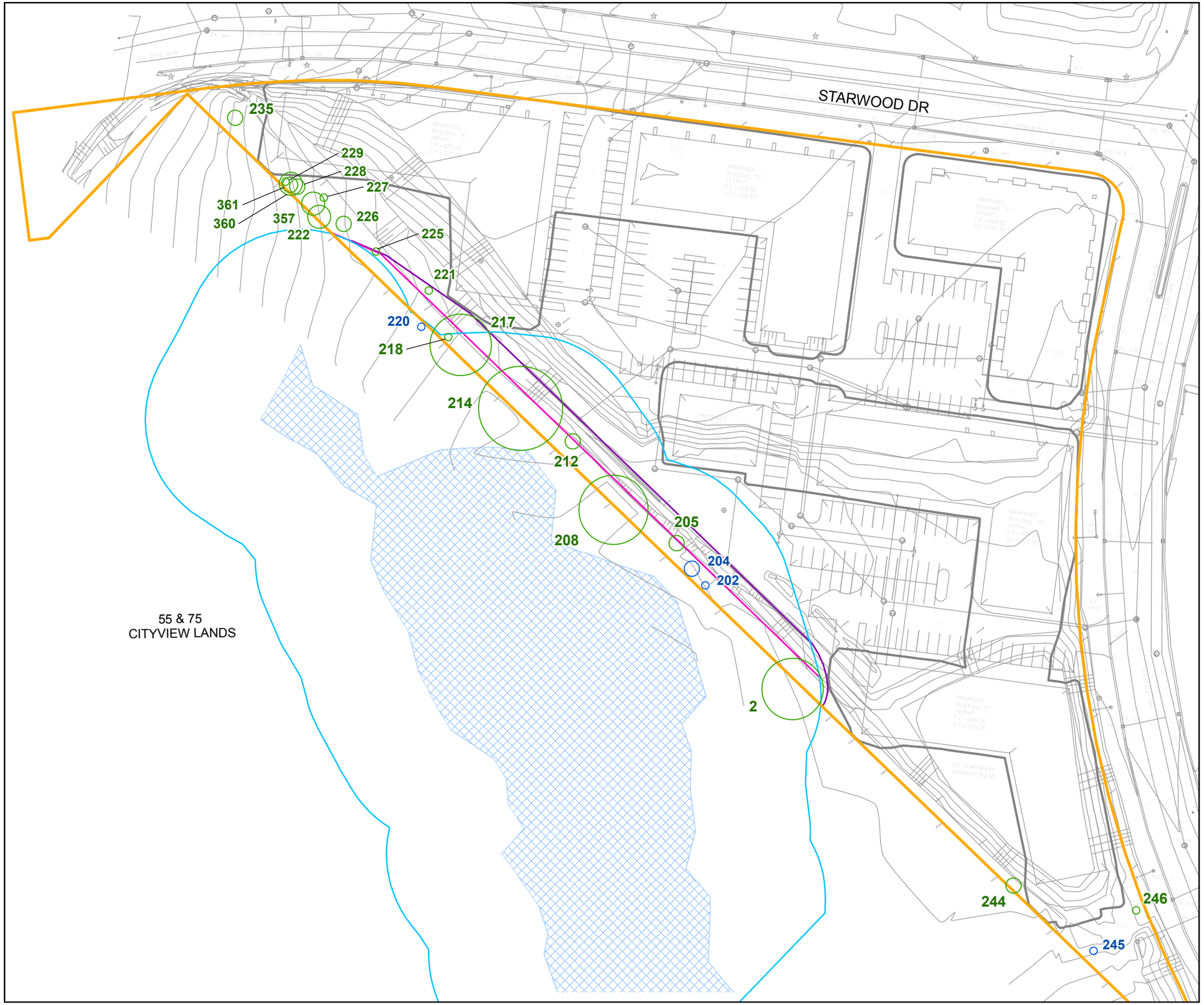
Preliminary plans for neighbouring lands include development adjacent to the west property boundary in the northern as well as the southern corners of the subject property. Refer to the TPP prepared for the 55 & 75 Cityview Drive property (NRSI 2013). Two trees (Tree #1778 and #236) will require removal as a result of development on the neighbouring 55 & 75 Cityview Drive property. The location of tree protection fencing on-site as shown on Figure 2 has taken into account proposed tree removal in the northern portion of the western boundary. Since the submission of the TPP prepared for 55 & 75 Cityview Drive (NRSI 2013) to review agencies, it is understood that subsequent site plan revision for that property may require the removal of certain shared property trees as identified on Figure 2 of the EIS (NRSI 2014). However, the

details regarding which trees may require removal due to site grading on the Cityview Drive property are currently unknown. The landowner of the Cityview Drive property will consult with the subject property landowner regarding the need for removal of shared-property trees.

Figure 2

Watson-Starwood

Tree Protection Plan



Legend

- Subject Property
- Tree in poor condition to be retained and monitored (scaled to crown)
- Tree to be retained (scaled to crown)
- Development Layout
- Development Limit (10m)
- Development Setback (5m)
- Excavation Limit
- Provincially Significant Wetland Buffer (30m)
- Provincially Significant Wetland (PSW) & OPA 42 - Significant Natural Area

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 1367
Date: May 9, 2014

NAD83 - UTM Zone 17
Size: 11x17"
1:1,000

0 20 40 60 Metres

N

Path: X:\1367_StarwoodEIS\NRSI_1367_Fig2_TreeProtectionPlan_1K_2014_05_09_KEB.mxd

5.0 Tree Compensation Plan

Section 5 (h) in the City's tree by-law (2010)-19058 states that *"where three or more trees are proposed for Destruction or Injuring, and where the Inspector so requires, a Landscaping, Replanting and Replacement Plan"* is required. Overall compensation for tree loss is a requirement of the City's by-law which notes that *"each tree Destroyed or Injured be replaced with one or more replacements trees to be planted and maintained to the satisfaction of the Inspector in accordance with the Landscaping, Replanting and Replacement Plans approved by the Inspector"* [Section 7 (b)].

A 1:1 or greater replacement plan is required for trees removed or injured in the City's by-law; however, from discussions with the City's Environmental Planner (Adèle Labbé) and from experience on other projects throughout the City, a compensation ratio of 3:1 is preferred by the City to be applied to all trees removed that are native or non-native and in excellent to fair condition.

According to City of Guelph Tree By-law Number (2010)-19058, trees exempt from compensation must have the following site specific criteria:

- "*A tree having no living tissue, having 70% or more of its crown dead, or being infected by a lethal pathogen, fungus or insect (including the Emerald Ash Borer or the Asian Longhorned Beetle), and where required, a certificate issued by an Arborist, confirming this justification for Destruction or Injuring, has been submitted to an Inspector" [Part 4, section (a)],*
- *"A tree which is Hazardous, and where required, a certificate issued by an Arborist, confirming this justification for Destruction or Injuring, has been submitted to an Inspector" [Part 4, section (b)]*
- *"A specimen of Rhamnus cathartica (common buckthorn), Rhamnus frangula (European or glossy buckthorn), Alnus glutinosa (black alder), Elaeagnus umbellate (autumn olive), or Morus alba (white mulberry)" [Part 4, section (g)],*
- *"A fruit tree that is capable of producing fruit for human consumption" [Part 4, section (h)]*.

Thirty-one trees will require removal due to the proposed Watson – Starwood Drive development. This includes trees requiring removal due to safety concerns (poor condition and/or high potential for structural failure) and the proposed grading and/or excavation for the underground parking. However, this total does not include the 2 trees that are proposed to be removed as a result of the neighbouring 55 & 75 Cityview Drive development (Tree #1778 and #236). Trees proposed for removal that have a high risk of structural failure and/or are in poor to very poor condition are exempt pursuant to Section 4 of the City's tree by-law and do not require compensation.

There are 28 native and non-native trees in good to fair condition proposed for removal. With application of a 3:1 ratio that is recommended by the City for native and non-native trees in good to fair condition, there will be 84 compensation plantings required. Table 4 provides a summary of the trees inventoried, total number proposed for removal and the proposed compensation plan.

Table 4. Summary of Trees to be Removed and Recommended Compensation Plan

Tree Inventory	**Total**
Total number of trees inventoried	57
→ Non-native trees to be removed	3
→ Native trees to be removed	28
Total number of trees proposed to be removed	31
Tree Compensation	
Native/Non-native trees in poor to very poor condition and/or high structural failure (exempt from compensation)	3
Native/Non-native trees in good to fair condition to be removed	28
3:1 Compensation for native/non-native trees in good to fair condition	**84**

Detailed landscaping plans will be required for the property at the Environmental Implementation Report (EIR) stage or Site Plan Stage; however, it is anticipated that compensation plantings can be located within the 10m distance from the western property boundary as identified in the EIS (NRSI 2014), over and above any street tree plantings required by the City of Guelph through the Site Plan Approval Stage. The EIS (NRSI 2014) recommends naturalization of the lands within the 10m distance from the western property boundary which will not only provide space for compensation plantings but provide opportunities for naturalization and active restoration. A smaller proportion of the compensation tree plantings can occur within the property amenity space, in conjunction with other native shrub and herbaceous plantings, to further enhance its ecological value (e.g., as bird nesting habitat). A majority of the trees proposed for

removal are very small (most <15cm DBH) and are comprised of pioneer species that would provide poor long-term tree canopy. To achieve restoration goals set out in the EIS (NRSI 2014) it is recommended that the final compensation strategy, including appropriate species and potential use of trees and shrubs, be negotiated with the City of Guelph prior to the development of landscaping plans.

6.0 Tree Protection Measures and Recommended Mitigation

6.1 Trees to be Retained

The Watson – Starwood EIS (NRSI 2014) discusses in detail a recommendation to use the existing berm and grades along the 5m zone between the property boundary and berm as a 'no touch' area. No grading will occur in this zone, and as such no disruption of the root zones currently found in this zone will be impacted. As shown on Figure 2, between 5m and 10m some grading is proposed, but no structures, pavement, etc. will occur. The resulting grades are anticipated to more closely resemble the grades on-site prior to the topsoil stripping and filling.

The proposed development limit allows for the retention of many of the trees along the western property boundary.

6.2 Prior to Construction

A combined sediment and erosion control fencing (i.e. silt fence) and temporary tree protection fence is recommended where trees are situated adjacent to the limit of disturbance. This tree protection fencing is to take the form of 1200mm high heavy-duty paige-wire fencing. The temporary tree protection fencing is to be installed and maintained by the Developer. Prior to works commencing on-site, fence installation and location is to be inspected by a Certified Arborist and/or the on-site Environmental Inspector. It is recommended that signage indicating the purpose of the protection fencing be attached to the fencing every 100-150m. Recommended fencing locations are shown on Figure 2.

A number of trees that are located in areas that also contain trees to be retained are recommended for removal due to their high risk of structural failure. As such, prior to installation of the tree protection fence, these safety hazard trees will need to be removed. The trees should be clearly marked for removal by a Certified Arborist. The trees should then be felled and removed with minimal disturbance to neighbouring trees, with a follow-up inspection conducted by a Certified Arborist to ensure no damage was incurred to adjacent trees.

In order to achieve grading within the 5 to 10m zone, the tree protection fencing (and associated silt fencing) is recommended to be installed at the 5m line. Although this is within the dripline, there will be no disruption of root zones or overhead branches. Once this grading is completed, the area should be reviewed by a Certified Arborist and the feasibility and effectiveness of moving the fence out to the 10m line should be determined (construction sequencing has not been detailed at the time of preparing this report, as such final grading may occur later in the construction sequence making the fence relocation less effective).

The Tree Protection Plan is to be reviewed and approved by the City of Guelph. Upon approval of the Tree Protection Plan, and prior to any on-site works (i.e. rough grading, tree removal), a qualified environmental consultant is to submit written verification to the City that all of the recommended tree protection measures have been installed in accordance with the Tree Protection Plan.

6.3 During Construction

Temporary tree protection fencing is to be maintained by the Developer during the entire construction period to ensure that trees being retained and their root systems are protected. Any minimal damage (i.e. damage to limbs or roots) to trees to be retained during construction must be pruned using proper arboricultural techniques. Should any of the trees intended to be retained be seriously damaged or die as a result of construction activities, the owner will remove and replace the tree at their own expense at a ratio agreed upon with the City of Guelph. Replacement species are to be reviewed by a Certified Ontario Landscape Architect (OLA) or Certified Arborist. Watering and pruning of newly planted trees will be carried out by the owner/contractor as required during the warranty period (approximately 2 years).

6.4 Post-Construction

As trees being retained are generally situated along the edge of the property, it is recommended that the temporary tree protection fencing be removed once construction activities are complete and associated grounds are stabilized with a vegetative cover (i.e. sod, landscaping) to the satisfaction of the Environmental Inspector or qualified other.

6.5 Mitigation

The recommendations provided below are aimed at protecting retained trees. Species used for replacement/enhancement plantings, with the potential exception of street trees, should be native to Wellington County and not include any species that are listed as introduced, or locally, provincially or federally significant. The use of hardy species will ensure successful early establishment and minimize the potential for invasive species proliferation. As described in the EIS (NRSI 2014), required compensation plantings can be incorporated into the 10m restoration zone on the subject property, although a smaller proportion of native species enhancement plantings can be established within the property amenity space. The restoration plan should identify suitable woody species and planting locations/spacing such that the plantings provide a dense barrier to human encroachment along the 10m Development Limit (i.e. edge of restoration zone). Opportunities to establish compensation tree plantings within the off-site SWM facility should also be explored during the detailed design stage. Compensation tree plantings should be located where increased canopy coverage is anticipated to provide a cooling effect on discharged stormwater, thereby mitigating impacts associated with thermal loading of receiving waters (i.e., Clythe Creek). For street tree plantings, the use of non-native species that are sometimes more tolerant of urban conditions (i.e. salt and drought tolerant) may be suitable as long as they do not include invasive species such as Norway maple (*Acer platanoides*).

At the detailed design stage, it is recommended that the following criteria be followed during the development of proposed planting plans:

- plantings along the western edge of the property are to be limited to native, non-invasive tree and shrub species indigenous to Wellington County that complement the surrounding natural features;
- tree species to be situated in close proximity to roads should be salt tolerant;
- avoid ash species due to the risk of the emerald ash borer (*Agrilus planipennis*);
- avoid ‘messy trees’, such as fruiting trees or poplars (*Populus* spp.) where plantings occur in close proximity to driveways and roadways;
- all plant material is to conform to the latest edition of the *Canadian Nursery Trades Association Specifications and Standards*;

- plantings installed as per specifications outlined in planting plans prepared by an OLA or Certified Arborist (e.g. place a minimum of 10cm of shredded pine-bark mulch or equivalent around all planted material);
- spacing of plant material should account for the ultimate size and form of the selected species and also the purpose of the planting, whether it be for screening, shade, naturalizing, rehabilitation, etc.;
- special attention to location and height of trees in proximity to utilities; and, ensure that there is sufficient soil volume for all plantings.

7.0 References

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APPENDIX I

Watson - Starwood Drive - Tree Inventory Data

Appendix I. Watson - Starwood Drive Tree Inventory

Tag #	Common Name	Scientific Name	Native/Non-native	DBH (cm)	Stem Count	Crown Radius (m)	Potential for Structural Failure	Overall Condition	Proposed Action	Rationale for Removal
2	Bur Oak	*Quercus macrocarpa*	Native	56.00	2	10.00	Medium	Fair	Retain	
3	Bur Oak	*Quercus macrocarpa*	Native	60.00	1	10.00	Low	Fair	Remove	Parking Garage Grading
202	Manitoba Maple	*Acer negundo*	Non-native	11.00	1	1.00	Medium	Poor	Retain & Monitor	
203	Willow spp.	*Salix spp.*	Native	12.00	2	1.00	Low	Good	Remove	Grading
204	Manitoba Maple	*Acer negundo*	Non-native	24.00	1	2.00	Medium	Poor	Retain & Monitor	
205	Manitoba Maple	*Acer negundo*	Non-native	20.00	1	2.00	Medium	Fair	Retain	
206	Willow spp.	*Salix spp.*	Native	10.00	1	1.00	Low	Good	Remove	Grading
207	Balsam Poplar	*Populus balsamifera*	Native	13.00	1	1.00	Low	Good	Remove	Grading
208	Siberian Elm	*Ulmus pumila*	Non-native	60.00	1	9.00	Low	Fair	Retain	
209	Willow spp.	*Salix spp.*	Native	12.00	1	1.00	Low	Good	Remove	Grading
210	Willow spp.	*Salix spp.*	Native	18.00	1	1.00	Low	Fair	Remove	Grading
211	Balsam Poplar	*Populus balsamifera*	Native	14.00	1	1.00	Low	Good	Remove	Grading
212	Manitoba Maple	*Acer negundo*	Non-native	15.00	1	2.00	Medium	Fair	Retain	
213	Bur Oak	*Quercus macrocarpa*	Native	53.00	2	10.00	High	Poor	Remove	Safety
214	Bur Oak	*Quercus macrocarpa*	Native	114.00	1	11.00	Medium	Fair	Retain	
215	Willow spp.	*Salix spp.*	Native	16.00	1	1.00	High	Good	Remove	Safety
216	Balsam Poplar	*Populus balsamifera*	Native	15.00	1	1.00	Low	Good	Remove	Grading
217	Bur Oak	*Quercus macrocarpa*	Native	75.00	1	8.00	Medium	Fair	Retain	
218	American Basswood	*Tilia Americana*	Native	16.00	1	1.00	Low	Fair	Retain	
219	Willow spp.	*Salix spp.*	Native	11.00	2	1.00	Low	Good	Remove	Grading
220	American Basswood	*Tilia Americana*	Native	21.00	1	1.00	Medium	Poor	Retain & Monitor	
221	Balsam Poplar	*Populus balsamifera*	Native	11.00	1	1.00	Low	Good	Retain	
222	Balsam Poplar	*Populus balsamifera*	Native	32.00	1	3.00	Low	Fair	Retain	
223	Bur Oak	*Quercus macrocarpa*	Native	95.00	1	6.00	High	Very Poor	Remove	Safety
224	Manitoba Maple	*Acer negundo*	Non-native	26.00	1	3.00	High	Poor	Remove	Safety
225	Balsam Poplar	*Populus balsamifera*	Native	12.00	1	1.00	Low	Fair	Retain	
226	Balsam Poplar	*Populus balsamifera*	Native	15.00	3	2.00	Low	Fair	Retain	
227	Balsam Poplar	*Populus balsamifera*	Native	15.00	1	1.00	Low	Good	Retain	
228	Balsam Poplar	*Populus balsamifera*	Native	16.00	1	2.00	Medium	Fair	Retain	
229	Manitoba Maple	*Acer negundo*	Non-native	15.00	1	1.00	Low	Fair	Retain	

Appendix I. Watson - Starwood Drive Tree Inventory

Tag #	Common Name	Scientific Name	Native/Non-native	DBH (cm)	Stem Count	Crown Radius (m)	Potential for Structural Failure	Overall Condition	Proposed Action	Rationale for Removal
230	Balsam Poplar	*Populus balsamifera*	Native	11.00	1	1.00	Low	Good	Remove	Grading
232	Balsam Poplar	*Populus balsamifera*	Native	12.00	2	1.00	Low	Fair	Remove	Grading
233	Balsam Poplar	*Populus balsamifera*	Native	10.00	1	1.00	Low	Good	Remove	Grading
234	Balsam Poplar	*Populus balsamifera*	Native	10.00	1	1.00	Low	Good	Remove	Grading
235	Manitoba Maple	*Acer negundo*	Non-native	12.00	3	2.00	Medium	Fair	Retain	
236	Trembling Aspen	*Populus tremuloides*	Native	11.00	1	1.00	Low	Good	Remove	Cityview Drive Grading
237	Balsam Poplar	*Populus balsamifera*	Native	11.00	1	0.00	Low	Fair	Remove	Grading
238	Willow spp.	*Salix spp.*	Native	19.00	1	1.00	Low	Good	Remove	Grading
239	Willow spp.	*Salix spp.*	Native	12.00	2	1.00	Low	Fair	Remove	Grading
240	Balsam Poplar	*Populus balsamifera*	Native	14.00	1	1.00	Low	Good	Remove	Grading
241	Willow spp.	*Salix spp.*	Native	11.00	2	1.00	Low	Good	Remove	Grading
242	Willow spp.	*Salix spp.*	Native	10.00	3	1.00	Low	Fair	Remove	Grading
243	Manitoba Maple	*Acer negundo*	Non-native	19.00	1	2.00	High	Fair	Remove	Safety/Grading
244	Bur Oak	*Quercus macrocarpa*	Native	22.00	1	2.00	Low	Good	Retain	
245	Manitoba Maple	*Acer negundo*	Non-native	11.00	1	1.00	Low	Poor	Retain & Monitor	
246	Balsam Poplar	*Populus balsamifera*	Native	13.00	2	1.00	Low	Fair	Retain	
247	Balsam Poplar	*Populus balsamifera*	Native	13.00	1	1.00	Medium	Fair	Remove	Grading
357	Balsam Poplar	*Populus balsamifera*	Native	35.00	1	3.00	Medium	Fair	Retain	
359	American Basswood	*Tilia Americana*	Native	20.00	1	3.00	Low	Fair	Remove	Grading
360	Balsam Poplar	*Populus balsamifera*	Native	30.00	1	3.00	Medium	Fair	Retain	
361	Balsam Poplar	*Populus balsamifera*	Native	25.00	1	2.00	Medium	Fair	Retain	
950	Poplar sp.	*Populus sp.*	Native	12.80	1	2.00	Low	Good	Remove	Grading
951	Manitoba Maple	*Acer negundo*	Native	19.60	1	3.00	Medium	Fair	Remove	Grading
1778	Bur Oak	*Quercus macrocarpa*	Native	71.00	1	8.00	Medium	Fair	Remove	Cityview Drive Grading
1793	Trembling Aspen	*Populus tremuloides*	Native	12.60	1	3.00	Low	Good	Remove	Grading
1794	White Willow	*Salix alba*	Non-native	89.40	2	9.50	Medium	Good	Remove	Grading
1798	Peach-leaved Willow	*Salix amygdaloides*	Native	13.30	1	3.00	Low	Good	Remove	Grading

Trees Located Within 55 & 75 Cityview Drive Property

APPENDIX II
Site Photos

Appendix II. Watson – Starwood Drive Site Photos

Photo 1. Western portion of subject property showing fill on right, treeline on left with portion of intervening ditch visible near left side of photograph (looking north, March 2013).

Photo 2. Berm and ditch along the west property boundary, showing base of large bur oak on property boundary (looking south, March 2013)

Photo 3. Berm and ditch along the west property boundary, showing large bur oak on property boundary and growth of shrubs (looking north, May 2013)

Photo 4. Western property boundary showing western side of berm as well as trees growing along property boundary (looking southwest, May 2013).

APPENDIX VI

City of Guelph Correspondence Regarding Proposed Trail Network (March 2014)

Subject: Fwd: FW: Guelph Trail Network
From: Ryan Archer <rarcher@nrsi.on.ca>
Date: 05/05/2014 1:22 PM
To: Ryan Archer <rarcher@nrsi.on.ca>

From: Jyoti.Pathak@guelph.ca [mailto:Jyoti.Pathak@guelph.ca]
Sent: March-18-14 11:59 AM
To: kbittman@coletara.com
Subject: Guelph Trail Network

Hi Karl,

As discussed on phone, here is the Guelph Trail Network in PDF format which is an updated version of the Guelph Trail Network Map 4 (2005).

A pedestrian off road connection from Watson Parkway North to the proposed trail connection on 55- 75 Cityview Drive North property (TBD) is required.

I will forward my formal comments before the end of the week.

Thanks

Jyoti

Attachments:

OPA- Schedule 8.pdf	812 KB

This Schedule is to be read in conjunction with the other Schedules and the text of The Official Plan

TransCanada Trail to Elora (North) and Elmira (Northwest via Kissing Bridge Trail)

GORBA Trails developed and maintained under special agreement with the Grand River Conservation Authority.

Guelph Off-Road and Bicycling Association (GORBA) Trails

Refer to the GORBA Trail Club for trails in this area.

GUELPH LAKE CONSERVATION AREA

PROPOSED Alternative route; shown in magenta colour, to replace two unfeasible connections shown with red arrows.

LANDS SUBJECT TO OFFICIAL PLAN AMENDMENT no.43

Refer to the University of Guelph Arboretum Trails

Continue to explore trail connections with the University of Guelph

Potential Connection to Guelph Radial Line Trail and Starkey Hill Trail

Trail routing in the new section of the Hanlon Business Park is based on the Draft Plan of Subdivision.

Potential trail gateway to be located at City boundary when area plans are developed.

Legend

- City Streets
- Future City Streets
- County Roads
- Railways
- Watercourses
- Waterbodies
- Natural Heritage System (subject to OPA 42)* & Open Space
- Corporate Boundary

Trail Network

- Existing City Trails
- Proposed City Trails
- Structure Required
- Staging Area
- Canoe Launch & Node
- Trail Gateway

General note for all future development areas: It is imperative that the City Wide Trail Master Plan be referenced in conjuction with this schedule as supporting documentation. Trail routing is to be provided as part of the development planning process and will be consistent with the goals, objectives and guiding principles of the GTMP.

*The Natural Heritage System that forms part of Official Plan Amendment 42 is currently under appeal and is illustrated for contextual purposes only and does not form part of this schedule

1 0.5 0 1 KM

Projection: UTM 17N NAD83
Produced by the City of Guelph
Planning Services
June 5, 2012

CITY OF GUELPH OFFICIAL PLAN

SCHEDULE 7: TRAIL NETWORK

CITY OF Guelph
Making a Difference

I:\gis_staging\Planning\OFFICIAL PLAN MAPPING NEW\Schedule7\Schedule7-TrailNetwork.mxd

APPENDIX VII
Watercourse Investigation Documentation

Figure 1

Watson-Starwood EIS

Video & Photo Locations

Legend

- Subject Property
- 55 & 75 Cityview Lands
- Provincially Significant Wetland (PSW) & OPA 42 - Significant Natural Area
- Provincially Significant Wetland Buffer (30m)
- Watercourse (GRCA)
- 360° Video Location
- # 1 Picture Number
- Picture Location (with direction picture was taken)

NATURAL RESOURCE SOLUTIONS INC.
Aquatic, Terrestrial and Wetland Biologists

Project: 1367 Date: April 3, 2013	NAD83 - UTM Zone 17 Size: 11x17" **1:1,750**

0 25 50 75 100 Metres

Path: X:\1367_StarwoodEIS\NRSI_1367_Fig1_CameraLocations_2K_2013_04_03_KEB.mxd

Pic 1: November 9, 2012

PIC 2: November 9, 2012

PIC 3: November 9, 2012

PIC 4: November 9, 2012

APPENDIX VIII
Photographs of Berm

Appendix VIII: Photographs of the Subject Property Berm

Photo 1.

Photo 2.

Photo 3.

Photo 4.

APPENDIX IX
Vascular Flora Species List

Appendix IX. Vascular Flora Species List

Scientific Name	Common Name	CC	CW	Weed	S-Rank	COSSARO	COSEWIC	SAR Schedule
PTERIDOPHYTES	**FERNS & ALLIES**							
Equisetaceae	**Horsetail Family**							
Equisetum arvense	Field Horsetail	0	0		S5			
GYMNOSPERMS	**CONIFERS**							
Juniperus virginiana	Eastern Red Cedar	4	3		S5			
Thuja occidentalis	White Cedar	4	-3		S5			
Pinaceae	**Pine Family**							
Pinus sylvestris	Scot's Pine		5	-3	SE5			
DICOTYLEDONS	**DICOTS**							
Aceraceae	**Maple Family**							
Acer negundo	Manitoba Maple	0	-2		S5			
Apiaceae	**Carrot or Parsley Family**							
Daucus carota	Wild Carrot		5	-2	SE5			
Asclepiadaceae	**Milkweed Family**							
Asclepias syriaca	Common Milkweed	0	5		S5			
Asteraceae	**Composite or Aster Family**							
Achillea millefolium ssp. millefolium	Common Yarrow		3	-1	SE?			
Cichorium intybus	Chicory		5	-1	SE5			
Cirsium arvense	Canada Thistle		3	-1	SE5			
Cirsium vulgare	Bull Thistle		4	-1	SE5			
Erigeron annuus	Daisy Fleabane	0	1		S5			
Euthamia graminifolia	Flat-topped Bushy Goldenrod	2	-2		S5			
Hieracium spp.	Hawkweed species							
Solidago altissima var. altissima	Tall Goldenrod	1	3		S5			
Solidago canadensis	Canada Goldenrod	1	3		S5			
Solidago nemoralis ssp. nemoralis	Gray Goldenrod	2	5		S5			
Symphyotrichum ericoides var. ericoides	White Heath Aster				S5			
Symphyotrichum lanceolatum var. lanceolatum	Tall White Aster	3	-3		S5			
Symphyotrichum novae-angliae	New England Aster	2	-3		S5			
Tussilago farfara	Coltsfoot		3	-2	SE5			
Boraginaceae	**Borage Family**							
Echium vulgare	Blueweed		5	-2	SE5			
Brassicaceae	**Mustard Family**							
Barbarea vulgaris	Yellow Rocket		0	-1	SE5			
Cornaceae	**Dogwood Family**							
Cornus stolonifera	Red-osier Dogwood	2	-3		S5			
Elaeagnaceae	**Oleaster Family**							
Elaeagnus angustifolia	Russian Olive		4	-1	SE3			
Fabaceae	**Pea Family**							
Medicago lupulina	Black Medick		1	-1	SE5			
Melilotus alba	White Sweet-clover		3	-3	SE5			
Trifolium pratense	Red Clover		2	-2	SE5			
Vicia cracca	Tufted Vetch		5	-1	SE5			
Fagaceae	**Beech Family**							
Quercus macrocarpa	Bur Oak	5	1		S5			
Plantaginaceae	**Plantain Family**							
Plantago lanceolata	Ribgrass		0	-1	SE5			
Plantago major	Common Plantain		-1	-1	SE5			
Rhamnaceae	**Buckthorn Family**							
Rhamnus cathartica	Common Buckthorn		3	-3	SE5			
Frangula alnus	Glossy Buckthorn		-1	-3	SE5			
Rosaceae	**Rose Family**							
Potentilla recta	Rough-fruited Cinquefoil		5	-2	SE5			
Sanguisorba minor	Salad Burnet		0	-1	SE4			
Salicaceae	**Willow Family**							
Populus balsamifera ssp. balsamifera	Balsam Poplar	4	-3		S5			
Populus tremuloides	Trembling Aspen	2	0		S5			
Salix species	Willow species							
Salix bebbiana	Long-beaked Willow	4	-4		S5			
Salix petiolaris	Slender Willow	3	-4		S5			
Scrophulariaceae	**Figwort Family**							
Verbascum thapsus	Common Mullein		5	-2	SE5			
Tiliaceae	**Linden Family**							
Tilia americana	American Basswood	4	3		S5			
Ulmaceae	**Elm Family**							
Ulmus pumila	Siberian Elm		5	-1	SE3			
Vitaceae	**Grape Family**							
Vitis riparia	Riverbank Grape	0	-2		S5			
Juncaceae	**Rush Family**							
Juncus tenuis	Path Rush	0	0		S5			

Appendix IX. Vascular Flora Species List

Scientific Name	Common Name	CC	CW	Weed	S-Rank	COSSARO	COSEWIC	SAR Schedule
Poaceae	**Grass Family**							
Panicum dichotomiflorum	Fall Panic Grass		-2	-1	SE5			
Phalaris arundinacea	Reed Canary Grass	0	-4		S5			
Phragmites australis	Common Reed	0	-4		S5			
Poa pratensis ssp. pratensis	Kentucky Bluegrass	0	1		S5			
Setaria viridis	Green Foxtail			-1	SE5			
Trisetum aestivum	Summer Wheat		5	-1	SE1			

Legend
CC Coefficient of Conservatism
CW Coefficient of Wetness
Weed Weediness Index
SRANK
S4 Apparently Secure
S5 Secure
? Rank Uncertain
SE Exotic Species

APPENDIX X
Bird Species List

Appendix VII. Bird Species Recorded From the Study Area

Scientific Name	Common Name	SRANK	COSSARO	COSEWIC	SARA Schedule	Grand River Watershed Conservation Priority	Wellington County Significant Breeding Bird	OBBA 17NJ62	NRSI Observed
	DUCKS, GEESE & SWANS								
Branta canadensis	Canada Goose	S5						AE	
Aix sponsa	Wood Duck	S5						FY	
Anas platyrhynchos	Mallard	S5						FY	
Mergus merganser	Common Merganser	S5B, S5N					√	FY	
	PARTRIDGES, GROUSE & TURKEYS								
Bonasa umbellus	Ruffed Grouse	S4				√		T	
Meleagris gallopavo	Wild Turkey	S5						H	
	LOONS								
Gavia immer	Common Loon	S5B, S5N	NAR	NAR		√	√	H	
	GREBES								
Podilymbus podiceps	Pied-billed Grebe	S4B, S4N				√	√	CF	
	HERONS & BITTERNS								
Ixobrychus exilis	Least Bittern	S4B	THR	T	Schedule 1	√	√	S	
Ardea herodias	Great Blue Heron	S4B					**	V	
Butorides virescens	Green Heron	S4B				√	**	FY	
	VULTURES								
Cathartes aura	Turkey Vulture	S5B				√	√	H	
	HAWKS, KITES & EAGLES								
Pandion haliaetus	Osprey	S5B				√	√	NY	
Circus cyaneus	Northern Harrier	S4B	NAR	NAR		√	√*	H	
Accipiter striatus	Sharp-shinned Hawk	S5	NAR			√	√*	A	
Accipiter cooperii	Cooper's Hawk	S4	NAR	NAR		√	√*	CF	
Buteo platypterus	Broad-winged Hawk	S5B				√	√	H	
Buteo jamaicensis	Red-tailed Hawk	S5	NAR	NAR				AE	
	CARACARAS & FALCONS								
Falco sparverius	American Kestrel	S4				√	√*	H	
	RAILS, GALLINULES & COOTS								
Rallus limicola	Virginia Rail	S5B				√		A	
Porzana carolina	Sora	S4B				√	√	T	
	PLOVERS								
Charadrius vociferus	Killdeer	S5B, S5N						FY	
	SANDPIPERS & PHALAROPES								
Actitis macularia	Spotted Sandpiper	S5				√		FY	
Scolopax minor	American Woodcock	S4B				√		D	
	PIGEONS & DOVES								
Columba livia	Rock Pigeon	SNA						NY	
Zenaida macroura	Mourning Dove	S5						FY	
	CUCKOOS & ANIS								
Coccyzus erythropthalmus	Black-billed Cuckoo	S5B				√	√*	H	
	TYPICAL OWLS								
Megascops asio	Eastern Screech-Owl	S4	NAR	NAR				FY	
Bubo virgianus	Great Horned Owl	S4						NY	
Asio otus	Long-eared Owl	S4				√	√	FY	
	SWIFTS								
Chaetura pelagica	Chimney Swift	S4B, S4N	THR	T	Schedule 1		√	T	
	HUMMINGBIRDS								
Archilochus colubris	Ruby-throated Hummingbird	S5B				√		D	
	KINGFISHERS								
Megaceryle alcyon	Belted Kingfisher	S4B					√	CF	
	WOODPECKERS								
Melanerpes erythrocephalus	Red-headed Woodpecker	S4B	SC	T	Schedule 1	√	√	H	
Picoides pubescens	Downy Woodpecker	S5						FY	
Picoides villosus	Hairy Woodpecker	S5					√*	FY	
Colaptes auratus	Northern Flicker	S4B					√*	NY	
Dryocopus pileatus	Pileated Woodpecker	S5				√	√*	N	

Scientific Name	Common Name	SRANK	COSSARO	COSEWIC	SARA Schedule	Grand River Watershed Conservation Priority	Wellington County Significant Breeding Bird	OBBA 17NJ62	NRSI Observed
	TYRANT FLYCATCHERS								
Contopus virens	Eastern Wood-Pewee	S4B					√	T	
Empidonax alnorum	Alder Flycatcher	S5B				√		T	
Empidonax traillii	Willow Flycatcher	S5B					√	S	
Empidonax minimus	Least Flycatcher	S4B				√	√	T	
Sayornis phoebe	Eastern Phoebe	S5B				√		NE	
Myiarchus crinitus	Great Crested Flycatcher	S4B						CF	
Tyrannus tyrannus	Eastern Kingbird	S4B				√	√*	FY	
	VIREOS								
Vireo gilvis	Warbling Vireo	S5B						FY	
Vireo olivaceus	Red-eyed Vireo	S5B						CF	
	CROWS & JAYS								
Cyanocitta cristata	Blue Jay	S5						FY	
Corvus brachyrhynchos	American Crow	S5B						CF	X
Corvus corax	Common Raven	S5					√	H	
	LARKS								
Eremophila alpestris	Horned Lark	S5B				√		T	X
	SWALLOWS								
Tachycineta bicolor	Tree Swallow	S4B						NY	
Stelgidopteryx serripennis	Northern Rough-winged Swallow	S4B				√		NY	
Riparia riparia	Bank Swallow	S4B				√	ficant in nesting c	NY	
Petrochelidon pyrrhonota	Cliff Swallow	S4B				√	ificant in nesting	NE	
Hirundo rustica	Barn Swallow	S4B	THR	T		√		FY	
	CHICKADEES & TITMICE								
Poecile atricapillus	Black-capped Chickadee	S5				√		NE	X
	NUTHATCHES								
Sitta canadensis	Red-breasted Nuthatch	S5				√	√*	FY	
Sitta carolinensis	White-breasted Nuthatch	S5						AE	
	CREEPERS								
Certhia americana	Brown Creeper	S5B				√	√*	CF	
	WRENS								
Thryothorus ludovicianus	Carolina Wren	S4				√	√	NY	
Troglodytes aedon	House Wren	S5B						AE	
Troglodytes hiemalis	Winter Wren	S5B					√*	T	
Cistothorus palustris	Marsh Wren	S4B				√	√	S	
	THRUSHES								
Sialia sialis	Eastern Bluebird	S5B	NAR	NAR		√		NY	
Catharus fuscescens	Veery	S4B				√	√*	T	
Hylocichla mustelina	Wood Thrush	S4B					√*	T	
Turdus migratorius	American Robin	S5B						NY	
	MOCKINGBIRDS & THRASHERS								
Dumetella carolinensis	Gray Catbird	S4B				√		A	
Toxostoma rufum	Brown Thrasher	S4B				√	√	CF	
Sturnus vulgaris	European Starling	SNA						NY	
	WAXWINGS								
Bombycilla cedrorum	Cedar Waxwing	S5B						NB	

Scientific Name	Common Name	SRANK	COSSARO	COSEWIC	SARA Schedule	Grand River Watershed Conservation Priority	Wellington County Significant Breeding Bird	OBBA 17NJ62	NRSI Observed
	WOOD-WARBLERS								
Seiurus aurocapillus	Ovenbird	S4B				√	√*	CF	
Parkesia noveboracensis	Northern Waterthrush	S5B				√		CF	
Vermivora cyanoptera	Blue-winged Warbler	S4B				√	√	S	
Mniotilta varia	Black-and-white Warbler	S5B				√	√*	NY	
Oreothlypis ruficapilla	Nashville Warbler	S5B				√		T	
Geothylpis philadelphia	Mourning Warbler	S4B				√		T	
Geothylpis trichas	Common Yellowthroat	S5B						AE	
Setophaga ruticilla	American Redstart	S5B				√	√*	T	
Setophaga magnolia	Magnolia Warbler	S5B				√	√	S	
Setophaga fusca	Blackburnian Warbler	S5B				√	√	S	
Setophaga petechia	Yellow Warbler	S5B						CF	
Setophaga pensylvanica	Chestnut-sided Warbler	S5B				√		S	
Setophaga pinus	Pine Warbler	S5B				√	√*	T	
Setophaga coronata	Yellow-rumped Warbler	S5B				√		T	
Setophaga virens	Black-throated Green Warbler	S5B				√	√	T	
	SPARROWS								
Pipilo erythrophthalmus	Eastern Towhee	S4B				√	√*	NB	
Spizella passerina	Chipping Sparrow	S5B						FY	
Spizella pallida	Clay-colored Sparrow	S4B				√	√	CF	
Spizella pusilla	Field Sparrow	S4B				√	√*	FY	
Passerculus sandwichensis	Savannah Sparrow	S4B				√	√*	NE	
Ammodramus savannarum	Grasshopper Sparrow	S4B				√	√	P	
Melospiza melodia	Song Sparrow	S5B						NY	
Melospiza georgiana	Swamp Sparrow	S5B				√		CF	
Zonotrichia albicollis	White-throated Sparrow	S5B				√		T	
	CARDINALS & ALLIES								
Piranga olivacea	Scarlet Tanager	S4B				√	√	S	
Cardinalis cardinalis	Northern Cardinal	S5						FY	X
Pheucticus ludovicianus	Rose-breasted Grosbeak	S4B					√*	T	
Passerina cyanea	Indigo Bunting	S4B						T	
	BLACKBIRDS								
Dolichonyx oryzivorus	Bobolink	S4B	THR	T	No Schedule	√	√*	T	
Agelaius phoeniceus	Red-winged Blackbird	S4						NY	
Sturnella magna	Eastern Meadowlark	S4B	THR	T		√	√*	T	
Quiscalus quiscula	Common Grackle	S5B						CF	
Molothrus ater	Brown-headed Cowbird	S4B						NY	
Icterus galbula	Baltimore Oriole	S4B					√*	FY	
	FINCHES								
Haemorhous purpureus	Purple Finch	S4B				√		FY	
Haemorhous mexicanus	House Finch	SNA						FY	
Spinus pinus	Pine Siskin	S4B						T	
Spinus tristis	American Goldfinch	S5B				√		FY	X
	OLD WORLD SPARROWS								
Passer domesticus	House Sparrow	SNA						T	

Legend
SRANK
S4 Apparently Secure
S5 Secure
SNA Rank not Applicable
B Breeding Population
N Non-breeding Population
COSEWIC, COSSARO Codes
E, END Endangered
T, THR Threatened
SC Special Concern
NAR Not at Risk

Breeding Evidence Codes
Observed
X Species observed in its breeding season with no evidence of breeding
Possible
H Species observed in its breeding season in suitable nesting habitat
S Singing male present of breeding calls heard in breeding season in suitable nesting habitat
Probable
P Pair observed in their breeding season in suitable nesting habitat
T Permanent territory presumed through registration of territorial song on at least 2 days, one week or more apart at the same place
D Courtship or display between a male and female or 2 males including courtship feeding and copulation
V Visiting probable nest site
A Agitated behaviour or anxiety calls of an adult
B Brood patch on adult female or cloacal protuberance on adult male
N Nest building or excavation of nest site
Confirmed
DD Distraction display or injury feigning
NU Used nest or egg shell found (occupied/laid this season)
FY Recently fledged young or downy young
AE Adults leaving or entering nest site in circumstances indicating occupied nest
FS Adult carrying faecal sac
CF Adult carrying food for young
NE Nest containing eggs
NY Nest with young seen or heard

APPENDIX XI
Herpetofauna Species List

Appendix VIII. Reptiles and Amphibians Recorded From the Study Area

Scientific Name	Common Name	SRANK	COSSARO	COSEWIC	SARA Schedule	Ontario Herp Atlas	NRSI Observed
Turtles							
Chelydra serpentina serpentina	Common Snapping Turtle	S3	SC	SC	Schedule 1	X	
Chrysemys picta marginata	Midland Painted Turtle	S5				X	
Clemmys guttata	Spotted Turtle	S3	END	E	Schedule 1	?	
Glyptemys insculpta	Wood Turtle	S2	END	T	Schedule 1	?	
Emydoidea blandingii	Blanding's Turtle (*Great Lakes/St Lawrence population*)	S3	THR	T	Schedule 1	X	
Snakes							
Lampropeltis t. triangulum	Eastern Milksnake	S3	SC	SC	Schedule 1	X	
Opheodrys vernalis	Smooth Greensnake	S4				X	
Nerodia sipedon sipedon	Northern Watersnake	S5	NAR	NAR		X	
Storeria dekayi dekayi	Northern (DeKay's) Brownsnake	S5	NAR	NAR		X	
Storeria occipitomaculata occipitomaculata	Northern Red-bellied Snake	S5				X	
Storeria occipitomaculata pahasapae	Black Hills Red-bellied Snake	SU				X	
Thamnophis sirtalis sirtalis	Eastern Gartersnake	S5				X	
Salamanders							
Notophthalmus viridescens viridescens	Red-spotted Newt	S5				X	
Toads and Frogs							
Bufo americanus	American Toad	S5				X	
Hyla versicolor	Tetraploid Gray Treefrog	S5				X	
Pseudacris triseriata pop. 2 (Gr. Lakes/St. Lawrence -	Western Chorus Frog	S3	NAR	T	Schedule 1	X	
Pseudacris crucifer crucifer	Northern Spring Peeper	S5				X	
Rana catesbeiana	Bullfrog	S4				X	
Rana clamitans melanota	Green Frog	S5				X	
Rana palustris	Pickerel Frog	S4	NAR	NAR		X	
Rana pipiens	Northern Leopard Frog	S5	NAR	NAR		X	
Rana septentrionalis	Mink Frog	S5				?	
Rana sylvatica	Wood Frog	S5				X	

Legend
SRANK
S2 Imperiled
S3 Vulnerable
S4 Apparently Secure
S5 Secure
SU Unrankable
COSEWIC, COSSARO Codes
T/THR - Threatened
SC - Special Concern
NAR - Not at risk

APPENDIX XII
Mammal Species List

Appendix IX. Mammals Recorded From the Study Area

Scientific Name	Common Name	SRANK	COSEWIC	COSSARO	SARA Schedule	Ontario Mammal Atlas	NRSI Observed
Blarina brevicauda	Northern Short-tailed Shrew	S5				X	
Canis latrans	Coyote	S5				x	
Castor canadensis	Beaver	S5				X	
Condylura cristata	Star-nosed Mole	S5				X	
Didelphis virginiana	Virginia Opossum	S4				X	
Eptesicus fuscus	Big Brown Bat	S5				X	
Erethizon dorsatum	Porcupine	S5				X	
Lasionycteris noctivagans	Silver-haired Bat	S4				X	
Lasiurus borealis	Red Bat	S4				X	
Lasiurus cinereus	Hoary Bat	S4				X	
Lepus europaeus	European Hare	SE				X	
Marmota monax	Woodchuck	S5				X	
Mephitis mephitis	Striped Skunk	S5				X	
Microtus pennsylvanicus	Meadow Vole	S5				X	
Mus musculus	House Mouse	SE				X	
Mustela erminea	Ermine	S5				X	
Mustela frenata	Long-tailed Weasel	S4				X	
Mustela vison	Mink	S5				X	
Myotis lucifuga	Little Brown Bat	S5	E			X	
Napeozapus insignis	Woodland Jumping Mouse	S5				X	
Odocoileus virginianus	White-tailed Deer	S5				X	X
Ondatra zibethicus	Muskrat	S5				X	
Parascalops breweri	Hairy-tailed Mole	S4				X	
Peromyscus leucopus	White-footed Mouse	S5				X	
Procyon lotor	Raccoon	S5				X	
Rattus norvegicus	Norway Rat	SE				X	
Sciurus carolinensis	Gray Squirrel Black Morph	S5				X	
Sciurus carolinensis	Gray Squirrel Gray Morph	S5				X	
Sorex cinereus	Masked (Common) Shrew	S5				X	
Sylvilagus floridanus	Eastern Cottontail	S5				X	X
Tamias striatus	Eastern Chipmunk	S5				X	
Tamiasciurus hudsonicus	Red Squirrel	S5				X	
Vulpes vulpes	Red Fox	S5				X	
Zapus hudsonius	Meadow Jumping Mouse	S5				X	

Legend
SRANK
S4 Apparently Secure
S5 Secure
SE Exotic Species
COSEWIC, SARO Codes
E, END Endangered

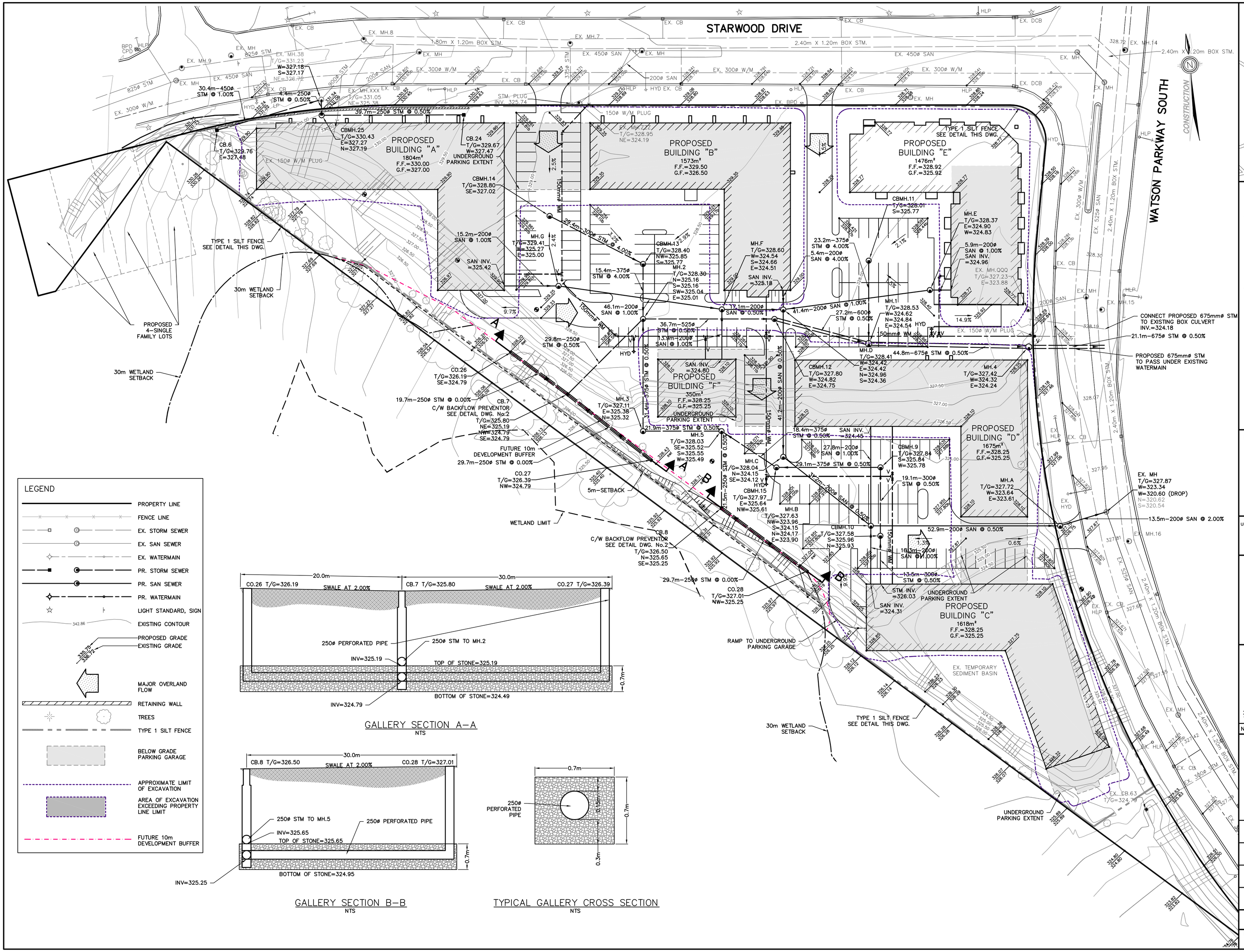
APPENDIX XIII
Butterfly and Odonata Species List

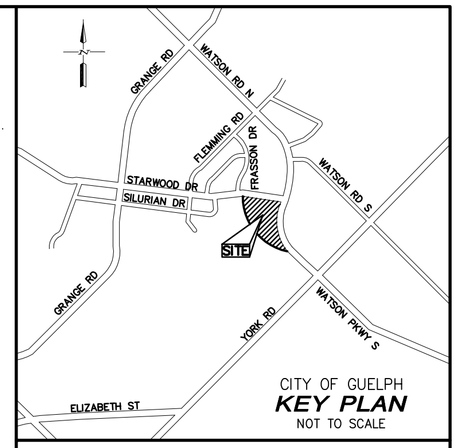
Appendix XIII. Butterfly Species Recorded From the Study Area

Scientific Name	Common Name	SRANK	COSSARO	COSEWIC	Butterfly Atlas	Regionally Significant	NRSI Observation
Hesperiidae							
Cartercephalus palaemon	Arctic Skipper	S5			X		
Euphyes conspicua	Black Dash	S3S4			X	X	
Poanes viator	Broad-winged Skipper	S4			X		
Erynnis Lucilius	Columbine Duskywing	S4			X		
Pholisora catullus	Common Sootywing	S3S4			X	X	
Polites origenes	Cross Line Skipper	S4			X		
Anatrytone logan	Delaware Skipper	S3S4			X	X	
Euphyes dion	Dion Skipper	S3S4			X	X	
Erynnis icelus	Dreamy Duskywing	S5			X		
Euphyes vestris	Dun Skipper	S5			X		
Thymelicus lineola	European Skipper	SE			X		
Poanes hobomok	Hobomok Skipper	S5			X		
Erynnis juvenalis	Juvenal's Duskywing	S5			X		
Ancyloxpha numitor	Least Skipper	S5			X		
Hesperia leonardus	Leonards Skipper	S4			X		
Polites mystic	Long Dash Skipper	S5			X		
Wallengrenia egeremet	Northern Broken Dash	S5			X		
Thorybes pylades	Northern Cloudy Wing	S5			X		
Polites peckius	Peck's Skipper	S5			X		
Amblyscirtes vialis	Roadside Skipper	S4			X		
Epargyreus clarus	Silver Spotted Skipper	S4			X		
Polites themistocles	Tawny Edged Skipper	S5			X		
Papilionidae							
Papilio polyxenes	Black Swallowtail	S5			X		
Papilio glaucus	Eastern Tiger Swallowtail	S4S5			X		
Pieridae							
Pieris rapae	Cabbage White	SE			X		
Colias philodice	Common (clouded) Sulphur	S5			X		
Colias eurytheme	Orange Sulphur	S5			X		
Lycaenidae							
Satyrium acadicum	Acadian Hairstreak	S4			X		
Lycaeana phlaeas	American Copper	S4			X		
Satyrium calanus	Banded Hairstreak	S4			X		
Lycaena hyllus	Bronze Copper	S5			X		
Harkenclenus titus	Coral Hairstreak	S4			X		
Callophrys niphon	Eastern Pine Elfin	S5			X		
Everes comyntas	Eastern Tailed Blue	S5			X		
Glaucopsyche lygdamus	Silvery Blue	S5			X		
Celastrina ladon	Spring Azure	S5			X		
Satyrium liparops	Striped Hairstreak	S5			X		
Celastrina neglecta	Summer Azure	S5			X		
Nymphalidae							
Vanessa virginiensis	American Painted Lady	S5			X		
Speyeria aphrodite	Aphrodite Fritillary	S5			X		
Satyrodes appalachia	Appalachian Eyed Brown	S4			X		
Speyeria atlantis	Atlantis Fritillary	S5			X		
Cercyonis pegala	Common Wood Nymph	S5			X		
Nympahlis vaualbum	Compton Tortoiseshell	S5			X		
Polygonia comma	Eastern comma	S5			X		
Satyrodes eurydice	Eyed Brown	S5			X		
Speyeria cybele	Great Spangled Fritillary	S5			X		
Polygonia progne	Grey Comma	S5			X		
Coenonympha tullia inornata	Inornate Ringlet				X		
Megisto cymela	Little Wood-Satyr	S5			X		
Boloria bellona	Meadow Fritillary	S5			X		
Nymphalis milberti	Milbert's Tortoiseshell	S5			X		
Danaus plexippus	Monarch	S4	SC	SC	X	X	
Nymphalis antiopa	Mourning Cloak	S5			X		
Phyciodes pascoensis	Northern Crescent	S5			X		
Enodia anthedon	Northern Pearly-Eye	S4			X		
Vanessa cardui	Painted Lady	SZB			X		
Phyciodes tharos	Pearl Crescent	S4			X		
Polygonia interrogationis	Question Mark	S5			X		
Vanessa atalanta	Red Admiral	SZB			X		
Boloria selene	Silver Bordered Fritillary	S5			X		
Chlosyne nycteis	Silvery Checkerspot	S4S5			X		
Limenitis archippus	The Viceroy	S5			X		
Limenitis arthemis arthemis	White Admiral/Banded Purple	S5			X		

Legend
SRANK
S3 Vulnerable
S4 Apparently Secure
S5 Secure
S#S# Range Rank (e.g., S2S3) indicates range of uncertainty
SE Exotic Species
SZB Breeding migrants/Variants
COSEWIC, COSSARO Codes
SC Special Concern

APPENDIX XIV
Grading Plan (Gamsby and Mannerow)





CITY OF GUELPH
KEY PLAN
NOT TO SCALE

NOTES :

1. TOPOGRAPHIC SURVEY PROVIDED BY STANTEC CONSULTING LIMITED DATED NOVEMBER 29, 2012
2. PROPOSED SITE LAYOUT PROVIDED BY MICHAEL SPAZIZNI ARCHITECT INC. DATED JULY 12, 2013
3. EX. INFRASTRUCTURE INFORMATION ON STARWOOD DRIVE FROM STANTEC CONSULTING LIMITED, CONTRACT No. 99-07, DRAWING No. R 118, DATED OCTOBER 28 1998
4. EX. INFRASTRUCTURE INFORMATION ON WATSON PARKWAY SOUTH FROM STANTEC CONSULTING LIMITED, CONTRACT No. 99-07, DRAWING No. R 120, DATED OCTOBER 28 1998
5. WETLAND LIMITS AND DEVELOPMENT SETBACKS PROVIDED BY NATURAL RESOURCE SOLUTIONS INC. DATED JULY 10, 2013.

BENCH MARKS :

GUELPH BENCHMARK #377
ON S.E. SIDE OF BOX CULVERT ON STARVIEW,
WEST OF CHESTERTON, ON NORTH SIDE
ELEVATION=341.215m

THE POSITION OF POLE LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND AND OVERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND, WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED.

BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR ANY DAMAGE TO THEM.

LEGEND

- PROPERTY LINE
- FENCE LINE
- EX. STORM SEWER
- EX. SAN SEWER
- EX. WATERMAIN
- PR. STORM SEWER
- PR. SAN SEWER
- PR. WATERMAIN
- LIGHT STANDARD, SIGN
- EXISTING CONTOUR
- PROPOSED GRADE
- EXISTING GRADE
- MAJOR OVERLAND FLOW
- RETAINING WALL
- TREES
- TYPE 1 SILT FENCE
- BELOW GRADE PARKING GARAGE
- APPROXIMATE LIMIT OF EXCAVATION
- AREA OF EXCAVATION EXCEEDING PROPERTY LINE LIMIT
- FUTURE 10m DEVELOPMENT BUFFER

GALLERY SECTION A-A
NTS

GALLERY SECTION B-B
NTS

TYPICAL GALLERY CROSS SECTION
NTS

NO.	DATE	REVISION DESCRIPTION	CH'KD
2.	-/-/-	RE-ISSUED FOR APPROVAL	A.E.K.
1.	11/06/13	ISSUED FOR APPROVAL	A.E.K.

Gamsby and Mannerow
ENGINEERS
GUELPH - OWEN SOUND - LISTOWEL - KITCHENER - EXETER
330 TRILLIUM DRIVE, UNIT D
KITCHENER N2E 3J2
Tel. 519-748-1440 www.gamsby.com

COLETARA DEVELOPMENT

STARWOOD DRIVE

CITY OF GUELPH

GENERAL PLAN

DRAWN BY :	APPROVED BY :	PROJECT NO. :	DRAWING NO. :
S.F.	A.E.K.	412086	1
DESIGNED BY :	DATE :	SCALE :	
A.E.K.	DECEMBER 2012	1:500	

Plotted On: May 8, 2014 412086-GP.dwg