Dunsire Developments

LANDSDOWN DRIVE

Environmental Impact Study

Dougan & Associates

JULY 2014

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1. INTRODUCTION

1.1. STUDY PURPOSE

Dougan & Associates has been retained by the proponent - Dunsire Developments - to undertake an Environmental Impact Study (EIS) as part of City of Guelph requirements associated with a proposed Zoning By-Law Amendment & Draft Plan of Condominium application. On August 26, 2013 Dougan & Associates (D&A), with the Dunsire Developments team, met with City Staff for a pre-consultation to review the preliminary Concept Plan for a proposed Zone Change and Vacant Land Draft Plan of Condominium application for lands municipally known as 24, 26, 28, and 32, Landsdown Drive, Guelph, Ontario. As a requirement of a complete application, the proponent is to prepare an Environmental Impact Study (EIS) based on a Terms of Reference approved by the City of Guelph Environmental Advisory Committee (EAC) on December 11th 2013 (*see Appendix B*).

1.2. LOCATION & CONTEXT

The Study Area is located within the Torrance Creek Subwatershed and borders Torrance Creek Provincially Significant Wetland (PSW) which is also considered Significant Woodland to the north east. As identified in the City of Guelph Official Plan (note that OPA 42 is now in effect), Torrance Creek PSW is a part of the Natural Heritage System (Schedule 10, City of Guelph Official Plan OPA 42 2010. See *Figure 16. Key Map of Subject Area* for study area and *Figure 20. Biophysical Constraints & Limits of Disturbance* for constraint boundaries.

The wetland boundary was delineated on May 13, 2013 by a D&A Certified OWES Wetland Evaluator and documented using a high accuracy Trimble GPS unit. The wetland boundary was confirmed with Grand River Conservation Authority (GRCA) staff on May 28, 2013.

1.3. SITE DESCRIPTION

The Dunsire Property is 1.874 ha site bound by single family residential lots and Landsdown Drive to the south-west, existing residential lands to the south-east and north-west, and an existing Grand River Conservation Authority (GRCA) Provincially Significant Wetland to the north-east. The site is comprised mainly of cultural meadow, an Austrian Pine Plantation (previously referred to as "Scot's Pine Plantation" in the draft Terms of Reference), a single family residential lot with associated one storey brick dwelling, two accessory buildings, an asphalt driveway, concrete walkways, and landscaped areas. Of this, 1.62 ha has been proposed for residential development. The whole of the Study Area is 2.74 ha and contains the Dunsire Property as well as 50 m into the Torrance Creek PSW (*See Figure 16. Key Map of Subject Property* and *Figure 17. Vegetation Communities* for a graphical delineation of the Dunsire Property vs. the Study Area).

1.4. PROPOSED SITE ALTERATIONS

While a portion of the Torrance Creek PSW is located on the northeast corner of the Dunsire property, the proposed residential lots are located outside of the 30 m wetland buffer and outside the 10 m buffer of the Significant Woodlands. In addition, any proposed grading and stormwater management is located outside the closest 15 m to the PSW. The Draft Plan of Condominium proposes 26 single-

family lots, on a common element road. One freehold lot is proposed with frontage on Landsdown Drive (*see Appendix A*).

The proposed development will have municipal sanitary and water services. Sanitary services will be connected to the existing Valley Road Sanitary Pumping Station. Water services will connect to the existing municipal watermain on Landsdown Drive and private watermain within the Valley Road development.

Similar to Valley Road, an oil/grit separator will be installed to control the quality of runoff before discharging into the infiltration trenches and ultimately to the wetland. Runoff will also be controlled for quantity to ensure post-development flows do not exceed pre-development levels for the design storm events. Foundation drainage will be provided by individual sump pumps discharging to the side yard grassed swales. Site grading will match existing elevations along the perimeter of the site and generally slope to the north toward the wetland.

The Guelph City-wide Trail Masterplan identifies an important north-south multi-use trail connection from Bathgate Drive (south of Kortright Road East) to Arkell Road along the west side of the significant Torrance Creek PSW Complex. The City's Parks & Recreation department requires that lands along the eastern edge of the development be conveyed to the City and zoned P.1 (Conservation Lands) to develop a 2.5 m wide public multi-use trail connection. A linear parcel having a minimum clear width of 6 m will be required to develop the public trail. The route and design of the trail will be considered as part of the application in order to assess impacts of the trail on the PSW and other sensitivities.

A road stub through the Austrian Pine Plantation is proposed to not preclude development and ensure the proper and orderly development of the property located to the north of the subject property. This proposed road stub is similar to that provided by the Valley Road Condominium located to the south of the subject lands.

1.5. EIS TRIGGER

The proposal is located within the Torrance Creek Subwatershed and a portion of the Torrance Creek Provincially Significant Wetland (PSW) & Significant Woodland is located on the subject property. (Schedule, City of Guelph Official Plan). The proposed development is located within the 120m adjacent lands and requires an Environmental Impact Study (EIS) to "demonstrate that there will be no negative impacts on the natural features of their ecological functions" in accordance with the Provincial Policy Statement 2014. The proposed residential development is located outside the 30 m buffer to the PSW. A 15 m buffer is proposed for grading and stormwater management features (infiltration trenches and some surface ponding area), storm sewer outlet/spreader swale, and proposed trail (to be dedicated to the City).

1.6. TERMS OF REFERENCE

The Terms of Reference (TOR) were reviewed and approved by the City of Guelph Environmental Advisory Committee (EAC) as well as the Grand River Conservation Authority (GRCA).

The Terms of Reference for the proposed Environmental Impact Study (EIS), dated September 18, 2013, are found in *Appendix B*. The TOR was approved by EAC on December 11, 2013.

2. METHODS

2.1. BACKGROUND REVIEW

2.1.1. EXISTING INVENTORIES

To provide the historical context of the site, background information available from the City of Guelph, Natural Heritage Information Centre (NHIC), Grand River Conservation Authority (GRCA), and Ontario Ministry of Natural Resources (OMNR) were accessed and reviewed. A desktop review of the site was completed using ortho photography and resource mapping. D&A sought out existing species inventory information, Species at Risk records, and data. Environmental reports conducted for nearby property development, were reviewed with respect to wildlife resources for the Torrance Creek PSW.

Specifically, these sources include the following:

- Natural Heritage Information Centre (NHIC) Biodiversity Explorer query (NHIC 2012);
- Ontario Breeding Bird Atlas (OBBA), 2001 – 2005 (Cadman et al. 2007);
- Atlas of the Mammals of Ontario (Dobbyn 1994);
- Ontario Herpetofaunal Atlas (Oldham and Weller, 2000);
- Wellington Upper Tier SAR List;
- 2003 Bathgate EIR (D&A);
- 2007 Valley Road Estates EIS (Aboud & Associates);
- 2005 Landsdowne Breeding Bird Survey (D&A);
- Torrance Creek Subwatershed Study (Totten Sims Hubicki Associates et al., 1999);
- The Ontbirds archives, which is the Ontario Field Ornithologists' electronic mailing listserv, providing bird sightings across Ontario, including Guelph; and
- Grand River Assessment Report.

These data were used to scope field investigations to ensure adequate documentation regarding significant issues (e.g. Species at Risk, locally rare species, etc.).

2.1.2. AGENCY LIAISON

Agency liaison is a component in reviewing the background and context of the site. For this project, the following agencies were contacted:

- The City of Guelph, Planning Services – provided the Wellington Upper Tier SAR List, and guidance on policy implementation
- The City of Guelph, Parks & Recreation – provided guidance on trail issues
- Guelph District MNR - provided a Species-at-Risk list for Wellington County
- Grand River Conservation Authority (GRCA) – provided verification of wetland boundary, and comments on the original EIS submission
- Guelph's Environmental Advisory Committee (EAC) – provided comments on the original EIS submission

2.2. FIELD STUDIES

2.2.1. VEGETATION RESOURCES

2.2.1.1. VEGETATION COMMUNITIES & VASCULAR PLANT LIST

Vegetation community classification was completed in summer 2013 to Ecosite or Vegetation Type based on the protocol of the Ecological Land Classification (ELC) System for Southern Ontario, first approximation (Lee, et. al., 1998). The survey included the Study Area plus 50m beyond the edge of the adjacent natural heritage feature (Torrance Creek PSW). A vascular plant survey was conducted simultaneously with the ELC assessment. Communities were assessed for type and level of human disturbance, and prevalence of invasive species. Rare or significant species were documented where encountered.

A survey of the dominant flora was conducted in habitats present in both summer (August 13, 2013) and spring (May 20, 2014) within the Study Area. Field data are corroborated with current status lists to identify species of significant conservation status. D&A followed NHIC standards for plant nomenclature and conservation status (NHIC, 2011).

A short-list of potential SAR species was generated during the background review. During the summer, 2013 flora survey, the habitats present were assessed as to their suitability to support Species-at-Risk (SAR) vegetation species that may be present in the area. For each of these species, the study area was assessed as to the likelihood of that species occurring, whether presently or in the future.

2.2.1.2. TREE INVENTORY

An inventory and assessment of all potentially impacted trees of 10 cm DBH (diameter at breast height), was conducted on October 22, 24 and November 5, 2013 within 5 m of the Significant Woodland along the North East side of the Study Area as well as throughout the Austrian Pine Plantation. A Tree Hazard Assessment was also conducted in a 10 m offset on both sides of the proposed trail.

Tree location data was collected using a Trimble GeoXH unit to facilitate data collection. In optimal conditions this hand-held global positioning system (GPS) provides real-time sub-metre accuracy of tree locations. Data collection was combined with tree tagging using a metal forestry tag to allow for effective future identification of each tree.

Once GPS data had been recorded, each tree was identified, assessed for biological and structural health, assigned a preservation priority value, hazard potential, and its size including DBH, height, and crown reserve were recorded. A detailed breakdown of criteria used to determine these parameters is provided in *Section 4.1.1.1 Tree Compensation Tally*, and Appendix *D*.

2.2.2. WILDLIFE RESOURCES

Initial observation of available habitat in the lands subject to site alterations is that it is comprised of anthropogenic (residential landscapes) and regularly disturbed (i.e. mowed) cultural meadows. These

observations were made during the vegetation community surveys on August 13, 2013, May 20, 2014 and tree inventory field work on October 22, 24 and November 5, 2013. No habitat was observed outside the PSW that would support amphibian breeding; nor were any "special" habitats supporting breeding birds available outside the PSW. Recognizing that breeding birds can occur in available habitat, caveats to avoid contravening the Migratory Birds Convention Act are recommended in the EIS.

Habitat for amphibians and breeding birds is available in the Torrance Creek PSW. Data for the feature was available through the 2007 Valley Road Estates EIS (Aboud & Associates) as well as the 2003 Bathgate EIR (D&A) and 2005 Landsdown Breeding Bird Survey (D&A). The presence of SAR and/or SWH within the PSW requires a buffer and a 30m buffer to the PSW is already a part of the proposed development. Site alterations within the outer 30m buffer (grading & SWM) will not substantially alter its use or composition from existing beyond restoration enhancement plantings and no intrusions into the PSW are proposed. Field surveys confirming the presence of SAR and/or SWH would not initiate further conservation, mitigation or compensation measures. It is therefore anticipated the existing secondary sources will be sufficient to assess impacts and confirm suitable mitigation, compensation and enhancement measures. This methodology was approved in the TOR (See *Appendix B*).

2.2.3. SPECIAL FEATURES & ECOLOGICAL FUNCTIONS

Potential special features and ecological functions (i.e. *Significant Natural Areas* and *Natural Areas* described in Section 6.1.1 of OPA 42) for the study area were reviewed. Those features and functions that had a likelihood of being a component of the study are cited below.

2.2.3.1. SIGNIFICANT WETLAND

The site includes a portion of the Torrance Creek Provincially Significant Wetland. Boundaries were flagged by a D&A staff certified in the Ontario Wetland Evaluation System (OWES) on May 13, 2013 and subsequently verified by GRCA staff May 28, 2013 and surveyed by J.D. Barnes on June 24, 2013 (*Figure 16. Key Map of Subject Property* and *Figure 17. Vegetation Communities*).

2.2.3.2. SIGNIFICANT WOODLAND

The site includes a portion of the Significant Woodland associated with the Torrance Creek Provincially Significant Wetland, as identified in the City of Guelph's Natural Heritage System. The wooded features on the Dunsire property were assessed using the Ecological Land Classification (ELC) system (see *Sections 2.2.1.1* and *2.2.1.2* for detailed assessment methods). In order to determine whether these features were a component of the adjacent Significant Woodland, the characterization was then assessed using relevant policy documents (see *Section 2.3* for list).

2.2.3.3. SPECIES AT RISK SCREENING

A short-list of potential SAR species was generated during the background review. A habitat assessment was done on November 17, 2013 to assess the suitability for Species-at-Risk (SAR) wildlife species that may be present in the area. For each of the potential SAR species, the Study Area was assessed as to the likelihood of that species occurring, whether presently or in the future. Any SAR encountered are addressed with respect to the Endangered Species Act.

2.2.3.4. SIGNIFICANT WILDLIFE HABITAT SCREENING

The Provincial Policy Statement (OMMAH 2005) prohibits development within areas identified as supporting Significant Wildlife Habitat. The Ontario Ministry of Natural Resources has produced guidelines and a decision support system to assist municipalities with identifying significant natural heritage features to ensure that land use planning is conducted in compliance with the natural heritage policies of the PPS.

The Torrance Creek PSW is documented to support Significant Wildlife Habitat (SWH) and, along with the PSW, has been considered in the current application through designation of a 30 m buffer. Nonetheless, D&A reviewed all categories of SWH outlined in the Significant Wildlife Habitat Technical Guide (OMNR, 2000) within the Dunsire Property to determine whether the proposed development will impact SWH or contributing habitat (within 120 m of proposed development). An initial SWH screening was done in mid-December 2013, and then updated in May 2014.

2.2.4. WATER RESOURCES

2.2.4.1. WETLAND WATER BUDGET APPROACH

The wetland water budget approach adopted for this development utilizes the Water Balance Method (WBM) of Thornthwaite and Mather (1957) in conjunction with the stormwater management (SWM) design to assess how the water regime will change in terms of flow rates, monthly volumes, and storm events. The objective of the water budget analysis is to maintain, as much as feasible, the runoff and recharge characteristics of the pre-development site.

As per the approved Terms of reference, the 2, 5, 25, and 100 year design storm events are used to set post-development SWM targets. Furthermore, stormwater runoff will be well-distributed overland through the buffer lands using a spreader swale to Torrance Creek PSW to maintain pre-development (natural) conditions, prevent the creation of concentrated flows where none currently exist, and promote the prevailing climatic conditions' continued role in proportioning runoff and recharge volumes.

2.3. LEGISLATION & POLICY FRAMEWORK

D&A reviewed the relevant legislation and policy documents applicable to the project, including:

- Endangered Species Act (2007)
- Migratory Birds Convention Act (1994)
- Species at Risk Act (2002)
- Conservation Authorities Act (2006) & Ontario Reg. 150/06)
- Clean Water Act (2006)
- Provincial Policy Statement (2005)
- City of Guelph Official Plan (2012 Consolidation)
- City of Guelph Official Plan Amendment 42: Natural Heritage System (2011)
- City of Guelph Tree By-law (2010)
- City of Guelph Development Charges By-law (2009)
- Grand River Conservation Authority Impact Study Guidelines (2005)

3. FINDINGS

The following inventory of existing conditions is based on field surveys supplemented with database records of historic species occurrences.

3.1. BACKGROUND REVIEW

Guelph Natural Heritage Strategy Phase 2: Terrestrial Inventory and Natural Heritage System Updates Volume 2: Technical Appendices (Dougan & Associates 2008) was used to determine local rarity. This document generated the significant wildlife list based on a full review of all available literature for Wellington County, as well as through consultation with experts from all relevant agencies (Canadian Wildlife Service, Grand River Conservation Authority, Natural Heritage Information Centre, Ontario Breeding Bird Atlas, Ontario Ministry of Natural Resources, and Ontario Parks) as well as numerous non-government groups (Bird Studies Canada, Guelph Field Naturalists, Royal Botanical Gardens, Royal Ontario Museum, University of Guelph, and the University of Western Ontario).

3.1.1. EXISTING INVENTORIES

3.1.1.1. NATURAL HERITAGE INFORMATION CENTRE BIODIVERSITY EXPLORER QUERY

3.1.1.1.1 *FLORA*

The database query yielded no results of vegetation species (NHIC 2012)

3.1.1.1.2 *FAUNA*

A query was made of the Natural Heritage Information Centre Biodiversity Explorer database (NHIC 2012). A query was made of the NHIC database to determine whether significant species have been reported for the Study Area or in the vicinity of the site. One significant species occurrence has been reported for the Study Area and its vicinity, including 1 km square designated as 17NJ61.

Scientific Name	Common Name	S RANK	COSEWIC	MNR Status	Last Observed
Chelydra serpentina	Snapping Turtle	S3	SC	SC	15/06/2010

3.1.1.2. ONTARIO MINISTRY OF NATURAL RESOURCES (OMNR)

3.1.1.2.1 *FLORA*

S-Rank status (NHIC, 2011) for all plants inventoried were reviewed indicating that all plants are either S5, Secure; S4, Apparently Secure; or SNA, not applicable, meaning the species is not a suitable target for conservation activities.

3.1.1.2.2 *FAUNA*

In the 1 X 1 km squares surrounding the Study Area, only 1 wildlife species record was found: Snapping Turtle (*Chelydra serpentina*). This species is ranked S3 in Ontario, indicating a provincial population that is considered "vulnerable", and is categorized as Special Concern, both provincially and federally (OMNR 2013; COSEWIC 2012).

3.1.1.3. ONTARIO BREEDING BIRD ATLAS (OBBA), 2001 – 2005

The Study Area is located in 10 X 10 km square 17NJ61 of the Ontario Breeding Bird Atlas (Cadman et al. 2007). There were a total of 114 species detected during atlas work (2001 – 2005), of which 59 were confirmed as breeding. Most of the confirmed species are considered common and widespread in southern Ontario, with Sranks of S5 or S4, indicating provincial populations that are "secure" or "apparently secure", respectively (NHIC 2013). Eight of the 114 breeding species are considered Species-at-Risk (COSEWIC 2012; OMNR 2013), with 4 of these being confirmed breeders: Common Nighthawk (*Chordeiles minor*), Chimney Swift (*Chaetura pelagic*), Red-headed Woodpecker (*Melanerpes erythrocephalus*), Eastern Wood-Pewee (*Contopus virens*), Barn Swallow (*Hirundo rustica*) (confirmed), Wood Thrush (*Hylocichla mustelina*) (confirmed), Bobolink (confirmed), and Eastern Meadowlark (*Sturnella magna*) (confirmed). These four birds noted as "confirmed" were confirmed as breeding in the 10x10 km square which the site is located within during the 2001-2005 OBBA work; the exact location of these observations are not recorded in available OBBA data.

3.1.1.4. ATLAS OF THE MAMMALS OF ONTARIO (DOBBYN 1994)

A similar check was made of the Atlas of the Mammals of Ontario (Dobbyn 1994). A total of 19 species of mammals have records within the 10 X 10 km square (17NJ61) that contains the Study Area; many of these species records are historic in nature (pre 1969) and, given the urbanization of the area since then, likely no longer occur in the vicinity. All species that are likely present within and adjacent to the Study Area are considered common and widespread in southern Ontario, with Sranks of S5 or S4, indicating provincial populations that are "secure" or "apparently secure", respectively (NHIC 2013).

3.1.1.5. ONTARIO HERPETOFAUNAL ATLAS

The Ontario Reptile and Amphibian Atlas (ORAA 2013) revealed records of 10 species of amphibians (frogs, toads, and salamanders) and reptiles (turtles and snakes) in the square (17NJ61) that includes the Study Area; 9 of them have S ranks of S5 or S4 (NHIC 2013) and are not categorized as Species-at-Risk. The one exception is Snapping Turtle, which has a Srank of S3 and is considered Special Concern, both federally and provincially (COSEWIC 2012; OMNR 2013).

3.1.1.6. ONTBIRDS ARCHIVES

The Ontbirds listserve (Ontbirds 2013) was checked for bird sightings in the last three years (i.e. back to November 2010) that occurred within the vicinity of the Study Area; no records pertaining to the site were found.

3.1.2. LOCAL BACKGROUND REVIEW

3.1.2.1. TORRANCE CREEK SUBWATERSHED STUDY

The Subwatershed Study (SWS) (Totten Sims Hubicki Associates et al., 1998) reviewed several Environmental Impact Studies and Class Environmental Assessments including Pine Ridge West EIS, Arbotetum EIS, the Scout Camp Well Class EA, and the Halesmanor Estates EIS as well as atlases of butterflies, amphibians, reptiles, breeding birds, and mammals. D&A reviewed the findings with consideration for the Dunsire Property. The study determined that the Torrance Creek PSW is a White cedar mixed organic swamp. The wetland in this area has also been declared a significant woodlot due to the presence of area-sensitive and forest interior species.

This EIS has summarized the list of wildlife from these previous studies. Of the list of reptiles and turtles generated in the SWS, two species were considered significant. Northern Ring-neck Snake (*Diadophis punctatus edwardsii*) is considered rare within Wellington County and Snapping Turtles *(Chelydra serpentine*) have the provincial status of Special Concern. For further information of habitat presence see *Appendix G*.

The SWS reviewed a total of 101 bird observations, of which 88 are breeding birds. No bird species were considered locally or provincially endangered, or threatened but three birds were considered regionally rare. This SWS also summarized a list of area-sensitive species; 16 area-sensitive species were recorded including: "Cooper's hawk (*Accipiter cooperii*), Northern Goshawk (*Accipiter gentilis*), Red-shouldered Hawk (*Buteo lineatus*), Broad winged Hawk (*Buteo platypterus*), Ruffled Grouse (*Bonasa umbellus*), Pileated Woodpecker (*Dryocopus pileatus*), Red Breasted Nuthatch (*Sitta canadensis*), Brown Creeper (*Certhia americana*), Winter Wren (*Troglodytes hiemalis*), Veery (*Catharus fuscescens*), Pine Warbler (*Setophaga pinus*), Black-and-White Wabler (*Mniotilta varia*), Oven bird (*Seiurus aurocapilla*), Northern Waterthrush (*Parkesia noveboracensis*), Canada Warbler (*Cardellina Canadensis*), and Scarlet Tanager (*Piranga olivacea*)" (1998, p. 69). The areas of proposed development on the Dunsire property do not contain the required habitat for any of the area-sensitive species. The adjacent Torrance Creek PSW may contain the required habitat for Pileated Woodpacker, Black-and-White Warbler, and Northern Waterthrush.

The SWS did not review any insect or butterfly surveys but it states that "*the monarch butterfly does occur in the subwatershed*" but "*it is unlikely that there are any areas that are critical to this species*" (1998, p. 70). For further information of habitat presence *see Table 1*.

No significant amphibians were noted in the SWS and concluded that Torrance Creek Subwatershed does not represent significant breeding areas.

Table 1. Summary of Torrance Creek Subwatershed Study Wildlife Findings

Species	Status	Presence of Species within Dunsire Property
Birds		
American Black Duck (*Anas rubripes*)	Regionally Rare	Required habitat is not present
Northern Goshawk (*Accipiter gentilis*)	Regionally Rare	Required habitat is not present
Blue Winged Warbler (*Vermivora cyanoptera*)	Regionally Rare	Required habitat is not present
Pileated Woodpecker (*Dryocopus pileatus*)	Area-Sensitive	Likely found within Torrance Creek PSW but required habitat is not present within Dunsire Property
Black-and-White Wabler (*Mniotilta varia*)	Area-Sensitive	Likely found within Torrance Creek PSW but required habitat is not present within Dunsire Property
Northern Waterthrush (*Parkesia noveboracensis*)	Area-Sensitive	Likely found within Torrance Creek PSW but required habitat is not present within Dunsire Property
Insects		
Monarch Butterfly (*Danaus plexippus*)	Special Concern (Provincial)	May be present during migration in non-significant numbers if Common Milkweed (*Asclepias syriaca*) is present.
Reptiles and Turtles		
Northern Ring-neck Snake (*Diadophis punctatus edwardsii*)	Regionally Rare	Likely found within Torrance Creek PSW but required habitat is not present within Dunsire Property
Snapping Turtle *(Chelydra serpentine*)	Special Concern (Provincial)	No suitable nesting sites present

3.1.2.2. WELLINGTON UPPER TIER SAR LIST

3.1.2.2.1 *FLORA*

D&A reviewed Wellington – Upper Tier list for species at risk plants, provided by City of Guelph Planning Staff, which includes:

- American Chestnut (*Castanea dentata*)
- American Ginseng (*Panax quinquefolius*)
- Butternut (*Juglans cinerea*)
- Hill's Pondweed (*Potamogeton hillii*)
- Tuberous Indian-plantain (*Arnoglossum plantagineum*)

Suitable habitat is present in the Study Area for Butternut, however no specimens were observed during either the vascular plant inventory or tree inventory field surveys. The vegetation community surveys were conducted on August 13, 2013, May 20, 2014 and the tree inventory field work was carried out on October 22, 24 and November 5, 2013. Habitat is not present in the Study Area for the remainder of the listed species noted above.

The Flora of Wellington County (2009) was consulted for all plants encountered during the field survey. Coffee Tinker's-weed (*Triosteum aurantiacum*) is the only species that shows up on this list with a ranking of R3 meaning it occurs on 6-10 sites surveyed. It was observed in polygon 6, which is the cultural woodland on the edge of the Torrance Creek PSW.

3.1.2.2.2 *FAUNA*

Guelph District MNR provided a Species-at-Risk list for Wellington County, identifying 1 species of amphibian, 22 species of birds, 3 species of fish, 3 species of insects, 4 species of mammals, 2 species of molluscs, and 7 species of reptiles (*see Appendix G*). Most of the species are associated with rivers and lakeshores, open wetlands, forests, and open country, none of which occur within or close to the site. However, 6 of these Species-at-Risk could occur in the surrounding landscapes, particularly the adjacent Provincially Significant Wetland (PSW), including: Barn Swallow, Chimney Swift, Monarch (*Danaus plexippus*), Eastern Ribbonsnake (*Thamnophis sauritus*), Blanding's Turtle (*Emydoidea blandingii*), and Snapping Turtle (*Chelydra serpentina*). These species are discussed as follows:

- **Chimney Swift** – no suitable chimneys, their preferred habitat (Cadman 2007), were observed in the houses immediately adjacent to the Dunsire Property.
- **Barn Swallow** – suitable habitat for this species, which is open habitat with suitable nesting structures (Lepage 2007), is not located on-site and no open water is available in the adjacent PSW. Therefore, it is not likely that this species is present.
- **Monarch** – the site is fairly open, but is limited in size and isolated from other open area in the region; in addition, there was no Common Milkweed (the host foodplant for this species (Holmes et al. 1991)) present at the site. Therefore, although the occasional migrant may be present foraging on the Dunsire Property, particularly during fall migration, the species would not be breeding at the site or present in significant numbers during migration.
- **Eastern Ribbonsnake** – this species is found close to wetland areas (Harding 1997). However, considering the disturbed residential nature of the adjacent lands, it is not likely present.
- **Blanding's Turtle** – this species could be present in the PSW, immediately to the north, as it prefers wetlands with clean, shallow water (Harding 1997). However, the Dunsire Property

itself is grass, with a small mowed area on the eastern portion. There were also no sandy areas present, and no areas with a southerly or westerly slope aspect; rather, the entire site slopes to the north, in the direction of the PSW. Therefore, it is not likely that this species utilizes the site for nesting as there is no suitable habitat present.

- **Snapping Turtle** – this species could be present in the PSW, immediately to the north, since its habitat requirements include shallow ponds, shallow lakes, and streams (Harding 1997). However, the Dunsire Property itself is composed of mostly thick, tall grass, with a small mowed area on the eastern portion. There are no sandy areas present, and no areas with a southerly or westerly slope aspect; rather, the entire site slopes to the north, in the direction of the PSW. Therefore, it is not likely that this species utilizes the site for nesting as there is no suitable habitat present.

3.1.2.3. 2007 VALLEY ROAD ESTATES EIS (ABOUD & ASSOCIATES)

An EIS was conducted for the development to the South East of the Dunsire Property. The results of the wildlife surveys within the report were reviewed to better understand the ecology within the adjacent Torrance Creek PSW.

Aboud & Associates conducted a breeding bird survey on July 11, 2006. They identified 13 species of which none were considered locally or provincially endangered, threatened or rare but 2 are considered area sensitive species. Aboud & Associates stated that "*the ruffed grouse and the hairy wood pecker require a minimum of 25 and10 ha of suitable forest habitat respectively to sustain their populations*" (2007, p.6). None of the Dunsire Property contains suitable forest habitat so it is unlikely that either species would occur there. The Torrance Creek PSW likely contains the required habitat, therefore it is likely that both species occur within the PSW but, as there is no habitat present on the Dunsire property itself, not occurring within the area of proposed development.

Aboud & Associates also completed a frog call survey in 2006 which determined the presence of both the chorus frog (*Pseudacris triseriata)* and Spring Peeper (*Pseudacris crucifer*) within the adjacent PSW. They stated within this report that "*it is reasonable to expect that species in addition to the 2 recorded are also present within the PSW and near the subject site*" (2007, p.6). Therefore, these species are also likely to be found in the PSW adjacent to the Dunsire Property.

3.1.2.4. 2003 BATHGATE EIR (D&A)

The development constructed to the north-west of the Dunsire Property conducted an Environmental Implementation Report which D&A reviewed to determine the wildlife present within the area. In *Section 2.2.3* of the report Dougan & Assoicates did not note any locally or provincially endangered, threatened or rare wildlife during any of their field investigations (2003, p.6).

3.1.2.5. 2005 LANDSDOWNE BREEDING BIRD SURVEY (D&A)

Dougan & Associates completed a breeding bird survey for Marshall Finamore Construction Ltd. in 2005. This survey was conducted from #18 – 34 Landsdown Drive and included a visual survey of 9 trees and/or shrubs along this corridor. The Survey concluded that there were no breeding birds utilizing the area.

3.2. FIELD STUDIES

3.2.1. VEGETATION RESOURCES

This section consists of three parts. First, vegetation communities are described following the Ecological Land Classification (ELC) system. Second, the conservation status of vascular plant species occurring in the study area is analyzed and findings are presented including a summary of the coefficient of conservatism for each ELC community. Third, the findings of the Tree Inventory and Assessment are described in detail.

3.2.1.1. ECOLOGICAL LAND CLASSIFICATION

Within the Study Area, the field survey recorded a total of 15 community polygons representing 7 ELC vegetation community types within the 3.23 ha area surveyed (1.87 ha Dunsire Property plus 1.36 Adjacent Lands) as summarized in *Table 2*. The vegetation communities are described in this section and are mapped for the Study Area on *Figure 17. Vegetation Communities*.

Table 2. Study Area vegetation community series summary

Vegetation Type	Polygon ID	ELC Code	No. of Polygons	Area (ha) Study Area	% Study Area	Area (ha) Dunsire Property	% Dunsire Property
Anthropogenic							
Agriculture	10	AGR	1	0.23	8%	-	-
Anthropogenic	3, 5, 9, 11, 12, 13, 14, 15	ANTH	9	1.08	33%	0.55	29.2%
Cultural Communities							
Coniferous Plantation Ecosite	8	CUP3	1	0.20	6%	0.18	9.5%
Dry-Moist Old Field Meadow	1,4	CUM1-1	2	1.08	33%	1.05	56.5%
Hedgerow	2	HR	1	0.13	4%	0.08	4.1%
Mineral Cultural Woodland Ecosite	6, 6b	CUW1	3	0.43	13%	0.00	0.2%
Aquatic & Wetland Communities							
White Cedar - Conifer Organic Coniferous Swamp	7b	SWC3-2	1	0.08	2%	0.01	0.5%
Total			**18**	**3.23**	**100%**	**1.87**	**100.0%**

Note: The area of Polygon 7 is not included in this table because the table is intended to show the relative size of vegetation communities for the study area. Polygon 7, representative of the entire Torrance Creek PSW, has an area of 56.80 ha (City of Guelph, 2010).

Within the Dunsire Property proper the field survey recorded a total of 14 community polygons representing 6 ELC vegetation community types within the 1.87 ha area. A breakdown of ELC vegetation communities and their associated areas distinct to the Dunsire Property is provided in *Table 2*.

3.2.1.1.1 *ANTHROPOGENIC COMMUNITIES*

Anthropogenic Communities consists of both agricultural communities (AGR) and strictly anthropogenic communities (ANTH) such as residences and associated lawns, driveways, and gardens. Within the Study Area limits, 1.31 ha of the land are used for anthropogenic purposes. Within Dunsire Property limits, Anthropogenic Communities accounts for 0.55 ha.

Agriculture (AGR) – Polygon 10

The Agriculture category includes lands in use for agricultural purposes such as pasture, actively tilled row crops, hay, grain, sod or orchard. These lands are typically quite homogenous and low in species diversity. From a terrestrial resources perspective these lands are generally of low ecological quality due to ongoing human management.

There is a 0.23 ha apple orchard at the north end of the Study Area which is outside the Dunsire Property border (polygon 10, *Figure 17. Vegetation Communities*).

Anthropogenic (ANTH) – Polygons 3, 5, 9, 11, 12, 13, 14, 15

Lands classified as ANTH include areas that have been cleared of natural vegetation and are in use for human activities such as parking lots, lawns, residential dwellings, commercial outlets, and industrial structures. Due to the removal of natural habitats, features, and functions from these areas, all lands categorized as ANTH are considered to be low quality.

Anthropoogenic lands constitute the second most common land classification within the Study Area at 33% (1.08 ha) and are comprised entirely of residential properties (residential dwellings, lawns and ornamental trees) with the exception of polygon 9, which is an area of recent disturbance characterized by bare soil that has recently been graded by machinery (observed for the 1st time on May 13th, 2013 during the wetland flagging exercise. It was later confirmed through Dunsire this was carried out by the current residents of the property). Within the Dunsire Property, Anthropogenic lands once again amounts to the second most common land classification taking up 29.2% (0.55 ha).

3.2.1.1.2 *CULTURAL COMMUNITIES*

Culturally influenced lands on within the Study Area include Cultural Meadow (CUM1-1), Cultural Woodland (CUW), Coniferous Plantation (CUP), and Hedgerow (HR). Together these cultural vegetation communities encompass 57% (1.84 ha) of the Study Area and 70% (1.32 hectares) of the Dunsire Property.

Coniferous Plantation (CUP3) – Polygon 8

Coniferous plantations are areas where canopy cover is greater than 60% and the dominating canopy trees are conifers planted in rows.

The Study Area contains 0.1977 ha of coniferous plantation, 0.178 hectares of which are on the Dunsire property. This feature, shown as polygon 8 on *Figure 17.*, consists of primarily non-native Austrian Pine (*Pinus nigra)* and Scots Pine (*Pinus sylvestris*). As introduced species without a naturalized source it is presumed these trees are ornamental plantings associated with the residential use that have become overgrown.

Some openings interrupt an otherwise dense plantation with successional understory species. In the openings, the ground layer is comprised of disturbance tolerant species similar to those observed in a cultural meadow including Goutweed (*Aegopodium podagraria*), Ground Ivy (*Glechoma hederacea*),

and Wild Carrot (*Daucus carot*). The somewhat diverse understory is composed of a mix of native species including White Spruce (*Picea glauca),* Black Walnut *(Juglans nigra),* Ninebark (*Physocarups opulifolius*) and non-native species including Lilac (*Syringa sp),* Honeysuckle *(Lonicera tatarica),* Glossy Buckthorn *(Frandula alnus),* and European Buckthorn *(Rhamnus cathartica).*

There were 32 species inventoried of which 14 (37%) are native to Ontario and 18 (47%) are introduced (*Figure 1. Comparison of native versus non-native plants within CUP3*). Six (6) additional plants were identified to genus level only due to being observed and/or collected at a stage of maturity in which it was not possible to identify them to species level (*Appendix F*). The mean coefficient of Conservatism for the Coniferous Plantation is provided in *Table 3.*

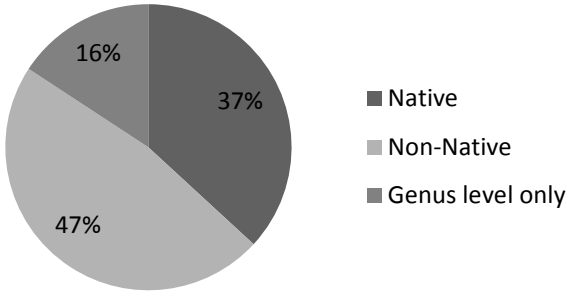


Figure 1. Comparison of native versus non-native plants within CUP3

Note on Tree Assessment - A total of 142 trees were found in the plantation. Species composition is provided in *Figure 10. Overall tree tally by species*. The most abundant species is the non-native Austrian Pine (*Pinus nigra*). A comparison of native versus non-native trees found in the plantation is provided in *Figure 2. Comparison of native versus non-native trees for the plantation.*

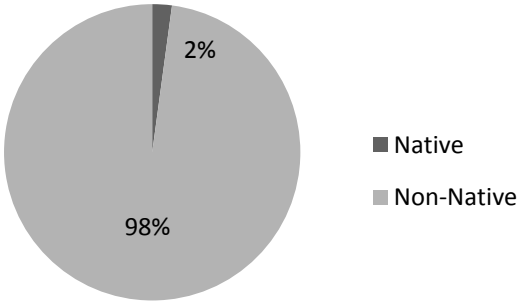


Figure 2. Comparison of native versus non-native trees for the plantation

Most of the plantation trees fall in the less than 20 cm DBH or the next largest category, 20-49 cm DBH. There are no trees greater than 50 cm DBH in the plantation.

<u>Cultural Meadow (CUM1-1) – Polygons 1, 4</u>

Cultural meadows are areas of recently abandoned agricultural lands that have begun to succeed toward a naturally-vegetated community. Cultural meadows represent a very early stage of natural succession. They lack woody species and are dominated primarily by opportunistic forbs and grasses.

Depending on soil moisture regimes, these communities can vary from dry pasture grasses to the aster/goldenrod assemblages on fresh to moist substrates.

Located centrally within the Study Area, this is the largest single vegetation community comprising 33% (1.08 ha) of the Study Area and 56.5% (1.05 ha) of the Dunsire Property. As an area of former anthropogenic uses, this community is characterized by dominance of disturbance tolerant species including Wild Carrot (*Daucus* carota), Brown Knapweed (*Centaurea jacea*), English Plantain *(Plantago lanceolata*), and Smooth Brome (*Bromus inermus*).

There were 41 species inventoried of which 16 (35%) are native to Ontario and 25 (56%) are introduced (*Figure 3. Comparison of native versus non-native plants within CUM1-1*). Four (4) additional plants were identified to genus level only due to being observed and/or collected at a stage of maturity in which it was not possible to identify them to species level (*Appendix F*). The mean coefficient of Conservatism for the Cultural Meadow is provided in *Table 3*.

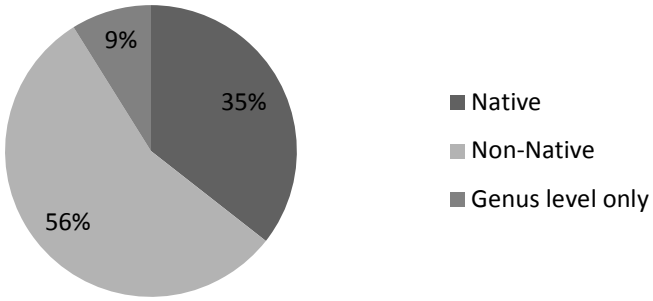


Figure 3. Comparison of native versus non-native plants within CUM1-1

<u>Hedgerow (HR) – Polygon 2</u>

Hedgerows are typically narrow strips of vegetation that typically occur along the edges of agricultural fields. In this case hedgerows are ornamental plantings planted around residential homes. Vegetation in these areas has been planted in some cases, or may have been retained by farmers as windbreaks along field edges.

There is a 0.13 ha hedgerow partially within the Study Area boundaries on the side closest to Landsdown Drive. This Hedgerow consists primarily of White Spruce (*Picea glauca*) with Eastern White Pine (*Pinus strobus*) and Norway Spruce (*Picea abies*), in the canopy. The understory is comprised of a mixture of woody native and non-native species. Natives include Basswood (*Tilia americana*), Black Walnut (*Juglans nigra*), Eastern White Cedar (*Thuja occidentalis*). Non-native species include Norway Maple (*Acer platanoides*), Lilac (*Syringa sp*), European Buckthorn (*Rhamnus cathartica*), Little Leaf Linden (*Tilia cordata*), Scots Pine (*Pinus sylvestris*). Most of the hedgerow (0.08 ha) is contained within the Dunsire Property.

In the Hedgerow feature, there were 24 species of trees 10 cm DBH or greater inventoried, of which 13 (45%) are native to Ontario and 11 (38%) are introduced (*Figure 4. Comparison of native versus non-native plants within HR*). Two additional plants were identified to genus level only due to being observed and/or collected at a stage of maturity in which it was not possible to identify them to species level (*Appendix F*). The mean coefficient of Conservatism for the Hedgerow is provided in *Table 3*.

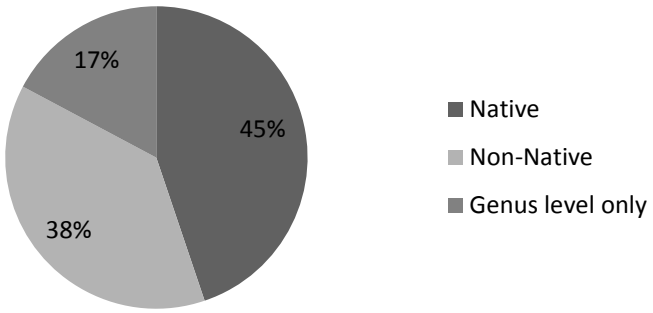


Figure 4. Comparison of native versus non-native plants within HR

Note on Tree Assessment - 60 trees of 10 cm DBH or greater were surveyed in the hedgerow at the south west side of the site, close to Landsdown Drive. A high percentage of these are native trees as indicated in *Figure 5. Comparison of native versus non-native trees for the hedgerow*.

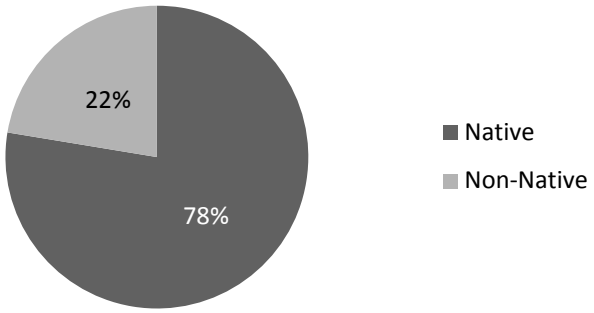


Figure 5. Comparison of native versus non-native trees for the hedgerow

Cultural Woodland (CUW1) – Polygons 6, 6b

Cultural woodlands are treed areas characterized by canopy coverage between 35 – 60%. These communities often represent the stage of natural succession between cultural thicket and forest, but may also represent a highly disturbed or fragmented forest.

Cultural Woodlands account for 0.43 ha of the study area (Polygons 6 and 6b). The only part of the Cultural Woodland that is contained within the Dunsire property is a 0.003 ha sliver of Polygon 6 (see *Figure 17. Vegetation Communities*).

This feature constitutes the successional edge of the Torrance Creek PSW. Classified as Cultural Woodland, this vegetation community is comprised of early successional woody species including both native and non-native species with an emphasis on invasive, non-native species. Abundant native species include Trembling Aspen (*Populus tremuloides*) and Riverbank Grape (*Vitis riparia*). Non-native species encountered were Honeysuckle (*Lonicera tatarica*), European Buckthorn (*Rhamnus cathartica*), and Manitoba Maple (*Acer negundo*).

The understory of these polygons consisted of a diverse mix of shrubs and small trees accompanied by disturbance tolerant herbaceous species similar to those observed in a cultural meadow. Understory

shrubs include Black Raspberry *(Rubus occidentails),* Grey Dogwood *(Cornus racemosa)*, Currant *(Ribes sp),* and Ninebark *(Viburnum opulus)*. Trees such as Hawthorn *(Crataegus sp),* American Elm *(Ulmus americana),* Black Cherry *(Prunus serotina)*, and Basswood *(Tilia cordata)* were also occasionally encountered in these cultural woodland areas indicating a likely successional trajectory toward deciduous forest.

There were 37 species inventoried of which 21 (51%) are native to Ontario and 16 (39%) are introduced (*Figure 6. Comparison of native versus non-native plants within CUW1*). Four (4) additional plants were identified to genus level only due to being observed and/or collected at a stage of maturity in which it was not possible to identify them to species level (*Appendix F*). The mean coefficient of Conservatism for the Cultural Woodland is provided in *Table 3*. Many Invasive species were noted within the sub canopy, understory, and ground layer, including Buckthorn (*Rhamnus cathartica*).

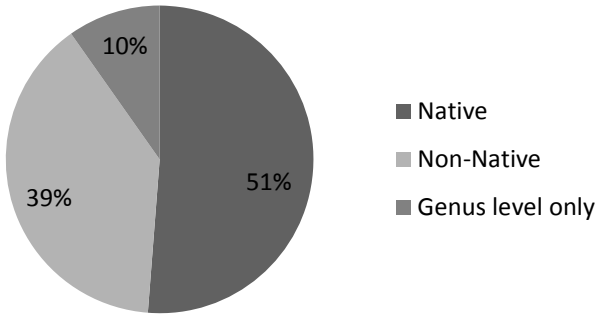


Figure 6. Comparison of native versus non-native plants within CUW1

Note on Tree Assessment - 52 trees were tagged and assessed in the 5 m buffer into the Woodland Edge. A high percentage of these are native trees as indicated in *Figure 7. Comparison of native versus non-native trees in the woodland edge*. It is important to note that the sub-canopy, understory, and ground layer is infested with European Buckthorn (*Rhamnus cathartica*) so the ratio of native to non-native species is not representative of the true conditions within the woodland edge.

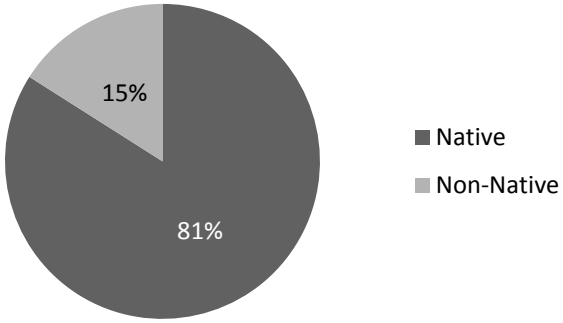


Figure 7. Comparison of native versus non-native trees in the woodland edge

White Cedar – Organic Coniferous Swamp (SWC3-2) – Polygon 7b

Coniferous swamps are characterized by their canopy layer, which contain at least 75% hydrophytic coniferous species and often exhibit standing water or vernal pooling. These swamps are dominated by Eastern White Cedar.

Since this polygon mostly occurs outside the Study Area, with the exception of 0.08 ha of the north corner of the subject property (polygon 7b), the survey was limited to a brief investigation of the lands within 50 m adjacent to the Study Area. A 0.01 ha part of the White Cedar – Organic Coniferous Swamp is contained within the Dunsire Property (see *Figure 17. Vegetation Communities*).

Description: The White Cedar – Organic Coniferous Swamp encountered on and adjacent to this site is a part of the Torrance Creek Provincially Significant Wetland Complex. Consistent with its definition, Eastern White Cedar (*Thuja occidentalis*) dominates the canopy layer (see Photo 1). While scattered pockets of standing water occur throughout the investigated area, the water table is below the surface for the majority of this region of the Torrance Creek PSW. The ecologist found that the depth of the water table was 33 cm below the surface in soil auger samples within the wetland during ELC work. The auger sample went to a depth of 65 cm and found only organic material, with not mottles or gley. There are canopy openings throughout the surveyed area where a dense ground layer of herbaceous perennials occur (Photo 2) including Jewelweed (*Impatiens capensis*), Fowel Mannagrass (*Glyceria striata*), Sensitive Fern (*Onoclea sensibilis*), and Enchanter's Nightshade (*Circaea lutetiana)*.

There were 28 species inventoried of which 25 (71%) are native to Ontario and 3 (9%) are introduced (*Figure 8. Comparison of native versus non-native plants within SWC3-2*). Seven (7) additional plants were identified to genus level only due to being observed and/or collected at a stage of maturity in which it was not possible to identify them to species level (see *Appendix F*). The mean coefficient of Conservatism for the White Cedar Organic Coniferous Swamp is provided in *Table 3*.

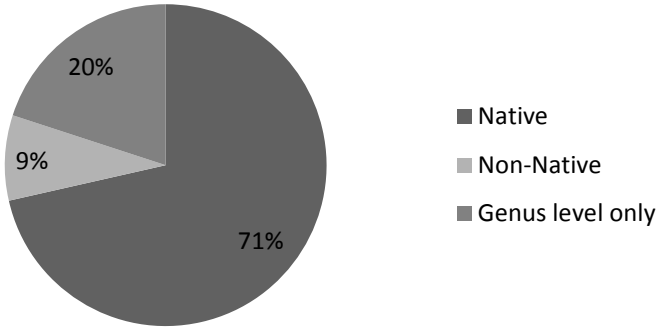


Figure 8. Comparison of native versus non-native plants within SWC3-2

Photo 1. Dense Cedar swamp characteristic area of Polygon 7

Photo 2. Openings with standing water surrounded by dense ground cover

Habitat: The presence of open water in a wooded setting gives rise to potential for Wood Frog breeding habitat. Woodpecker holes in trees consistent with those made by a Pileated Woodpecker and field siting during a subsequent tree inventory visit conducted by D&A staff on October 22, 2013 confirm the presence of this interior forest indicator species. Deer tracks were observed at the time of the survey.

Periphery: The edges of the wetland closest to the Study Area contain early successional species and/or disturbance tolerant canopy species including Trembling Aspen (*Populus tremuloides*), White Birch (*Betula papyrifera*), Manitoba Maple *(Acer negundo),* Balsam Fir *(Abies balsamea),*and sub-canopy species Cherry *(Prunus sp)* and Dogwood *(Cornus racemosa).*

Photo 3. (left) Planted Trembling Aspens are in poor condition at time of survey.
Photo 4. (right) Planted Trembling Aspen trees planted in a row in area of disturbance.

There is a row of planted Trembling Aspen tree whips (*Populus tremuloides*) where the wetland edge was previously cleared (clearing observed on May 13th, 2014 during the wetland boundary delineation. Dunsire subsequently confirmed that clearing was undertaken by the resident.), as described under Anthropogenic Communities in this Report (see *Photos 3 & 4*). The trees are planted at approximately 2 m spacing. Some are falling over and have dead branches at top of their canopy (see *Photo 3*). A few small (approximately 50 cm tall) Eastern White Cedars were also planted in this area.

3.2.1.2. VASCULAR PLANT SPECIES AND STATUS

During the two season (spring and summer) vascular plant surveys of the entire Study Area a total of 162 species were found, 89 (55%) of which are native to Ontario and 73 (45%) are introduced (*Figure 9. Comparison of native versus non-native plants for the full Study Area*). Eight (8) additional plants were identified to genus level only due to being observed and/or collected at a stage of maturity in which it was not possible to identify those to species level (*see Appendix F*). The mean Coefficient of Conservatism (CC) and species richness was determined for each vegetation community and is presented in *Table 3*. The Study Area's mean CC is 1.56. No species inventoried is considered endangered, threatened, or rare.

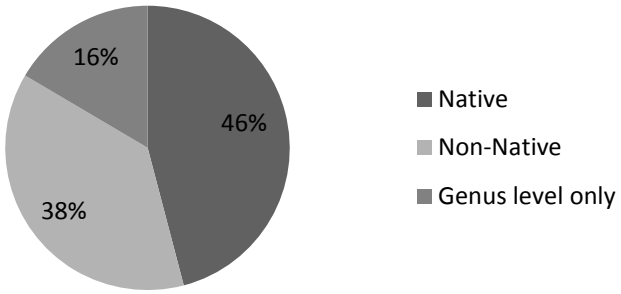


Figure 9. Comparison of native versus non-native plants for the full Study Area

Table 3. Summary of species richness and mean CC

Vegetation Type	ELC Code	Species Richness (incl. introduced species)	Mean CC (incl. introduced species)
Anthropogenic			
Agriculture (10)	AGR	-	-
Anthropogenic (3,5,9,11,12,13,14,15)	ANTH	-	-
Cultural Communities			
Coniferous Plantation Ecosite (8)	CUP3	32	1.31
Dry-Moist Old Field Meadow (1,4)	CUM1-1	41	0.54
Hedgerow (2)	HR	24	2.04
Mineral Cultural Woodland Ecosite (6,6b)	CUW1	37	1.38
Aquatic & Wetland Communities			
White Cedar - Organic Coniferous Swamp (7b)	SWC3-2	28	3.14
Total		**162**	**1.56**

3.2.1.3. TREE INVENTORY

An inventory and assessment of all Regulated Trees as per City of Guelph Tree By-law (By-law Number (2010) – 19058), was conducted on October 22, 24, and November 5, 2013 for the Study Area. In accordance with the Tree By-law and the City of Guelph Official Plan Amendment (OPA 42), all trees and indigenous shrubs greater than 10 cm diameter at breast height (DBH) were tagged and evaluated for size (DBH, Height, and Crown Reserve), Species, and Health.

The Study Area was surveyed according to the location of trees which occurred in three distinct areas as summarized in *Table 4*.

Table 4. Summary of On-Site trees > 10 cm DBH

Area Name	ELC Polygon	Description	No. of Trees
Plantation	8	Austrian Pine dominated plantation	**142**
Woodland Edge	6, 6b, 7, 7b	5 m within the Cultural Woodland and Torrance Creek PSW, located at the northeast side of the Study Area	**52**
Hedgerow	2	Hedgerow on southwest side of Dunsire Property including trees on the Dunsire Property and trees on neighbouring property that are potentially impacted by development.	**60**
Total:			**254**

The locations of the trees surveyed and their respective crown reserve (diameter of the canopy), preservation priority, and hazard potential are shown on *Figure 19. Tree Compensation Plan*. *Appendix D Tree Inventory Data* provides a summary of all tagged tree data. Detailed descriptions of the parameters used in the arborist assessment are available at the end of *Appendix D*.

3.2.1.4. OVERALL DESCRIPTION

A total of 254 trees of 10 cm DBH or greater were identified and tagged during the field investigation. A total of 20 species of trees were tagged and evaluated. A further 3 genera were also identified (but it was not possible to identify the individuals in these genera to species level due to a lack of available identifying characteristics at the time of the site visits). Of the species identified, 11 are native to the City of Guelph and 9 are non-native. The total number of individual native trees tagged is 89 and non-native is 160. A further 5 individual trees were identified to the genus level.

The trees identified to genus level include Ash (*Fraxinus sp),* Mountain Ash *(Sorbus sp)* and Apple (*Malus sp*). Even though the Ash were not identified to the species level, they were considered native for the purposes of tallying native versus non-native trees (see below) because they were either Green Ash (*F. pennsylvanica*) or White Ash (*F. americana*), both of which are native species. The species and genera and their relative abundance are shown in *Figure 10. Overall tree tally by species*.

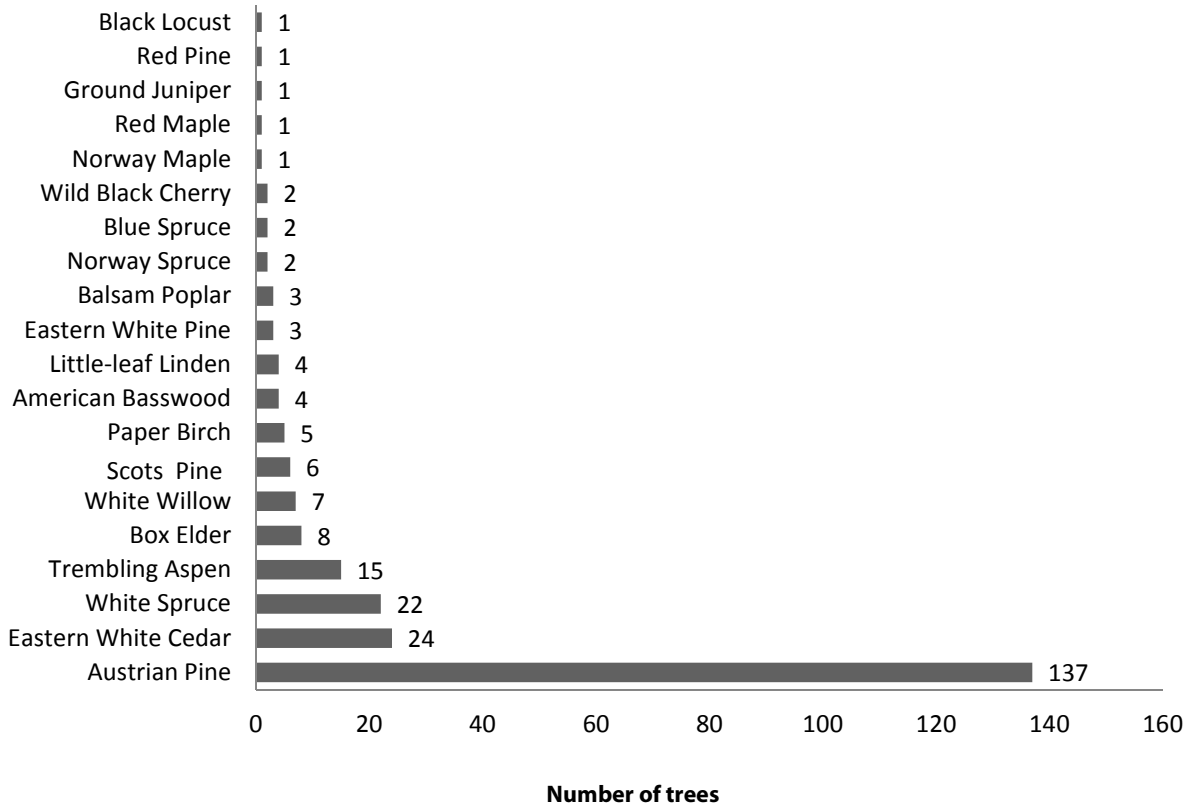


Figure 10. Overall tree tally by species

The most abundant species is Austrian Pine (*Pinus nigra*), a non-native tree, the most of which are in the plantation. The next most abundant species was Eastern White Cedar (*Thuja occidentalis*), found in the Woodland Edge and Hedgerow, followed by White Spruce (*Picea glauca*) also found in the Hedgerow.

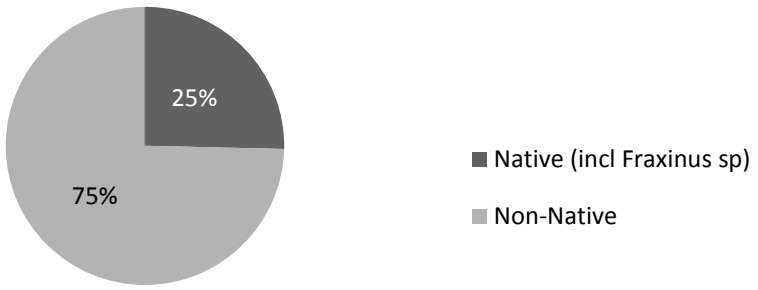


Figure 11. Comparison of native versus non-native trees for the Study Area

Table 5 provides a breakdown of number of specimens that ranked either High, Medium, or Low for Structural Condition, Biological Health, and Preservation Priority parameters. Data were collected on the Structural Condition, Biological Health, and Preservation Priority for each tree tagged. The term Structural Condition refers to the physical structure of the tree, and trees with poor condition may be leaning or have cracks, multiple stems, or broken branches. Biological Health was assessed by observing signs of tree health such as rot, cavities, epicormic shoots, crown dieback, bulges, fissures,

and insect holes. Preservation Priority is a function of size, desirable species, high condition ranking, and/or high health ranking.

Table 5. Summary of Structural Condition, Biological Health, and Preservation Priority rankings

	Structural Condition (No. of Trees)	Biological Health (No. of Trees)	Preservation Priority (No. of Trees)
High	87	51	29
Medium	142	175	167
Low	25	28	58
Total	**254**	**254**	**254**

Most of the trees in the plantation are non-native species. Many of the trees in the Woodland Edge are invasive species including White Willow (*Salix alba*), Manitoba Maple (*Acer negundo*), and Black Locust (*Robinia pseudoacacia*).

Sixteen (16) trees were of a large DBH (over 50 cm DBH). *Figure 12*. (below) provides a breakdown of the size distribution of trees.

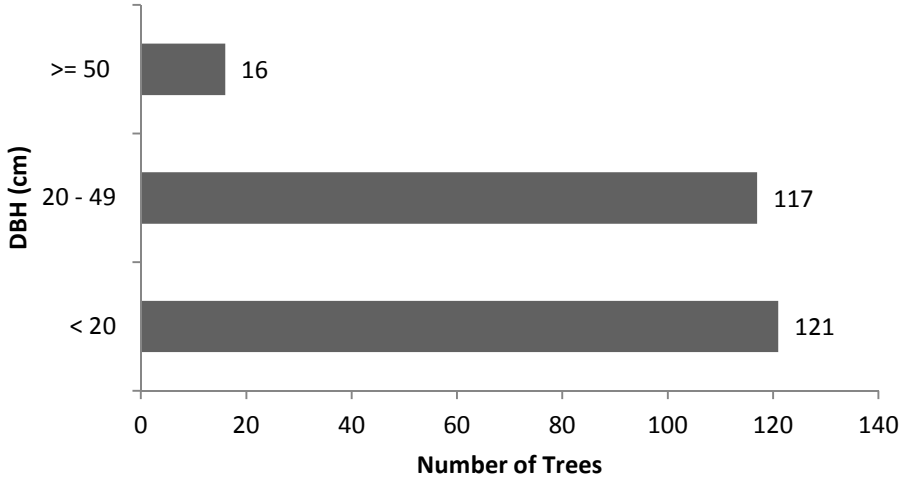


Figure 12. Size distribution of trees by DBH

Of all 254 trees surveyed, 187 are located on Dunsire Property. The remaining 67 are either on neighbouring property or in Torrance Creek PSW.

There were no regionally or locally significant species found, nor any endangered species (see *Section 4.1.1*).

3.2.2. WILDLIFE RESOURCES

The proposed development is limited to the portions of the Dunsire Property outside the Torrance Creek PSW. Observations of available habitat in the subject lands indicate that they are comprised of anthropogenic (residential landscapes) and regularly disturbed (i.e. mowed) cultural meadows. No

habitat was observed outside the Torrance Creek PSW that would support amphibian breeding; nor were any "special" habitats supporting breeding birds available outside the Torrance Creek PSW (*recognizing that breeding birds can occur in available habitat, caveats to avoid contravening the Migratory Birds Convention Act are recommended*).

Habitat for amphibians and breeding birds is available in the Torrance Creek PSW. Data for the feature is available through the 2007 Valley Road Estates EIS (Aboud & Associates) as well as the 2003 Bathgate EIR (D&A) and 2005 Landsdown Breeding Bird Survey (D&A) available in *Section 3.1.1. Existing Inventories*.

3.2.2.1. INCEDENTAL WILDLIFE SIGHTINGS

During the completion of field studies two species were observed; American Goldfinch (*Spinus tristis*) and Pileated Woodpecker (*Dryocopus pileatus*). Evidence (tracks) of White-Tailed Deer (*Odocoileus virginianus*) was also noted. American Goldfinch and White-Tailed Deer are considered common. The Pileated Woodpecker is considered an area sensitive species and was observed within the Torrance Creek PSW. Pileated Woodpecker was recorded incidentally on October 24, 2013 by D&A field staff at the Landsdown Study Area. This area-sensitive species utilizes a wide range of habitats, including forest and open parks, preferring larger patches of mature and older forest (deciduous/coniferous mixed) for nesting (Naylor 2007). Therefore, it may occur in adjacent areas, such as the PSW, but its occurrence within the Study Area would be as a non-breeding transient only.

3.2.3. SPECIAL FEATURES & ECOLOGICAL FUNCTIONS

3.2.3.1. SIGNIFICANT WETLAND

The Torrance Creek PSW is a White Cedar mixed organic swamp. The wetland in this area has also been declared a significant woodlot due to the presence of area-sensitive and forest interior species. The boundary of the Torrance Creek PSW has been flagged in the field and verified by GRCA Staff. The flagging has been surveyed by an Ontario Land Survey and is used in all mapping and plans to denote the edge of the feature and form the basis for measurements of buffers and setbacks (see *Figure 17. Vegetation Communities*).

3.2.3.1. SIGNIFICANT WOODLAND

The Significant Woodland associated with the Torrance Creek PSW is a swamp (i.e. a treed feature) that is 56.80 hectares in size. It was designated as a Significant Woodland based on the Ecological Functions criteria laid out by the NHRM *(2010 pp. 68-69*), which include: i) Woodland Interior, ii) Water Protection, and iii) Woodland Diversity.

Appendix 1 of the Natural Heritage Strategy of OPA 42 shows the ELC for the Polygon 8 of this EIS (*see Figure 17*), is a Cultural Thicket. D&A field assessment in 2013 identifies the features as community type as CUP3 Cultural Plantation. It is 0.19 ha in size. The dominant canopy species is *Pinus nigra* (Austrian Pine) with occasional *Pinus sylvestris* (Scots Pine) and lilac & buckthorn in the understorey. This Austrian Pine Plantation was screened for its potential to qualify as an extension of the Significant Woodland. The Natural Heritage Resource Manual states that "*A bisecting opening 20 metres or less in width between crown edges is not considered to divide a woodland into two separate woodlands"(2010 NHRM, p. 72).* Polygon 8 is separated from the Significant Woodland associated with the Torrance

Creek Wetland Complex by approximately 10 to 12 metres. It is therefore considered to be contiguous with/a part of the Significant Woodland.

3.2.3.2. SPECIES AT RISK SCREENING

For each of the potential SAR species identified during the background review, the Study Area was assessed on November 17, 2013 as to the likelihood of that species occurring, whether presently or in the future. The potential for the species to occur within the Dunsire Property was reviewed and is presented in *Section 3.1.2.2. Wellington Upper Tier SAR List*.

3.2.3.3. SIGNIFICANT WILDLIFE HABITAT SCREENING

An initial SWH screening was done in mid-December 2013, and then updated in May 2014. Additionally, the Valley Road Estates Environmental Impact Study (EIS) prepared by Aboud and Associates (2007) for the adjacent lands to the south of the subject property includes the following background information from the Torrance Creek Subwatershed Study:

> *The Torrance Creek Subwatershed Study identifies this PSW as significant wildlife habitat because it contains seasonal concentration areas (i.e. locally significant deer wintering area and species of conservation concern (i.e. habitat for area-sensitive forest birds). The key functions of the Torrance Creek Subwatershed north of Arkell Road are groundwater discharge, which forms the headwaters of Torrance Creek, groundwater recharge, and water storage* (Totten Sims Hubicki Associates et al., 1999 in Aboud and Associates, 2007).

All categories of SWH outlined in the Significant Wildlife Habitat Technical Guide (OMNR, 2000). On-site to screening compared all background records to existing habitat available and found there was nothing suitable to support habitat functions outside of the PSW. No significant wildlife habitat was located within the subject lands (*see Appendix G* for details).

3.2.4. WATER RESOURCES

3.2.4.1. WATER BUDGET

The pre-development and post-development monthly water budget calculations - provided in *Appendix D* of SBM's Preliminary Site Servicing & Stormwater Management Report - utilize the Thornthwaite & Mather (1957) method for computing monthly potential Evapo-transpiration and the Water Balance.

The average annual precipitation for the area in which this study area is located is about 923 mm. This amount, the average monthly precipitation, and average monthly temperatures were obtained from data recorded at the Guelph Arboretum meteorological station for the period from 1971 to 2000. The soil type was obtained from the site's geotechnical report by Inspec-Sol Inc. The runoff factor for this soil type and vegetation was obtained from the MOE SWM Planning & Design Manual (2003).

Under existing conditions, the total 2.48 ha catchment area is calculated to have an impervious surface of 6.8%. Approximately 32% of the total catchment area is comprised of impervious surface under post-development conditions. The impervious surfaces are considered to contribute 10% of the precipitation it receives to evapotranspiration, 90% to runoff, and 0% to recharge/infiltration. As such,

development (increased impervious cover) results in additional precipitation being available for runoff and recharge due to the decrease in evapotranspiration.

Based on comments received from the City and GRCA, it was recommended that infiltration measures be used with the implied goal of restricting post-development average annual runoff volumes directed to the PSW to pre-development levels. To achieve this target, approximately 128.5 m of infiltration trenches, described in detail in *Section 5.1* of the above mentioned SWM report, are implemented.

Table 6. Summary of the effect the proposed development

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Total Yearly
Pre-Development Evapotranspiration Volume (m^3)	0.0	0.0	0.0	746.9	1867.3	2512.8	2681.4	2505.0	1772.5	915.1	240.1	0.0	**13241.2**
Post-Development Evapotranspiration Volume (m^3)	0.0	0.0	0.0	531.8	1329.5	1789.1	1909.1	1783.6	1262.0	651.6	170.9	0.0	**9427.7**
Percent Change	0.0%	0.0%	0.0%	-28.8%	-28.8%	-28.8%	-28.8%	-28.8%	-28.8%	-28.8%	-28.8%	0.0%	**-28.8%**
Pre-Development Runoff & Rechage* Volume (m^3)	239.7	119.8	59.9	1258.3	3232.8	1622.2	814.0	408.4	204.9	117.4	1004.7	479.4	**9561.5**
Post-Development Runoff & Rechage* Volume (m^3)	302.2	151.1	75.5	1373.7	3559.4	2147.3	1462.6	1093.5	802.7	548.1	1254.6	604.3	**13375.0**
Percent Change	26.1%	26.1%	26.1%	9.2%	10.1%	32.4%	79.7%	167.7%	291.7%	366.8%	24.9%	26.1%	**39.9%**
Pre-Development Runoff Volume (m^3)	104.0	52.0	26.0	545.8	1402.2	703.6	353.1	177.2	88.9	50.9	435.8	207.9	**4147.3**
Post-Development Runoff Volume (m^3)	169.2	84.6	42.3	279.3	1547.9	775.1	519.6	170.3	0.0	0.0	218.9	338.4	**4145.6**
Percent Change	62.8%	62.8%	62.8%	-48.8%	10.4%	10.2%	47.2%	-3.9%	-100.0%	-100.0%	-49.8%	62.8%	**0.0%**
Pre-Development Recharge* Volume (m^3)	135.7	67.9	33.9	712.5	1830.6	918.5	460.9	231.3	116.0	66.5	568.9	271.4	**5414.2**
Post-Development Recharge* Volume (m^3)	133.0	66.5	33.2	1094.4	2011.5	1372.2	943.1	923.2	802.7	548.1	1035.7	265.9	**9229.4**
Percent Change	-2.0%	-2.0%	-2.0%	53.6%	9.9%	49.4%	104.6%	299.2%	591.7%	724.3%	82.1%	-2.0%	**70.5%**

*Note: Recharge is synominous with infiltration in the MOE SWM Planning and Design Manual, some of which discharges back the the wetland as base flow.

Table 6 (above) shows that for the post developed site, including infiltration trenches, reduces evapotranspiration by 29% which results in a 40% increase in runoff and recharge, no appreciable change in runoff, and about a 70% increase in recharge.

It is noted that, runoff volumes from the internal roads and private driveways are controlled for quality (80% min. removal of total suspended solids) using an oil/grit separator (OGS) for pre-treatment prior to the infiltration trenches which is considered a best management practice as per the Credit Valley Conservation Authority's Low Impact Development Stormwater Management Planning and Design Guide Section 4.4. Total site runoff is also controlled for quantity (flows from the 2, 5, 25, and 100-year storm events are attenuated to the pre-development levels) by the site SWM system prior to discharging to the GRCA wetland via a spreader swale to maintain pre-development (natural) conditions and prevent the creation of concentrated flows.

Conclusions from SBM's Preliminary Site Servicing & Stormwater Management Design Report include the following:

- Sanitary and water services can be provided to the proposed development and will be designed during the detailed design phase of the project.
- To balance pre- and post-development average annual runoff volumes directed to the PSW, infiltration trenches have been proposed. The summary table presented in the *Section 5.1*, water budget calculations in *Appendix D*, and infiltration calculations in *Appendix E*, show that the proposed infiltration trenches are capable of achieving this. A 73 mm in-line orifice is used to create structure storage and surface ponding at the surface of CBMH #4. The orifice was sized to maximize the available surface storage during the 2-year storm event for catchment area 202 without overflowing. The maximum available storage (structure and surface) for catchment area 202 is estimated to be 33.54 m^3.

- A 156 mm in-line orifice is used to create structure storage and surface ponding at the surface of CBMH #3. The orifice was sized to maximize the available surface storage during the 2-year storm event for catchment area 203 without overflowing. The maximum available storage (structure and surface) for catchment area 203 is estimated to be 25.51 m^3.
- A 167 mm in-line orifice, calculated to attenuate the 2-year post-development flows from the total catchment area (202, 203, and 204) to pre-development levels, is set at an elevation of 235.00 m at the outlet of STMH #7 to create storage in the infiltration trenches, structures, and surface ponding at the surface of CB #6.
- The maximum storage provided in the infiltration trenches, structures, and pipes is calculated to be 68.31 m^3.
- The surface ponding starts at the top of grate elevation of CB #6 (235.10 m) and the maximum ponding depth is 0.84 m (235.94 m). The surface ponding area is 426.46 m^2 and maximum available surface storage is 120.83 m^3.
- The total storage volume for this catchment area (infiltration trenches, structures and surface storage) is calculated to be 189.14 m^3.
- A two-stage weir is proposed as the control outlet for the higher storm events (5-year, 25-year, and 100-year). The crest elevation of the lower stage is set at 335.70 m and length is 1.48 m to attenuate the 5-year flows to pre-development levels. The crest elevation of the upper stage is 335.90 m and length is 55 m to attenuate the 25-year and 100-year flows to slightly below pre-development levels (due to site constraints). Since the reduction in post-development peak flow rates is minor and these storm events are infrequent, we do not anticipate that this will have a negative impact on the PSW.
- Attenuated 2-year storm flows (0.047 m3/s) from STMH#7 are conveyed to CBMH #9 located in the wetland buffer via 200 mm pipe.
- The attenuated flows from the higher storm events (5-year, 25-yaer and 100-year storm) will outflow from catchment area 204 via the two-stage weir and enter to the wetland buffer. These flows are conveyed to CBMH #9 via the grassed swale upstream of the proposed trail.
- Three (3) 450 mm pipes are proposed to convey the attenuated 100-year flows from CBMH #9 plus the 100-year flows from catchment area A7 to the level spreader swale without surface ponding.
- The proposed level spreader swale is 10.0 m long, protected from erosion using rip rap, and is to be installed perfectly level to promote overland sheet flow to the PSW rather than concentrated flows, to match pre-development conditions.
- The proposed Stormceptor STC 750 oil/grit separator provides an enhanced level of stormwater quality control (80% removal of total suspended solids).
- The existing GRCA wetland will be partially maintained by the flows from the site's SWM system.
- The site's SWM system meets the current Provincial, Conservation Authority, and Municipal guidelines for stormwater quantity and quality controls.
- The site's SWM system, in conjunction with the sediment and erosion control measures presented in *Section 7*, will be used to retain sediment on-site and reduce the potential for erosion of downstream features.

3.2.4.2. GROUNDWATER

The measurements of groundwater elevations are shown in *Section 3.2* of the Supplementary Geotechnical Report provided in *Appendix B* of SBM's *Preliminary Site Servicing & Stormwater*

Management Design Report. This report indicates that the groundwater elevation ranges from 1.37 m to 2.16 m below existing ground elevation. The high groundwater elevation affects building footing elevations and associated site grading as well as the potential for dewatering during installation of services.

3.3. LEGISLATION & POLICY FRAMEWORK

D&A reviewed the environmental policy context for the study area. This is used as a context to evaluate the opportunities and constraints imposed by the existing natural heritage features present at the site. Current Provincial, GRCA, MNR and City, including Natural Heritage System (OPA42) land use policy and regulations relevant to the site and the proposed development were reviewed and are documented in this section. The biophysical findings of the study area were cross-referenced with the applicable policies and legislation. This inquiry informs the site implications of the proposed development.

3.3.1. LEGISLATION

3.3.1.1. ENDANGERED SPECIES ACT (2007)

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

Site Implications: No Endangered species were documented through the course of this Environmental Impact Study. This legislation therefore does not present a constraint to the proposed Site Plan for Landsdown Drive.

3.3.1.2. MIGRATORY BIRDS CONVENTION ACT (1994)

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

Site Implications: Incidental take of migratory birds, nests or eggs must be avoided by limiting activities during sensitive periods and mitigation measures to ensure appropriate nesting areas are re-established in the site. Vegetation clearing should not take place within the active nesting season between May 25th and July 31st. No confirmed breeders were observed on the property. If the areas proposed for re-development are thoroughly checked during the active breeding season for bird nests by a qualified biologist during the construction phase, and no nests are found, then construction may be permitted. However, it is possible to remove vegetation when fewer birds are breeding at the beginning and end of the timing window (i.e. August 1st to May 24th).

3.3.1.3. SPECIES AT RISK ACT (2002)

Enacted in 2002, the Species at Risk Act (SARA) provides legal protection for species at risk. This act also helps to protect species identified as sensitive from becoming extinct and secure the actions for

their recovery. This may include protecting critical habitat, and rehabilitation of impacted critical habitat.

Site Implications: No species at risk (SAR) were documented through the course of this Environmental Impact Study. This legislation therefore does not present a constraint to the proposed Site Plan for Landsdown Drive. This is further supported by the Screening for Known or Candidate Significant Wildlife Habitat (*see Appendix G*), which determined that there is no significant wildlife habitat located within the study area.

3.3.1.4. CONSERVATION AUTHORITIES ACT ONTARIO REGULATION 150/06 (2006)

The Grand River Conservation Authority is authorized under Section 28 of the Conservation Authorities Act to implement and enforce the Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses (Ontario Regulation 150/06). Permits are required to identify potential interference in areas within the 100-year floodline, 15 m of the shoreline, 15 m within a valley's top of bank, hazard lands, and 120 m around all PSWs and ELC wetlands greater than 2 ha, and 30 m around all ELC wetlands greater than 0.5 ha.

Site Implications: Torrance Creek PSW is located adjacent to the study area along the North-East border. Because the proposed site plan development is within 120 m of the PSW, this study examines the potential impacts of the proposed development, in part to obtain a permit from the GRCA in accordance with the requirements of this Act. Furthermore, a 30 m buffer has been applied to the PSW in the proposed site plan and designated as the new property line. Property demarcation will be installed (details to be provided in the Environmental Implementation Report). All property within this buffer will be conveyed to the City as public lands.

3.3.1.5. CLEAN WATER ACT

The Clean Water Act (CWA), 2006 is intended to protect existing and future sources of drinking water. The Act is part of the Ontario government's commitment to implement the recommendations of the Walkerton Inquiry as well as protecting and enhancing human health and the environment. The CWA sets out a framework for source protection planning on a watershed basis with Source Protection Areas established based on the watershed boundaries of Ontario's 36 Conservation Authorities. The Grand River, Long Point Region, Catfish Creek, and Kettle Creek Conservation Authorities have entered into a partnership for The Lake Erie Source Protection Region. Drinking Water Source Protection represents the first barrier for protecting drinking water including surface and ground water from becoming contaminated or overused thereby ensuring a sufficient, clean, safe supply now and for the future.

Assessment Reports:

The Grand River Source Protection Area has prepared a Proposed Source Protection Plan which contains detailed scientific information that: identifies vulnerable areas associated with drinking water systems; assesses the level of vulnerability in these areas; and identifies activities within those vulnerable areas which pose threats to the drinking water systems, and assess the risk due to those threats.

The Grand River Proposed Source Protection Plan delineates three types of vulnerable areas: Well Head Protection Areas, Highly Vulnerable Aquifers and Significant Groundwater Recharge Areas. The

subject property has been identified as being within an area with Well Head Protection as well as a Significant Groundwater Recharge Area. Mapping which shows these areas is available at: http://www.sourcewater.ca/index/document.cfm?Sec=7&Sub1=10&Sub2=0

Pages 7-10 from the Proposed Source Protection Plan, Volume II read as follows:

Policy Number	**Policies Addressing Prescribed Drinking Water Threats within the City of Guelph**
Sewage System or Sewage Works- Sanitary Sewers and Related Pipes	
CG-MC-14 *Existing/Future Prescribed Instr. WHPA-A-v.10; WHPA-B-v.10; ICA (NIT)*	For existing and future sanitary sewers and pipes with a design capacity greater than 10,000 m3/day within vulnerable areas where this activity is or would be a significant drinking water threat, the Ministry of the Environment shall ensure that the Environmental Compliance Approval that governs the sanitary sewer and related pipes includes appropriate terms and conditions to ensure the activity ceases to be and/or never becomes a significant drinking water threat.
Sewage System or Sewage Works- Discharge of Stormwater from a Stormwater Management Facility	
CG-MC-15 *Existing/Future Prescribed Instr. WHPA-A-v.10; WHPA-B-v.10; ICA (NIT)*	For the existing or future discharge of stormwater from a stormwater management facility within vulnerable areas where this activity is or would be a significant drinking water threat, the Ministry of the Environment shall ensure that the Environmental Compliance Approval that governs the stormwater management facility includes appropriate terms and conditions to ensure that the activity ceases to be and/or never becomes a significant drinking water threat.

Site Implications: The City of Guelph: Guelph Waterworks Well Supply and Issue Contributing Areas (Appendix K, and Appendix L) show that the subject site is within Wellhead Protection Zone WHPA-C, with a Vulnerability Score of 2-6, but not within an Issue Contributing Area.

GRCA Source Protection Maps show that the site area generally has a Vulnerability of 6 or less for Well Head Protection Areas and Significant Groundwater Recharge Areas. A very small portion at the Northeast corner of the site appears to have a Vulnerability of 8. Using this information in combination with the Significant Drinking Water Threat Policy Applicability Table on the City of Guelph: Guelph Waterworks Well Supply Areas (Appendix K) shows that Policies apply to Prescribed Drinking Water Threats 1, 2, and 16. Of those, only Threat 2 policies CG-MC-14 and CG-MC-15 are relevant to the single family residential condominium development proposed for this site. However, neither is applicable to the site plan development as they apply to WHPA-A and WHPA-B areas with Vulnerabilities of 10 as per the pages 7-10 from the Proposed Source Protection Plan, Volume II.

3.3.1.6. PROVINCIAL POLICY STATEMENT (2005), GROWTH PLAN FOR THE GREATER GOLDEN HORSESHOE & MNR TECHNICAL GUIDELINES

The Provincial Policy Statement (PPS) is issued under the authority of Section 3 of the Planning Act. Section 3 requires that decisions affecting planning matters "shall be consistent with" policy statements under the Act. It should also be noted that Section 4.3 of the PPS establishes that the PPS is to be read in its entirety and all relevant policies are to be applied to each situation.

Section 2.1 of the Provincial Policy Statement (2005), which relates specifically to natural heritage, establishes clear direction on the adoption of an ecosystem approach, and the protection of resources that have been identified as 'significant': wetlands, habitats of endangered or threatened species, fish habitat, woodlands, valleylands, wildlife habitat, and areas of natural and scientific interest.

Natural heritage systems are currently defined under the Provincial Policy Statement (PPS) as follows:

"…a system made up of natural heritage features and areas, linked by natural corridors which are necessary to maintain biological and geological diversity, natural functions, viable populations of indigenous species and ecosystems. These systems can include lands that have been restored and areas with the potential to be restored to a natural state."

Furthermore the PPS states that:

"*Planning authorities are encouraged to identify natural heritage features and areas that complement, link, or enhance natural systems*."

Relevant portions of the Section 2.1 include the following:

Section 2.1.4 of the PPS states that development and site alteration in (a.) *significant wetlands* or (b.) *significant woodlands* is not permitted unless it has been demonstrated that there will be *no negative impacts* on the natural features or their ecological functions.

Section 2.1.6 of the PPS states that development and site alteration on *adjacent lands* to natural heritage features identified in Section 2.1.4 are not permitted unless there has been an evaluation of the ecological function of the adjacent lands and it has been demonstrated that there will be *no negative impacts* on the natural features or on their ecological functions (OMMAH, 2005).

In March 2010, the Province released the finalized Second Edition of the Natural Reference Manual (NHRM), which is intended to guide the implementation of the PPS (2005). This update explicitly recognizes linkages "*between & among natural heritage features & areas, surface water features & ground water features, & hydrological functions*" which are necessary for the ecological and hydrological integrity of watersheds.

Section 7.1 of the NHRM (2010) states that planning authorities shall protect significant woodlands south and east of the Canadian Shield (see figure 4-3) by:

- not permitting development and site alteration in significant woodlands south and east of the Canadian Shield unless it has been demonstrated that there will be no negative impacts on the feature or its ecological functions; and
- not permitting development and site alteration on adjacent lands unless the ecological function has been evaluated and it is demonstrated that there will be no negative impacts on the feature or its ecological function.

Site Implications: Schedule 2 of the Official Plan (December 2012 Consolidations; currently in effect) identifies the adjacent wetland as a Provincially Significant Wetland, Significant Woodland, and part of the Natural Heritage System.

Investigating any potential impacts that development of land adjacent to the ecological function of Significant Woodlands and Wetlands are a requirement for this study in accordance with the PPS.

A 30 m buffer from the edge of the Significant Wetland has been applied to the proposed site plan in compliance with the PPS. This buffer has been the primary basis for designating the proposed property line. Where there is slight variation at the outer edge of the buffer, it has been in recognition of the linkages "*between & among natural heritage features & areas, surface water features & ground water features, & hydrological functions*" to ensure hydrological integrity to the adjacent wetland. Property demarcation will be installed (details to be provided in an Environmental Implementation Report).

A water balance has been completed by SBM Ltd. in compliance with Section 2.1.6 of the PPS. It concludes that average annual runoff volumes from this site to the wetland under post-development

conditions match pre-development conditions. Furthermore, "dirty" runoff from the internal roads and private driveways is controlled for quality (80% min. removal of total suspended solids) and all site runoff is controlled for quantity (flows from the 2-year, 5-year, 25-year, and 100-year design storm events are attenuated to their pre-development levels) by the site SWM system prior to discharging to the wetland (see *Section 3.2.4.1 Water Budget* for details).

The study area contains a coniferous plantation, consisting of primarily of non-native Austrian Pine (*Pinus nigra)* and Scots Pine (*Pinus sylvestris*). It is represented by Polygon 8 on *Figure 17*.

> *Woodland openings: A bisecting opening 20 metres or less in width between crown edges is not considered to divide a woodland into two separate woodlands. The area of the developed opening (e.g., maintained public road or rail line) is not included in the woodland area calculation. (2010 NHRM, p. 72)*

Polygon 8 is separated from the Significant Woodland associated with the Torrance Creek Wetland Complex by approximately 10 to 12 metres. It is therefore considered to be contiguous with/a part of the Significant Woodland. This EIS must therefore demonstrate that there will be no negative impacts on the feature or ecological functions from this proposed development.

> *Ecological function: means the natural processes, products or services that living and non-living environments provide or perform within or between species, ecosystems and landscapes. These may include biological, physical and socio-economic interactions (2014 PPS, p. 41).*
>
> *Negative impacts: means*
>
> *d) in regard to other natural heritage features and areas, degradation that threatens the health and integrity of the natural features or ecological functions for which an area is identified due to single, multiple or successive development or site alteration activities(2014 PPS, p. 45).*
>
> *The PPS definition for "negative impacts" does not state that all impacts are negative, nor does it preclude the use of mitigation to prevent, modify or alleviate the impacts to the significant natural heritage feature or area. For example, demonstration of no negative impacts on a significant woodland through mitigation measures may be contemplated, provided that factors such as the successional status and replaceability of the woodland components and functions within a reasonable time frame (e.g., 20 years) are considered (2010 Natural Heritage Reference Manual, pg. 119).*

Site Implications: While Polygon 8 is considered to be part of a Significant Woodland, it is not a natural feature. This EIS must demonstrate that its removal will not negatively impact the remainder of the significant woodland.

There are opportunities to enhance woodland so as to offset anticipated negative impacts associated with a contemplated development. The approach put forth in the Vegetation Compensation Plan follows these general principles:

Biodiversity Enhancements

- Removal of select invasive exotic tree & shrub species in the edge of PSW;
- Replacement plantings consisting of native tree & shrub species.

Canopy Replacement & Biodiversity Enhancement

- Replacement of the lost canopy to account for loss of habitat structure. Replacements would represent a Biodiversity Enhancement in the long term as species would be selected from native trees & shrubs as opposed to the current composition (*Scots Pine, considered an invasive exotic species*). Area to provide canopy replacement would be located in the Wetland Buffer.

Consolidation, Linkage & Enhancement of Available Habitat

- The proposed removals and biodiversity enhancements will achieve a spatial redistribution of available habitat on the landscape that reduces current fragmentation, enhances existing linkage functions and strengthens proposed buffer functions by relocating the spatial distribution of canopy to the edge of the existing PSW.

An assessment of Net Effect on the Significant Woodland can be found in *Section 5.3.2*., and is based on the Ecological Functions identified in the NHRM (2010, pp.68-69).

3.3.2. LOCAL POLICY

3.3.2.1. CITY OF GUELPH OFFICIAL PLAN (CONSOLIDATION)

The City of Guelph, as a single tier municipality, applies the powers conferred on the Municipality by the Planning Act and the Municipal Act through the use of the Official Plan. The purpose of the plan is, in part, to "promote long-term community sustainability; the plan embodies concepts and actions that are intended to simultaneously achieve social well-being, economic vitality and environmental protection". It is important to note that the December 2012 consolidation only includes those amendments that were approved by Council and were in force as of November 30, 2012. This consolidation does not include Official Plan Amendments that were under appeal to the Ontario Municipal Board at the time of this application. This application was made prior to the OPA 42 now in effect.

Under Section 2.4.14

The Growth Management Strategy (Part 2.4.14 of the Official Plan) states that with respect to the Natural Heritage System, "The City will define the natural heritage system to be maintained, restored and, where possible, improved and will recognize the linkages between *natural heritage features and areas,* surface water, and groundwater features. *Development* will be prohibited within defined features in accordance with the provisions of the Provincial Policy Statement and the Growth Plan". The City will "Ensure that water quality and quantity is protected, improved or restored". Through consultation with the Grand River Conservation Authority (GRCA), and other interested parties, the City will encourage the development of a system of parks, open space, and trails that is clearly demarcated, is based on a coordinated approach to trail development, and is based on good land stewardship practices for public and private lands.

Site Implications: The City's Land Use Plan (Official Plan, Schedule 1, Consolidations) places the subject properties in a General Residential zone. Schedule 2 of the Official Plan identifies the adjacent wetland as a Provincially Significant Wetland, Significant Woodland, and part of the Natural Heritage System. Schedule 2 places the site within the Arkell Springs Water Resource Protection Area.

The City-wide Master Trail Plan conceptually illustrates a municipal pedestrian trail through the proposed buffer to the wetland. The route and design of the trail are considered as part of the application in order to assess impacts of the trail on the PSW. The trail alignment is shown on *Appendix*

C. SBM Grading Plan. The trail design will adhere to the City standard for a Secondary Off-Road Trail in Minor City Parks and Stormwater Management Areas as stipulated in Figure 5-4 of the Guelph Trail Master Plan included as *Appendix H*.

A water balance has been completed by SBM Ltd. in compliance with Section 2.1.6 of the PPS. It concludes that average annual runoff volumes from this site to the wetland under post-development conditions match pre-development conditions. Furthermore, "dirty" runoff from the internal roads and private driveways is controlled for quality (80% min. removal of total suspended solids) and all site runoff is controlled for quantity (flows from the 2-year, 5-year, 25-year, and 100-year design storm events are attenuated to their pre-development levels) by the site SWM system prior to discharging to the wetland (*see Section 3.2.4.1. Water Budget* for details).

Under Section 6.1.1

General Policies for Natural Heritage Features state that the "City requires the protection of *natural heritage features* and their associated *ecological functions* and also encourages their enhancement where appropriate."

Site Implications: The protection of natural heritage features and functions will be ensured through the implementation of the 30 m buffer to the NHS. The intent of the proposed development is to have no negative impact to the wetland or woodland features or ecological function.

The development of a conceptual Vegetation Compensation Plan shows additional enhancements to ecological function of the site (see *Figure 21*) with the use of native plantings and the removal of exotic and/or invasive species.

Under Section 6.2.7

Through the development review process, as stated under General Policies for Watershed Planning the City encourages "*development* proponents to prepare information devices including signage, homeowner brochures, and other similar means that will assist in explaining the ecosystem approach used to protect the City's Natural Heritage System.

Site Implications: Recommendations of this study include the development of signage and a landowner stewardship brochure for all new residents of the proposed development.

Under Section 6.4.3

General Policy for Wetlands (6.4.3) specify that Environmental Impact Studies for development close to a PSW "Shall indicate that the development proposal will not: Result in a loss of the *wetland's ecological function;* Create subsequent demand for future *development* which will *negatively impact* on the *wetland's ecological function;* Conflict with existing site-specific wetland management practices; or Result in loss of contiguous *wetland*."

Site Implications: The protection of natural heritage features and functions will be ensured through the implementation of the 30 m buffer to the NHS.

A water balance has been completed by SBM Ltd. in compliance with Section 2.1.6 of the PPS. It concludes that average annual runoff volumes from this site to the wetland under post-development conditions match pre-development conditions. Furthermore, "dirty" runoff from the internal roads and private driveways is controlled for quality (80% min. removal of total suspended solids) and all site runoff is controlled for quantity (flows from the 2-year, 5-year, 25-year, and 100-year design storm events are attenuated to their pre-development levels) by the site SWM system prior to discharging to the wetland (see *Section 3.2.4.1. Water Budget* for details).

Under Section 6.8

Forestry and Woodland resources require a tree inventory of all trees over 10 cm diameter at breast height (DBH), with consideration of the feasibility of retaining desired trees, and the protection measures required for these trees during site development and building construction. For proposals within or adjacent to a significant woodland, the City requires that an EIS will, among other things, indicate the negative impacts of the proposal on the woodland; indicate any measures that would reduce the negative impacts; and recommend provisions, in instances where trees need to be removed, for their replacement or any other enhancement opportunities.

Site Implications: A tree inventory in compliance with City By-law Number (2010) - 19058 and in conformance with the requirements of Section 6.5 of the OP was on October 22, 24, and November 5, 2013 for Lots 24, 26, 28, and 32, Landsdown Drive, Guelph, Ontario. Of all 254 individual trees surveyed, 185 are located on Dunsire property. The remaining 69 are either on neighboring property or in the adjacent significant woodland. There were no regionally or locally significant species found, nor any endangered species. For a full reporting of the tree assessment of this study, see *Appendix D: Landsdown Drive Tree Inventory*. Mitigation measures to reduce negative impacts are outlined in *Section 5.1 Mitigation* of this EIS.

A portion of the significant woodland (Polygon 8 – Austrian Pine Plantation) is proposed for removal. In accordance with Section 6.8 this EIS has developed a compensation plan which outlines measures that both reduce negative impacts of the proposed development, and provides provisions for enhancements. A Vegetation Compensation Plan is required for the replacement of all healthy, non-invasive trees measuring over 10cm DBH proposed for removal. See *Section 5.2 Compensation* for details of the Vegetation Compensation Plan (*Figure 21*).

Under Section 7.13.1

With respect to the Natural Heritage System (NHS) it is stated that where appropriate and reasonable, consideration will be given to measures to provide for the enhancement of *natural heritage features* within the NHS designation.

Site Implications: The proposed development does not negatively impact the NHS. The development of a Vegetation Compensation Plan shows additional enhancements to ecological function of the site (see *Figure 21*) with the use of native plantings and the removal of exotic and/or invasive species. A detailed compensation plan will be provided in the EIR.

3.3.2.2. GUELPH NATURAL HERITAGE STRATEGY (OPA 42) (2011)

The purpose of OPA 42 is to replace the current Core and Non-Core Greenlands policies and mapping within the City's Official Plan with a Natural Heritage System that is consistent with current provincial policy. This plan provides extensive information and guidance supplementary to the Official Plan with respect to development regulations for lands on or adjacent to those forming part of the Natural Heritage System (NHS). The Ontario Municipal Board (OMB) approved OPA 42 – the Natural Heritage System Amendment on June 4, 2014 bringing it into force and effect. While this decision means that the policies are now in force and effect for the City, this application was made prior to the June 4th approval.

Under Section 6A.1

One of the purposes of the Natural Heritage System is to provide permanent protection to the Significant Natural Areas (including *Ecological Linkages*) and *established buffers.*

Site Implications: This application was made prior to the June 4th approval of OPA 42. Prior to this approval the established buffers were not identified as part of the Natural Heritage System (or Core / Non-Core Greenlands) according to City of Guelph's 2012 Official Plan.

Under Section 6A.1.1

> *"Adjacent lands* are those lands contiguous to a specific *natural heritage feature or area* where it is likely that *development* or *site alteration* would have a *negative impact* on the *natural heritage feature or area*. Generally, an Environmental Impact Study (*EIS)* or Environmental Assessment (*EA)* is required to assess potential impacts of the proposed activities, and recommend appropriate setbacks (i.e., *established buffers*) from the *natural heritage feature or area* within the *adjacent lands*, to ensure no *negative impacts*. The *minimum buffers*, where applicable, are identified to prevent damage and degradation to the *natural heritage features and areas* that are part of the Natural Heritage System".

Table 6.1 in OPA 42 provides widths for minimum buffers and lands considered "adjacent lands" for components of the Natural Heritage System including Provincially Significant Wetlands (PSW). *Table 7* (below) provides minimum buffer and adjacent land widths for select Significant Natural Features relevant to the study area. The minimum buffer is 30 m for a PSW and width of adjacent lands is 120 m. Minimum buffers to Significant Woodlands Is 10 m from the dripline. Buffers for Cultural Woodlands are to be established through an EIS and the width of adjacent lands is 50 m.

Table 7. Minimum buffers and Adjacent Lands to Significant Natural Areas

Significant Natural Area	Width of Minimum Buffers (m)	Width of Adjacent Lands (m)
Provincially Significant Wetland	30	120
Significant Woodland	10 (from the drip line)	50
Cultural Woodlands	To be established through and EIS	50

With the exception of the uses permitted under 6A.1.2 (below), *established buffers* are to be actively or passively restored to, or maintained in a natural state in support of the *ecological* and /or *hydrologic functions* of the adjacent protected *natural heritage features and areas*.

Site Implications: The protection of natural heritage features and functions will be ensured through the implementation of a 30 metre buffer to the PSW. While there will be grading within the outer portion of the 30m buffer to the PSW, it will be a temporary disturbance as the vegetation establishes. The buffer will be actively restored to a natural state in accordance with the requirements for a Vegetation Compensation Plan under 6A.5.4 (below).

An area of 0.167 hectares of the significant woodland (Polygon 8 – Austrian Pine Plantation) is proposed for removal. In accordance with Section 6A.1.2 and 6A.5.4_this EIS has developed a compensation plan which outlines measures that achieve no net negative impacts to the NHS. A Vegetation Compensation Plan is required for the replacement of all healthy, non-invasive trees measuring over 10cm DBH proposed for removal. See *Section 5.2 Compensation* for details of the Vegetation Compensation Plan *(see Figure 21).*

Under 6A.1.2 General Permitted Uses

Development and *site alteration* shall not be permitted within the Natural Heritage System, including *minimum* or *established buffers*, except for the following uses:

i. legally existing uses, buildings or structures;
ii. *passive recreational activities*;

iii. low impact scientific and educational activities;
iv. fish and wildlife management;
v. forest management;
vi. *habitat conservation;* and
vii. *restoration* activities.

An EIS may be required for the construction of trails and walkways and *habitat conservation* where the proposed work has the potential to result in negative impacts to the NHS. Development may be permitted within adjacent lands if an Environmental Impact Study (EIS) demonstrates that there will be no negative impacts on the protected natural heritage feature or its associated ecological function. The following is a summary of policies specific to each natural heritage feature found on the study area:

Site Implications: The City of Guelph Official Plan Amendment (OPA) 42 identifies the northeast corner of the subject property as a 'Significant Natural Area' on Schedule 10 – Natural Heritage System. Schedule 10A – ANSIs and Wetlands shows these lands to be 'City of Guelph Confirmed Wetland', and Schedule 10C – Significant Woodlands shows these lands to be 'Significant Woodland'.

A 30 m buffer from the edge of the Significant Wetland has been applied to the proposed site plan. This buffer has been the primary basis for designating the proposed property line, conferring 0.28 ha of land from private to City ownership. The minor exceptions to this line are two narrow portions of land behind Lots 1-5 and Lot 10 (0.03 ha), where the maximum distance of private property into the buffer is 5.08 m. However, 0.01 ha of lands are conferred to the City behind Lots 6-8.

The Grading Plan developed by SBM Ltd. has determined that to achieve the objective in General Policy 6A.1.9 to ensure "support of the…*hydrologic functions* of the adjacent protected *natural heritage features and areas"* (i.e. to have no negative hydrologic impact on the Significant Wetland) infiltration trenches are required. Alternative locations were explored. Based on the MOE spatial separation requirements for the infiltration trenches (4 m offset from buildings, 1 m above ground water elevation, etc.), the only feasible location for the infiltration trenches is North of Units 1-10, adjacent to the wetland. The infiltration trenches have been set as close as possible (4 m) to the backs of Units 1-5. However, due to the SWM requirements and required length of trenches to balance pre- and post-development runoff in the water budget, some SWM features (infiltration trenches and surface ponding areas) are slightly within the 30 m wetland buffer. This revised design has allowed the complete removal of a SWM retention pond within the wetland buffer (proposed in the Draft EIS, December 2013). Property demarcation will be installed along the proposed property line (details to be provided in an Environmental Implementation Report).

Under 6A.5.4 Vegetation Compensation Plan

This section of OPA 42 states that:

1. "The detailed requirements for a Vegetation Compensation Plan will be developed by the City through the Urban Forest Management Plan. The requirements, once developed, will be applied to determine appropriate vegetation compensation for the loss of trees through *development* and *site alteration*.
2. The Vegetation Compensation Plan shall identify, to the satisfaction of the City, where the replacement vegetation will be planted. Where replanting is not feasible on the subject property, the planting may be directed off-site to lands identified in consultation with the City, including lands within the Natural Heritage System and may include:

i) *Established buffers*,
ii) *Significant Valleylands*,
iii) *Significant Landform*,
iv) *Ecological Linkages*, or
v) Restoration Areas.

3. All replacement vegetation should be indigenous species and compatible with the site conditions within which they are proposed. In some cases, re-vegetation may consist of a combination of trees, shrubs and herbaceous species, or may consist exclusively of indigenous herbaceous species and grasses where the *restoration* objective is to establish a meadow habitat."

4. The vegetation compensation plantings do not replace the normal landscape planting requirements as part of the approval of any development or site alteration.

5. A Vegetation Compensation Plan is required to be implemented through on site or off site plantings or cash in lieu equal to the value of the replacement vegetation will be required by the City."

Site Implications: The development of a Vegetation Compensation Plan shows additional enhancements to ecological function of the site with:

i. the use of native plantings, including a combination of trees, shrubs and herbaceous species, and
ii. the removal of exotic and/or invasive species in conformance with 6A.5.4 of OPA 42.

See *Section 5.2.1 Compensation Plan*, and *Figure 21. Vegetation Compensation Plan (Conceptual)* for details.

Trees were assessed for biological health during the Tree Inventory and Assessment. All trees greater than 10cm dbh that were rated as "medium-high" for Biological Health meet compensation requirements under OPA 42 and were included in the tree compensation tally.

3.3.2.3. GUELPH TREE BY-LAW (2010) - 19058

The City of Guelph Tree By-law regulates the destruction or injury of trees on private property drawing on authority from the Municipal Act. If a property owner wishes to remove or injure a Regulated Tree, as defined in the By-law, and if none of the exemptions set out in the by-law are applicable, then application for removal or injury is required.

The City of Guelph Tree By-law Part VI – Issuance of Permits, Section 7 provides conditions that an inspector can place on permits to destroy or injure a tree including, among other things, that each tree destroyed or injured be replaced by one or more replacement trees. If replacement planting is not achievable on the subject land, a cash in lieu amount of $500.00 per tree destroyed or injured is to be paid as a substitute. Where trees are to be retained, a Tree Protection Plan (TPP) is required.

The by-law lists exemptions for Regulated Trees requiring a permit to be destroyed or injured provided in the by-law, three of which are applicable to this site. They include:

- 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);
- A tree which is Hazardous; and

- A specimen of invasive exotic tree as listed in the by-law, most notably *Rhamnus cathartica* (Common Buckthorn), which is known to occur on site.

Considerations for issuing a permit (Part VI – Issuance of Permits) include:

- The native status of the tree; Regionally or locally significant or endangered species;
- Condition;
- Location;
- Reason for the proposed destruction or injury;
- Whether it is a heritage tree;
- The presence within the Regulated Tree, of breeding birds;
- The protection and preservation of ecological systems and their functions including the preservation of native flora and fauna; and
- Erosion, flood control and sedimentation of watercourses.

Site Implications: An inventory and assessment of all Regulated Trees as per City of Guelph Tree By-law (By-law Number (2010) – 19058), was conducted on October 22, 24, and November 5, 2013 for Lots 24, 26, 28, and 32, Landsdown Drive, Guelph, Ontario. In accordance with the Tree By-law and the City of Guelph Official Plan Amendment (OPA) 42 (in effect), all trees greater than 10 cm DBH were tagged and evaluated for size (DBH, Height, and Crown Reserve), Species, and Health.

Of all 254 Regulated trees surveyed, 187 are located on Dunsire property. The remaining 67 are either on neighboring property or in the adjacent significant woodland. There were no regionally or locally significant species found, nor any endangered species. For a full reporting of the tree assessment of this study, *see Appendix D Tree Inventory Data*.

Trees that are exempt from permitting requirements were not considered for compensation. Dead trees as well as specimens of *Rhamnus cathartica* were encountered on the subject lands but since they are exempt from the By-law were not tagged and surveyed.

Hazardous trees are defined in the By-law as trees that are "destabilized or structurally compromised to an extent that an imminent danger of death, injury or structural damage exists". In order for a tree to be a hazard there must be both a chance that the tree will fall and a target. Since the Dunsire Property is to be developed as a residential neighborhood, there will be targets present on site including houses, people, and cars, among other things. Trees that were rated as "low" for structural condition during the Tree Inventory and Assessment are trees that were leaning drastically or have major structural defects. "Low" ranking trees meet the City By-law's definition of a hazardous tree, therefore all trees rated "low" for structural condition are considered exempt from permitting requirements. Conversely, all trees that ranked "medium-high" for structural condition were included in the tree compensation tally.

3.3.2.4. DEMARCATION POLICY (1996)

The City of Guelph's Property Demarcation Policy states that the Recreation and Parks Department will co-operate with the demarcation of common property lines between existing public City parks and private property.

Site Implications: The development requires property demarcation as black chain-link fencing along the private/City property line. The fencing shall be on public property and will not have any gates or openings.

3.3.2.5. GRCA ENVIRONMENTAL IMPACT STUDY GUIDELINES (2005)

The overall purpose of the guidelines is to facilitate GRCA's regulatory and advisory roles with respect to land use planning applications submitted under provincial and federal legislation. The intent of these guidelines is to:

i. Provide a standardized set of study guidelines specific to wetlands;

ii. Improve the quality of reports submitted in support of development applications; and

iii. Facilitate and expedite the GRCA permit/municipal plan review process

The guidelines define an EIS as "a process that addresses the potential impact of site-specific development on wetlands and supporting hydrological features such as watercourses and groundwater recharge areas" (GRCA, 2005).

Site Implications: The terms of reference for the EIS were developed in consultation with the Grand River Conservation Authority's Environmental Impact Study Guidelines and Submission Standards for Wetlands (GRCA, 2005). See *Appendix B* for the EIS Terms of Reference.

3.4. SUMMARY OF BIOPHYSICAL CONSTRAINTS

The site implications of the proposed development as determined by the policy and legislation filters has determined that the biophysical constraints can be limited to the following issues: changes to the tree canopy, effects on adjacent significant wetland, effects on significant woodland, effects on significant wildlife habitat, and effects on the water balance. See *Figure 20 – Biophysical Constraints and Limits of Disturbance* for a graphical representation of constraints.

3.4.1. VEGETATION RESOURCES

Tree Canopy – The existing tree canopy on the Dunsire property contributes to environmental services such as moderating temperatures, erosion control and pollution filtration as well as contributing to the area of the Significant Woodland (i.e. Vegetation Unit 8). The proposed removal of trees from the site must demonstrate no negative impact to the Significant Woodland and requires a permit through the City of Guelph's tree by-law.

3.4.2. WILDLIFE RESOURCES

Breeding Birds - While there were no confirmed breeders observed on the property, careful attention must be given to ensure that the federal 1994 Migratory Birds Convention Act (MBCA) is not being contravened. Section 6 of the Migratory Birds Regulations (MBRs) made under the federal 1994 MBCA makes it an offence to "disturb, destroy or take a nest, egg, nest shelter, eider duck shelter or duck box of a migratory bird." To this end, it is recommended that habitat removal and/or construction works take place outside the breeding season for migratory birds so as not to "disturb" their nesting.

Environment Canada (EC) normally recommends restrictions on vegetation clearing during core breeding periods. To provide some guidance in this matter, the core breeding period has been chosen to roughly correspond with the period when 75% of the individuals of each species complete their nesting cycle. On the Dunsire Property vegetation clearing should not take place within the active nesting season between May 25th and July 31st.

3.4.3. SPECIAL FEATURES

Significant Wetland – While there are no Significant Wetlands on the Dunsire property, it constitutes 'Adjacent Lands' to the Provincially Significant Wetland. OPA 42 provides minimum widths for buffers and lands considered "adjacent lands" for components of the Natural Heritage System. The minimum buffer to a Significant Wetland is 30 m from the staked wetland edge, and width of adjacent lands is 120 m.

Significant Woodland – The Significant Woodland associated with the Torrance Creek PSW is a swamp (i.e. a treed feature) that is 56.80 hectares in size. It was designated as a Significant Woodland based on the Ecological Functions criteria laid out by the NHRM *(2010 pp. 68-69*), which include: i) Woodland Interior, ii) Water Protection, and iii) Woodland Diversity.

Appendix 1 Natural Heritage Strategy of OPA 42 shows the ELC for the Polygon 8 of this EIS (*see Figure 17*), is a Cultural Thicket. D&A field assessment in 2013 identifies the features as community type as CUP3 Cultural Plantation. It is 0.19 ha in size. The dominant canopy species is *Pinus nigra* (Austrian Pine) with occasional *Pinus sylvestris* (Scots Pine) and lilac & buckthorn in the understorey. This Austrian Pine Plantation was screened for its potential to qualify as an extension of the Significant Woodland. The Natural Heritage Resource Manual states that "*A bisecting opening 20 metres or less in width between crown edges is not considered to divide a woodland into two separate woodlands"(2010 NHRM, p. 72)*. Polygon 8 is separated from the Significant Woodland associated with the Torrance Creek Wetland Complex by approximately 10 to 12 metres. It is therefore considered to be contiguous with/a part of the Significant Woodland.

Significant Wildlife Habitat – For each of the potential SAR species identified during the background review, the Study Area was assessed as to the likelihood of that species occurring, whether presently or in the future. The potential for the species to occur within the Dunsire Property was reviewed and is presented in *Section 3.1.1. Wellington Upper Tier SAR List Existing Inventories*. Observations of available habitat in the subject lands indicate that they are comprised of anthropogenic (residential landscapes) and regularly disturbed (i.e. mowed) cultural meadows. No habitat was observed outside the Torrance Creek PSW that would support amphibian breeding; nor were any "special" habitats supporting breeding birds available outside the Torrance Creek PSW.

3.4.4. WATER RESOURCES

Water Balance - The water balance concludes that average annual runoff volumes from this site to the wetland do not increase under post-development conditions. Runoff volumes from the internal roads and private driveways are controlled for quality for pre-treatment prior to the infiltration swales. This practice is considered a best management practice as per the Credit Valley Conservation Authority's Low Impact Development Stormwater Management Planning and Design Guide. Total site runoff is also controlled for quantity (flows from the 2, 5, 25, and 100-year storm events are attenuated to the pre-development levels) by the site SWM system prior to discharging to the wetland (see *Section 3.2.4.1 Water Budget* for details).

Groundwater – Due to the relatively high assumed seasonal high groundwater elevation ranging from 1.37 m to 2.16 m below existing ground elevation, the building footings and weeping tiles were set just above the assumed seasonal high groundwater levels, the infiltration trenches were set 1 m above the assumed seasonal high groundwater levels (as per MOE guidelines), and site grades were raised to accommodate both of these. As such, negative impacts to the NHS are not anticipated.

4. ASSESSMENT OF POTENTIAL IMPACTS

The activities associated with the proposed site alterations for the Landsdown Drive Residential development will result in disturbances to the existing cultural and natural features and functions. Some disturbances may constitute an impact either positive or negative. This section provides a summary of the activities associated with the proposed site alterations and examines their effect upon resources characterized in the findings. Potential impacts, both *positive* and *negative*, that may result from the identified activities are identified and assessed in *Table 11*. Where mitigation of identified negative impacts is possible the result will be applied to determine if any residual negative impacts remain. Further enhancement opportunities will be identified to offset residual negative impacts to determine the net effect of the proposed site alterations. Details of recommended mitigation and enhancement measures are explored in the following section.

4.1. ACTIVITIES

The proposed site alterations are for the purpose of developing residential lots and associated dwellings. At present, the Dunsire property has been managed for a variety of anthropogenic uses which have maintained the site in a disturbed state. Due to this ongoing "maintenance" it is not anticipated that the site preparations will result in significant 'new' disturbances. The activities and disturbances that are part of the construction and establishment of new residential lots and dwellings are explained below.

4.1.1. VEGETATION REMOVAL

The removal of vegetation will be required for the development of 26 single-family lots on a common element road and one freehold lot (*see Appendix A*). Vegetation removal will be limited to tree and associated understory removal in portions of the existing Austrian Pine Plantation (Vegetation Unit 8), the existing hedgerow (Vegetation Unit 2) as well as select specimen trees around the property perimeter. It will also include the removal of invasive species (in Vegetation Unit 6). See *Figure 18. Tree Preservation Plan*.

D&A and SBM Ltd. coordinated to assess the feasibility of retaining desired trees where possible. The initial development plan assessed in the December 2013 EIS has been revised and the new plan is assessed in current EIS. Limits of disturbance for construction and grading works were considered with respect to tree locations. As a result of this assessment, trees received one of three possible designations: Preserve, Preserve If Possible, and Remove. The following definitions apply to each designation:

Preserve - Trees that have a dripline that is substantially outside the limits of disturbance (30% of the crown or greater will not be impacted) and having moderate to high biological health and moderate to high ranking structural condition. Tree is likely to survive at least 3-5 years.

Preserve If Possible - Proximity to a building envelope or limits of disturbance due to grading may result in damage the root zone to the detriment of the tree; preserve if possible to be determined at the time of construction. Recommendations on pruning are to be provided as part of detailed design.

Remove - Any tree for which at least 30% of the dripline is within the limits of disturbance, has low biological health, and/or severe structural defects, and is not likely to survive more than 1-3 years, and/or will not survive proposed development. *Table 8* provides a summary of proposed actions (Preserve, Preserve If Possible, and Remove).

Table 8. Summary of proposed tree preservation actions.

	Preserve	Preserve If Possible	Remove
Study Area Trees	**100**	**7**	**147**

The development plan assessed in the 2013 EIS proposed the removal of 185 trees and the preservation of 62 trees, with an additional 7 trees identified with a "potential for injury". The current plan preserves 38 more trees (15% increase) than the December 2013 plan. There are no removals within the Torrance Creek PSW. The removal of Polygon 8 as a portion of the significant woodland represents 0.167 ha. Select removals of invasive exotic species are recommended as part of the biodiversity enhancements proposed in the Vegetation Compensation Plan (*see Figure 18. Tree Preservation Plan* and *Figure 21. Vegetation Compensation Plan*).

4.1.1.1. TREE COMPENSATION TALLY

A two-step process was used to determine tree compensation numbers. Step one, based on the City of Guelph Tree By-law involves filtering the tree data (*Appendix D*) to determine if the tree requires a Permit for removal (*see Figure 13*). When trees require a Permit, they are subject to conditions under the By-law (Section 7). Step two applies the criteria of the Guelph Natural Heritage Strategy OPA 42 to Permitted trees to determine when compensation is required (*see Figure 14*).

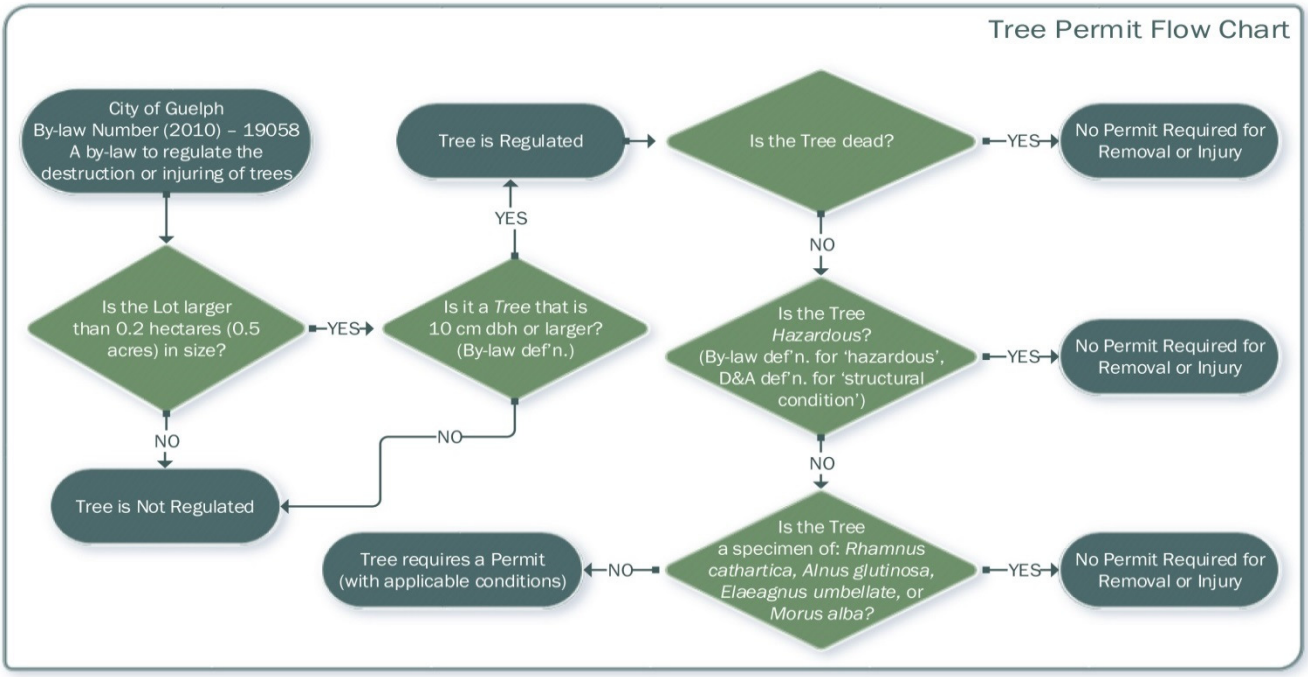


Figure 13. Tree permit flow chart.

Overall, there are 147 trees proposed for removal in the study area. Of the trees proposed for removal, 133 trees require a permit and 14 are exempt due to being hazardous trees (see *Table 9*).

Table 9. Summary of permitting requirements

	Proposed Removals	No Permit Required	Permit Required
Study Area Trees	**147**	**14**	**133**

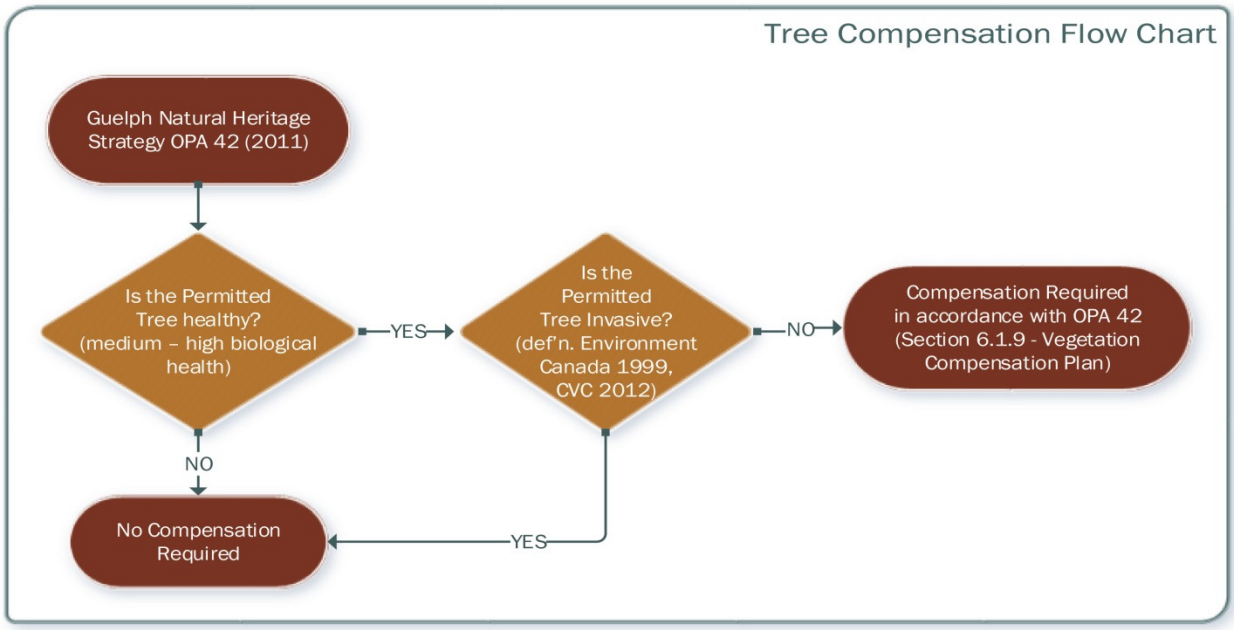


Figure 14. Tree compensation flow chart.

Of the 133 trees that require a Permit, compensation applies to the trees that are healthy and are not considered invasive. The total number of trees requiring compensation is 109. *See Appendix D* for detailed tree assessment data and criteria used to determine compensation requirements. Trees that were designated as "Preserve if Possible" are to be assessed for removal at the time of construction. Should removal be necessary, compensation will be determined as per the process outlined above.

Table 10 summarizes the number of trees requiring compensation out of the trees requiring a permit.

Table 10. Summary of trees requiring compensation

	Permit Required	No Compensation Required	Compensation Required
Study Area Trees	**133**	**38**	**109**

The removal of vegetation is a single occurrence activity that will take place before any other activities. The loss of canopy and understorey shrubs and ground cover will be temporary to accommodate Lot establishment and dwelling construction; Re-vegetation will take place and recover canopy and understorey loss in the long term.

4.1.2. STORM WATER MANAGEMENT

The development plan assessed in the December 2013 EIS incorporated a storm water management pond within the buffer to the PSW. The property line was set between the SWM facility and the PSW, thereby providing the City with ownership over the inner 15 m of the buffer. The storm water management for the current development plan is described below.

Runoff volumes from the internal roads and private driveways are controlled for quality (80% min. removal of total suspended solids) using an oil/grit separator (OGS) for pre-treatment prior to the infiltration trenches which is considered a best management practice as per the Credit Valley

Conservation Authority's Low Impact Development Stormwater Management Planning and Design Guide Section 4.4. Total site runoff is also controlled for quantity (flows from the 2, 5, 25, and 100-year storm events are attenuated to the pre-development levels) by the site SWM system prior to discharging to the GRCA wetland. Further detail is provided in SBM's Preliminary Site Servicing & Stormwater Management Design Report.

Some SWM features (infiltration trenches and surface ponding areas) are slightly (4.4 m max.) within the 30 m wetland buffer. Alternative locations were examined, however, their proposed locations were deemed necessary and unavoidable for the following reasons:

4.1.2.1. INFILTRATION TRENCHES

- Infiltration measures are required to meet the GRCA's assumed water budget objective to balance average annual pre and post development surface runoff volumes. They were designed/sized to meet this objective. See *Section 5.1* of the SWM report for more detail.
- To meet the water budget objectives, the trenches must be located at the lowest site elevations to capture as much surface runoff as possible (i.e. trenches in the front yards of the units or rear yards of units 13-26, would not capture enough surface runoff to meet the water budget objectives, or would require significantly more length to do so)
- The MOE spatial separation requirements infiltration measures are 4 m horizontal offset from buildings and 1 m vertical offset from the high ground water elevation.
- Due to the 4 m building offset, side or rear yard trenches were not feasible due to proximity to existing or proposed buildings.
- We attempted to locate infiltration trenches in the front yards of units 1-12, however, due to the estimated seasonal high ground water elevation being as high as 1.37 m below existing ground elevation, their required depth of about 1 m to provide enough storage and infiltration to meet the water budget targets, and the grading constraints of having to tie into existing property line grades and self-contain the drainage on-site, we could not feasibly have front yard infiltration trenches 1 m above the ground water elevation and set the invert of the downstream outlet pipe at or above the top of the infiltration trenches (to ensure they are fully utilized during every storm event prior to outletting to the downstream storm system and ultimately the wetland, to meet the water budget objectives) without storm water leaving the system at CBMH#3 and ultimately to the wetland between units 1 and 2.
- Therefore, the only feasible location for the infiltration trenches was north of units 1-10, adjacent to the wetland, as proposed.
- Although they are slightly (4.4 m) within the 30 m wetland buffer, we feel this is a vast improvement over the first proposal which had the SWM surface ponding area entirely within the 30 m wetland buffer.
- The option of shifting the entire site layout to the south to minimize the disturbance in the wetland buffer was considered, however, this would eliminate units 17 and 22 and further reduce the depth of units 1-16 and 23-26 (some of which are already more shallow than desired which limits marketability and building layout/design) which could result in the abandonment of the project due to economic feasibility.

4.1.2.2. SWM SURFACE PONDING AREA

- SWM surface ponding areas are required to meet the City's and GRCA's objectives to balance pre and post development peak flow rates during the required design storm events (2, 5, 25,

and 100 year). They were designed/sized to meet these objectives. See *Section 6* of the SWM report for more detail.

- The opportunity for surface storage exists only at the low spots on site where runoff is collected (i.e. catchbasins). The available surface storage areas located furthest away from the wetland (at CBMH#3 and CBMH#4) were maximized with the proposed grading design to prevent, as much as feasible, any surface ponding areas in the wetland buffer.
- As described above, the only feasible location for the infiltration trenches was north of units 1-10, they had to be kept 1 m above the ground water elevation, and were required to be about 1 m deep to meet the water budget targets. This caused the proposed surface elevations over the trenches to be significantly higher than existing grades, inhibiting the potential for surface ponding in the area of the trenches. Therefore, two trenches north of units 1-5 were utilized to meet the water budget targets and leave enough space north of units 6-11 for a surface ponding area to meet the required SWM objectives.
- Again, the proposed grading design was optimized to maximize the available surface storage volume at this location (around CBMH#6) to meet the required SWM objectives and minimize the disturbance in the wetland buffer.
- Although this storage area is slightly (2.2 m) within the 30 m wetland buffer, this surface area is required to provide sufficient storage to meet the SWM objectives and we feel this is a vast improvement over the first proposal which had the SWM surface ponding area entirely within the 30 m wetland buffer.
- This surface ponding area is not designed as a "SWM pond", but rather a "dry ponding area" which is only utilized in design storm events with a return period of 2 years or more, and after the remaining site storage and infiltration capacity is exceeded.
- The option of shifting the entire site layout to the south to minimize the disturbance in the wetland buffer was considered, however, this would eliminate units 17 and 22 and further reduce the depth of units 1-16 and 23-26 (some of which are already more shallow than desired which limits marketability and building layout/design) which could result in the abandonment of the project due to economic feasibility.

4.1.2.3. LID MEASURES

LID measures, in addition to the proposed infiltration trenches, were considered for the proposed development and are discussed below:

- Rainwater Harvesting – although not specifically used to reduce calculated runoff volumes (difficult to quantify and enforce, minor reduction in volumes, etc.), we support the use of this LID to maintain healthy vegetation without using potable water.
- Green Roofs – As sloped roofs are proposed for this development, this LID measure was not considered
- Roof Downspout Disconnection – Downspouts within this development are proposed to discharge to grade to promote infiltration and pre-treatment.
- Soakaways, Infiltration Trenches, and Chambers – Infiltration trenches are proposed for this development. See *Section 4.1.2*. individual lot soakaways or chambers were not feasible due to the grading and spatial separation constraints provided in *Section 4.1.2*.
- Bioretention, Vegetated Filter Strips, Enhanced Grass Swales, and Dry Swales – Usually located adjacent to impervious surfaces such as the internal roads and private drives, these LID measures were not utilized due to their potential risk of soil and ground water contamination and the importance of the wetland as a source of clean water. Instead, "dirty" runoff from the

roads and driveways are conveyed to an oil/grit separator for quality treatment prior to discharging to the proposed infiltration swales.

- Permeable Pavement – also not considered due to the potential risk of soil and ground water contamination
- Perforated Pipe System – this LID system is proposed between CBMH#8 and MH#7 but could not be used elsewhere on site due to the high ground water elevation (site storm sewers may not have the required 1 m vertical offset to permit infiltration) and/or steep slopes (gentle pipe slopes of 0.5-1% are required) .

4.1.3. SERVICING

The new dwellings will be serviced by water, sanitary & hydro. Water for domestic and fire-fighting use will be provided by connecting to the existing municipal watermain on Landsdown Drive and a private watermain with the Valley Road development. Due to the difference in elevation between the site and existing sanitary sewer a gravity connection to Landsdown is not feasible. Therefore the sanitary sewer will discharge via gravity to the existing sanitary pumping station located in the adjacent Valley Road development, where it will be pumped to the Landsdown sanitary sewer.

The storm sewer outlet for the proposed development is the wetland itself. Therefore, the storm sewer and spreader swale outlet structure are within the 30 m wetland buffer. This servicing disturbance in the wetland buffer is considered necessary and unavoidable for the following reasons:

- There are no other feasible storm sewer outlets available for this site. The storm sewer at Landsdown Dr. is at a higher elevation than the site storm sewers and does not have the capacity for the site storm flows. The site naturally drains to the wetland, which is maintained by storm water.
- The proposed trail was designed to be set at existing grade, as much as feasible, to minimize the re-grading disturbance in the wetland buffer. As such, there is an existing low point in the proposed trail alignment near the northwest corner of the property. The City's trail design criteria require a swale on the high side and parallel to the swale prevent overland flow over the trail surface. At low points in the swale/trail profile, a culvert is required to direct these flows under the trail to the low side. As a culvert was required at this location anyway, and the storm sewer outlet needed to be on the low (north) side of the trail to meet the trail design criteria, this location was also chosen for the storm sewer outlet.
- The trail was located as far away from the wetland as possible, which is the toe of the grading disturbance discussed in *Section 4.1.4.*
- The storm sewer spreader swale outlet structure was then located as far away from the wetland as possible by keeping the elevation of the invert of the outlet pipe and the level spreader as high as possible while maintaining the 150 mm required swale depth on the high (south) side of the trail and conveying the 100-yr design storm flows under the trail (three 450 mm diameter pipes at 1.8% slope are proposed).
- Due to the City's trail design criteria, the storm sewer spreader swale outlet must be located north of the trail to prevent overland flow over the trail surface.
- As the 30m wetland buffer area, minus the area required for the site infiltration and surface storage measures, is proposed to be dedicated to the City, a private servicing easement may be required over these lands in favor of the future condominium corporation so that this storm sewer and spreader swale outlet structure can be maintained by the condo corporation.

4.1.3.1. POTENTIAL DEWATERING

Due to the high groundwater elevation, the contractor may be required to provide localized dewatering during service installation to keep the excavation stable and free of water standing water. The pipe bedding material may also need to be site modified during construction (i.e. from sand to stone) to ensure the bedding is not compromised.

The dewatering system shall be maintained and the surrounding area monitored for potential negative impacts such as, but not limited to, sedimentation and erosion. Any negative impacts shall be immediately reported to the Project Engineer.

If groundwater is encountered during servicing, dewatering effluent shall be disposed of so as not to be injurious to public health or safety, property, the environment, fisheries, or any part of the work completed or under construction. All dewatering effluent shall to be directed to a dewatering trap as per OPSD 219.240 for sediment and erosion control prior to discharging overland to the wetland. If required, dewatering traps are to be located entirely on site and out of the 30 m wetland buffer. If the dewatering operation exceeds the capacity of the dewatering trap, or if dewatering trap fails, the operation shall be stopped immediately until a second (contingency) trap is constructed for the dewatering operation to continue. The proposed locations of the dewatering traps (primary and contingency) are shown on drawing C2 in Appendix A.

4.1.4. GRADING

Grading activities will be required for the proposed residential units, internal roads, to create surface SWM storage areas, to maintain minimum separation from the infiltration trenches to the assumed high seasonal high water elevation and cover over the trenches, and for contouring the lots after construction. The proposed site grading will match the existing ground elevations along the perimeter of the property and slope to match existing elevations along the northwest corner of the site within the wetland buffers. The building footings have been set at or above the assumed seasonal high groundwater elevation and the site grading has been raised, as much as feasible, to accommodate the high top of foundation elevations. In an effort to maintain reasonable grades on the roadway and yards and work towards a cut/fill balance on site, proposed residential units have been graded from back to front or as split drainage lots with rear look outs or walk outs. Internal road grades toward the centre of the site were raised to minimize the effect (from the front of the buildings) of the buildings being raised out of the assumed seasonal high groundwater elevations. No grading activities are proposed within Torrance Creek PSW. Some grading activities for the infiltration trenches and SWM surface storage area are proposed within the wetland buffers. These activities were deemed necessary and unavoidable for the following reasons:

- As discussed in *Section 4.1.2*., the estimated seasonal high ground water elevation is as high as 1.37 m below existing ground elevation, the MOE requires a 1 m vertical offset from infiltration measure to the ground water elevation, an infiltration trench depth of about 1 m was required to provide enough storage and infiltration to meet the water budget targets, at least 150 mm of topsoil and sod or seed was provided over the trenches, and the trenches needed to be located behind units 1-5 as shown. Therefore, finished ground elevations over the trenches had to be set well above existing ground elevations. This creates the proposed 3:1 maximum permissible slope (to minimize the disturbance) within the 30m wetland buffer.
- This slope is also required (to a lesser extent) adjacent to the SWM surface ponding area north of units 6-10 in order to retain a sufficient storage volume to meet the SWM quantity control objectives as discussed in *Section 4.1.2*.

- Although the trail is set at existing grades, as much as feasible, some minor pre-grading is required to prepare the subgrade at the trail location for future surfacing by the City.
- The option of shifting the entire site layout to the south to minimize the grading disturbance in the wetland buffer was considered, however, this would eliminate units 17 and 22 and further reduce the depth of units 1-16 and 23-26 (some of which are already more shallow than desired which limits marketability and building layout/design) which could result in the abandonment of the project due to economic feasibility.

At the landscape level the overall slopes will remain the same (i.e. from Landsdown Drive down to the northeast toward the Torrance Creek PSW). At the site level the proposed grading is a single occurrence activity during construction that will permanently alter existing grades over the long term.

4.1.5. CONSTRUCTION OF NEW DWELLINGS

A new residential condominium development consisting of single family dwellings as well as paved roads with water and sewers are proposed. The new condominium development will occupy an area of 1.53 ha. This is a single occurrence activity but is permanent in duration. The most significant change from existing due to this activity will be the increase in impermeable surface. Infiltration will be reduced by the area of the proposed buildings which amounts to approximately 40% of the post-development area on the Dunsire property. The effect of this activity on water balance can be mitigated through the use of LID (infiltration galleries) and SWM controls. The change in use is of low magnitude & extent considering the current maintained disturbance over the majority of the lands proposed for development and the avoidability of the effects through implementation of LID & SWM controls.

4.1.6. HUMAN OCCUPATION

Following site preparation and construction the subdivision will become occupied and human use of the property will increase. Normal use of the dwellings and yards introduce a large and uncertain number of practices but they are generally associated with recreation, residential landscaping and other passive activities. An encroachment study in Kitchener (Taylor, 1992) examined residential encroachments into regionally-designated Environmentally Sensitive Policy Areas (ESPA's). Of 444 lots studied, encroachments were observed on 88% of lots. Types of encroachments onto 'protected' lands included:

- Extension of mowed, planted or cleared property
- Private laneways constructed
- Construction of fences
- Pool construction
- Construction of sheds, swing sets, composters
- Woodpiles and abandoned vehicles
- Construction of permanent buildings
- Dumping of yard debris and garbage, building materials
- Spread of exotic plant species

These activities will vary in frequency and duration but are considered to be repetitive and permanent. A 30 meter buffer is proposed to ensure the ongoing health and ecological integrity of biological and ecological systems in the context of ongoing human activities. All rear yards backing onto natural heritage buffers will have a rear yard fence with no gates. It is assumed that the bulk of activities will

be limited to the lots but there may be encroachment activities into the buffer. The proposed 3:1 slope (*see Section 4.1.4. Grading*) provides a grade separation that will limit the feasibility of many types of encroachment that rely on level ground (i.e. extension of mowed, planted or cleared property; construction of private laneways; construction of sheds, swing sets, composters; etcetera…). Also, once constructed, it is anticipated the proposed future pedestrian trail would, due to the introduction of passive observation opportunity by neighbors and the public, would further contain potential encroachment to the walkway within the 30 m buffer to the Torrance Creek PSW.

4.1.7. RECREATIONAL TRAIL

The City-wide Master Trail Plan conceptually illustrates a municipal pedestrian trail through the proposed buffer to the wetland. The route and design of the trail are considered as part of the development application in order to assess impacts of the City trail on the PSW. The trail alignment is shown in *Appendix C*. The current development proposal includes implementation of the trail's construction to the "Basic Trail Development" standard as per the City of Guelph's current "Specifications for Basic Trail Development". This includes rough grading and seeding. The trail design will adhere to the City standard for a Secondary Off-Road Trail in Minor City Parks and Stormwater Management Areas as stipulated in Figure 5-4 of the Guelph Trail Master Plan included as *Appendix H*.

As the trail is not to be open to the public until fully developed and connected to north & south sections by the City at some point in the future, assessment of impacts from user activities is not considered in this report and will need to be assessed by the City when full development and opening of the trail to the public commences.

Activities associated with the basic trail development include:

Alignment – Multiple alignments for the trail were investigated. The final proposed alignment was selected to be at the furthest possible distance from the edge of the PSW, while simultaneously preserving the maximum number of trees. The area for the proposed alignment is through vegetation Units 1, 9 & 11 which are cultural meadow & anthropogenic communities respectfully. The grading and seeding of the basic trail will be a temporary disturbance and will not substantially change the structure, composition or function of this area.

Encroachment - There are no existing ad hoc trails through this area and no known destinations within the adjacent wetland that would be cause to expect their development in the future. The property has been well maintained and existing debris is not a concern.

Grading - The rough grading of the trail results in minimal site disturbance due to the existing flat landscape. The details can be seen as per the SBM Grading Plan (*Appendix C*).

Re-vegetation - The re-vegetation of the trail alignment can be seen as per *Figure 21: Vegetation Compensation Plan (Conceptual)*.

Future recreational use – The trail will be closed to pedestrians in the foreseeable future until connections are made both to the north and south of the site. The City will assess the effects of public users when full development and opening of the trail commences.

4.1.8. BIODIVERSITY ENHANCEMENTS

Along with the disturbance activities the proposed site alterations include restorative enhancements to the vegetation community. Biodiversity enhancement activities include removal of invasive exotic species, new and replacement planting of native tree, shrub and groundcovers, tree preservation, edge management and buffer establishment, fencing and conveyance of proposed buffer lands to the City of Guelph. Enhancements will be implemented at time of construction and are therefore a single occurrence activity but they will take place across the site and remain for the long term. Biodiversity enhancements are detailed in *Section 5.2 Compensation* and on *Figure 21: Vegetation Compensation Plan (Conceptual)*.

4.2. IMPACT ASSESSMENT

The impacts of the activities of the proposed development are assessed in *Table 11 – Impact Summary Matrix*.

Table 11. Impact Summary Matrix

<table>
<tr><th>Activity</th><th>Potential Impact</th><th>Likelihood of Occurrence</th><th>Magnitude / Extent</th><th>Duration / Frequency</th><th>Avoidability / Reversibility</th><th>Significance</th></tr>
<tr><td rowspan="4">Vegetation Removal</td><td>Modification of the existing vegetation community.</td><td>This will occur as a result of implementing the proposed site plan.</td><td>• The Dunsire Property is 1.87ha in size. The proposed residential development will remove 1.60 ha of existing vegetation with another 0.17 ha of disturbance from trail and grading development for a total of 1.77ha (94.65%) of the site disturbed.
• Clearing operations will not remove the vegetation cover of natural ELC features from the Dunsire Property; although, Unit 8 (Coniferous Plantation Ecosite) is considered to be part of the Significant Forest.
<table>
<tr><th>Community Series</th><th>ELC Code</th><th>Vegetation Community Name</th><th>Total Area (ha)</th><th>Area to be Impacted (ha)</th></tr>
<tr><td>Anthropogenic</td><td>ANTH</td><td>Anthropogenic</td><td>0.55</td><td>0.49</td></tr>
<tr><td>Cultural</td><td>CUP3</td><td>Coniferous Plantation Ecosite</td><td>0.18</td><td>0.15</td></tr>
<tr><td>Cultural</td><td>CUM1-1</td><td>Dry Moist Old Field Meadow</td><td>1.05</td><td>1.05</td></tr>
<tr><td>Cultural</td><td>HR</td><td>Hedge Row</td><td>0.08</td><td>0.08</td></tr>
<tr><td>Cultural</td><td>CUW1</td><td>Mineral Cultural Woodland Ecosite</td><td>0.00</td><td>0.00</td></tr>
<tr><td>Aquatic and Wetland</td><td>SWC3-2</td><td>White Cedar – Conifer Organic Coniferous Swamp</td><td>0.01</td><td>0.00</td></tr>
<tr><td colspan="3">Total</td><td>1.87</td><td>1.77</td></tr>
</table></td><td>• One time occurrence, (i.e. during construction).
• Will result in permanent shift in vegetation community composition.</td><td>• It is not possible to avoid the removal of vegetation in order to implement the proposed site plan. The existing vegetation communities will change as a result of the removal. It is possible to reverse this impact by replanting; and, it is possible to improve the existing vegetation community composition through the following mitigation & enhancement measures:
i. Removal of exotic invasive species thereby removing a potential seed source that could invade Torrance Creek PSW.
ii. Provision of habitat enhancement structures as part of the design.</td><td>Impact is neutral (neither positive nor negative) and of Low Significance due to:
• Certain likelihood,
• Moderate magnitude relative to area disturbed,
• Duration is temporary but changes are permanent,
• Will result in an overall benefit in ecological function over time through implementation of mitigation and enhancement measures.</td></tr>
<tr><td>Modification of the existing Arboricultural Resources.</td><td>This will occur as a result of implementing the proposed site plan.</td><td>• Removal of 147 trees on Dunsire Property of which 109 trees qualify for compensation as per the City of Guelph Tree By-law. Trees that do not qualify for compensation include trees that are considered invasive species, hazardous trees, and trees in poor biological health as observed by signs of disease and dieback during tree survey.</td><td>• One time occurrence, (i.e. during construction).
• The loss will be temporary as new plantings are proposed to replace and enhance canopy cover.</td><td>• It is not possible to avoid the removal of trees in order to implement the proposed site plan. It is possible to reverse this impact by replanting; and, it is possible to improve the overall floral species composition including woody and herbaceous species through the following mitigation & enhancement measures:
i. Tree protection fencing erected around disturbance zone(s);
ii. Removal of invasive species;
iii. Overall increase in the quality and quantity of vegetation through biodiversity enhancement plantings to restore habitat and forest edge feature and function;
iv. Restore species and structural diversity (forest edge) by providing a greater number of propagation units (seed, potted stock and tree whips) compared to strictly caliper tree planting;
v. Caliper tree plantings in open areas within the wetland buffer to provide aesthetic feature for trail and adjacent properties; and
vi. Dense shrub layer plantings at forest edge to prevent encroachment by invasive exotic plants and anthropogenic activities.</td><td>Impact is positive and of Low Significance due to:
• Certain likelihood,
• Moderate magnitude relative to area disturbed,
• Duration is temporary but changes are permanent,
• Will result in an overall positive benefit to ecological function over time through removal of exotic species and replacement of native species.</td></tr>
<tr><td>Construction disturbance of wildlife</td><td>Moderate; disturbance is possible and dependent on the season and duration of construction activities.</td><td>• Clearing operations may disturb wildlife and interfere with nesting birds (if conducted in the breeding season).
• The extent of construction disturbances is limited to portions of the property outside the PSW.
• No significant wildlife species were confirmed as users of the Dunsire Property for breeding, forage or overwintering functions.</td><td>• From time of commencement construction activities could range between 6 months to a year.
• Construction activities are a single occurrence activity.</td><td>• It is possible to avoid or reduce the magnitude of the disturbance if vegetation removal and/or general construction works take place outside the breeding bird season. In Guelph the breeding bird season corresponds roughly to the period between April 15th and July 31st.</td><td>Impact is neutral and of Low Significance due to:
• Moderate likelihood
• Low sensitivity of potential targets
• Temporary duration
• Impact can be avoided by timing of activities</td></tr>
<tr><td>Decreased soil stability</td><td>Soil disturbance will occur due to grubbing.</td><td>• Vegetation clearing and grubbing activities will make portions of the site temporarily more susceptible to erosion.</td><td>• From time of commencement construction activities could range between 6 months to a year.
• Construction activities are a single occurrence activity.
• Soil stability will be restored upon Re-vegetation of the site.</td><td>• It is not possible to avoid soil disturbance in order to grub out the root systems of trees to accommodate construction of the proposed residential dwellings, access routes and their amenities.
• Soil destabilization may result in increased erosion and loss of soil.
• Sedimentation in the adjacent natural areas can be avoided through use of sedimentation and erosion control (SEC) measures.
• Soil destabilization is reversible through Re-vegetation following construction.</td><td>Impact is neutral and of Low Significance due to:
• Certain likelihood
• High magnitude relative to area disturbed
• Duration is temporary
• The frequency is a single occurrence event
• Negative impacts can be <u>avoided</u> through the use of SEC measures
• Soil destabilization can be <u>reversed</u> through Re-vegetation</td></tr>
</table>

Activity	Potential Impact	Likelihood of Occurrence	Magnitude / Extent	Duration / Frequency	Avoidability / Reversibility	Significance
Grading	Import/ Export of Fill	Grading is certain. Some gravel will be required for foundations of dwellings and driveways. Some top soil may be imported to amend lawn and garden amenities.	• The import of fill is limited to the portion of the property included in the Vacant Land Draft Plan of Condominium and will be of low volume as it will be required only for foundations and amenities. • Imported fill will be of divergent origin and character to that of existing and may affect stability and/or permeability functions. However, as the imported material will be used primarily as a base for structures the overall magnitude will be commensurate to that caused by the construction of new roads/dwellings. • Existing soils are already disturbed due to tilling activities and importation of new material should not result in the loss of native or displacement of native material. • Importation of topsoil may bring in weed seed from invasive exotic species. However, much of the site is already covered by invasive exotic species and it is not expected that any imported species would represent a greater threat to biodiversity than what is already present.	• Once imported the duration of the fill placement is considered permanent. • This is a single occurrence event.	• Granular fill is required to construct stable foundations for dwellings and driveways and is therefore unavoidable. Careful stockpiling and amendment of existing topsoil may allow avoidance of importing additional topsoil. • Once imported and placed it is not possible to reverse this impact while maintaining the proposed residential dwellings.	Impact is ***negative*** and of **Low Significance** due to: • Probable likelihood • Sensitivity of target is low and the extent is limited • The effect of the impact is permanent • Avoidance is not possible & irreversible
	Construction disturbance of wildlife	Moderate; disturbance is possible depending on the season and duration of construction activities.	• Grading operations may disturb wildlife and interfere with nesting birds (if conducted in the breeding season). • No significant wildlife species were confirmed as users of the site for breeding, forage or overwintering functions.	• From time of commencement construction activities could range between 6 months to a year. • Construction activities are a single occurrence activity.	• It is possible to avoid or reduce the magnitude of the disturbance if grading activities and/or general construction works take place outside the breeding bird season. In Guelph the breeding bird season corresponds roughly to the period between April 15th and July 31st.	Impact is ***neutral*** and of **Low Significance** due to: • Moderate likelihood • Low sensitivity of potential targets • Temporary duration • Impact can be avoided by timing of activities
	Decreased soil stability	Soil disturbance will occur due to grading	• Grading activities will make portions of the site temporarily more susceptible to erosion and/or sedimentation.	• From time of commencement construction activities could range between 6 months to a year. • Construction activities are a single occurrence activity. • Soil stability will be restored upon Re-vegetation of the site.	• It is not possible to avoid soil disturbance in order to grade the site to accommodate construction of the proposed residential dwellings, access routes and their amenities. • Soil destabilization may result in increased erosion and loss of soil. • Sedimentation in the adjacent natural areas can be avoided through use of siltation fencing erected around disturbance zone in conformance with GRCA 2006 Erosion and Sedimentation Control Guidelines for Urban Construction. • Soil destabilization is reversible through Re-vegetation following construction. Temporary seed mix/annual nurse crop grass species within limits of disturbance.	Impact is ***negative*** and of **Low Significance** due to: • Certain likelihood. • High magnitude relative to area disturbed. • Duration is temporary. • The frequency is a single occurrence event. • Negative impacts can be avoided through the use of ESC. • Soil destabilization can be reversed through Re-vegetation.
	Potential alteration of drainage patterns	Moderate; minor changes to local drainage will occur around dwellings and vehicular/ pedestrian routes. There are no major changes proposed to overall drainage patterns for flows onto and off of the site.	• The Preliminary Site Servicing and SWM Design Report by KAM Engineering / SBM Ltd. shows the intent of the stormwater management scheme is to match, as much as feasible, the pre-development conditions of the site by maintaining similar drainage patterns to the existing wetland. The stormwater management system is a "treatment train" approach with lot level, conveyance, and end-of-pipe controls to provide the required water quality and quantity controls for the development. See *Section 6* of the SWM report for more detail. • The intent of the water budget scheme is to meet the GRCA's assumed objective to balance average annual pre and post development surface runoff volumes. Infiltration trenches were designed/sized to meet this objective. See *Section 5.1* of the SWM report for more detail. • Under post-development conditions, a 0.29 ha portion of the site area within the 30m wetland buffer (A7) drains uncontrolled to the north to the existing GRCA wetland, which matches the existing drainage pattern for this area. This uncontrolled drainage area has post-development surface characteristics (and therefore runoff volumes) matching pre-development conditions, and therefore is excluded from the water budget and SWM modelling Runoff volumes from the internal roads and private driveways are controlled for quality (80% min. removal of total suspended solids) using an oil/grit separator (OGS) for pre-treatment prior to the infiltration swales which is considered a best management practice as per the Credit Valley Conservation Authority's Low Impact Development Stormwater Management Planning and Design Guide *Section 4.4*. Total site runoff is also controlled for quantity (flows from the 2, 5, 25, and 100-year storm events are attenuated to the pre-development levels) by the site SWM system prior to discharging to the GRCA wetland.	• Temporary, during construction • Will cause permanent changes to site.	• This impact will be largely avoided as existing drainage conditions will be maintained to adjacent natural area.	Impact is ***neutral*** and of **Low Significance** due to: • Maintains existing runoff conditions to natural area. • Can be mitigated by installation of quantity and quality controls (as outlined in The Preliminary Site Servicing and SWM Design Report by SBM Ltd.).
Servicing	Construction of storm sewer and spreader swale outlet	- Will occur as the wetland is the feasible storm water outlet for this site	• Impacts for these activities are associated with the grading activities required for their installation and are outlined above in the section on grading. • The locations and details are shown on the site engineering drawings provided. A private servicing easement may be required over these lands in favor of the future condominium corporation so that this storm sewer and spreader swale outlet structure can be maintained by the condo corp.	• Construction activities are a single occurrence activity. • It is anticipated that maintenance activities within the wetland buffer would take place one day per year.	• It is not possible to avoid this servicing disturbance as this site storm outlet and estimated annual maintenance is required for the development	Impact is ***negative*** and of **Low Significance** due to: • Certain likelihood. • Construction duration is temporary and the frequency is a single occurrence event. • Maintenance duration is very minor (1 day assumed) and frequency is assumed to be once per year at most. • Disturbance is limited to the proposed easement

Activity	Potential Impact	Likelihood of Occurrence	Magnitude / Extent	Duration / Frequency	Avoidability / Reversibility	Significance
						area only (as shown on the site engineering drawings provided) • Negative impacts can be avoided through the use of ESC and disposing of material collected during maintenance off-site.
	Dewatering effluent discharging to wetland	Low - only if groundwater is encountered during servicing	• If localized dewatering is required, dewatering effluent shall be shall to be directed to a dewatering trap as per OPSD 219.240 for sediment and erosion control prior to discharging overland to the wetland. If required, dewatering traps are to be located entirely on site and out of the 30 m wetland buffer. If the dewatering operation exceeds the capacity of the dewatering trap, or if dewatering trap fails, the operation shall be stopped immediately until a second (contingency) trap is constructed for the dewatering operation to continue.	• construction activities are a single occurrence activity	• avoided if groundwater is not encountered during servicing and if it is, impacts will be mitigated through the use of dewatering traps	Impact is ***negative*** and of **Low Significance** due to: • groundwater may not be encountered during servicing and if it is, impacts will be mitigated through the use of dewatering traps
Storm Water Management	Construction of infiltration trenches and surface ponding area (grading) in wetland buffer	- Will occur as they cannot be located elsewhere on site (see *Section 4.1.2.*)	• Impacts for these activities are associated with the grading activities required for their installation and are outlined above in the section on grading. • The locations and details are shown on the site engineering drawings provided. It is proposed that the retained site area include the infiltration trenches and surface ponding area (i.e. not part of the wetland buffer lands dedicated to the City).	• Construction activities are a single occurrence activity.	• It is not possible to avoid this disturbance as alternative site locations were analyzed and deemed unfeasible (*see Section 4.1.2.*).	Impact is ***negative*** and of **Low Significance** due to: • Certain likelihood. • Construction duration is temporary and the frequency is a single occurrence event. • Disturbance is limited to the minimal area these features extend into the wetland buffer (as shown on the site engineering drawings provided). Negative impacts can be avoided through the use of ESC and disposing of material collected during maintenance off-site.
	Potential increase in runoff to the wetland (due to the increase in impervious cover)	Increased impervious cover will occur although potential impacts on water budget (infiltration) and peak flow rates to the wetland (storm water management) have been mitigated through the site engineering design	• The Preliminary Site Servicing and SWM Design Report by KAM Engineering / SBM Ltd. shows the intent of the stormwater management scheme is to match, as much as feasible, the pre-development conditions of the site by maintaining similar drainage patterns to the existing wetland. The stormwater management system is a "treatment train" approach with lot level, conveyance, and end-of-pipe controls to provide the required water quality and quantity controls for the development. See *Section 6* of the SWM report for more detail. • The intent of the water budget scheme is to meet the GRCA's assumed objective to balance average annual pre and post development surface runoff volumes. Infiltration trenches were designed/ sized to meet this objective. See *Section 5.1* of the SWM report for more detail.	• Temporary, during construction. • Will cause permanent changes (though mitigated) to site.	• This impact will be largely avoided as infiltration trenches are proposed to balance average annual pre and post development surface runoff volumes to the wetland and the proposed site SWM features provide quality controls (oil/grit separator provides 80% total suspended solids removal in addition to the LID measures proposed) and quantity controls (peak flows from the 2, 5, 25, and 100-year storm events are attenuated to the pre-development levels prior to discharging to the wetland).	Impact is ***neutral*** and of **Low Significance** due to: • Potential impacts are mitigated through the use of infiltration trenches and site SWM features as described (see the Preliminary Site Servicing and SWM Design Report by KAM Engineering / SBM Ltd. for more detail).
Construction Of New Dwellings	Changes to permeability	This will positively occur as a result of implementing the proposed site plan.	• Infiltration will be reduced by the area of the proposed buildings which amounts to approximately 40% of the post-development area on the Dunsire property. • The effective extent of the impact will be reduced through implementation of infiltration galleries and SWM controls.	• One time occurrence. • Will cause permanent changes.	• This impact is partially avoidable and not reversible. However, compensation can be achieved through implementation of infiltration galleries and SWM controls.	Impact is ***negative*** and of **Moderate Significance** due to: • Certain likelihood. • Low magnitude and extent (affects 40 % of the site). • Causes permanent change. • The effect of the impact can be avoided through use of infiltration galleries and SWM controls.
Human Occupation	Encroachment of Natural Areas	Moderate	• Encroachment activities following establishment of buffers and biodiversity enhancements could affect the long term success of NHS features and functions if encroachment is severe or excessive. • The extent will likely be limited to lands immediately adjacent to the residential landscape and may include conversion of the restored natural habitat of buffer to manicured landscape, and litter or the dumping of yard waste into the restored natural habitat of buffer. This outcome will be partially mitigated by the grade separation which makes certain types of encroachment unfeasible. • The potential magnitude of the impact will be relative to the number of residents able to exhibit encroachment behaviors. In this case it will be limited to 26 new residences.	• Post-construction. • Dependent on education and compliance by residents. • Potential to be long term and iterative.	• May be avoided through education of the future residents to discourage encroachments into vegetated buffers such as dumping of garbage or yard waste; lawn extensions into buffers or features. • May be partially avoided by installing a chain link fence to demarcate the property boundary between the development and the lands conveyed to the City. • May be reversible through enhancement and monitoring of the buffer beyond property line. • Recommend distribution of the City's standard environmental homeowner's manual	Impact is ***negative*** and of **Low Significance** due to: • Moderate likelihood. • Limited extent. • Can be avoided and/or mitigated through fencing and education.
	Ornamental Plantings	Moderate	• Limited to future plantings of the proposed residences. • Ornamental plantings create the potential for the introduction of non-native and invasive plant species to the adjacent natural habitat. • The potential magnitude of the impact will be relative to the number of residents able to exhibit encroachment behaviors. In this case it will be limited to 26 new residences.	• Post-construction. • Dependent on education and compliance by residents.	• May be avoided through education of the future residents to use native or non-invasive species in yard and garden landscaping by providing a stewardship brochure/pamphlet, including guidelines for ornamental plantings. • May be partially avoided by installing a chainlink fence to demarcate the property boundary between the development and the lands conveyed to the City.	Impact is ***negative*** and of **Low Significance** due to: • Moderate likelihood. • Limited extent. • Can be avoided and/or mitigated through fencing and education.
	Increased Predation of	Moderate	• Localized loss of wildlife species populations and reduction in biodiversity.	• Post-construction.	• May be avoided through education of the future residents to keep pets indoors or on a leash by providing a stewardship	Impact is ***negative*** and of **Low Significance** due to:

Activity	Potential Impact	Likelihood of Occurrence	Magnitude / Extent	Duration / Frequency	Avoidability / Reversibility	Significance
	Wildlife by Pets		• The potential magnitude of the impact will be relative to the number of residents able to exhibit encroachment behaviors. In this case it will be limited to 26 new residences.	• Dependent on education and compliance by residents.	brochure/pamphlet. • May be partially avoided by installing a chainlink fence to demarcate the property boundary between the development and the lands conveyed to the City.	• Moderate likelihood. • Limited extent. • Can be avoided and/or mitigated through fencing and education.
	Lighting & Windows	Moderate	• Highly localized disturbance of wildlife use of limited magnitude and extent.	• Post-construction. • Dependent on design of lighting for residential development.	• May be partially avoided by minimizing site lighting in areas adjacent to natural area. This includes use of minimal or muted lighting, use of reflectors to minimize spread of light, use of motion sensors to minimize area lighted all night, and positioning buildings to back onto NHS features. • Where buildings are adjacent to natural areas or dense vegetation, impact may be partially avoided by installing window glazing that should be chosen to minimize the risk for bird collisions.	Impact is ***negative*** and of **Low Significance** due to: • Moderate likelihood. • Limited extent. • Can be mitigated by building design.
Basic Trail Development - Trail Construction	• Vegetation Disturbances • Soil Disturbances	Certain; required by the City of Guelph	• The trail is proposed through existing cultural and anthropgenic communities with a compensation plan to restore native cover with canopy enhancements. This is a low magnitude event with a limited extent. • Bare Ground will occur temporarily as part of basic grading. This is a low magnitude event with a limited extent. Disturbed soils will be mitigate potential erosion by using sediment & erosion control and will be re-vegetated according to the mitigation/compensation plan. • Potential risk from Deadfall; only if trail creates new edges but the proposed alignment does not disturb edges and no hazard trees were found in the arborist's assessment. • Encroachment (future – trail not open to users as part of current development) • Hazard Trees (future – risk to users – none detected in survey – not creating new edges) • Informal Trails (none adjacent to proposed development – possible risk associated with future users but basic trail not open to users as part of current development)	• Single temporary disturbance associated with the construction.	• The end result of basic trail development will not be substantially different from the existing. Disturbance is not avoidable but is reversible and Re-vegetation is anticipated to achieve enhanced native vegetation cover. • The property has been well maintained and existing debris is not a concern; however, debris from construction must be removed to keep the alignment in a natural condition. • Re-vegetation and planting along the trail alignment should proceed according to the recommended mitigation & compensation concepts in *Section 5*. • Timing for installation of basic trail should follow removals and site prep and concurrently with site grading. Re-vegetation and property demarcation would follow.	Impact is ***neutral*** and of **Low Significance** due to: • Certain likelihood. • The magnitude of the change is low to negligible as the basic trail will not result in a substantively different land cover than exists. • The disturbance is a single event and is temporary. • Impacts can be avoided and reversed through proper sedimentation and erosion controls and a vegetation compensation plan. • Mitigation of impacts to the PSW and trees through sensitive alignment.
Mitigation and Biodiversity Enhancement Strategies	Removal of Invasive Exotic Species	This will positively occur as a result of implementing the proposed site plan.	• Exotic species dominate the canopy with a proliferation of understory and ground level invasive species. Removals will occur throughout the Dunsire Property and into the mantle of the woodland to reduce the abundance of undesirable species, reduce the seed source for re-colonization and reduce the competition that may affect the establishment of new native plantings.	• This will be a single occurrence event associated with construction • Removals will affect the ecological diversity of the natural heritage system for the long term	• This activity should not be avoided or reversed.	Impact is ***positive*** and of **Moderate Significance** due to: • Certain likelihood • Limited extent relative to the abundance of invasive exotic species in the overall system • Long term effects • Positive improvement to the biodiversity of the system.
	Tree Preservation Plan	This will positively occur as a result of implementing the proposed site plan.	• This plan will be used to limit the disturbance to treed resources to activities essential to accommodate construction and the proposed dwellings.	• The plan has already been prepared and will be implemented at time of construction	• This activity should not be avoided or reversed.	Impact is ***positive*** and of **High Significance** due to: • Certain likelihood • Implementation is extent throughout the study area • High magnitude due to the sensitivity of preserving canopy and/or high quality native species while ensuring the removal invasive exotics • Long term effects
	Biodiversity Enhancement Plantings	This will positively occur as a result of implementing the proposed site plan.	• The magnitude or relative change as a result of implementing the Biodiversity Enhancement Plantings is low. However, the significance of the change associated with the enhancements is moderate to high due to the number of factors it is employed to mitigate and/or enhance. • The extent or coverage of the Biodiversity Enhancement Plantings is low relative to the site as a whole (0.30 ha or 16%). • The Vegetation Compensation Plan proposes planting 236 caliper trees which represents a 2:1 replacement / removal ratio. • Introduction of a variety of tree sizes including 40mm, 50-60mm, and 1.5-2m native tree whips (70). • Net gain of 2146 m2 of diverse, native vegetation communities. • Biodiversity enhancement and improvement to the structure and function of the forest edge by planting 892 native shrubs. • The establishment of herbaceous ground layer composed of native plants to complete the transition from canopy to shrub thicket to meadow will be accomplished by sowing 1951 m2 with native seed mix. • The resulting CC value of the proposed vegetation community is 3.15 (*see Table 13*). This	• Implementation of the Biodiversity Enhancement Plantings is a single occurrence activity that is permanent in duration.	• This activity should not be avoided or reversed.	Impact is ***positive*** and of **High Significance** due to: • Certain likelihood • Compensates for disturbances due to construction, replaces and enhances canopy losses (2:1), increases quantity native vegetation cover, increases quality of vegetation cover. Consolidates, links and enhances vegetation cover and habitat adjacent to the significant natural heritage features.

Activity	Potential Impact	Likelihood of Occurrence	Magnitude / Extent	Duration / Frequency	Avoidability / Reversibility	Significance
			represents an increase of 1.59 when compared to the average CC value for existing features, which was 1.56. *See Table 3*. Summary of species richness and mean CC.			
	Buffer	This will positively occur as a result of implementing the proposed site plan.	• The magnitude or relative change as a result of implementing the buffer is low. However, the significance of the change associated with the enhancements is moderate to high due to the number of factors it is employed to mitigate and/or enhance. • The extent or coverage of the buffer is low relative to the site as a whole (0.30 ha or 16%). • A positive effect of the implementation of the buffer is the mitigation of other impacts: o Protect natural heritage features from development and vice versa o Manage natural vegetation and the transition to manicured urban spaces o Permit trail development and use while minimizing conflicts with adjoining land uses o Control the spread of invasive plants into natural habitats o Provide supplementary habitat to that in the protected features(s) o Ensure slope stability within the protected area o Attenuate noise from urban uses o Attenuate light from artificial sources o Attenuate temperature impacts of the "urban heat island" o Attenuate wind from urban areas o Attenuate the movement of water-borne chemicals and particulate matter (contaminants, nutrients, sediments) from urban spaces o Prevent and mitigate encroachment from adjoining land uses o Promote ecological functions such as habitat connectivity and biodiversity with implications beyond the local feature • Structural integration of the natural features and functions including root zone integration and immediate interactions with water tables.	• Implementation of the buffer is a single occurrence activity that is permanent in duration.	• This activity should not be avoided or reversed.	Impact is ***positive*** and of **High Significance** due to: • Certain likelihood • Mitigating influence on other potential impacts associated with residential development adjacent to a significant natural heritage feature.
	Conveyance of Natural Heritage Lands to a Public Agency	This will positively occur as a result of implementing the proposed site plan.	• The proponent will offer the lands within the 30m buffer (excluding the SWM Block) to the City of Guelph. • The magnitude associated with placing the natural heritage lands into public ownership is very high as it ensures the conservation of the feature for the long term.	• This will be a single occurrence event • Conveyance of the natural heritage lands to the public will be a permanent change in ownership	• This activity should not be avoided or reversed.	Impact is ***positive*** and of **High Significance** due to: • Certain likelihood • High Magnitude • Large extent • Permanent duration

5. MITIGATION & COMPENSATION STRATEGIES

Having identified the activities associated with the proposed development and assessed the potential impacts of those activities on the existing natural heritage features characterized for the Dunsire Property D&A have designed mitigation and compensation strategies to achieve a net result of no negative impacts or net gain in quantity and/or quality for remnant natural heritage features and functions. The objective of mitigating identified impacts is to protect the natural heritage features and functions or minimize impacts. Mitigation can be described as actions taken during the planning, design, construction and operation of works and undertakings to alleviate [avoid or reduce/minimize] potential adverse effects on features and functions. Compensation is distinct from mitigation in that it addresses the 'residual' impacts that remain after mitigation measures have been implemented. Compensation can take different forms, however the ultimate objective is to ensure that the project will not result in negative impacts. Compensation is the replacement and/or enhancement in either the quantity or quality of the existing features and functions.

The main principles behind mitigation/compensation are:

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

5.1. MITIGATION

In the following sections methods to avoid or reduce identified impacts are acknowledged, and their potential effectiveness assessed.

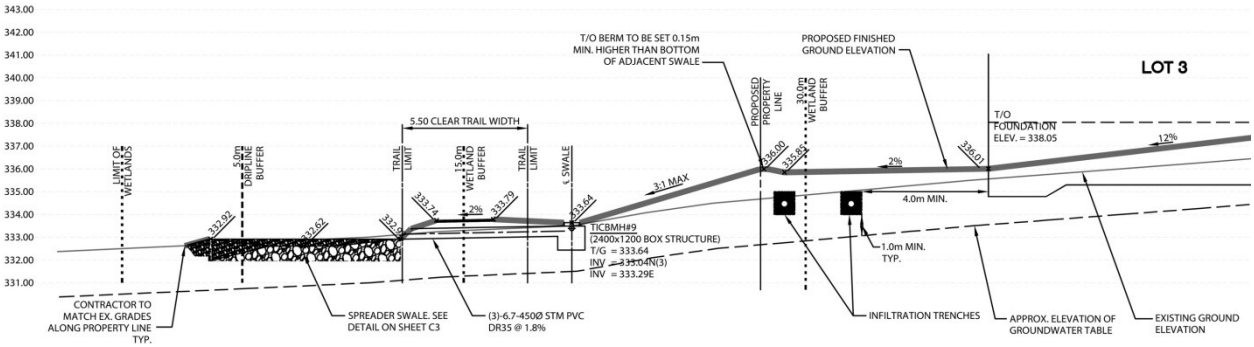
5.1.1. WETLAND BUFFER

The Dunsire property includes the Torrance Creek PSW. This feature is comprised of Significant Woodlands (SW), Provincially Significant Wetlands (PSW) and Significant Wildlife Habitat (SWH). It is recommended that a 30 m buffer be applied to the staked limit of the PSW. The purpose of the buffer is to:

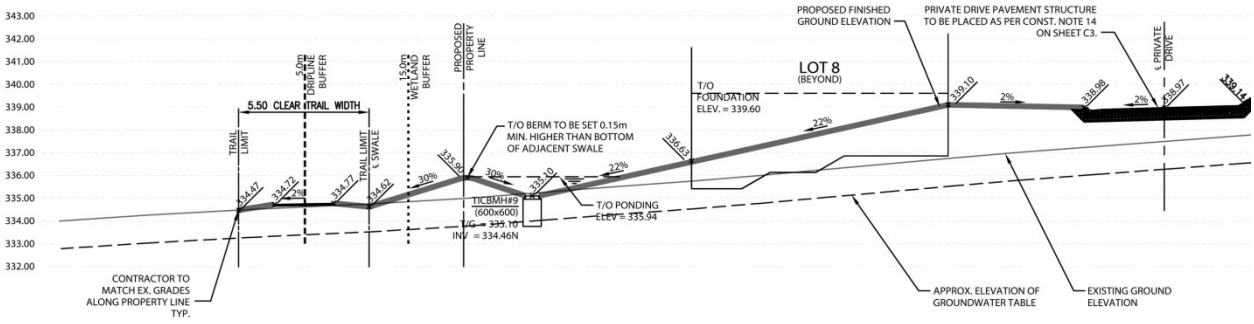
- Protect natural heritage features from development and vice versa
- Manage natural vegetation and the transition to manicured urban spaces
- Permit trail development and use while minimizing conflicts with adjoining land uses
- Control the spread of invasive plants into natural habitats
- Provide supplementary habitat to that in the protected features(s)
- Ensure slope stability within the protected area
- Attenuate noise from urban uses
- Attenuate light from artificial sources
- Attenuate temperature impacts of the "urban heat island"
- Attenuate wind from urban areas
- Attenuate the movement of water-borne chemicals and particulate matter (contaminants, nutrients, sediments) from urban spaces
- Prevent and mitigate encroachment from adjoining land uses
- Promote ecological functions such as habitat connectivity and biodiversity with implications beyond the local feature

This corresponds with the 30 m Vegetation Protection Zone required in the Protected Countryside of the Greenbelt and aligns with the evidence summarized in Section 16.0 - Annotated Bibliography: Adjacent Lands and Buffers Research – of the Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2014.

Further examination of the features and functions at the local level shows that the recommended 30 meters provides an adequate distance for structural integration of the natural features and functions including root zone integration and immediate interactions with water tables. The SWM Study by SBM Ltd. has maintained existing drainage patterns in that the new catchments do not divert water away from their current trajectory toward the PSW and treat runoff for both quantity and quality before discharge. Total site runoff is also controlled for quantity (flows from the 2, 5, 25, and 100-year storm events are attenuated to the pre-development levels) by the site SWM system prior to discharging to the wetland. The sections from the SBM Grading Plan shown in *Figure 15* illustrate the wetland buffer.



PART OF SECTION D-D - SECTION THROUGH INFILTRATION TRENCHES AND SPREADER SWALE
SCALE = N.T.S.



PART OF SECTION E-E - SECTION THROUGH STORMWATER MANAGEMENT DETENTION AREA
SCALE = N.T.S.

SOURCE: SBM GRADING PLAN

Figure 15. Sections D-D and E-E from SBM Grading Plan

The inclusion of grading, SWM infrastructure and a recreational trail within the 30 m buffer has been offset by the habitat enhancement plans with the net effect of providing a more diverse feature that is consolidated with the adjacent PSW expanding the natural edge composition, structure and functions. Naturalized cover is proposed in the Tree Compensation Plan that will initiate succession to achieve forest cover targets.

Anticipated activities associated with the residential landuses will be effectively isolated with encroachment effects confined to the buffer itself, protecting the PSW, Significant Woodland and Significant Wildlife Habitat. The pedestrian trail alignment has been developed to provide the greatest possible setback from the PSW, while minimizing impacts to trees. It's anticipated effects are currently negligible as there will be no substantive change from existing land cover. Further biodiversity enhancements including invasive species removals and native plantings within the buffer are detailed in *Section 5.2. Compensation* of this report.

The development shall install property demarcation as black chain-link fencing along the private/City property line. The fencing shall be on public property and will not have any gates or openings.

5.1.2. SEDIMENT & EROSION CONTROL

The Sediment & Erosion Control Plan is detailed in SBM's Preliminary Site Servicing & Stormwater Management Design Report. The following is an excerpt from that report:

> *Primary sediment control will be achieved with the installation of a heavy duty silt fence to OPSD 219.130 within the 30 m wetland buffer, light duty silt fence to OPSD 219.110 along the north and west property lines outside of the 30 m wetland buffer, and straw bales around catchbasins in rear yard swales. Refer to drawing C1 in Appendix A for locations.*
>
> *Erosion control is provided by the site's SWM quantity controls, limiting the post-development flows to the pre-development levels. Additionally, 300 mm minimum thick 200 mm diameter rip-rap protection is proposed at the pipe outlet to the spreader swale prior to discharging to the PSW.*
>
> *The following sediment and erosion control notes are incorporated on the grading and erosion control plan on drawings C1 and C3 provided in Appendix A:*
>
> 1. *Protect all exposed surfaces and control all runoff during construction.*
> 2. *All erosion control measures to be in place before starting construction and remain in place until restoration is completed.*
> 3. *Maintain erosion control measures during construction.*
> 4. *All collected sediment to be disposed of at an approved location.*
> 5. *Minimize area disturbed during construction.*
> 6. *Limit the size of disturbed areas by minimizing nonessential clearing and grading.*
> 7. *Maintain overland sheet flow and avoid concentrated flows.*
> 8. *If localized dewatering is required, dewatering effluent shall be shall to be directed to a dewatering trap as per OPSD 219.240 for sediment and erosion control prior to discharging overland to the wetland. If required, dewatering traps are to be located entirely on site and out of the 30 m wetland buffer. If the dewatering operation exceeds the capacity of the dewatering trap, or if dewatering trap fails, the operation shall be stopped immediately until a second (contingency) trap is constructed for the dewatering operation to continue.*
> 9. *Protect all catchbasins, manholes, and pipe ends from sediment intrusion with geotextile (Terrafix 270 R or approved equal).*
> 10. *Keep all sumps clean during construction.*

11. *Prevent wind-blown dust.*
12. *Make an effort to retain existing vegetation and stabilize exposed soils with vegetation where, and as soon as possible.*
13. *Straw bales to be used in localized areas as directed by the engineer during construction for works which are in or adjacent to flood lines, fill lines and hazardous slopes.*
14. *Straw bales to be terminated by rounding bales to contain and filter runoff.*
15. *Obtain approval from the City of Guelph and the Grand River Conservation Authority (GRCA) prior to construction for works which are in, or adjacent to wetlands, flood lines, fill lines, and hazardous slopes.*
16. *All silt fencing and details are at the minimum to be constructed in accordance with the Ministry of Natural Resources Guidelines on Erosion and Sediment Control for Urban Construction Sites.*
17. *Additional straw bales, silt fence, and rip-rap materials should be kept on the site for contingency purposes.*
18. *The owner's representative, Mr. Yousif Kazandji (Development Manager) shall (or shall assign someone to) inspect the site at least once a week during construction. In the case of a deficiency in any of the implemented sediment and erosion control measures, the Project Engineer, Mr. Kevin Moniz, P.Eng. (Strik Baldinelli Moniz Ltd.) shall be contacted immediately to determine appropriate repair measures.*
19. *The Project Engineer, Mr. Kevin Moniz, P.Eng., will inspect installed sediment and erosion control measures on a monthly basis, after a rainfall event of 13 mm or greater, or more frequently as required.*
20. *Maintenance shall be carried out, within 48 hours, on any part of the sediment and erosion control features found to need repair.*
21. *Monthly reports (stamped and signed by a Professional Engineer) on the condition of the sediment and erosion control measures will be submitted to the City of Guelph and the Grand River Conservation Authority and will include the following:*
    a. *A brief project description*
    b. *Condition of Existing and Adjacent Site*
    c. *Updated construction drawing detailing the erosion and sediment controls installed*
    d. *The condition of the sediment and erosion control measures*
    e. *Repair requirements for damaged sediment and erosion control measures*
    f. *Inspection requirements during inactive construction periods, and*
    g. *Inspection and maintenance form.*
22. *Once construction and landscaping has been substantially completed, the installed sediment and erosion control shall be removed and any accumulated sediment shall be disposed of off-site at an appropriate location.*

All of the above notes and any sediment and erosion control measures are at the minimum to be in accordance with the Ministry of Natural Resources Guidelines on Erosion and Sediment Control for Urban Construction Sites. The contractor may incorporate additional sediment and erosion control measures to their construction management plan. Additional sediment and erosion control measures

may be required as site-determined by the City of Guelph or Engineer and additional materials (as mentioned in the notes above and on the drawings) are to be kept on-site for this purpose.

5.1.3. MIGRATORY BIRDS

Incidental take of migratory birds, nests or eggs must be avoided by limiting activities during sensitive periods and mitigation measures to ensure appropriate nesting areas are reestablished in the site. Vegetation clearing should not take place within the active nesting season between April 15th and July 31st. If the areas proposed for development are thoroughly checked during the active breeding season for bird nests by a qualified biologist during the construction phase, and no nests are found, then construction may be permitted. However, it is possible to remove vegetation when fewer birds are breeding at the beginning and end of the timing window (i.e. August 1st and April 14th).

5.1.4. TREE PROTECTION PLAN

Trees to be preserved must be protected according to the OPSS 801, which state that tree protection fencing must be installed around trees to be retained at the radius of the dripline. If a 1.5 m clearance zone cannot be established between the limit of grading and the barrier, the barrier can be placed within the dripline but must be a minimum of 0.75 m away from the trunk and the clearance zone must be 1.5 m. A continuous barricade can be formed to protect several trees if they are less than 4.5 m apart. If there is existing fencing which serves the same purpose as the protection fencing than the fencing will connect to the existing fencing, while ensuring sufficient protection to the tree.

Barriers must be at least 1.2 m tall and be supported by steel posts. The number of posts is not specified as long as the fencing material remains erect. Barriers must remain in place for the duration of construction operations. Tree protection fencing will follow City standards SD-90 and SD-90 c. These specifications can be found online at:

http://guelph.ca/wp-content/uploads/PartB_Standard_Contract_Specifications_2014.pdf

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

- No construction equipment is to be stored within the tree protection fencing; signage should be placed on the tree protection fencing at 15 m intervals to inform construction workers to keep outside of the fencing and respect the TPZ;
- If construction work results in the crushing or severing of roots of trees to remain, these roots shall be re-cut by a qualified arborist to create a clean wound;
- If construction work results in the breaking or tearing of branches of trees to remain, these branches shall be re-cut by a qualified arborist to create a clean wound;
- Dead branches shall be pruned from trees to remain by a qualified arborist; and
- Clearing of vegetation within the site as part of site preparation should be conducted in the late fall or winter months (September – April) so as not to coincide with the breeding seasons of birds, as per the Migratory Birds Convention Act. If this cannot be accommodated the site should be surveyed by an avian biologist prior to clearing to ensure that nesting is not taking place.

5.1.5. EDUCATION AND STEWARDSHIP

Preserving the ecological integrity of the Torrance Creek PSW is in dependent upon public awareness about the sensitivities of the adjacent open space. Increasing the level of public awareness can be

achieved through a variety of mechanisms including distribution of educational materials, signage and participation in community based stewardship events.

The distribution of the Guelph Residents Environmental Handbook can serve to educate new residents as to the sensitivities of the adjacent natural area and provide guidance in terms of how they can assist in long term conservation of the open space system.

5.2. COMPENSATION

The guiding ecological principles that form the basis of this plan are:

1. Consolidate, link and enhance the available habitat; and
2. Increase both quality and quantity of vegetation through both on and off-site (Dunsire Property) compensation.

The Vegetation Compensation Plan (*Figure 21*) provides vegetation community targets, planting densities and an analysis of changes proposed to the quantity and quality of vegetation as a result of implementation.

Quality improvements are achieved by:

- Invasive species removal; and
- Biodiversity enhancement (as evidenced by change in Coefficient of Conservatism value).

Quantity improvements will be achieved by:

- On-site enhancement to existing vegetated areas including the existing cultural meadow (Polygon 1) where it abuts the wetland feature and the existing recently disturbed area (Polygon 9); and
- Off-site enhancement to the successional edge of the wetland feature (Polygon 6).

5.2.1. COMPENSATION PLAN

The proposed development will result in a loss of canopy cover due to removal of much of the Austrian Pine Plantation and parts of the Hedgerow. Lost features are summarized in *Table 12*. Enhancements to both on-site and off-site features are also summarized under "Gained Feature Summary". This is followed by a summary of enhanced area, and finally a calculation of net gain.

The Vegetation Compensation Plan includes the replacement of 109 trees with 234 caliper trees, which represents a tree replacement ratio of 2:1. Variable plant material sizes (i.e. 40 mm and 60 mm caliper) are included among replacement trees.

OPA 42 Policy 6.9.1 Vegetation Compensation Plan (part 3) indicates that, "In some cases, re-vegetation may consist of a combination of trees, shrubs and herbaceous species, or may consist exclusively of indigenous herbaceous species and grasses where the restoration objective is to establish a meadow habitat." The Vegetation Compensation Plan is intended to provide enhancement to the ecological function of the woodland in terms of size, integrity, and wildlife habitat by enhancing the edge that includes shrub plantings and native meadow seeding in the 30m buffer.

Table 12. Comparison of lost features and proposed vegetation enhancement

Gained Feature Summary								
#	**TREATMENT AREA**	**PROPOSED ENHANCEMENT & COMPENSATION MEASURES**						
		Area (sq. m)	**50-60mm Caliper Trees**	**40mm Caliper Trees at 3m O.C.**	**Tree Whips at 1.5m O.C.**	**Shrubs at 1.5m O.C.**	**Native Seed Area (sq. m)**	**Notes**
1	**PROPOSED MANTLE**	288		24	11	134	120	Trees to cover 30%, Shrubs to cover 70% of proposed area at maturity. Trees and Shrubs to receive 1 sq. meter mulch ring. Remainder to receive Native Seed mix to establish meadow.
2	**EXISTING MANTLE EDGE**	208		17	8	97		Trees to cover 30%, Shrubs to cover 70% of proposed area at maturity.
3	**EXISTING MANTLE INTERIOR (Plantable Area)**	1415		118	51	660		Invasive species removal followed by tree and shrub plantings. Plantable area is inside 3 meter buffer to allow for drip line of trees in adjacent areas. Trees to account for 30% and shrubs for 70% of plantable area. Final area for planting depends on area resulting from invasive species removal, to be determined at Detailed Design stage.
4a) & 4b)	**PROPOSED SAUM & SLOPE STABILIZATION PLANTING**	1908	77				1831	Sow native meadow mix and caliper tree planting as per City of Guelph Trail Master Plan. Trees to receive 1 sq. meter mulch ring. Remainder to receive Native Seed mix to establish meadow.
	TOTAL	***3819***	***77***	***159***	***70***	***892***	***1951***	
Lost Feature Summary								
		Area (sq. m)	**Removals**	**Compensation Required**				**Notes**
	Trees	-	**147**	**109**				
	Significant Woodland (Poly. 8)	1673						Canopied area being removed - Polygon 8
Net Gain/Loss Summary								
			Trees					
		Area (sq. m)	**60 mm + 40 mm Caliper Trees**	**Replacement Ratio**	**Tree Whips at 1.5m O.C.**	**Shrubs at 1.5m O.C.**	**Native Seed Area (sq. m)**	**Notes**
	TOTAL GAINED FEATURES (From Enhancement Measures)	3819	236	-	70	892	1951	
	TOTAL LOST FEATURES	1673	***109**	-	-	-	-	***Trees requiring compensation**
	NET GAIN:	**2146**	**119**	**2.01**	**70**	**892**	**1951**	**2:1 Tree Replacement Ratio; Net gain to consolidated natural area; overall increase in the native species composition; floral quality improvement: CC from 1.56 to 3.15**

Note that plant material quantities are estimated based on area and proposed spacing. The Vegetation Compensation Plan indicates invasive species are to be removed in "Treatment Area 3 - Existing Mantle Interior". The quantities for removal and subsequent area to be planted are to be determined at the Environmental Implementation Report / Detailed Design stage.

5.3. QUANTIFICATION OF NET EFFECT ON BIOPHYSICAL CONSTRAINTS

The net effect of the development and the mitigation and compensation efforts are examined with a focus on the biophysical constraints of the study area that have been identified in *Section 3.4* of this report. *The Vegetation Compensation Plan (Figure 21*) illustrates a strategy to consolidate, link, and enhance the available habitat.

5.3.1. NET EFFECT ON VEGETATION

Of the trees being removed, 109 qualify for compensation. The Vegetation Compensation Plan proposes planting 236 caliper trees (*see Table 12*). This represents a net gain of 119 caliper trees, or a

2:1 replacement / removal ratio (i.e. for every compensation-qualified tree removed, two trees are to be replaced).

In addition to caliper replacement trees the following quantifiable enhancements are included in the Vegetation Compensation Plan:

- Introduction of a variety of tree sizes including 40mm caliper, 50-60mm caliper, and 1.5-2m tall native tree whips (70).
- Net gain of 2146 m^2 of diverse, native vegetation communities.
- Biodiversity enhancement and improvement to the structure and function of the forest edge by planting 892 native shrubs.
- The establishment of herbaceous ground layer composed of native plants to complete the transition from canopy to shrub thicket to meadow will be accomplished by sowing 1951 m^2 with native seed mix.
- The resulting CC value of the proposed vegetation community is 3.15 (*see Table 13*). This represents an increase of 1.59 when compared to the average CC value for existing features, which was 1.56. See *Table 3. Summary of species richness and mean CC.*

Table 13. Coefficient of Conservatism values under existing and proposed conditions

Feature	**Existing Conditions Mean CC (incl. introduced species)**	**Post Implementation Mean CC (incl. introduced species)**
Existing conditions: Edge of Polygon 1 forming wetland buffer. Proposed Implementation: As per Vegetation Compensation Plan, *Figure 21* - Treatment Areas 4a) and 4b). *See Appendix I* for proposed plant species.	0.54	3.97
Polygon 2. Hedgerow	2.04	3.71
Polygon 4. Dry-Moist Old Field Meadow	0.54	-
Existing conditions: Polygon 6 and 6b. Proposed Implementation: As per Vegetation Compensation Plan, *Figure 21* – Treatment Areas 1, 2, and 3. *See Appendix I* for proposed plant species.	1.38	2.56
Polygon 7. White Cedar - Conifer Organic Coniferous Swamp	3.14	3.14
Polygon 8. Coniferous Plantation Ecosite	1.31	0.00
Study Area	**1.56**	**3.15**

Note on Table 13: Mean CC was calculated following the Floristic Quality Assessment System for Southern Ontario (Oldham et al., 1995), which involves dividing the sum of all CC values for the species occurring in each area by the total number of native and introduced plants in that area.

In summary:

- Caliper Trees - 2:1 replacement: neutral impact (over 15 – 20 years).
- Tree whips – 70 additional native trees: positive impact.
- Shrubs – 892 additional native shrubs: positive impact.
- Groundcover – 1951 m^2. additional native herbaceous groundcover: positive impact.
- CC Value – from 1.56 to 3.15: positive impact.

Therefore, the net effect on the Tree Canopy and the study area's ecological functioning – upon establishment of the Vegetation Compensation Plan - is positive.

5.3.2. NET EFFECT ON SIGNIFICANT WOODLAND

The following is a listing of the ecological functions associated with the Torrance Creek significant woodland that identifies whether or not Polygon 8 plays a contributory role to the maintenance and vitality of the feature and its functions.

Ecological Function Criteria (2010 NHRM pp 68-69)	Does Polygon 8 Contribute to the Ecological Function of the Significant Woodland associated with the Torrance Creek Wetland Complex)?	Is Function Impacted through removal of Polygon 8?	Is Compensation Available to Offset the Function?	Net Impact
a) Woodland Interior	No	No	Yes	Positive
b) Proximity to other woodlands or other habitats	No	No	N/A	Neutral
c) Linkages	No	No	N/A	Neutral
d) Water Protection	No	No	Yes	Neutral
e) Woodland Diversity	No	No	Yes	Positive

Based on the assessment of the functionality of Polygon 8, and its contribution to the ecological function of the Significant Woodland, the removal of Polygon 8 will not affect the status of the Significant Woodland as a whole. Thereby it is evident that the removal of this feature demonstrates no net negative impact to ecological function.

The Vegetation Compensation Plan provides improvements to ecological function of the adjoining Significant Woodland including improvements to:

- Woodland Interior; and
- Woodland Diversity.

The proposed Vegetation Compensation Plan (see *Section 5.2.1* and *Figure 21*) demonstrates a net gain in the ecological function criteria as laid out by the NHRM (2010).

The basic trail being proposed as part of the current development will not interfere with any of the functional attributes supporting the adjacent Significant Woodland (i.e. hydrology, habitat functions) as it is essentially continuing the current use of the land.

The site's existing mantle areas have been disturbed, are non-existent, and/or are primarily composed of invasive species. Generally, these areas will undergo invasive species removal and enhancement plantings to restore a stable edge condition. Invasive species observed on site include:

- Black Locust (*Robinia pseudoecacia*);
- Box Elder / Manitoba Maple (*Acer negundo)*;
- Buckthorn (*Rhamnus cathartica*);
- European Weeping Birch (*Betula pendula*);
- Glossy Buckthorn (*Frangula alnus*);

- Norway Maple (*Acer platanoides*);
- Scotch Pine (*Pinus sylvestris)*;
- Tartarian Honeysuckle (*Lonicera tatarica*); and
- White Willow (*Salix alba)*.

Enhancement plantings will provide increased habitat function by introducing wildlife forage and cover species and deterring encroachment. The ground layer of vegetation in areas leading up to the forest edge will be reinstated by seeding with native meadow species.

The Vegetation Compensation Plan results in an overall increase in the native composition of plant species on the subject property and adjacent lands. In addition to the 2:1 replacement ratio of caliper trees, species and structural diversity (forest edge) is achieved through strategic placement of tree and shrub plantings. The following improvements to the site's ecological resources will result from the proposed treatment approach:

A) Improved Floristic Quality:

The proposed treatments include measures to remove non-native vegetation combined with measures to introduce native vegetation through planting and sowing seed. This approach will result in an improvement to the floristic quality as indicated by an improvement to the coefficient of conservatism. All proposed species in the Proposed Compensation Plan Plant List (*Appendix I*) were checked for regional native status as per Frank and Anderson (2009) The Flora of Wellington County.

B) Improved Function:

i. <u>Increased Patch Size:</u>

- Restoration plantings will ultimately result in a forested community adding to the size of the Significant Woodland by 0.382 ha (a net gain of 0.215 ha).

ii. <u>Integrity:</u>

- The establishment of an intact forest edge consisting of native species that create a transition from canopy to thicket to meadow provides a barrier to encroachment by non-native species.
- Densely stemmed and lightly-thorned "deterrent" shrub species are difficult to pass through for people and pets. Deterrent shrub plantings are proposed at the areas where the forest mantle is to be enhanced or re-established to improve resiliency to potential negative impacts (e.g. residential yard waste, encroachment by pets).

iii. <u>Wildlife Value:</u>

- The establishment of an intact forest edge consisting of native species that create a transition from canopy to thicket to meadow enhances the variety of cover types for wildlife using the forest edge.
- The Vegetation Compensation Plan provides a great number of propagation units allowing for the introduction of a wide range of species including flowering and fruit bearing species such as Nannyberry, Serviceberry, Currants, Raspberries, and Elderberries that will attract wildlife foragers.

C) Improved Aesthetics:

The Vegetation Compensation Plan accounts for the resulting appearance of the trail corridor and open space by providing caliper trees in the Proposed Saum area (*Vegetation Compensation Plan, Treatment Area 4, Figure 21*). Species selections for the plan include flowering species of trees and shrubs such as Serviceberry, Northern Mountain Ash, Roses, and Purple Flowering Raspberry, as well as flowering forbes such as Asters, *Monarda*, and *Rudbeckia*. Screening is provided using conifer plantings where rear yards adjoin the Proposed Saum area.

The net effect on the Significant Woodland and its ecological functions – upon establishment of the Vegetation Compensation Plan - is positive.

5.3.3. NET EFFECT ON SIGNIFICANT WETLAND

The proposed development is limited to the adjacent lands of the PSW. The EIS has determined that there are no significant natural heritage features or functions in the adjacent lands contributing to the integrity of existing biological quality, diversity and functions in the PSW and that the proposed development will not directly diminish the significant attributes of the PSW. Indirect impacts will be mitigated by the implementation of a 30m buffer and vegetation enhancements. The hydrological functions of the adjacent lands do contribute to the integrity of existing biological quality, diversity and functions in the PSW and will be affected by the proposed development. The SWM Study by SBM Ltd. has maintained existing drainage patterns in that the new catchments do not divert water away from their current trajectory toward the PSW and treat runoff for both quantity and quality before discharge. Total site runoff is also controlled for quantity (flows from the 2, 5, 25, and 100-year storm events are attenuated to the pre-development levels) by the site SWM system prior to discharging to the wetland.

The net effect on the Significant Wetland and its ecological functions is neutral.

5.3.4. NET EFFECT ON SIGNIFICANT WILDLIFE HABITAT

Significant wildlife habitat is associated with the PSW & the Significant Woodland. The proposed development is limited to the adjacent lands of the PSW & Significant Woodland. The EIS has determined that there is no significant wildlife habitat in the adjacent lands contributing to the integrity of existing biological quality, diversity and functions in the PSW & Significant Woodland and that the proposed development will not directly diminish the significant attributes of the PSW & Significant Woodland. Indirect impacts will be mitigated by the implementation of a 30m buffer and vegetation enhancements.

The net effect on Significant Wildlife Habitat is neutral.

6. RECOMMENDATIONS & CONCLUSION

Dunsire Developments proposes to construct 26 single-family lots, on a common element road plus a freehold lot. The Dunsire Property is located adjacent to Torrance Creek PSW. The property is mostly cultural meadow with a hedgerow and plantation composed of primarily exotic canopy species.

Through field surveys and background review it was determined that there are no endangered, threatened, or rare species located within the Study Area. Torrance Creek PSW is known to contain many significant species. The proposed development includes a 30 m along the Torrance Creek PSW to protect the features and function of the wetland.

The proposed development plans to remove 1.77 ha of vegetation from the Dunsire property; the majority of which is cultural meadow and anthropogenic in composition but will also include tree and associated understory removal in the Austrian Pine Plantation, hedgerow and select specimen trees around the property perimeter including invasive species removals. The north east edge of the property, along Torrance Cree PSW, was noted to be infested with buckthorn and other invasive species which is being proposed to be removed in the Biodiversity Enhancements. There are no removals proposed within the Torrance Creek Wetland.

The tree inventory determined that there are 254 trees located in the Study Area. 147 of these trees are proposed for removal to accommodate development or as part of proposed mitigation measures. Of the trees proposed for removal, 109 meet the criteria requiring compensation according to the City of Guelph Tree By-Law and OPA 42.

The proposed Vegetation Compensation Plan recommends both quality and quantity enhancements through linking and improving the existing habitat within the Dunsire Property as well as within Torrance Creek PSW. This will be achieved through the removal of invasive species and replacing them with native species therefore increasing biological and structural diversity. Removal and planting will occur within the Mantle, and Saum. Quality improvements are measurable through a comparison of pre and post development Coefficient of Conservatism (CC) values. Within the proposed compensation area the current CC value is 1.56. It has been determined that the CC value after removal and planting will be 3.15.

Through the careful characterization of existing resources, an examination of the activities and impacts associated with the proposed development (both positive and negative) it is the conclusion of this Environmental Impact Study, that the proposed residential development will **not result in any net negative impacts** to the environmental integrity of the Study Area and the Torrance Creek PSW **so long as the proposed mitigation and compensation measures are fully implemented**.

6.1. RECOMMENDATIONS

- **Monitoring**
  - A monitoring plan will be required to ensure that the proposed mitigation and compensation measures perform as intended. The monitoring plan will consist of baseline, during construction, and post construction stages. Deficiencies identified through

monitoring activities will be addressed by Dunsire Developments to the satisfaction of the City of Guelph.

Table 14. Monitoring Plan requirements

Function/Feature	Baseline Monitoring	During Construction Monitoring	Post Construction Monitoring
Erosion and Sediment Control	The existing site does not exhibit signs of erosion concerns. The existing vegetation appears to be sufficient to prevent erosion and major sedimentation to the PSW.	Prior to construction, the sediment and erosion control plan provided in Section 7 of SBM's Preliminary Servicing and Stormwater Management Report and the Site Engineering Drawings in *Appendix A* of that report will be implemented. The routine monitoring and noted in the plan will be implemented during construction to protect the PSW from erosion and sedimentation.	The Project Engineer, Mr. Kevin Moniz, P.Eng., shall complete a final inspection of the site after the first rainfall event of 13 mm or greater after the sediment and erosion control features have been removed, to ensure the completed SWM features and vegetation are adequately protecting the PSW from erosion and sedimentation.
Wetland	Plant lists from two season vegetation surveys provided in the Landsdown Drive EIS provide baseline conditions.	Immediate responses in plant communities are not expected as a result of construction. No monitoring is proposed for during the construction period.	- Monitoring for change in vegetation communities to occur annually for 3 years beginning the same year as construction is complete. - Vegetation monitoring in plot based distribution within staked wetland. - Monitor for indicators of change, i.e. composition & abundance, CC, wetness index.
Compensation	Plant lists from two season vegetation surveys provided in the Landsdown Drive EIS provide baseline conditions.	Construction inspection including plant material (conformity to detailed design specifications), plant handling procedure, planting procedure, plant layout. - Acceptance of new plant material at time of Substantial Completion.	- Warranty monitoring consisting of two season inspections (spring and fall) for two years to monitor restoration planting performance. - End of warranty period inspection. - Acceptance of retained trees.

- **Construction**
  - The property has been well maintained and existing debris is not a concern; however, debris from construction must be removed to keep the alignment in a natural condition.

- Recommend property demarcation fencing to prevent encroachment – show fencing on Vegetation Compensation Plan – reference City's Demarcation Policy.
- Sediment and Erosion Controls should proceed according to the plan provided in *Section 7* of the SWM report.
- Recommend that a certified arborist be on-site during grading operations around trees identified as "Preserve if Possible" on the Tree Preservation Plan.

➢ **Buffer**

- Recommend that following construction and restoration, the lands comprising the buffer to the PSW be conveyed to the City of Guelph.

➢ **Trail**

- Recommend interpretive signage – to be detailed as part of Environmental Implementation Report.
- Recommend trail rules signage be provided at all trail access points to address common resident impact items including dumping of yard waste, encroachments, pet waste, etc. – to be detailed as part of Environmental Implementation Report.
- Re-vegetation and planting along the trail alignment should proceed according to the recommended mitigation & compensation concepts in *Section 5*.
- Detailed trail plan showing trail design details (including signage, trail gates, structures, etc.) to be detailed as part of Environmental Implementation Report.
- Timing for installation of basic trail should follow removals and site prep and concurrently with site grading. Re-vegetation and property demarcation would follow.

➢ **Compensation**

- Recommend that compensation should be detailed for construction in the Environmental Implementation Report.
- The proposed locations for compensation planting should be finalized in consultation with the Parks and Open Space and Forestry divisions.

➢ **Post-Construction**

- Recommend distribution of the City's standard environmental homeowner's manual.

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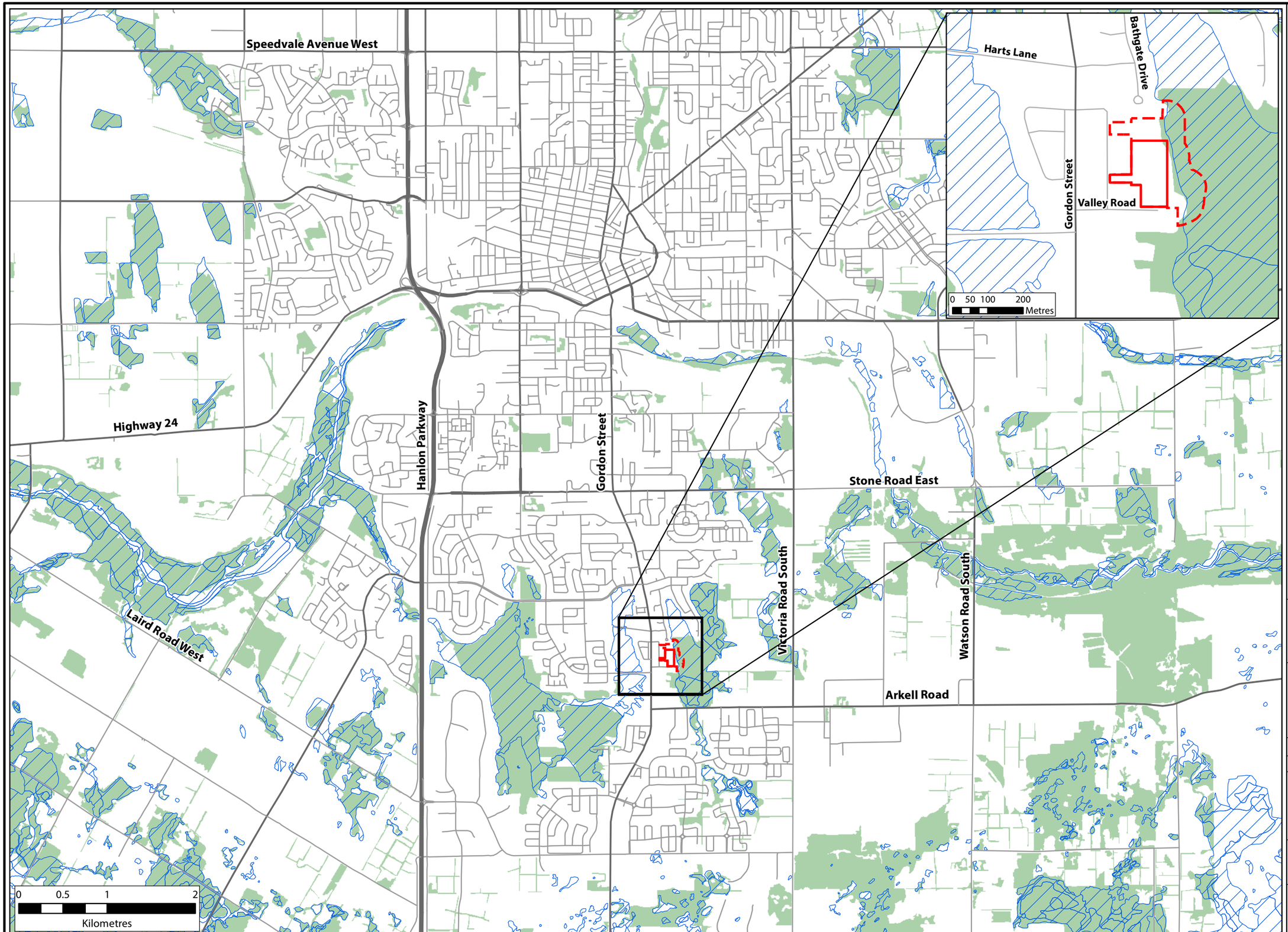
Figure 16. Key Map of Subject Property



Legend

- Dunsire Property
- Study Area
- Wetland (MNR)
- Wooded Area (MNR)

Road

- Expressway / Highway
- Arterial
- Collector / Local

Landsdown Drive EIS
Key Map of Subject Property

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PROJECT: DA13-045-02

CLIENT: DUNSIRE DEVELOPMENTS

DATE: JULY 2014

SCALE: 1:40,000

DRAWN BY: LC

CHECKED BY: TF

UTM Zone 17 NAD83

Figure:

16

Figure 17. Vegetation Communities

7
6
15
6
7b
9
6b
11
5
8
1
4
10
3
12
2
13
14
Landsdown Drive
0 20 40 80
Metres

Legend

- Dunsire Property
- Study Area
- Existing Disturbance (D&A, May 5, 2013.)
- Limit of Wetland as flagged by GRCA & City of Guelph (J.D. Barnes Ltd., June 24, 2013.)
- Edge of Trees delinated by others (J.D. Barnes Ltd., June 24, 2013.)

Condo Draft Plan (July 18, 2014)

- Lot Line
- Proposed Future Lot Line
- Building Envelope
- Proposed Trail
- Proposed Rough Trail Grading

Vegetation Community

- AGR (10)
- ANTH (3, 5, 9,11-15)
- CUM1-1 (1,4)
- CUP3 (8)
- CUW1 (6,6b)
- HR (2)
- SWC3-2 (7,7b)

2006 Orthoimagery (GRCA)

Landsdown Drive EIS
Vegetation Communities

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DATE:JULY 2014

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CHECKED BY: TF

UTM Zone 17 NAD83

Figure:
17

Figure 18. Tree Preservation Plan

Legend

- Study Area
- Dunsire Property

Condo Draft Plan (July 18, 2014)

- Lot Line
- Proposed Future Lot Line
- Building Envelope
- Proposed Trail
- Proposed Rough Trail Grading

Proposed Tree Action *

(Crown shown to scale)

- Preserve
- Preserve If Possible **
- Remove

* **See Appendix D: Tree Inventory Data Table** for "Proposed Tree Action" criteria.

** **Preserve If Possible:** Proximity to the building envelope may damage the root zone to the detriment of the tree; preserve if possible to be determined at the time of construction. Recommendations on pruning to be provided as part of detailed design.

Key Map:

2006 Orthoimagery (GRCA)

Landsdown Drive EIS
Tree Preservation Plan

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UTM Zone 17 NAD83

DATE: JULY 2014

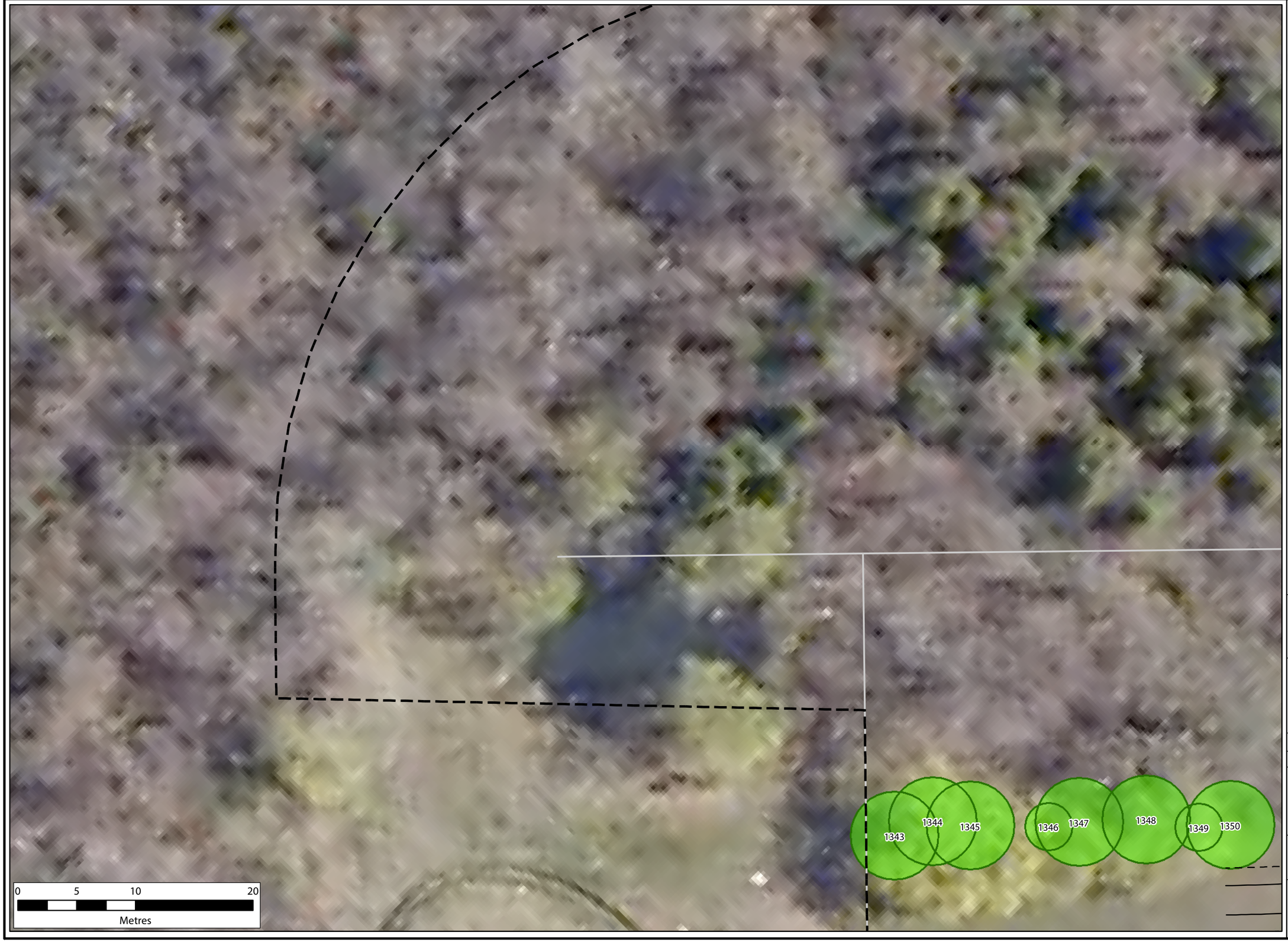
SCALE: 1:1,000

DRAWN BY: LC

CHECKED BY: TF

Figure:

18 - Key Map



Legend

- Study Area
- Dunsire Property

Condo Draft Plan (July 18, 2014)

- Lot Line
- Proposed Future Lot Line
- Building Envelope
- Proposed Trail
- Proposed Rough Trail Grading

Proposed Tree Action *

(Crown shown to scale)

- Preserve
- Preserve If Possible **
- Remove

*** See Appendix D: Tree Inventory Data Table** for "Proposed Tree Action" criteria.

**** Preserve If Possible:** Proximity to the building envelope may damage the root zone to the detriment of the tree; preserve if possible to be determined at the time of construction. Recommendations on pruning to be provided as part of detailed design.

Key Map:

2006 Orthoimagery (GRCA)

Landsdown Drive EIS
Tree Preservation Plan

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PROJECT: DA13-045-02

CLIENT: DUNSIRE DEVELOPMENTS

DATE: JULY 2014

SCALE: 1:300

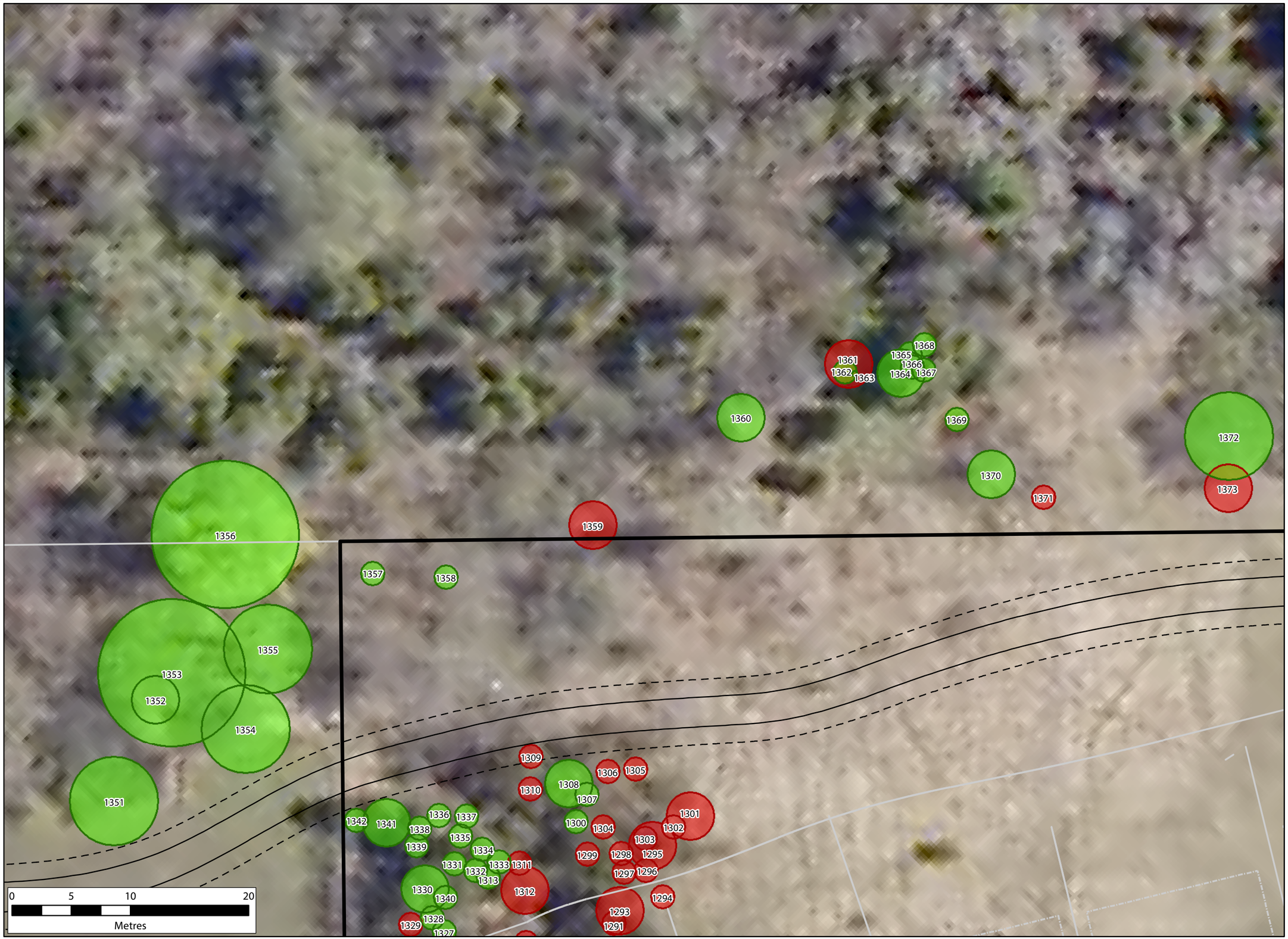
DRAWN BY: LC

CHECKED BY: TF

UTM Zone 17 NAD83

Figure:

18 - 1



Legend

- Study Area
- Dunsire Property

Condo Draft Plan (July 18, 2014)

- Lot Line
- Proposed Future Lot Line
- Building Envelope
- Proposed Trail
- Proposed Rough Trail Grading

Proposed Tree Action *

(Crown shown to scale)

- Preserve
- Preserve If Possible **
- Remove

*** See Appendix D: Tree Inventory Data Table** for "Proposed Tree Action" criteria.

**** Preserve If Possible:** Proximity to the building envelope may damage the root zone to the detriment of the tree; preserve if possible to be determined at the time of construction. Recommendations on pruning to be provided as part of detailed design.

Key Map:

2006 Orthoimagery (GRCA)

Landsdown Drive EIS
Tree Preservation Plan

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

PROJECT: DA13-045-02

CLIENT: DUNSIRE DEVELOPMENTS

DATE: JULY 2014

SCALE: 1:300

DRAWN BY: LC

CHECKED BY: TF

UTM Zone 17 NAD83

Figure:

18 - 2

Legend

- Study Area
- Dunsire Property

Condo Draft Plan (July 18, 2014)

- Lot Line
- Proposed Future Lot Line
- Building Envelope
- Proposed Trail
- Proposed Rough Trail Grading

Proposed Tree Action *

(Crown shown to scale)

- Preserve
- Preserve If Possible **
- Remove

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PROJECT: DA13-045-02

CLIENT: DUNSIRE DEVELOPMENTS

DATE: JULY 2014

SCALE: 1:300

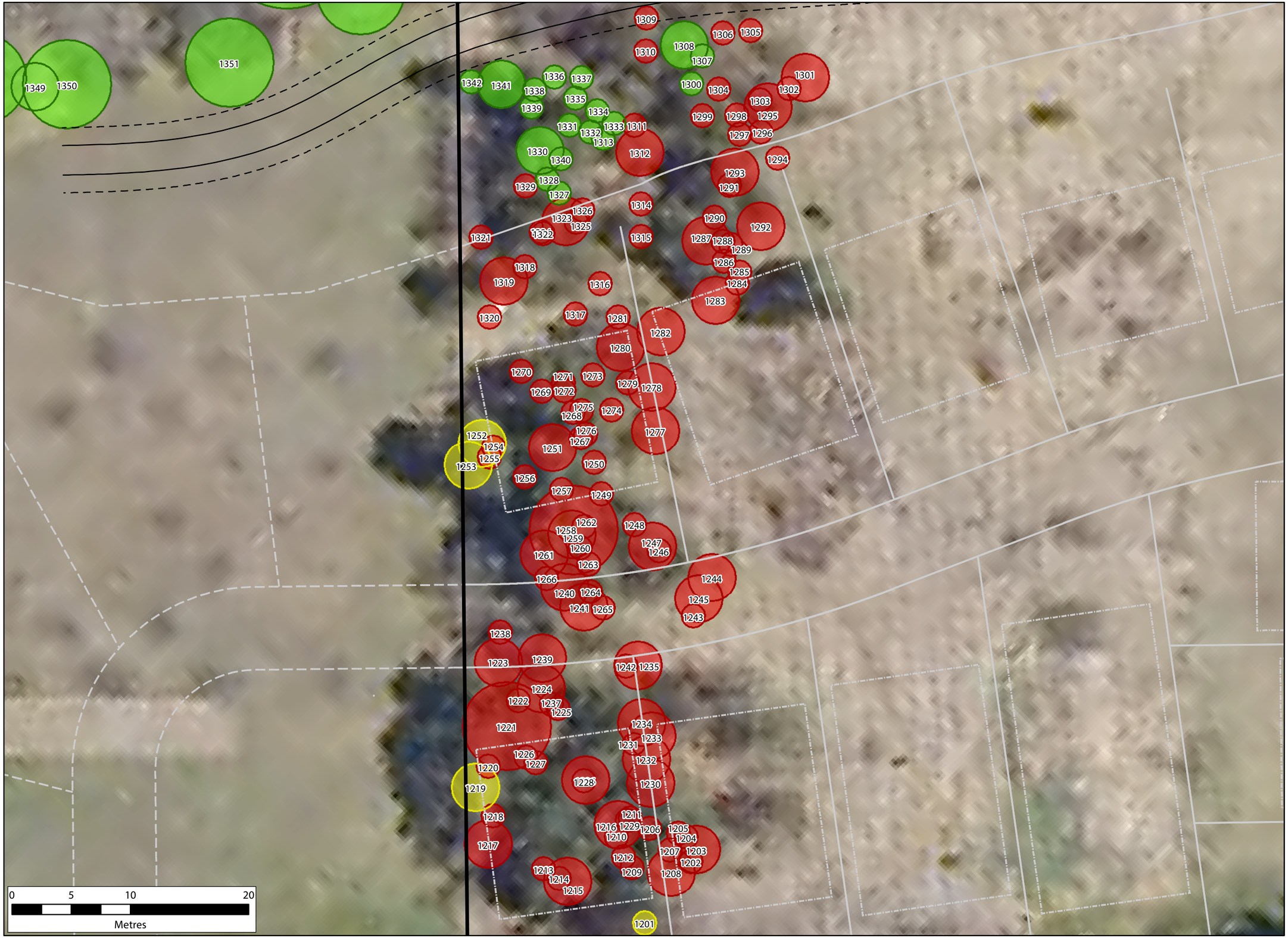
DRAWN BY: LC

CHECKED BY: TF

UTM Zone 17 NAD83

Figure:

18 - 3



Legend

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- Dunsire Property

Condo Draft Plan (July 18, 2014)

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- Proposed Trail
- Proposed Rough Trail Grading

Proposed Tree Action *

(Crown shown to scale)

- Preserve
- Preserve If Possible **
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Key Map:

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Tree Preservation Plan

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PROJECT: DA13-045-02

CLIENT: DUNSIRE DEVELOPMENTS

UTM Zone 17 NAD83

DATE: JULY 2014

SCALE: 1:300

DRAWN BY: LC

CHECKED BY: TF

Figure:

18 - 4

Legend

- Study Area
- Dunsire Property

Condo Draft Plan (July 18, 2014)

- Lot Line
- Proposed Future Lot Line
- Building Envelope
- Proposed Trail
- Proposed Rough Trail Grading

Proposed Tree Action *

(Crown shown to scale)

- Preserve
- Preserve If Possible **
- Remove

*** See Appendix D: Tree Inventory Data Table** for "Proposed Tree Action" criteria.

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Key Map:

2006 Orthoimagery (GRCA)

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Tree Preservation Plan

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PROJECT: DA13-045-02

CLIENT: DUNSIRE DEVELOPMENTS

DATE: JULY 2014

SCALE: 1:300

DRAWN BY: LC

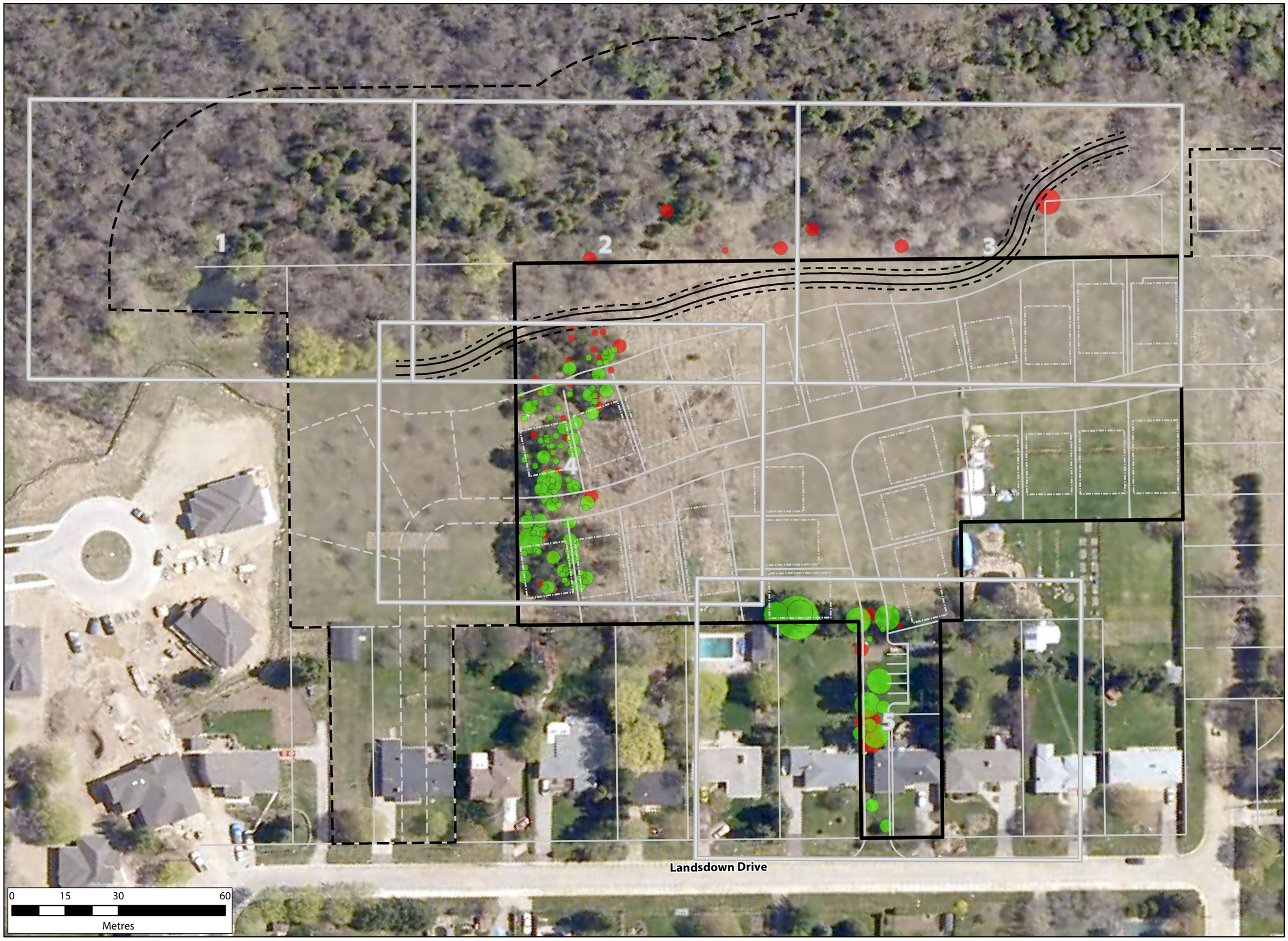
CHECKED BY: TF

UTM Zone 17 NAD83

Figure:

18 - 5

Figure 19. Tree Compensation Plan



Legend

- Study Area
- Dunsire Property

Condo Draft Plan (July 18, 2014)

- Lot Line
- Proposed Future Lot Line
- Building Envelope
- Proposed Trail
- Proposed Rough Trail Grading

Tree To Be Removed *

(Crown shown to scale)

- Compensation Required
- No Compensation Required

* **See Appendix D: Tree Inventory Data Table** for "Compensation Required" criteria.

Key Map:

2006 Orthoimagery (GRCA)

Landsdown Drive EIS
Tree Compensation Plan

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PROJECT: DA13-045-02

CLIENT: DUNSIRE DEVELOPMENTS

DATE: JULY 2014

SCALE: 1:1,000

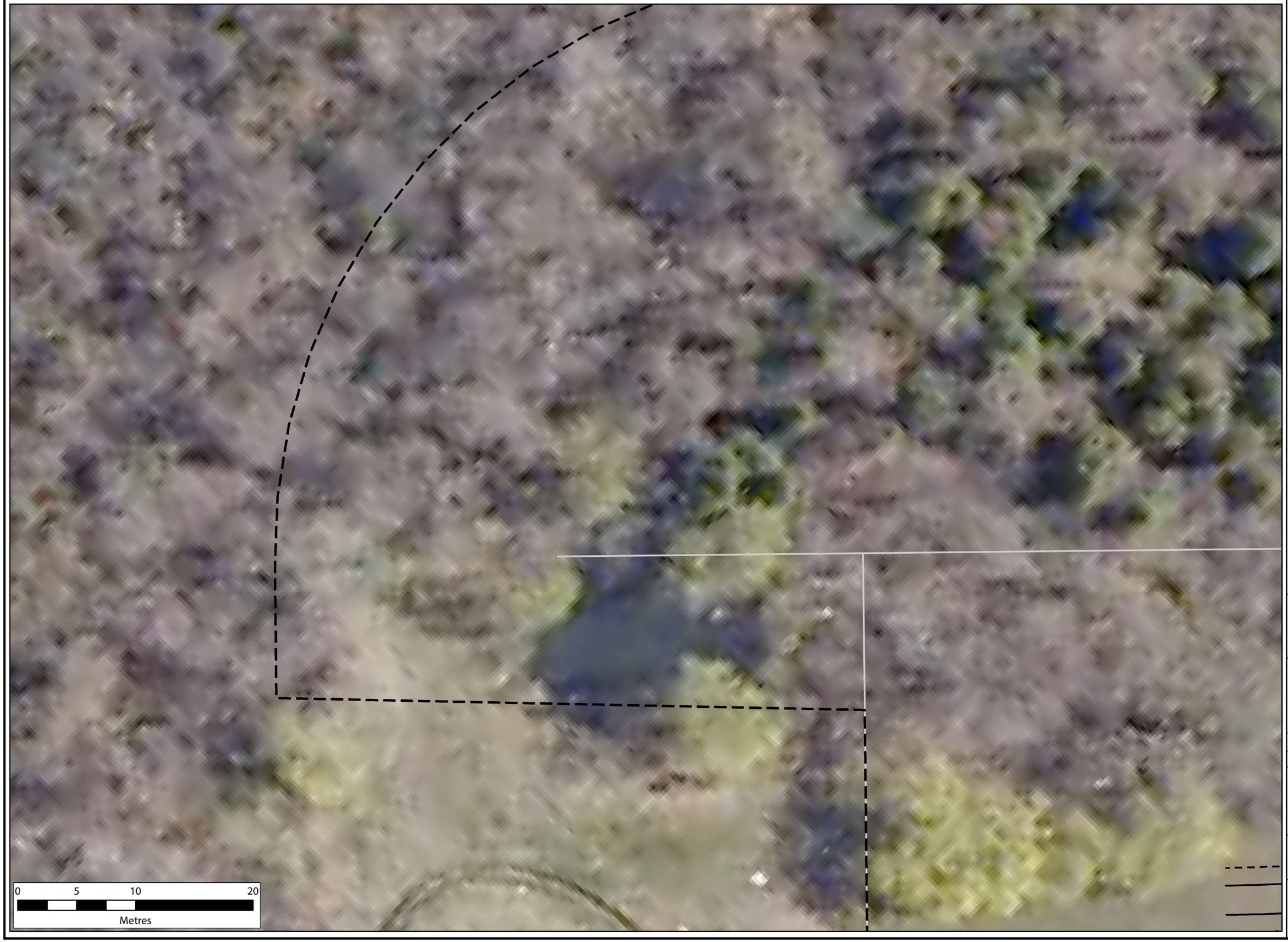
DRAWN BY: LC

CHECKED BY: TF

UTM Zone 17 NAD83

Figure:

19 - Key Map



Legend

- Study Area
- Dunsire Property

Condo Draft Plan (July 18, 2014)

- Lot Line
- Proposed Future Lot Line
- Building Envelope
- Proposed Trail
- Proposed Rough Trail Grading

Tree To Be Removed *

(Crown shown to scale)

- Compensation Required
- No Compensation Required

* See Appendix D: Tree Inventory DataTable for "Compensation Required" criteria.

Key Map:

2006 Orthoimagery (GRCA)

Landsdown Drive EIS
Tree Compensation Plan

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PROJECT: DA13-045-02

CLIENT: DUNSIRE DEVELOPMENTS

N E W S

UTM Zone 17 NAD83

DATE: JULY 2014

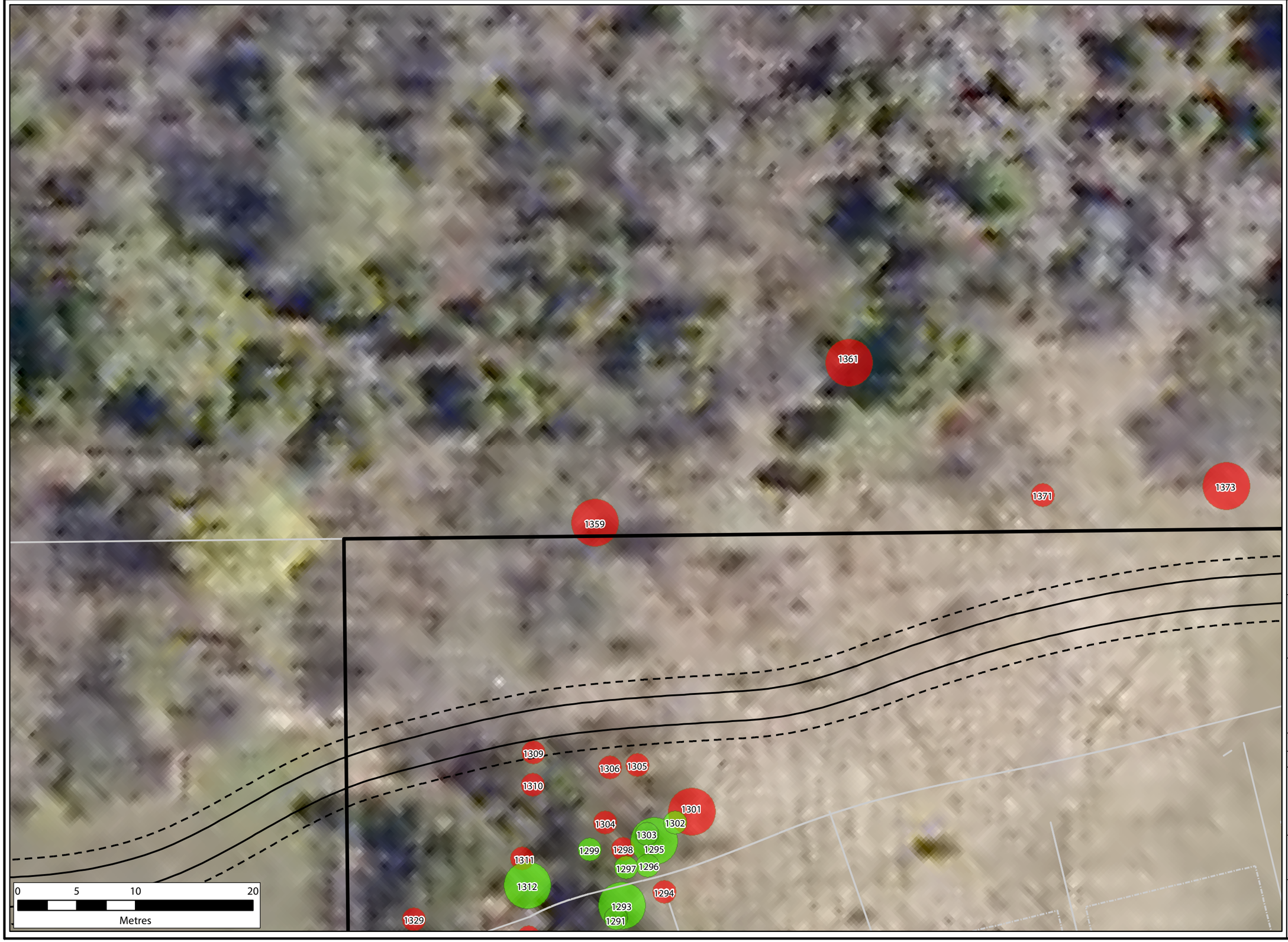
SCALE: 1:300

DRAWN BY: LC

CHECKED BY: TF

Figure:

19 - 1



Legend

- Study Area
- Dunsire Property

Condo Draft Plan (July 18, 2014)

- Lot Line
- Proposed Future Lot Line
- Building Envelope
- Proposed Trail
- Proposed Rough Trail Grading

Tree To Be Removed *

(Crown shown to scale)

- Compensation Required
- No Compensation Required

* See Appendix D: Tree Inventory DataTable for "Compensation Required" criteria.

Key Map:

2006 Orthoimagery (GRCA)

Landsdown Drive EIS
Tree Compensation Plan

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PROJECT: DA13-045-02

CLIENT: DUNSIRE DEVELOPMENTS

UTM Zone 17 NAD83	DATE: JULY 2014
	SCALE: 1:300
	DRAWN BY: LC
	CHECKED BY: TF

Figure:

19 - 2

1374

1377

1391

0 5 10 20

Metres

Legend

Study Area

Dunsire Property

Condo Draft Plan (July 18, 2014)

Lot Line

Proposed Future Lot Line

Building Envelope

Proposed Trail

Proposed Rough Trail Grading

Tree To Be Removed *

(Crown shown to scale)

Compensation Required

No Compensation Required

* See Appendix D: Tree Inventory DataTable for "Compensation Required" criteria.

Key Map:

2006 Orthoimagery (GRCA)

Landsdown Drive EIS
Tree Compensation Plan

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PROJECT: DA13-045-02

CLIENT: DUNSIRE DEVELOPMENTS

N E W S

UTM Zone 17 NAD83

DATE: JULY 2014

SCALE: 1:300

DRAWN BY: LC

CHECKED BY: TF

Figure:

19 - 3

Legend

- Study Area
- Dunsire Property

Condo Draft Plan (July 18, 2014)

- Lot Line
- Proposed Future Lot Line
- Building Envelope
- Proposed Trail
- Proposed Rough Trail Grading

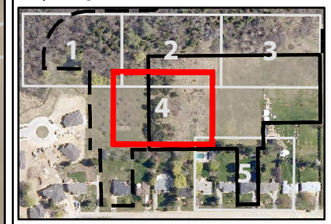
Tree To Be Removed *

(Crown shown to scale)

- Compensation Required
- No Compensation Required

* See Appendix D: Tree Inventory DataTable for "Compensation Required" criteria.

Key Map:



2006 Orthoimagery (GRCA)

Landsdown Drive EIS
Tree Compensation Plan

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PROJECT: DA13-045-02

CLIENT: DUNSIRE DEVELOPMENTS

DATE: JULY 2014

SCALE: 1:300

DRAWN BY: LC

CHECKED BY: TF

UTM Zone 17 NAD83

Figure:

19 - 4

Legend

- Study Area
- Dunsire Property

Condo Draft Plan (July 18, 2014)

- Lot Line
- Proposed Future Lot Line
- Building Envelope
- Proposed Trail
- Proposed Rough Trail Grading

Tree To Be Removed *

(Crown shown to scale)

- Compensation Required
- No Compensation Required

* See Appendix D: Tree Inventory DataTable for "Compensation Required" criteria.

Key Map:

2006 Orthoimagery (GRCA)

Landsdown Drive EIS
Tree Compensation Plan

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PROJECT: DA13-045-02

CLIENT: DUNSIRE DEVELOPMENTS

UTM Zone 17 NAD83

DATE: JULY 2014

SCALE: 1:300

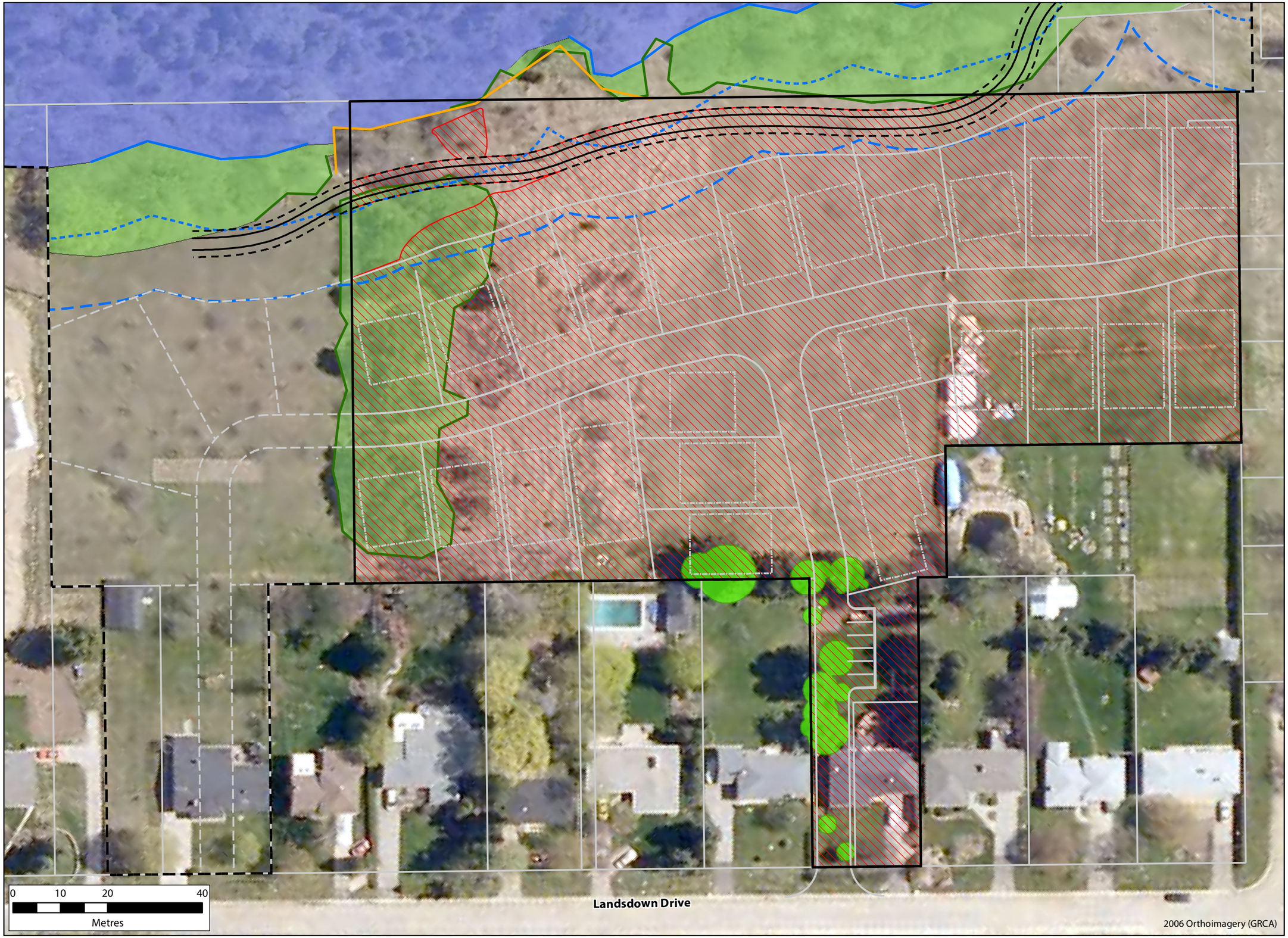
DRAWN BY: LC

CHECKED BY: TF

Figure:

19 - 5

Figure 20. Biophysical Constraints & Limits of Disturbance



Legend

Dunsire Property

Study Area

Biophyisical Constraint

Tree Removal
(Outside Significant Woodland; Canopy shown to scale)

Significant Natural Areas

Provincially Significant Wetland (PSW)

Significant Woodland

Limit of Wetland as flagged by GRCA & City of Guelph
(J.D. Barnes Ltd., June 24, 2013.)

Edge of Trees delinated by others
(J.D. Barnes Ltd., June 24, 2013.)

Existing Disturbance
(D&A, May 5, 2013.)

Significant Natural Area Buffer

PSW (15 m)

PSW (30 m)

Significant Wildlife Habitat

Note: Associated with the PSW & Significant Woodland Features

Activities & Limits of Disturbance

Activities (including vegetation removal, storm water management, servicing, grading & recreational trail.)

Condo Draft Plan (July 18, 2014)

Lot Line

Proposed Future Lot Line

Building Envelope

Proposed Trail

Proposed Rough Trail Grading

Landsdown Drive EIS Biophysical Constraints & Limitts of Disturbance

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PROJECT: DA13-045-02

CLIENT: DUNSIRE DEVELOPMENTS

N E S W

UTM Zone 17 NAD83

DATE: JULY 2014

SCALE: 1:750

DRAWN BY: LC

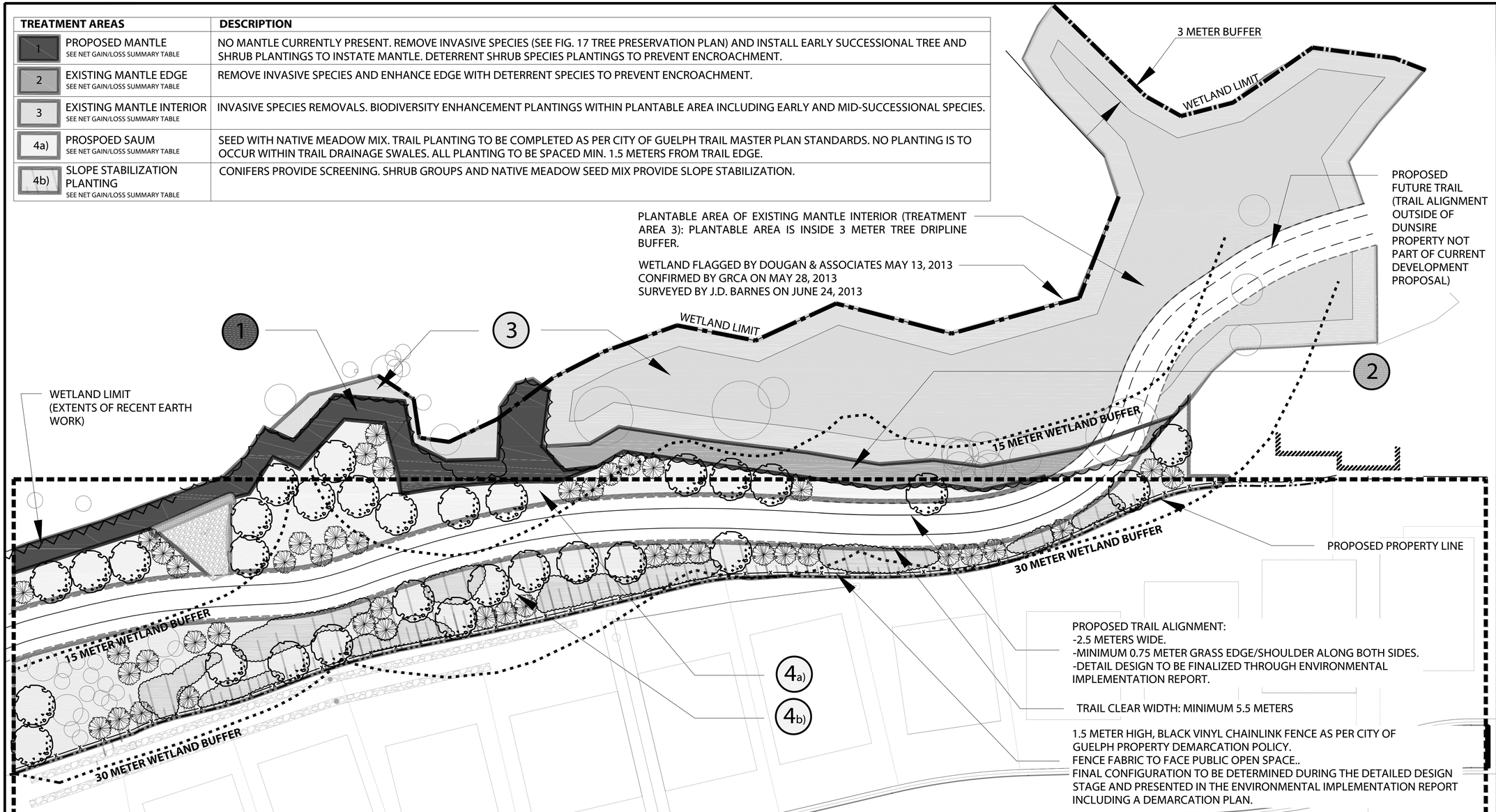
CHECKED BY: TF

Figure:

20

Figure 21. Vegetation Compensation Plan (Conceptual)

TREATMENT AREAS	DESCRIPTION
1 PROPOSED MANTLE SEE NET GAIN/LOSS SUMMARY TABLE	NO MANTLE CURRENTLY PRESENT. REMOVE INVASIVE SPECIES (SEE FIG. 17 TREE PRESERVATION PLAN) AND INSTALL EARLY SUCCESSIONAL TREE AND SHRUB PLANTINGS TO INSTATE MANTLE. DETERRENT SHRUB SPECIES PLANTINGS TO PREVENT ENCROACHMENT.
2 EXISTING MANTLE EDGE SEE NET GAIN/LOSS SUMMARY TABLE	REMOVE INVASIVE SPECIES AND ENHANCE EDGE WITH DETERRENT SPECIES TO PREVENT ENCROACHMENT.
3 EXISTING MANTLE INTERIOR SEE NET GAIN/LOSS SUMMARY TABLE	INVASIVE SPECIES REMOVALS. BIODIVERSITY ENHANCEMENT PLANTINGS WITHIN PLANTABLE AREA INCLUDING EARLY AND MID-SUCCESSIONAL SPECIES.
4a) PROSPOED SAUM SEE NET GAIN/LOSS SUMMARY TABLE	SEED WITH NATIVE MEADOW MIX. TRAIL PLANTING TO BE COMPLETED AS PER CITY OF GUELPH TRAIL MASTER PLAN STANDARDS. NO PLANTING IS TO OCCUR WITHIN TRAIL DRAINAGE SWALES. ALL PLANTING TO BE SPACED MIN. 1.5 METERS FROM TRAIL EDGE.
4b) SLOPE STABILIZATION PLANTING SEE NET GAIN/LOSS SUMMARY TABLE	CONIFERS PROVIDE SCREENING. SHRUB GROUPS AND NATIVE MEADOW SEED MIX PROVIDE SLOPE STABILIZATION.



LEGEND

PROPOSED FEATURES

- PROPOSED DECIDUOUS TREE
- PROPOSED CONIFEROUS TREE
- PROPOSED SHRUB PLANTING

BASE INFORMATION

- DUNSIRE PROPERTY BOUNDARY
- FLAGGED WETLAND LIMIT
- WETLAND BUFFER
- EXTENTS - RECENT EARTH WORK
- PROPERTY DEMARCAT. FENCE
- PROPOSED PROPERTY LINE
- 2.5 M WIDE TRAIL
- 5.5 M TRAIL CLEAR WIDTH
- EXISTING EDGE OF TREES
- PROPOSED SWM FEATURE (BY OTHERS)
- EXISTING TREE TO REMAIN

Net Gain/Loss Summary

Gained Feature Summary

#	TREATMENT AREA	PROPOSED ENHANCEMENT & COMPENSATION MEASURES						
		Area (sq. m)	50-60mm Caliper Trees	40mm Caliper Trees at 3m O.C.	Tree Whips at 1.5m O.C.	Shrubs at 1.5m O.C.	Native Seed Area (sq. m)	Notes
1	PROPOSED MANTLE	288		24	11	134	120	Trees to cover 30%, Shrubs to cover 70% of proposed area at maturity. Trees and Shrubs to receive 1 sq. meter mulch ring. Remainder to receive Native Seed mix to establish meadow.
2	EXISTING MANTLE EDGE	208		17	8	97		Trees to cover 30%, Shrubs to cover 70% of proposed area at maturity.
3	EXISTING MANTLE INTERIOR (Plantable Area)	1415		118	51	660		Invasive species removal followed by tree and shrub plantings. Plantable area is inside 3 meter buffer to allow for drip line of trees in adjacent areas. Trees to account for 30% and shrubs for 70% of plantable area. Final area for planting depends on area resulting from invasive species removal, to be determined at Detailed Design stage.
4a) & 4b)	PROPOSED SAUM & SLOPE STABILIZATION PLANTING	1908	77				1831	Sow native meadow mix and caliper tree planting as per City of Guelph Trail Master Plan. Trees to receive 1 sq. meter mulch ring. Remainder to receive Native Seed mix to establish meadow.
	TOTAL	***3819***	***77***	***159***	***70***	***892***	***1951***	

Lost Feature Summary

	Area (sq. m)	Removals	Compensation Required			Notes
Trees	-	**147**	**109**			
Significant Woodland	1673					Area being removed

Net Gain/Loss Summary

	Area (sq. m)	Trees: 60 mm + 40 mm Caliper Trees	Trees: Replacement Ratio	Trees: Tree Whips at 1.5m O.C.	Shrubs at 1.5m O.C.	Native Seed Area (sq. m)	Notes
TOTAL GAINED FEATURES (From Enhancement Measures)	3819	236	-	70	892	1951	
TOTAL LOST FEATURES	1673	***109**	-	-	-	-	***Trees requiring compensation**
NET GAIN:	**2146**	**119**	**2.01**	**70**	**892**	**1951**	**2:1 Tree Replacement Ratio; Net gain to consolidated natural area; overall increase in the native species composition; floral quality improvement: CC from 1.56 to 3.15**

NOTE: PROPOSED SPECIES LISTS FOR TREATMENT AREAS 1-4 ARE PROVIDED IN LANDSDOWN DRIVE EIS APPENDIX I. COMPENSATION PLAN PLANT LIST

No.	Description	Date
x	xx	YYYY/MM/DD

Revisions

VEGETATION COMPENSATION PLAN (CONCEPTUAL)

Project: LANDSDOWN DRIVE EIS (WHITE CEDAR ESTATES)

Client: DUNSIRE DEVELOPMENTS

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

North

Date: 2014/07/22

Scale: 1:250

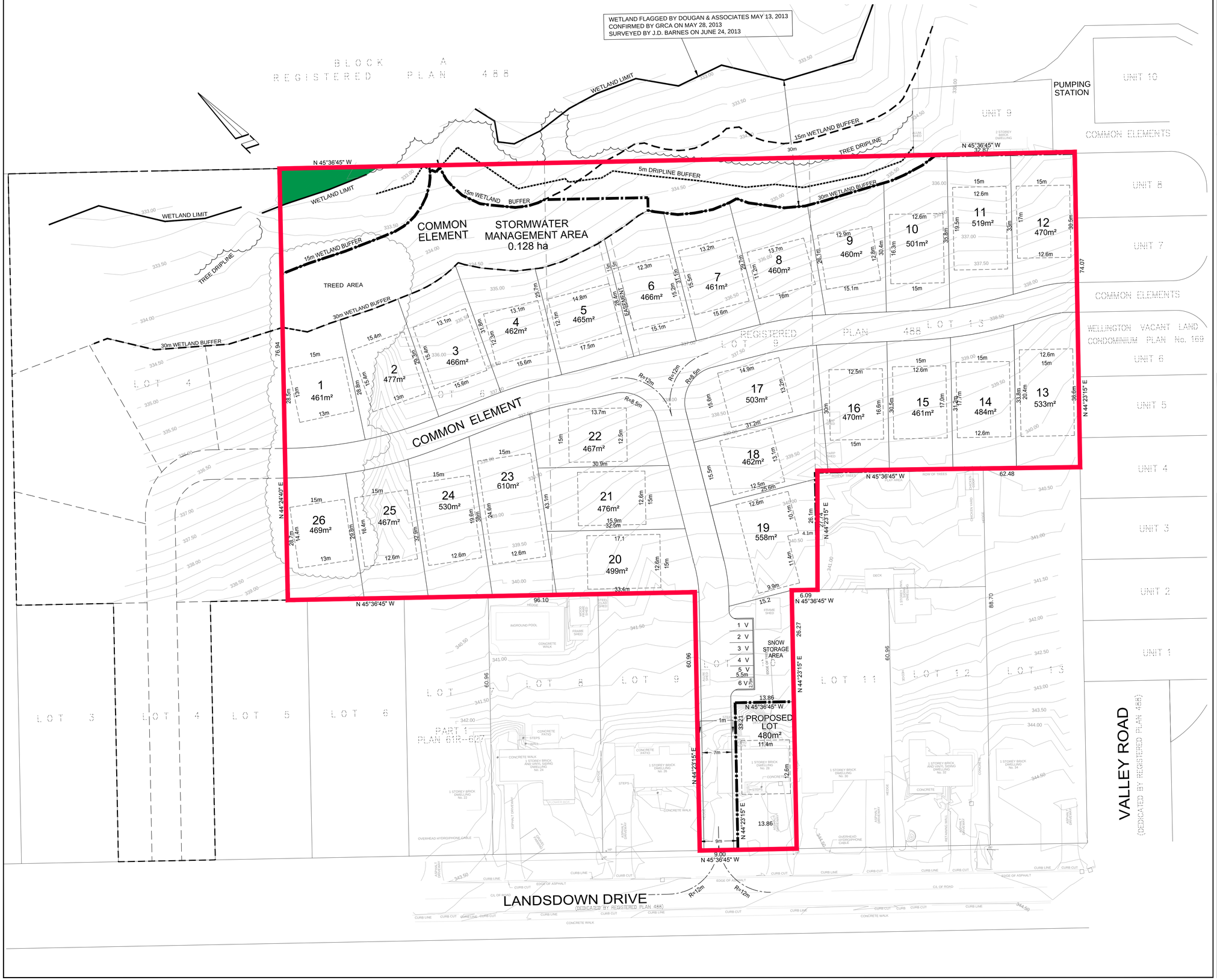
Drawn By: NA

Checked By: TF

Figure Number:

FIGURE_21

Appendix A. Draft Plan of Vacant Condominium



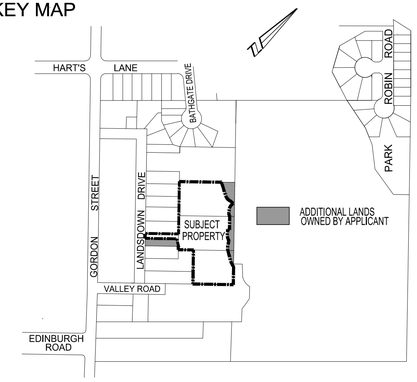
ASTRID J. CLOS
PLANNING CONSULTANTS

Phone: (519) 836-7526 (836-PLAN)
Fax: (519) 836-9568
Cell: (519) 710-7526 (710-PLAN)
Email: astrid.clos@ajcplanning.ca
Web: www.ajcplanning.ca
423 WOOLWICH STREET, SUITE 201
GUELPH , ONTARIO N1H 3X3

DRAFT PLAN OF CONDOMINIUM
WHITE CEDAR ESTATES

DATE: JUNE 12, 2014	SCALE 1:400
PROJECT No. 1323	DRAWN BY: G.K.S.

KEY MAP



LEGAL DESCRIPTION

PART OF LOTS 6, 9, 10 AND 13
REGISTERED PLAN 488
CITY OF GUELPH
COUNTY OF WELLINGTON

LAND USE SCHEDULE

DESCRIPTION	UNITS	DWELLINGS	AREA (hectares)
SINGLE DETACHED UNITS	1-26	26	1.267
COMMON ELEMENT STORM WATER MANAGEMENT	-	-	0.128
COMMON ELEMENT ROAD, VISITOR PARKING	-	-	0.262
TOTAL	26	26	1.657

NOTES

1. ORIGINAL SURVEY AND TOPOGRAPHICAL INFORMATION BY J.D. BARNES LTD.
2. MINIMUM LOT AREA 460m²
3. MINIMUM LOT FRONTAGE 15m
4. MINIMUM FRONT YARD 6m
5. MINIMUM SIDE YARD 2 STOREYS 1.5m
5. MINIMUM REAR YARD 7.5m OR 20% OF THE LOT DEPTH, WHICHEVER IS LESS.

ADDITIONAL INFORMATION

(UNDER SECTION 51(17) OF THE PLANNING ACT)

INFORMATION REQUIRED BY CLAUSES a,b,c,d,e,f,g,j and I ARE AS SHOWN ON DRAFT PLAN.

(h) MUNICIPAL WATER
(i) CLAYEY SILT TO SILTY SAND
(k) MUNICIPAL SEWER

OWNER'S CERTIFICATE

I AUTHORIZE ASTRID J. CLOS, PLANNING CONSULTANTS TO PREPARE AND SUBMIT THIS DRAFT PLAN OF CONDOMINIUM TO THE CITY OF GUELPH

SHAWN KEEPER
DUNSIRE (LANDSDOWN) INC.

DECEMBER 11th, 2013
DATE

SURVEYOR'S CERTIFICATE

I CERTIFY THAT THE BOUNDARIES OF THE LAND TO BE SUBDIVIDED AND THEIR RELATIONSHIP TO THE ADJACENT LANDS ARE CORRECTLY SHOWN.

THE BOUNDARIES OF THE LAND HAVE BEEN PARTIALLY COMPILED FROM FIELD WORK AND AVAILABLE LAND REGISTRY OFFICE RECORDS.

GRANT STIDWILL, O.L.S.
J.D. BARNES LTD.

DECEMBER 10th, 2013
DATE

Jul 04,2014--1:25pm (21577-13)
C:\Users\George.Shirton\appdata\local\temp\AcPublish_3668\Condo Draft Plan Landsdown Drive (REV g).dwg

Appendix B. EIS Terms of Reference

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

September 18, 2013

ATTN: Allan C. Hearne | Senior Development Planner

Planning Services
Planning, Building, Engineering and Environment
City of Guelph

RE: Draft Terms of Reference for an Environmental Impact Study for Lots 24, 26, 28, and 32, Landsdown Drive, Guelph, Ontario

Dear Mr. Hearne:

Thank you for meeting with our team on August 26th for the Pre-Consultation to review the preliminary Concept Plan for a proposed Zone Change and Vacant Land Draft Plan of Condominium application for the above referenced properties. Dougan & Associates has been retained by Dunsire Developments to address the City's Natural Heritage interests on these lands through the preparation of an Environmental Impact Study (EIS). After careful consideration of staff input at the pre-consultation meeting as well as background information already obtained through site surveys and secondary research we have prepared the following Terms of Reference (TOR) to confirm the submission requirements for a Scoped EIS.

We have enclosed 15 copies of the Terms Of Reference to facilitate distribution to City Staff, the Environmental Advisory Committee (EAC), & GRCA; we trust this will be sufficient. Additional copies will be made available at your request.

Please review at your earliest convenience and feel free to contact me with any questions or concerns. We look forward to your response.

Best Regards,

Todd Fell, BLA, OALA, CSLA
Landscape Architect, Manager

CC. Astrid J. Clos, RPP, MCIP, (Astrid J. Clos Planning Consultants);
Kevin Moniz, P.Eng., Director (KAM Engineering Ltd.);
Shawn Keeper, P.Eng., President (Dunsire Developments).

LANDSDOWNE DRIVE EIS TERMS OF REFERENCE

This Terms of Reference has been prepared to confirm the submission requirements for a Scoped Environmental Impact Study (EIS) for a proposed Zone Change and Vacant Land Draft Plan of Condominium application for of Lots 24, 26, 28, and 32, Landsdowne Drive, Guelph, Ontario.

1. Description of the Proposed Development

The subject properties are located within the Torrance Creek Subwatershed and border the Torrance Creek Provincially Significant Wetland (PSW) & Significant Woodland (Schedule 2, City of Guelph Official Plan 2012). The wetland boundary was delineated on May 13, 2013 by a D&A Certified OWES Wetland Evaluator staff and documented using a high accuracy Trimble GPS unit. The wetland boundary was confirmed with Grand River Conservation Authority (GRCA) staff on May 28, 2013. Development is limited to lands outside the PSW with a 30 meter buffer proposed between the feature and the rear lot line of the nearest residences.

The site plan for Dunsire (Landsdowne) Inc.'s lands proposes 25 single-family lots, on a common element road, both created through a draft plan of vacant condominium (See Appendix A). The proposed development will be connected to the existing Valley Road Sanitary Pumping Station. Similar to Valley Road, storm water infiltration galleries and an oil and grit separator will be installed and ultimately discharging into the wetland. Foundations drainage will be provided by individual sump pumps discharging to the grassed rear yard areas. Site grading will be controlled by the storm water management outlet at the proposed edge of the setback from the wetland and the existing elevations along the property limits.

The City-wide Master Trail Plan shows a municipal pedestrian trail through the proposed buffer to the wetland. The route and design of the trail will be considered as part of the application in order to assess impacts of the trail on the PSW. Additionally, infiltration galleries are being considered in the outer 15m of the wetland buffer (adjacent to the proposed lots) which will be detailed in the SWM section of the Functional Servicing Report.

An option to consider the future extension of the road through an existing Scot's Pine Plantation to the north of the property line may result in the creation of a stub road. The road would be stubbed similar to the Valley Road condo and not a full cul-de-sac or hammerhead which would encumber lots.

The proposed EIS will provide a summary of the types of grading and servicing works required to complete the development; these will be detailed further in the Functional Servicing Report. A base plan with recent aerial photo will be provided, including site contours, vegetation with ELC assignments, confirmed wetland boundaries, and areas regulated by Grand River Conservation Authority.

2. Background and Policy Framework

To provide the historical context of the site, any background information available from the City of Guelph, Natural Heritage Information Centre (NHIC), Grand River Conservation Authority (GRCA), and Ontario Ministry of Natural Resources (OMNR) will be accessed and reviewed. A desktop review of the site will be completed using ortho photography and resource mapping. We will seek out existing species inventory information, Species at Risk records, and data. These sources include the following:

- The in effect City of Guelph Official Plan (OP) & OPA 42, under appeal and not in effect;
- Natural Heritage Information Centre (NHIC) Biodiversity Explorer query (NHIC 2012);

- Ontario Breeding Bird Atlas (OBBA), 2001 – 2005 (Cadman et al. 2007);
- Atlas of the Mammals of Ontario (Dobbyn 1994);
- Ontario Herpetofaunal Atlas (OMNR 2011b);
- Wellington Upper Tier SAR List;
- Existing Inventories; and,
- The Ontbirds archives, which is the Ontario Field Ornithologists' electronic mailing listserv, providing bird sightings across Ontario, including Guelph.

We will use these data to scope field investigations to ensure adequate documentation regarding significant issues (e.g. Species at Risk, locally rare species, etc.). During this work phase we will also review the environmental policy context for the study site. This will be used as a context to evaluate the opportunities and constraints imposed by the existing natural heritage features present at the site. Current Provincial, GRCA, MNR and City, including Natural Heritage System (OPA42) land use policy and regulations relevant to the site and the proposed development will be reviewed and documented.

3. Biophysical Site Characterization

The following studies will be conducted to provide a biophysical characterization of the site and surrounding natural heritage features.

a. Vegetation

i. Ecological Land Classification & Vascular Plant List

Vegetation community classification will be completed in summer 2013 to Ecosite or Vegetation Type based on the protocol of the Ecological Land Classification (ELC) System for Southern Ontario, first approximation (Lee, et. al., 1998). The survey will include the study area plus 50m beyond the edge of the adjacent natural heritage feature (Torrance Creek PSW). A vascular plant survey will be conducted simultaneously with the ELC assessment. Communities will be assessed for type and level of human disturbance, and prevalence of invasive species. Rare or significant species will be documented where encountered.

ii. Tree Inventory and Assessment

General

The tree inventory and assessment will be conducted on trees greater than 10 cm in diameter (dbh) across the site and within 5m of the edge of any woodlands. Trees will be surveyed, mapped and rated by an ISA Certified Arborist to determine preservation opportunities and constraints.

Scott's Pine Plantation

An initial site walk has indicated that there is a Scott's Pine plantation within the study limits. A survey to inventory and assess the biophysical condition and preservation priority will be conducted.

Significant Woodland

The proposed development will take place on lands adjacent to a Significant Woodland, a Tree Inventory and Assessment will be conducted to determine the size (dbh, height, crown reserve), composition, and biophysical condition of trees within 5m of the edge of the woodland. The data collection for ecological function of the woodland will be addressed under the ELC component.

b. Wildlife

The proposed development is limited to the portions of the site outside the Torrance Creek PSW. Initial observation of available habitat in the lands subject to site alterations indicates that it is comprised of anthropogenic (residential landscapes) and regularly disturbed (i.e. mowed) cultural meadows. No habitat was observed outside the PSW that would support amphibian breeding; nor were any "special" habitats supporting breeding birds available outside the PSW (*recognizing that breeding birds can occur in available habitat caveats to avoid contravening the Migratory Birds Convention Act will be endorsed in the EIS*).

Habitat for amphibians and breeding birds is assuredly available in the Torrance Creek PSW. Data for the feature is available through the 2007 Valley Road Estates EIS (Aboud & Associates) as well as the 2003 Bathgate EIR (D&A) and 2003 Landsdowne Breeding Bird Survey (D&A). As the proposed site alterations are limited to the adjacent lands and a 30m buffer to the feature is proposed it is anticipated these secondary sources will be sufficient to assess impacts and identify suitable mitigation, compensation and enhancement measures. D&A do **not** propose any further wildlife surveys as part of the current EIS.

c. Ecological Features & Functions

i. Wetland Boundary Delineation

The boundary of the PSW has been flagged in the field and verified by GRCA Staff. The flags have been surveyed by an Ontario Land Survey and will be used in all mapping and plans to denote the edge of the feature and form the basis for measurements of buffers and setbacks. D&A do not propose any further evaluation of the wetland according to the Ontario Wetland Evaluation System (OWES).

ii. Species At Risk Screening

Vegetation and wildlife assessments will include surveys for species at risk, as well as provincially and regionally significant species. Due to being outside the timing window for frogs and birds, these species will not be covered as part of the scope of the proposed work.

During the flora surveys, the habitat present will be assessed as to its suitability to Species-at-Risk (SAR) wildlife species that may be present in the area. A short-list of potential SAR species will be generated during the background review. For each of these species, the study area will be assessed as to the likelihood of that species occurring, whether presently or in the future. Any SAR encountered will be addressed with respect to the Endangered Species Act, and the OMNR will be consulted as required.

iii. Significant Wildlife Habitat Screening

The Provincial Policy Statement (MMAH 2005) prohibits development within areas identified as supporting Significant Wildlife Habitat. The Ontario Ministry of Natural Resources has produced guidelines and a decision support system to assist municipalities with identifying significant natural heritage features to ensure that land use planning is conducted in compliance with the natural heritage policies of the PPS.

The Torrance Creek PSW is already known to support Significant Wildlife Habitat (SWH) and, along with the PSW, has been considered in the current application through designation of a 30m buffer. None-the-less, D&A will review all categories of SWH outlined in the Significant Wildlife Habitat Technical Guide (OMNR, 2000) to ensure the feature is fully characterized for its potential to support

SWH in order to inform the impact evaluation and potential mitigation/compensation strategies. Field investigations will be conducted within the ELC survey zone (50m from edge) and MNR will be consulted as required to confirm the status for SWH categories.

iv. Wetland Water Budget Approach

The wetland water budget approach to be adopted for this development will utilize the Water Balance Method (WBM) of Thornthwaite and Mather (1957) in conjunction with the stormwater management (SWM) design to assess how the water regime will change in terms of flow rates, monthly volumes, and storm events. The objective of the water budget analysis is to maintain, as much as feasible, the runoff and recharge characteristics of the pre-development site.

Although it is not appropriate to use the monthly water budget quantities to set strict post-development SWM targets, special consideration will be given to ensure that increases in direct runoff due to development are mitigated (treated for quality, released at pre-development levels, and larger/stored volumes recharged to the wetland). Therefore, it is proposed that annual direct runoff flows be used to set post-development SWM targets. Furthermore, stormwater detained in the SWM facility will be well-distributed overland through the buffer lands to the wetland in an attempt to maintain pre-development (natural) conditions, prevent the creation of sustained open water features where none currently exist, and promote the prevailing climatic conditions' continued role in proportioning runoff and recharge volumes.

4. Assessment of Potential Impacts

The following effects will be reviewed in terms of their short to long term impacts on the resources of the study area:

a. Direct on-site impacts

The direct effects of development to on site habitats and ecological functions will be determined. Specific evaluations will examine:

- the potential removal of the existing Scot's Pine Plantation to accommodate a future road to the north of the study site; and,
- the location and design criteria for a municipal pedestrian trail within the 30m buffer;
- the use of infiltration galleries (SWM) within the first 15m of the buffer adjacent to the residential lots.

Other potential impacts to assess will include elimination of habitat through tree clearing and grading as well as examination of potential changes to hydrological or disturbance cycles.

b. Indirect impacts

The indirect effects of development to on site & adjacent habitats will be examined; this includes effects related to encroachment, fragmentation, ancillary effects from changes in hydrology and increased human proximity. Relevant information from geotechnical and stormwater studies will be incorporated.

c. External Effects

This examination can include, but is not limited to, an assessment of the potential change due to the proposed development in the condition, contribution, representation, and linkage of local-scale natural communities & species populations to the broader network of natural systems in the adjacent landscape.

5. Recommendations for Natural Feature Protection, Enhancement and/or Mitigation

The main principles behind mitigation/compensation are:

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

Towards that end, methods to avoid or reduce identified impacts will be acknowledged, and their potential effectiveness will be assessed. Specific recommendations will examine:

- Buffer requirements to offset impacts to the PSW (*30m wetland & 10m tree dripline*);
- Vegetation replacements (*tree compensation approach; detailed compensation plan to be provided in the EIR*);
- SWM methods to maintain water balance;
- Fencing to reduce encroachment concerns;
- Potential biodiversity enhancements with the emphasis placed on consolidation of natural cover and functions in core areas;
- Support of other management strategies (such as stormwater management and drainage density maintenance) to yield land use efficiency;
- Land transfer to public ownership; and,
- Lastly, natural heritage oriented areas (*urban land uses that can support natural heritage functions*) can be explored as contributors to the NHS.

Figure 1. Site Plan / Air Photo Overlay

Landsdowne Drive
Condo Draft Plan

DOUGAN & ASSOCIATES
ECOLOGICAL CONSULTING & DESIGN
77 Wyndham Street South • Guelph ON N1E 5R9
T 519.822.1609 • F 519.822.5389 • www.dougan.ca

PROJECT: DA13-045-02

CLIENT:

DATE: SEPTEMBER 2013

SCALE: 1:1,000

DRAWN BY: LW

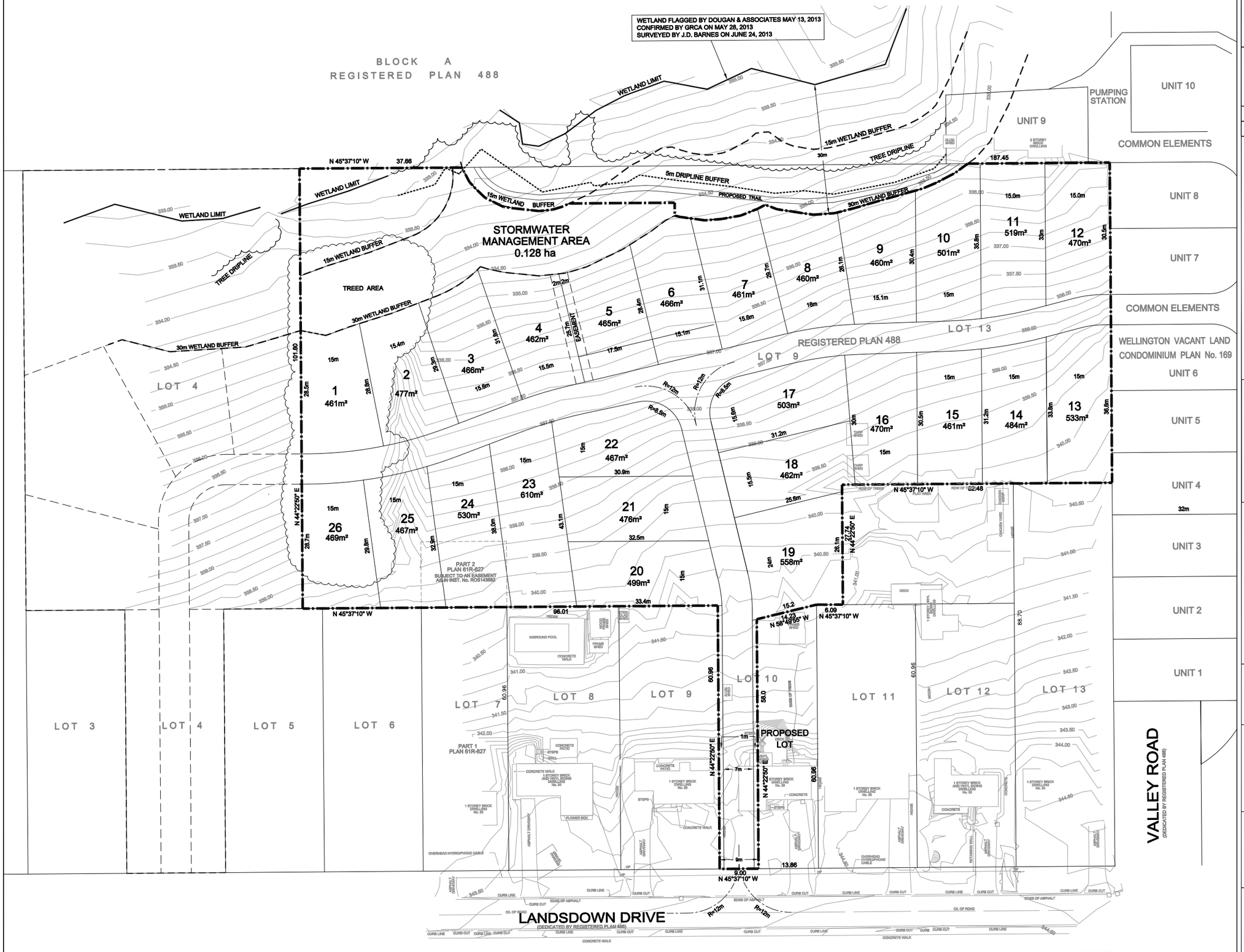
CHECKED BY:

UTM Zone 17 NAD83

Figure:

1

Appendix A. Landsdown Drive Preliminary Site Plan



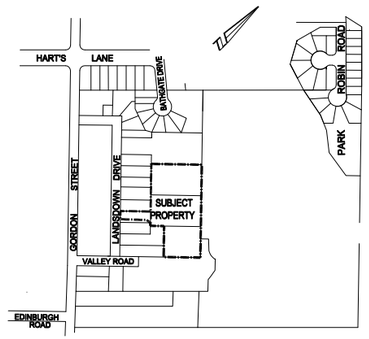
ASTRID J. CLOS
PLANNING CONSULTANTS

Phone: (519) 836-7526 (836-PLAN)
Fax: (519) 836-9568
Cell: (519) 710-7526 (710-PLAN)
Email: astrid.clos@ajcplanning.ca
Web: www.ajcplanning.ca
423 WOOLWICH STREET, SUITE 201
GUELPH , ONTARIO N1H 3X3

DRAFT PLAN OF CONDOMINIUM
LANDSDOWN DRIVE

DATE: SEPTEMBER 16, 2013	SCALE 1:400
PROJECT No. 1323	DRAWN BY: G.KS.

KEY MAP



LEGAL DESCRIPTION

PART OF LOTS 6, 7 AND 13
AND
PART OF BLOCK A
AND
ALL OF LOTS 8, 9, 10 AND 12
REGISTERED PLAN 488
CITY OF GUELPH

LAND USE SCHEDULE

NOTES

1. ORIGINAL SURVEY AND TOPOGRAPHICAL INFORMATION BY J.D. BARNES LTD.

ADDITIONAL INFORMATION

(UNDER SECTION 51(17) OF THE PLANNING ACT)

INFORMATION REQUIRED BY CLAUSES a,b,c,d,e,f,g,j and l ARE AS SHOWN ON DRAFT PLAN.

(h) MUNICIPAL WATER AVAILABLE
(i)
(k) MUNICIPAL SEWER AVAILABLE

OWNER'S CERTIFICATE

I AUTHORIZE ASTRID J. CLOS, PLANNING CONSULTANTS TO PREPARE AND SUBMIT THIS DRAFT PLAN OF CONDOMINIUM TO THE CITY OF GUELPH

_____ DATE

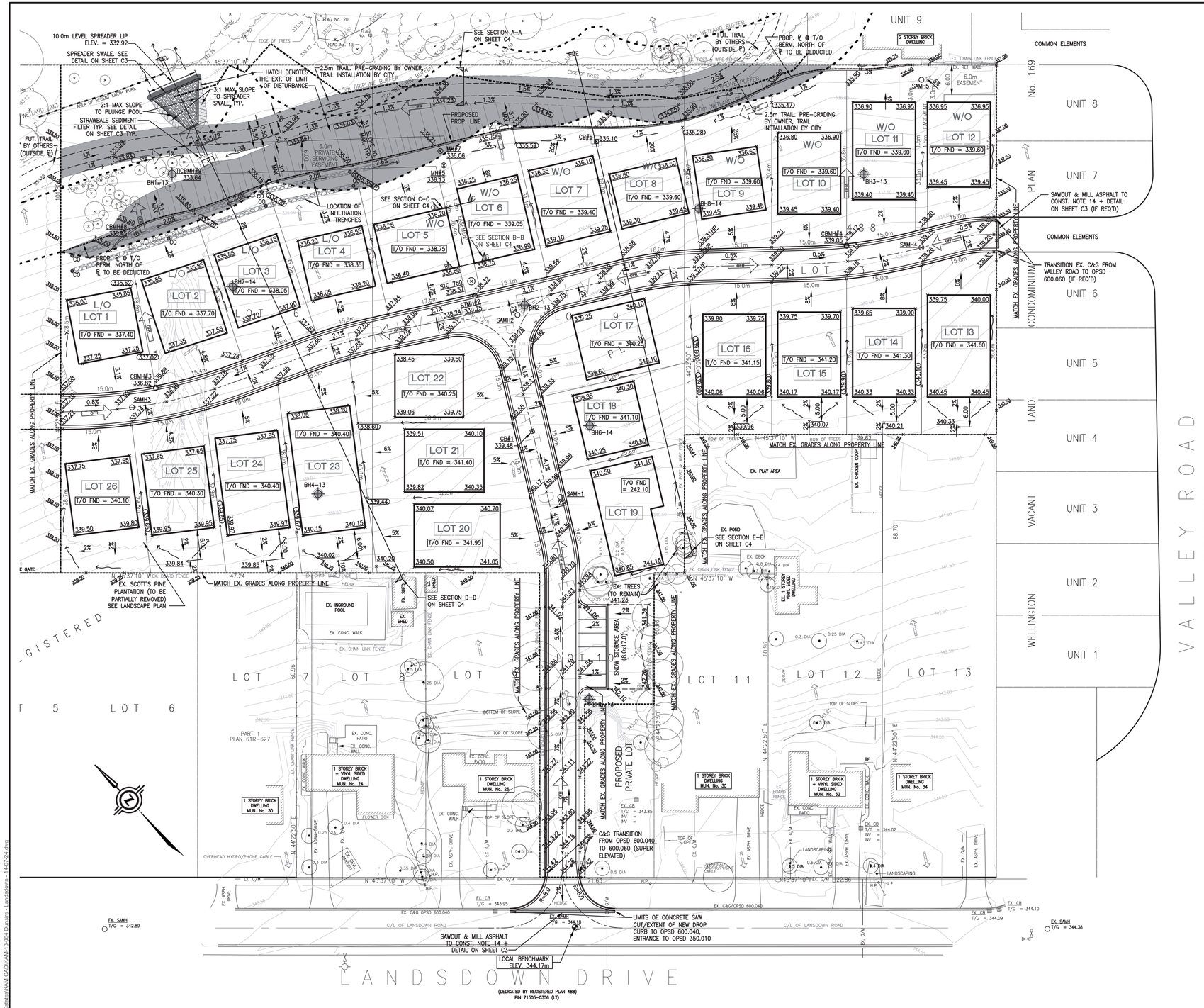
SURVEYOR'S CERTIFICATE

I CERTIFY THAT THE BOUNDARIES OF THE LAND TO BE SUBDIVIDED AND THEIR RELATIONSHIP TO THE ADJACENT LANDS ARE CORRECTLY SHOWN.

_____, O.L.S. DATE

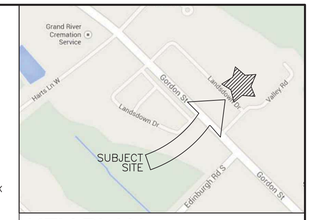
Sep 16,2013–4:18pm **(21577-13)**
H:\13-215\21577-13\acad\Condo Draft Plan Landsdown Drive (REV D.dwg

Appendix C. SBM Grading, Storm Sewer Catchment, and Stormwater Plans



LEGAL INFORMATION

PART OF
LOTS 6 + 7
AND ALL OF
LOTS 8 + 9 RP 488
IN THE
CITY OF GUELPH
COUNTY OF WELLINGTON



KEY PLAN
N.T.S.

BENCHMARK:

ELEVATIONS HERON ARE GEODETIC AND ARE REFERRED TO MINISTRY OF TRANSPORTATION BENCHMARK 00819698810 HAVING AN ELEVATION OF 333.831m.

LOCAL BENCHMARK:

LOCATION: A CONCRETE NAIL NORTH OF A MANHOLE LOCATED ALONG THE CENTRELINE OF LANDSDOWN DRIVE DIRECTLY OPPOSITE A 1 STOREY BRICK DWELLING, No. 28

GEODETIC ELEVATION = 344.17m

REFERENCE DOCUMENTS

1. LEGAL & TOPOGRAPHICAL INFORMATION OBTAINED FROM PLAN PROVIDED BY J.D. BARNES LTD. REFERENCE No. 13-30-500-01-B DATED SEPTEMBER 27, 2013.
2. EXISTING MUNICIPAL SERVICING AS-BUILTS PROVIDED BY THE CITY OF GUELPH.
3. SITE PLAN PROVIDED BY ASTRID CLOS PROJECT No. 1323 DATED JUNE 11, 2014.
4. GEOTECHNICAL INFORMATION OBTAINED FROM REPORT No. TO4093Bs1, DATED OCTOBER 7, 2013 BY INSPECSOL ENGINEERING SOLUTIONS
5. SBM ENGINEERING LTD. FUNCTIONAL SERVICING & STORMWATER MANAGEMENT REPORT DATED JULY 24, 2014.
6. TREE PROTECTION PLAN DATED JULY 7, 2014 BY DOUGAN AND ASSOCIATES.

GENERAL NOTES:

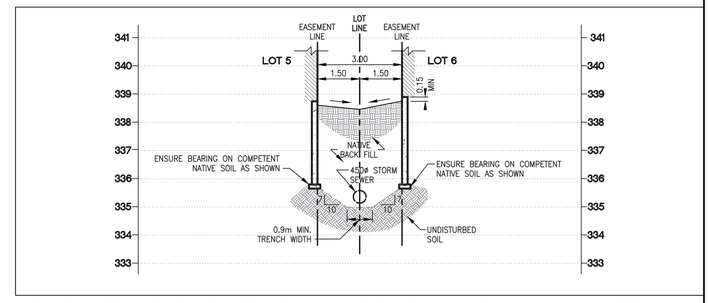
1. THE OWNER'S PROFESSIONAL ENGINEER IS REQUIRED TO INSPECT THE INSTALLATION OF SERVICES AND GRADING INCLUDED IN THIS PROJECT IN ACCORDANCE WITH THE GENERAL REVIEW COMMITMENT CERTIFICATION PROCESS. THE CONTRACTOR IS TO PROVIDE AT LEAST 48 HOURS PRIOR TO COMMENCING CONSTRUCTION OF THE SITE SERVICES.
2. SBM ENGINEERING LTD. IN NO WAY ACCEPTS RESPONSIBILITY FOR ANY INACCURACIES FOUND ON THIS PLAN RELATIVE TO EXISTING CONDITIONS FOR THE SITE.

GRADING NOTES:

1. EXISTING DRAINAGE OF ABUTTING LANDS IS NOT TO BE DISTURBED.
2. BASEMENT OPENINGS TO BE MINIMUM 300mm ABOVE THE CENTRELINE OF ROAD UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.
3. GROUND ELEVATIONS AT HOUSES ABUTTING OVERLAND FLOW ROUTES ARE TO BE 225mm ABOVE OVERLAND FLOW ROUTE ELEVATIONS.
4. RETAINING WALLS 1.0m HIGH OR GREATER, AND GUARD RAILS (IF REQUIRED) ARE TO BE DESIGNED BY AND CONSTRUCTED TO THE SPECIFICATIONS OF A REGISTERED PROFESSIONAL ENGINEER IN ACCORDANCE WITH THE ONTARIO BUILDING CODE.
5. GRADE IS TO SLOPE 2% MIN AWAY FROM THE PROPOSED UNITS FOR 1.5m MIN.
6. REFER TO TREE PROTECTION PLAN DATED JULY 7, 2014 BY DOUGAN AND ASSOCIATES.

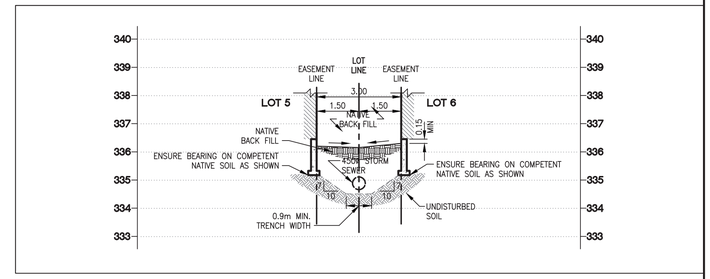
LEGEND

+ 271.00	EXISTING SPOT ELEVATION TO REMAIN (ASSUMED BASED ON EX. CONTOURS)	OFR	EXISTING OVERLAND FLOW ROUTE
	EXISTING CONTOUR	OFR	PROPOSED OVERLAND FLOW ROUTE
x 271.00	PROPOSED SPOT ELEVATION		PROPOSED SILT FENCE (DET. ON SHEET C3)
x 271.00	PROPOSED SWALE ELEVATION		EXISTING FIRE HYDRANT
	EXISTING CATCHBASIN		EXISTING WATER VALVE
	PROPOSED CATCHBASIN	W G	EXISTING WATER OR GAS METER
	EXISTING MANHOLE	W/O	PROPOSED WALK-OUT
	PROPOSED MANHOLE	L/O	PROPOSED LOOK-OUT
	PROPOSED SWALE		PROPOSED STRAWBALE SEDIMENT FILTER (DET. ON SHEET C3)
2.0%	PROPOSED SLOPE		LIMIT OF DISTURBANCE
	PROPOSED DRAINAGE DIRECTION		BOREHOLE (SEE GEOTECHNICAL REPORT)



SECTION B-B - SECTION THROUGH EASEMENT (FRONT)

SCALE = 1:100



SECTION C-C - SECTION THROUGH EASEMENT (REAR)

SCALE = 1:100

AS CONSTRUCTED SERVICES	COMPLETION			No.	REVISIONS	D/M/Y	BY
		DESIGN	KEK	1	FOR ENVIRONMENTAL IMPACT STUDY	18/12/13	KAM
		DRAWN	KEK	2	RESUBMISSION FOR ENVIRONMENTAL IMPACT STUDY	24/07/14	KAM
		CHECKED	KAM				
		APPROVED	KAM				
		DATE	05-11-13				
		CAD	13-084				

CONSULTANT
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CIVIL - STRUCTURAL ENGINEERS
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Tel: (519) 471-6667 Fax: (519) 471-0034
Email: sbm@sbmltd.ca

ENGINEER'S STAMP
LICENSED PROFESSIONAL ENGINEER K.A. MONIZ 100124864 JULY 24/14 PROVINCE OF ONTARIO

ENGINEER'S STAMP

CLIENT
DUNSIRE DEVELOPMENTS
465 PHILLIP STREET, SUITE 203A
WATERLOO, ON N2L 6C7
P:1.888.519.2346
E: INFO@DUNSIRE.COM

SCALE
SCALE - 1 : 400
4.0 0 8.0m

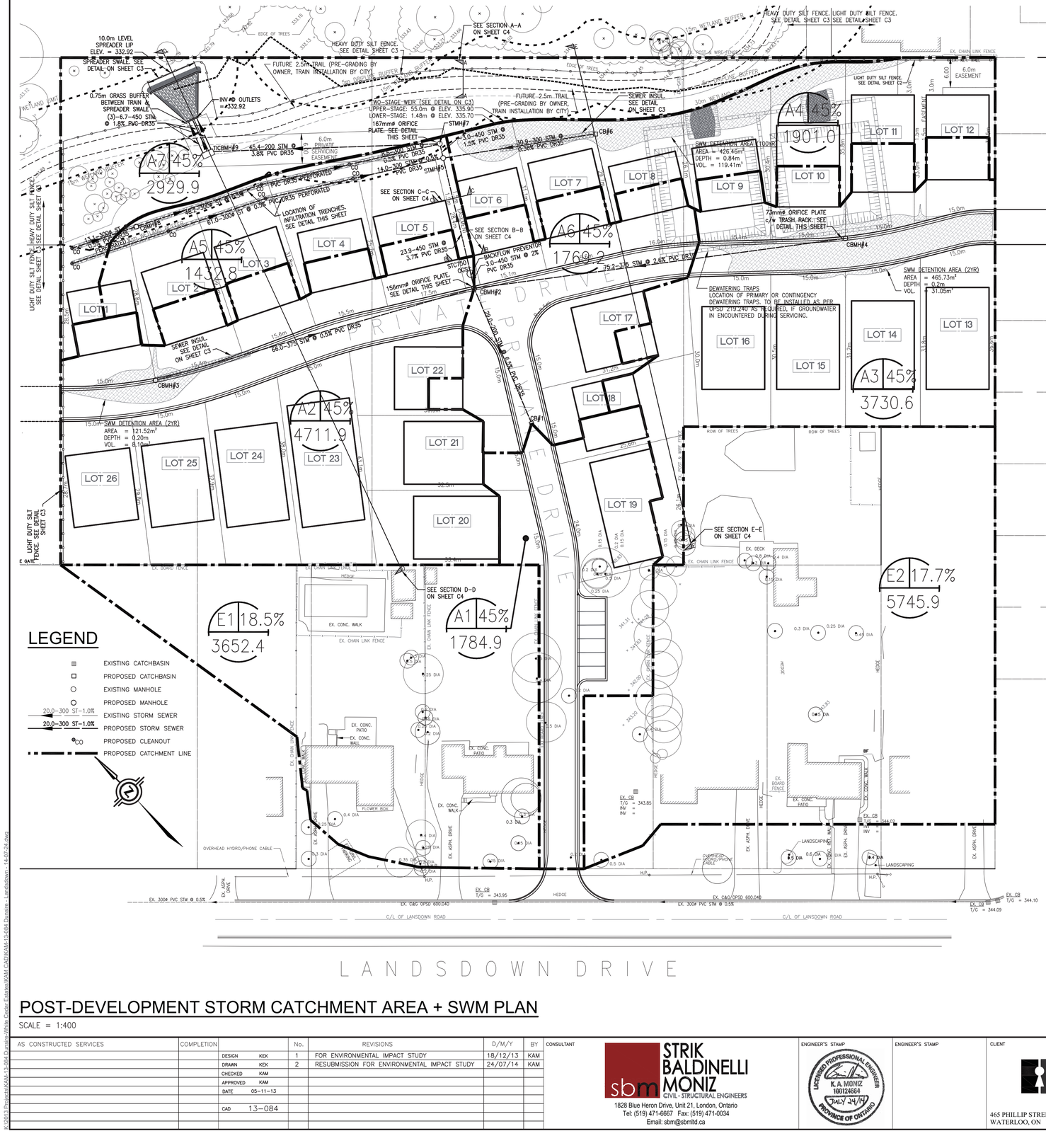
TITLE
SITE GRADING PLAN
--
WHITE CEDAR ESTATES
LANDSDOWN DRIVE
GUELPH, ONTARIO

PROJECT No.
KAM-13-084

SHEET No.
C1

PLAN FILE No.
-

K:\2013 Projects\KAM-13-084 Dunsire-White Cedar Estates\KAM CAD\KAM-13-084 Dunsire - Landsdown - 14-07-24.dwg



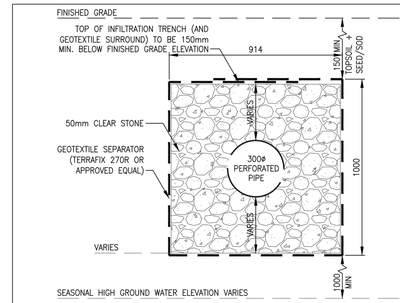
POST-DEVELOPMENT STORM CATCHMENT AREA + SWM PLAN

SCALE = 1:400

STORM SYSTEM STRUCTURE CHART

STRUCTURE	TOP OF GRATE	INVERT	STRUCTURE	TOP OF GRATE	INVERT
CBMH#1 600x600 OPSD 400.020 OPSD 705.010	339.48	336.08N	STMH#5 1200ø OPSD 401.010 OPSD 701.010	336.06	334.30N 334.35E 334.35S 334.35W
CBMH#2 1200ø OPSD 400.020 OPSD 701.010	338.25	335.38N 335.46E 336.18S 335.46W	CBMH#6 600x600 OPSD 400.100 OPSD 705.010	335.10	334.46W
CBMH#3 1200ø OPSD 400.020 OPSD 701.010	336.82	335.79E	STMH#7 1200ø OPSD 401.010 OPSD 701.010	336.06	335.00NW 334.30S 334.30W
CBMH#4 1200ø OPSD 400.020 OPSD 701.010	339.05	337.45W	CBMH#8 1200ø OPSD 400.100 OPSD 701.010	335.45	334.58E 334.58W
OIL/GRIT SEP. STORMCEPTOR STC750 (SEE SWM RPT.)	338.37	335.24N 335.32S	*TICBMH#9 2400x1200 BOX STRUCTURE OPSD 400.100	333.64	333.04N(3) 333.29E

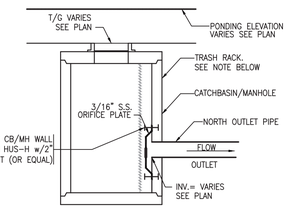
*PROVIDE SEALED SHOP DRAWINGS FOR STRUCTURE DESIGN



NOTES:
1. SBM ENGINEERING LTD. RECOMMENDS A MAINTENANCE FREQUENCY OF 1 YEAR TO CLEAN AND FLUSH ALL DRYWELLS AND EXFILTRATION PIPES.
2. PERFORATIONS OF 3/8" (9.5mm) DIAMETER UNIFORMLY SPACED AROUND THE FULL PERIPHERY OF THE PIPE ARE DESIRABLE, WITH NOT LESS THAN 50 PERFORATIONS PER SQUARE METRE. PERFORATIONS BETWEEN 1/4" (6mm) AND 1/2" (12.5mm) MAY BE USED PROVIDED THAT AN OPENING AREA OF NOT LESS THAN 15,000mm² PER m² OF PIPE SURFACE IS ACHIEVED.
3. UNDER THE ONTARIO WATER RESOURCES COMMISSION ACT, THE DISCHARGE INTO EXFILTRATION TRENCHES OF POLLUTING MATERIAL IS PROHIBITED.

INFILTRATION TRENCH DETAIL

N.T.S



PROFILE OF ORIFICE PLATE

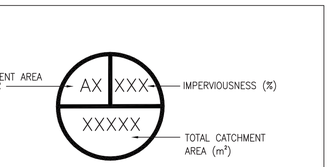
ORIFICE PLATE
-3/16" S.S. PLATE WITH HILTI HUS-H w/2" EMBEDMENT (OR EQUAL)
-ORIFICE OPENING VARIES. SEE PLAN FOR SIZE.

NOTE:
ALL OPENINGS AROUND PERIMETER OF PLATE TO BE SEALED WITH COMPATIBLE SEALANT.

THE CONTRACTOR IS TO LOCATE THE ORIFICE PLATE WITHIN A PERFORATED RISER OR TRASH RACK THAT HAS SMALLER OPENINGS THAN THE REQUIRED ORIFICE DIAMETER.

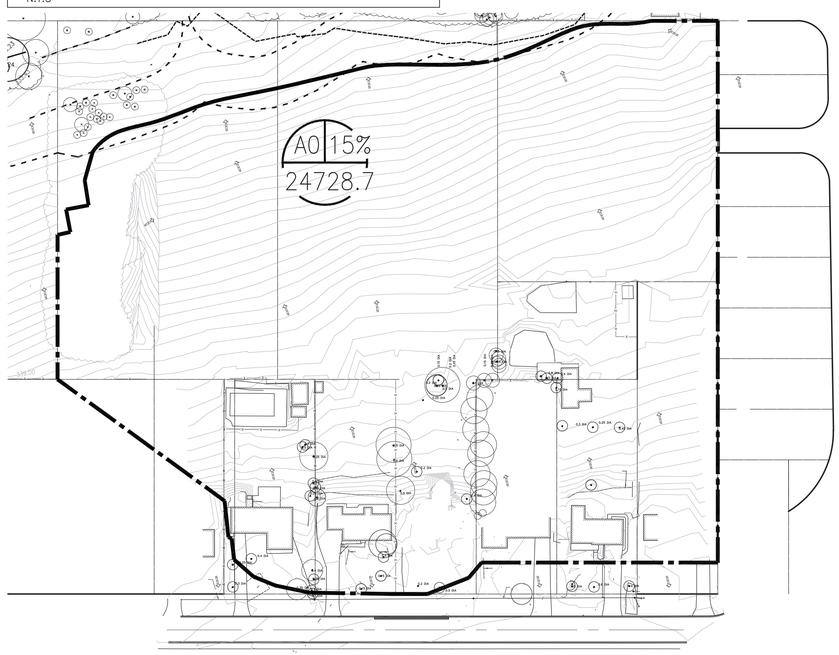
ORIFICE PLATE DETAIL

N.T.S



CATCHMENT AREA MARKER

N.T.S



PRE-DEVELOPMENT STORM CATCHMENT AREA PLAN

SCALE = 1:800

AS CONSTRUCTED SERVICES	COMPLETION

		No.	REVISIONS	D/M/Y	BY
DESIGN KEK		1	FOR ENVIRONMENTAL IMPACT STUDY	18/12/13	KAM
DRAWN KEK		2	RESUBMISSION FOR ENVIRONMENTAL IMPACT STUDY	24/07/14	KAM
CHECKED KAM					
APPROVED KAM					
DATE 05-11-13					
CAD 13-084					

CONSULTANT
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ENGINEER'S STAMP
LICENSED PROFESSIONAL ENGINEER K. A. MONIZ 100124664 JULY 24/14 PROVINCE OF ONTARIO

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CLIENT
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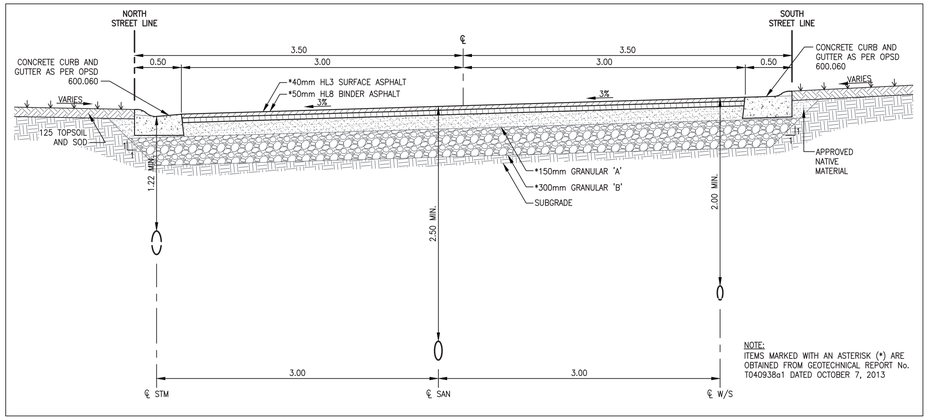
WATERLOO, ON N2L 6C7
P: 1.888.519.2346
E: INFO@DUNSIRE.COM

SCALE
SCALE - 1 : 400
4.0 0 8.0m

TITLE
STORM SEWER CATCHMENT AREA & SWM PLAN
--
WHITE CEDAR ESTATES
LANDSDOWN DRIVE
GUELPH, ONTARIO

PROJECT No. KAM-13-084
SHEET No. C2
PLAN FILE No. -

K:\2013 Projects\KAM-13-084 Dunsire-White Cedar Estates\KAM CAD\KAM-13-084 Dunsire - Landsdown - 14-07-24.dwg



TYPICAL CROSS SECTION FOR PRIVATE DRIVE (EAST / WEST)

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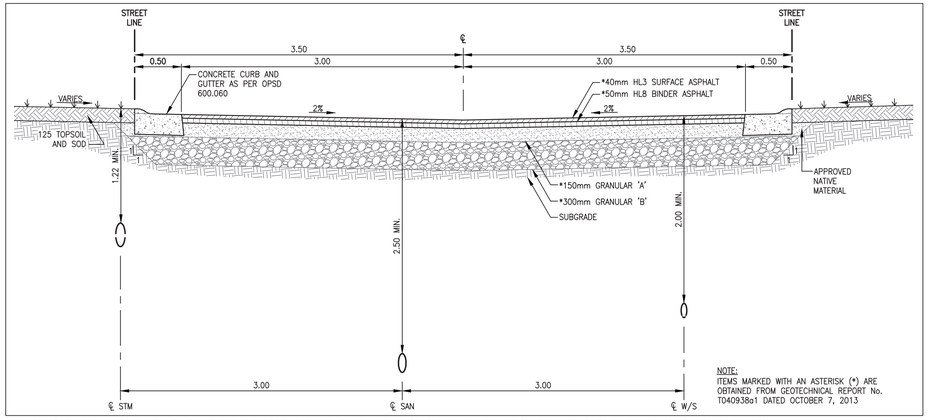

TYPICAL CROSS SECTION FOR PRIVATE DRIVE (NORTH / SOUTH)

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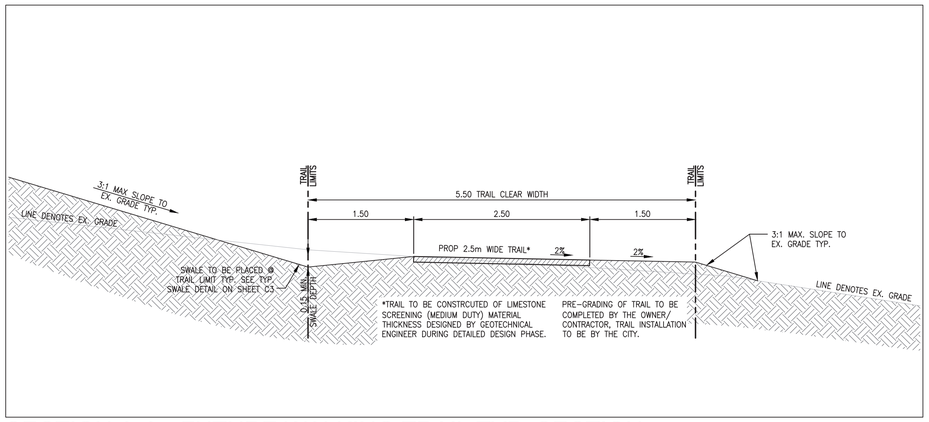

SECTION A-A - FUTURE WALKING TRAIL TYP. SECTION

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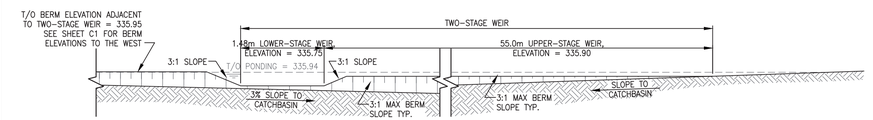
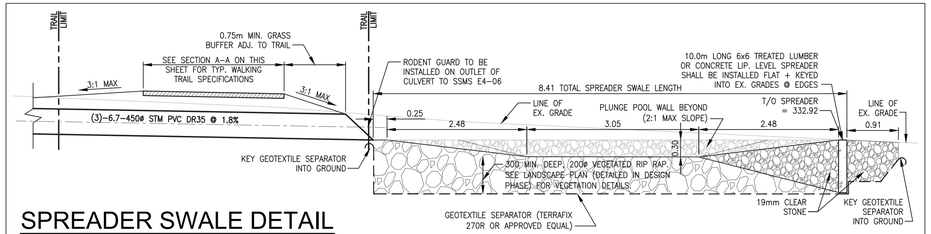


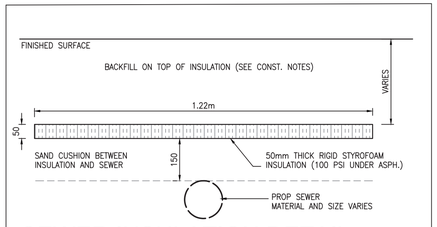
TWO-STAGE WEIR DETAIL

SCALE = 1:50



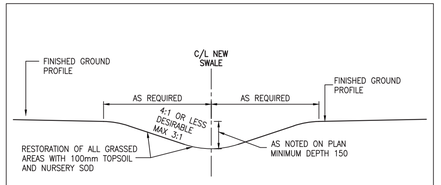
SPREADER SWALE DETAIL

SCALE = 1:50



SEWER INSULATION DETAIL

N.T.S



TYPICAL SWALE DETAIL

N.T.S

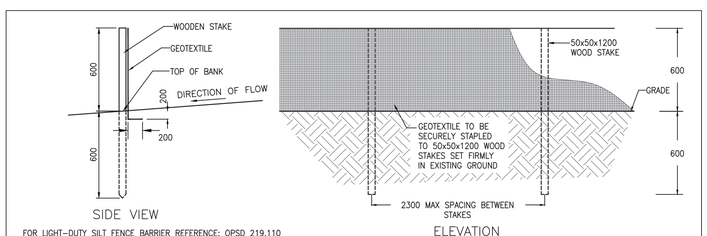
PAVEMENT MILLING DETAIL

N.T.S

NOTE:
REFER TO CONST. NOTE 14 ON THIS SHEET FOR MATERIAL THICKNESS TYP.

STRAW BALE CHECK DAM

N.T.S



FOR LIGHT-DUTY SILT FENCE BARRIER REFERENCE: OPSD 219.110
FOR HEAVY-DUTY SILT FENCE BARRIER REFERENCE: OPSD 219.130

SILT FENCE DETAIL

N.T.S

SEDIMENT CONTROL MEASURES

1. PROTECT ALL EXPOSED SURFACES AND CONTROL ALL RUNOFF DURING CONSTRUCTION.
2. ALL EROSION CONTROL MEASURES TO BE IN PLACE BEFORE STARTING CONSTRUCTION AND REMAIN IN PLACE UNTIL RESTORATION IS COMPLETED.
3. MAINTAIN EROSION CONTROL MEASURES DURING CONSTRUCTION.
4. ALL COLLECTED SEDIMENT TO BE DISPOSED OF AT AN APPROVED LOCATION.
5. MINIMIZE AREA DISTURBED DURING CONSTRUCTION.
6. ALL DEWATERING TO BE DISPOSED OF IN AN APPROVED SEDIMENTATION BASIN.
7. PROTECT ALL CATCH BASINS, MANHOLES AND PIPE ENDS FROM SEDIMENT INTRUSION WITH A SILT SACK OR A GEOTEXTILE FABRIC (TERRAFIX 270 R) OR APPROVED SILT SACS.
8. KEEP ALL SUMPS CLEAN DURING CONSTRUCTION.
9. PREVENT WIND-BLOWN DUST.
10. STRAW BALES TO BE USED IN LOCALIZED AREAS AS DIRECTED BY THE ENGINEER DURING CONSTRUCTION FOR WORKS WHICH ARE IN OR ADJACENT TO FLOOD LINES, FILL LINES AND HAZARDOUS SLOPES.
11. STRAW BALES TO BE TERMINATED BY ROUNDING BALES TO CONTAIN AND FILTER RUNOFF.
12. OBTAIN APPROVAL FROM GRCA PRIOR TO CONSTRUCTION FOR WORKS WHICH ARE IN, OR ADJACENT TO FLOOD LINES, FILL LINES AND HAZARDOUS SLOPES.
13. ALL SILT FENCING AND DETAILS ARE AT THE MINIMUM TO BE CONSTRUCTED IN ACCORDANCE WITH THE MINISTRY OF NATURAL RESOURCES GUIDELINES ON EROSION AND SEDIMENT CONTROL FOR URBAN CONSTRUCTION SITES.
14. ALL OF THE ABOVE NOTES AND ANY SEDIMENT & EROSION CONTROL MEASURES ARE AT THE MINIMUM TO BE IN ACCORDANCE WITH THE MINISTRY OF NATURAL RESOURCES GUIDELINES ON EROSION AND SEDIMENT CONTROL FOR URBAN CONSTRUCTION SITES.

CONSTRUCTION NOTES:

1. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES UNDER THE OCCUPATIONAL HEALTH AND SAFETY ACT AS REQUIRED BY THE MINISTRY OF LABOUR.
2. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE MINIMUM STANDARDS AND SPECIFICATIONS OF THE MUNICIPALITY'S ENGINEERING DEPARTMENT.
3. ALL WORK IN THE MUNICIPAL ROAD ALLOWANCE SHALL MEET THE MINIMUM STANDARDS AND SPECIFICATIONS OF THE MUNICIPALITY'S ENGINEERING DEPARTMENT. THE STANDARD CONTRACT DOCUMENTS FOR MUNICIPAL CONSTRUCTION PROJECTS AS ADOPTED AND AS AMENDED FROM TIME TO TIME ARE TO BE APPLIED TO WORKS WITHIN THE MUNICIPAL ROAD ALLOWANCE UNLESS OTHERWISE APPROVED BY THE MUNICIPAL ENGINEER. THE CONTRACTOR IS REQUIRED TO OBTAIN & PAY FOR PERMIT TO WORK IN MUNICIPAL R.O.W.
4. ALL EXCAVATIONS FOR PROPOSED SERVICES SHALL BE SUPPORTED ON GRANULAR FILL. ALL TOPSOIL, SOFT AND OTHERWISE UNSUITABLE MATERIAL SHALL BE REMOVED AND THE SUBGRADE SHOULD BE PROOF-ROLLED AND INSPECTED BY THE GEOTECHNICAL ENGINEER. ANY LOOSE OR SOFT ZONES NOTED IN THE INSPECTION SHOULD BE EXCAVATED AND REPLACED WITH APPROVED INORGANIC ON-SITE OR IMPORTED FILL. ALL FILL MATERIAL SHOULD BE INSPECTED AND APPROVED BY THE GEOTECHNICAL ENGINEER AND SHOULD BE PLACED IN LIFTS NOT EXCEEDING 300mm THAT ARE COMPACTED TO 100% SPMDD. THE FILL MATERIAL SHOULD COMPRISE OF CLEAN COMPACTIBLE FILL WITHIN 3% OF THE OPTIMUM MOISTURE CONTENT.
5. PRIOR TO COMMENCING ANY WORK ON THE INSTALLATION OF SERVICES & GRADING, AN APPROVED SET OF PLANS AND SPECIFICATIONS MUST BE AVAILABLE ON THE JOB AND SHALL REMAIN THERE WHILE WORK IS BEING DONE.
6. THE OWNERS OF THE UTILITIES MUST BE INFORMED AT LEAST TWO WEEKS PRIOR TO CONSTRUCTION ON ANY EXISTING MUNICIPAL ROAD ALLOWANCE. ALL EXISTING UNDERGROUND UTILITIES WITHIN THE LIMITS OF THE CONSTRUCTION SITE SHALL BE LOCATED AND MARKED. ANY UTILITIES, DAMAGED OR DISTURBED DURING CONSTRUCTION, SHALL BE REPAIRED OR REPLACED TO THE SATISFACTION OF THE GOVERNING BODY AT THE CONTRACTOR'S EXPENSE.
7. PRIOR TO COMMENCING ANY CONSTRUCTION, ALL SEWER OUTLET INFORMATION, BENCHMARKS, ELEVATIONS, DIMENSIONS AND GRADES MUST BE CHECKED BY THE CONTRACTOR AND VERIFIED AND ANY DISCREPANCIES REPORTED TO THE ENGINEER.
8. THE CONTRACTOR SHALL CONSTRUCT TEMPORARY MEASURES TO CONTROL SILT ENTERING THE STORM DRAINAGE SYSTEM TO THE SPECIFICATIONS OUTLINED IN THE GUIDELINES ON EROSION AND SEDIMENT CONTROL FOR URBAN CONSTRUCTION SITES PREPARED BY THE MINISTRY OF NATURAL RESOURCES. THESE MEASURES ARE TO BE INSTALLED PRIOR TO COMMENCING ANY CONSTRUCTION FOR THIS PROJECT AND ARE TO REMAIN IN PLACE UNTIL CONSTRUCTION HAS BEEN COMPLETED TO THE SPECIFICATIONS OF THE MUNICIPALITY'S ENGINEERING DEPARTMENT.
9. ALL EXISTING UNDERGROUND UTILITY (TELEPHONE DUCT, GAS MAINS, SEWER, WATERMAINS) THAT WILL BE CROSSED UNDER DURING THE INSTALLATION OF SERVICES FOR THIS DEVELOPMENT SHALL BE SUPPORTED BY A SUPPORT BEAM OR BY OTHER METHODS AS MAY BE REQUIRED BY THE OWNERS OF THE UTILITY BEING CROSSED UNDER.
10. THE CONTRACTOR SHALL INFORM THE MUNICIPAL PUBLIC TRANSIT COMMISSION AT LEAST FOUR DAYS PRIOR TO COMMENCING CONSTRUCTION ON ANY STREET THAT IS AN MUNICIPAL PUBLIC TRANSIT ROUTE THAT WILL BE AFFECTED BY CONSTRUCTION.
11. THE OWNER/CONTRACTOR SHALL HAVE ITS PROFESSIONAL ENGINEER PROVIDE FULL-TIME INSPECTION DURING CONSTRUCTION ON AN EXISTING MUNICIPAL STREET OR EASEMENT AND PROVIDE A CERTIFICATE OF COMPLETION OF WORKS UPON COMPLETION OF ALL WORKS TO BE CONSTRUCTED.
12. THE CONTRACTOR IS RESPONSIBLE FOR:
    –CONNECTING ANY EXISTING SEWER OR DRAIN ENCOUNTERED DURING CONSTRUCTION TO A NEW SEWER OF SIMILAR SIZE AND MATERIAL OR INTO ANOTHER EXISTING SEWER.
    –ENSURING THAT THERE IS NO INTERRUPTION OF ANY SURFACE OR SUBSURFACE DRAINAGE FLOW THAT WOULD ADVERSELY AFFECT NEIGHBOURING PROPERTIES.
13. STRIP FULL DEPTH OF TOPSOIL IN AREAS TO BE DISTURBED AND STOCK PILE FOR RE-USE IN GRASSED/LANDSCAPED AREAS.
14. ALL SURFACES WHICH ARE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO A CONDITION AT LEAST AS GOOD AS ORIGINAL, OR AS PER BELOW (WHICHEVER IS GREATER) OR IF WITHIN THE MUNICIPAL RIGHT OF WAY TO THE SATISFACTION OF THE MUNICIPAL ENGINEER, ALL AT NO COST TO THE MUNICIPALITY.
    14.1. GRASSED AREAS TO BE RESTORED w/ 100mm TOPSOIL + SOD
    14.2. CONCRETE SIDEWALK TO OPSD 310.010.
    14.3. CONCRETE CURB AND GUTTER AS SPECIFIED.
    14.4. ANY ASPHALT AREA DISTURBED DURING CONSTRUCTION SHALL BE RESTORED AS FOLLOWS:
        14.4.1. PROOF ROLL SUBGRADE (TO THE SATISFACTION OF THE GEOTECHNICAL ENGINEER) PRIOR TO PLACEMENT OF GRANULARS (98% SPMDD MIN.).
        14.4.2. MILL ADJACENT ASPHALT TO BE TIED INTO 50mm DEEP x 500mm WIDE PRIOR TO RESTORATION (SEE DETAIL ON SHEET C3.
        14.4.3. MIN. RECOMMENDED LIGHT DUTY PAVEMENT STRUCTURE (TO BE REVIEWED & APPROVED BY THE GEOTECHNICAL ENGINEER)
            – 40mm HL3 SURFACE ASPHALT COMPACTED TO 92% MAXIMUM RELATIVE DENSITY
            – 50mm HL8 BINDER ASPHALT COMPACTED TO 92% MAXIMUM RELATIVE DENSITY
                – ASPHALT TO BE SUPPLIED AND PLACED IN ACCORDANCE WITH OPSS 310
            – 150mm OF GRANULAR 'A' COMPACTED TO 98% SPMDD
            – 300mm OF GRANULAR 'B' COMPACTED TO 98% SPMDD
15. ALL PROPOSED STORM AND SANITARY SEWER PIPE TO BE PVC DR 35 OR MUNICIPALITY APPROVED PIPE WITH TYPE I BEDDING UNDER 4.5 M OF COVER AND TYPE II BEDDING OVER 4.5M OF COVER. ALL SEWER BEDDING MUST BE COMPACTED TO 95% STANDARD MAXIMUM DRY DENSITY (MINIMUM)
16. THE STRUCTURAL DESIGN OF SEWERS IS BASED ON THE TRANSITION WIDTH UNLESS OTHERWISE NOTED.
17. ALL STORM AND SANITARY SEWERS/SERVICES AND CATCHBASIN LEADS SHALL HAVE APPROVED RUBBER GASKET JOINTS + BE INSTALLED USING A LASER LEVEL.
18. 2.0m LENGTHS OF 150mm DIAMETER PERFORATED FILTER WRAPPED HDPE PIPE ARE TO BE INSTALLED AS SUBDRAINS CONNECTED TO TWO SIDES OF EACH CATCHBASIN AND CATCHBASIN MANHOLE WITHIN PAVED AREAS. THE SUBDRAINS ARE TO BE LOCATED JUST BELOW SUBGRADE ELEVATION
19. NO FOUNDATION DRAIN CONNECTIONS WILL BE PERMITTED INTO THE SANITARY SEWERS AND NO DIRECT GRAVITY CONNECTIONS FROM THE FOUNDATION DRAINS WILL BE PERMITTED TO THE STORM SYSTEM UNLESS THE STORM SYSTEM HAS THE CAPACITY TO PROVIDE FOR SUCH CONNECTIONS TO THE SATISFACTION OF THE MUNICIPALITY'S ENGINEERING DEPARTMENT.
20. ALL LINE PAINTING TO BE COMPLETED IN ACCORDANCE WITH THE MTO STANDARDS, IF REQUIRED.
21. ALL SUBSTITUTIONS MUST BE APPROVED BY THE MUNICIPALITY'S ENGINEERING DEPARTMENT.

LIST OF COMMON STANDARDS USED

OPSD	219.110	LIGHT-DUTY SILT FENCE BARRIER
OPSD	219.130	HEAVY-DUTY SILT FENCE BARRIER
OPSD	219.180	STRAW BALE FLOW CHECK DAM
OPSD	219.211	ROCK FLOW CHECK DAM – FLAT BOTTOM DITCH
OPSD	219.240	DEWATERING TRAP
OPSD	350.010	URBAN INDUSTRIAL, COMMERCIAL, AND APARTMENT ENTRANCES
OPSD	400.020	CAST IRON, SQUARE FRAME WITH SQUARE FLAT GRATE FOR CATCHBASINS, HERRINGBONE OPENINGS
OPSD	400.100	CAST IRON, SQUARE FRAME WITH SQUARE FLAT GRATE FOR CATCHBASINS, PERFORATED OPENINGS
OPSD	401.010	CAST IRON, SQUARE FRAME WITH CIRCULAR CLOSED OR OPEN COVER FOR MAINTENANCE HOLES
OPSD	401.030	MAINTENANCE HOLE, CAST IRON, WATERTIGHT COVER AND SQUARE FRAME
OPSD	404.020	ALUMINUM SAFETY PLATFORM FOR CIRCULAR MAINTENANCE HOLE
OPSD	405.010	MAINTENANCE HOLE STEPS, HOLLOW
OPSD	406.020	STEEL LADDER FOR MAINTENANCE HOLES
OPSD	600.040	CONCRETE BARRIER CURB WITH STANDARD GUTTER
OPSD	600.060	CONCRETE SEMI-MOUNTABLE WITH STANDARD GUTTER
OPSD	701.010	PRECAST MANHOLE – 1200mm DIAMETER
OPSD	701.030	MAINTENANCE HOLE COMPONENTS, 1200mm DIAMETER, TAPERED TOP AND FLAT CAP
OPSD	704.010	PRECAST CONCRETE ADJUSTMENT UNITS FOR MAINTENANCE HOLES, CATCHBASINS AND VALVE CHAMBERS
OPSD	705.010	PRECAST CONCRETE CATCHBASIN 600 x 600
OPSD	708.030	CATCHBASIN CONNECTION FOR FLEXIBLE MAIN PIPE SEWER
OPSD	803.04	BACKFILL FOR SEWERS AND PRESSURIZED CONDUITS, RIGID AND FLEXIBLE PIPE
OPSD	1001.01	PRECAST MANHOLE–1200mm DIA.
OPSD	1004.01	MANHOLE BENCHING DETAILS
OPSD	1005.02	BEDDING FOR SANITARY SEWERS, FLEXIBLE PIPE
OPSD	1006.020	SEWER SERVICE CONNECTIONS FOR FLEXIBLE MAIN PIPE SEWER
OPSD	1101.020	VALVE OPERATOR DETAIL
OPSD	1102.02	BEDDING FOR PRESSURIZED CONDUITS, FLEXIBLE PIPE
OPSD	1104.010	WATER SERVICE CONNECTION DETAIL 20 AND 25mm DIAMETER SIZES
OPSD	1109.011	CATHODIC PROTECTION FOR PVC WATERMAIN SYSTEMS
SSMS	E1-01	STANDARD BEDDING FOR SEWERS AND WATERMAINS
SSMS	E2-02	VALVE AND BOX INSTALLATION DETAIL
SSMS	E2-05	STANDARD WATER SERVICE CONNECTION DETAIL FOR NON-METALLIC SERVICES
SSMS	E4-06	RODENT GRATE FOR ATTACHMENT TO OUTLET

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AS CONSTRUCTED SERVICES | COMPLETION

			No.	REVISIONS	D/M/Y	BY
DESIGN	KEK		1	FOR ENVIRONMENTAL IMPACT STUDY	18/12/13	KAM
DRAWN	KEK		2	RESUBMISSION FOR ENVIRONMENTAL IMPACT STUDY	24/07/14	KAM
CHECKED	KAM					
APPROVED	KAM					
DATE	05-11-13					
CAD	13-084					

CONSULTANT

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LICENSED PROFESSIONAL ENGINEER
K.A. MONIZ
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JULY 24/14
PROVINCE OF ONTARIO

ENGINEER'S STAMP

CLIENT

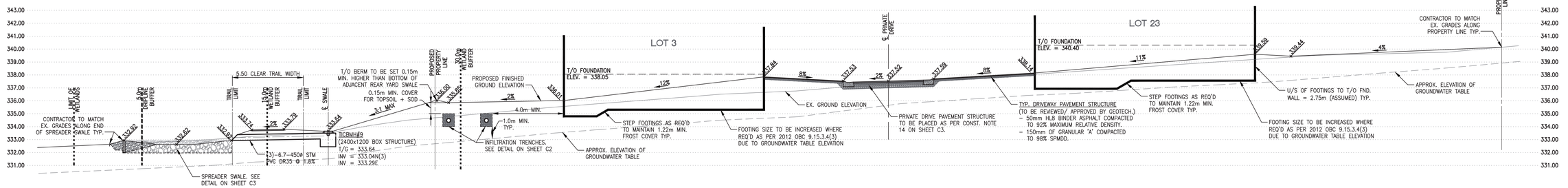
DUNSIRE DEVELOPMENTS
465 PHILLIP STREET, SUITE 203A
WATERLOO, ON N2L 6C7
P: 1.888.519.2346
E: INFO@DUNSIRE.COM

SCALE: AS NOTED

TITLE: NOTES, DETAILS AND CROSS-SECTIONS

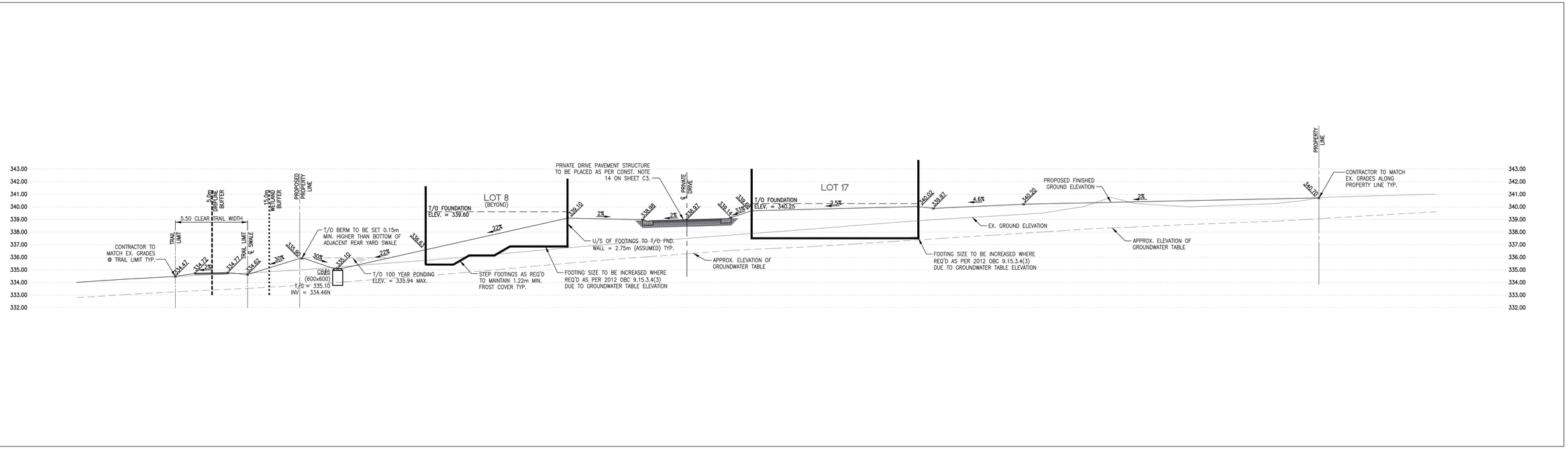
WHITE CEDAR ESTATES
LANDSDOWN DRIVE
GUELPH, ONTARIO

PROJECT No. KAM-13-084
SHEET No. C3
PLAN FILE No. –



SECTION D-D - SITE CROSS-SECTION THROUGH INFILTRATION TRENCHES AND SPREADER SWALE

SCALE = 1:150



SECTION E-E - SITE CROSS-SECTION THROUGH STORMWATER MANAGEMENT DETENTION AREA

SCALE = 1:150

AS CONSTRUCTED SERVICES	COMPLETION		No.	REVISIONS	D/M/Y	BY
		DESIGN KEK	1	FOR ENVIRONMENTAL IMPACT STUDY	18/12/13	KAM
		DRAWN KEK	2	RESUBMISSION FOR ENVIRONMENTAL IMPACT STUDY	24/07/14	KAM
		CHECKED KAM				
		APPROVED KAM				
		DATE 05-11-13				
		CAD 13-084				

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SCALE: AS NOTED

TITLE: SITE CROSS SECTIONS

WHITE CEDAR ESTATES
LANDSDOWN DRIVE
GUELPH, ONTARIO

PROJECT No. KAM-13-084

SHEET No. C4

PLAN FILE No. –

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Appendix D. Tree Inventory Data Table

Appendix D: Tree Inventory Data Table

Tree Tag #	Scientific Name	Common Name	DBH1 [1] (cm)	DBH2 (cm)	DBH3 (cm)	DBH4 (cm)	DBH5 (cm)	DBH6 (cm)	Crown Reserve [2] (m)	Height [3] (m)	Structural Condition [4]	Biological Health [5]	Preservation Priority [6]	Native Status [7]	Invasive [8]	Proposed Action [9]	Removal Permit Required [10]	Compensation Required [11]	Dunsire Property [12]	Location [13]	X Coordinate	Y Coordinate	Comments
1201	*Pinus nigra*	Austrian Pine	25						01-03	05-10	High	Medium	Medium	Non-native	No	Preserve If Possible	N/A	N/A	Yes	Plantation	564355.7536	4818754.9908	lots of dead lower branches
1202	*Pinus nigra*	Austrian Pine	17						01-03	05-10	High	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564362.1542	4818755.8991	machine damage on trunk
1203	*Pinus nigra*	Austrian Pine	20						03-05	05-10	High	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564363.2109	4818756.2698	machine damage on trunk
1204	*Pinus nigra*	Austrian Pine	25						01-03	10-15	Medium	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564363.3405	4818757.6298	sapsucker holes
1205	*Pinus nigra*	Austrian Pine	17						01-03	10-15	Medium	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564363.0848	4818758.3505	
1206	*Pinus nigra*	Austrian Pine	16						01-03	10-15	High	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564361.6776	4818760.3443	
1207	*Pinus nigra*	Austrian Pine	19						01-03	10-15	High	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564361.5762	4818757.8308	evenly spaced holes on trunk, insect?
1208	*Pinus nigra*	Austrian Pine	20						03-05	05-10	High	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564360.3184	4818756.4064	
1209	*Pinus nigra*	Austrian Pine	18						01-03	10-15	High	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564358.2545	4818759.0563	
1210	*Pinus nigra*	Austrian Pine	15						01-03	10-15	Medium	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564359.1798	4818761.8067	
1211	*Pinus nigra*	Austrian Pine	20						01-03	10-15	High	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564361.1215	4818762.0826	
1212	*Pinus nigra*	Austrian Pine	20						01-03	05-10	Medium	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564358.4236	4818760.2250	
1213	*Pinus nigra*	Austrian Pine	17						01-03	05-10	Medium	Low	Low	Non-native	No	Remove	Yes	No	Yes	Plantation	564352.9404	4818764.2419	
1214	*Pinus nigra*	Austrian Pine	13						01-03	05-10	High	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564353.2873	4818762.7719	
1215	*Pinus nigra*	Austrian Pine	20						03-05	10-15	Medium	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564353.5938	4818762.0738	
1216	*Pinus nigra*	Austrian Pine	25						03-05	10-15	Medium	High	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564360.0024	4818762.4282	
1217	*Pinus nigra*	Austrian Pine	20						03-05	05-10	Medium	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564351.0794	4818769.0336	
1218	*Pinus nigra*	Austrian Pine	14						01-03	05-10	High	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564353.1006	4818770.4301	
1219	*Pinus nigra*	Austrian Pine	25						03-05	10-15	High	High	Medium	Non-native	No	Preserve If Possible	N/A	N/A	Yes	Plantation	564353.7381	4818773.1875	
1220	*Pinus nigra*	Austrian Pine	20						01-03	10-15	High	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564355.7271	4818773.6512	
1221	*Pinus nigra*	Austrian Pine	30						05-10	10-15	Medium	High	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564359.2496	4818774.9655	birds nest at about 3m height
1222	*Pinus nigra*	Austrian Pine	20						01-03	10-15	High	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564361.5161	4818775.8265	
1223	*Pinus nigra*	Austrian Pine	25						03-05	05-10	Medium	High	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564362.5595	4818779.3084	
1224	*Pinus nigra*	Austrian Pine	25						03-05	10-15	Medium	High	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564363.5954	4818775.1762	
1225	*Pinus nigra*	Austrian Pine	13						01-03	05-10	Low	Low	Low	Non-native	No	Remove	No	No	Yes	Plantation	564363.4056	4818772.9970	
1226	*Pinus nigra*	Austrian Pine	19						01-03	05-10	High	High	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564358.5262	4818771.9351	
1227	*Pinus nigra*	Austrian Pine	16						01-03	05-10	High	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564358.8146	4818771.0470	
1228	*Pinus nigra*	Austrian Pine	12	9	7				01-03	05-10	Low	Medium	Low	Non-native	No	Remove	No	No	Yes	Plantation	564360.5925	4818767.0755	
1229	*Pinus nigra*	Austrian Pine	16						01-03	05-10	Medium	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564360.7748	4818762.1407	
1230	*Pinus nigra*	Austrian Pine	25						03-05	10-15	High	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564364.4347	4818762.9956	evenly spaced holes present on trunk
1231	*Pinus nigra*	Austrian Pine	12						01-03	05-10	Medium	Low	Low	Non-native	No	Remove	Yes	No	Yes	Plantation	564365.7894	4818766.3124	
1232	*Pinus nigra*	Austrian Pine	25						03-05	10-15	Medium	High	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564365.6138	4818764.6741	
1233	*Pinus nigra*	Austrian Pine	25						03-05	10-15	High	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564367.3459	4818765.7593	
1234	*Pinus nigra*	Austrian Pine	20						03-05	05-10	Medium	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564367.5120	4818767.1082	
1235	*Pinus nigra*	Austrian Pine	25						03-05	10-15	Medium	High	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564370.7160	4818770.7361	
1236	*Pinus nigra*	Austrian Pine	20						03-05	10-15	High	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564360.7232	4818767.0455	
1237	*Pinus nigra*	Austrian Pine	25						01-03	05-10	Medium	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564363.2358	4818773.6654	
1238	*Pinus nigra*	Austrian Pine	20						01-03	10-15	Medium	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564364.4592	4818780.9536	
1239	*Pinus nigra*	Austrian Pine	20						03-05	10-15	Medium	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564365.4279	4818776.8863	
1240	*Pinus nigra*	Austrian Pine	25						03-05	10-15	Medium	High	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564371.0241	4818779.8225	
1241	*Pinus nigra*	Austrian Pine	19						03-05	05-10	Medium	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564370.9512	4818777.4723	
1242	*Picea glauca*	White Spruce	12						01-03	05-10	High	High	High	Native	No	Remove	Yes	Yes	Yes	Plantation	564369.9671	4818771.4338	
1243	*Pinus nigra*	Austrian Pine	12	11					01-03	05-10	Medium	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564376.9619	4818770.3802	
1244	*Pinus sylvestris*	Scotch Pine	19						03-05	05-10	High	Medium	Low	Non-native	Yes	Remove	Yes	No	Yes	Plantation	564380.3501	4818771.5875	
1245	*Pinus nigra*	Austrian Pine	25						03-05	05-10	Medium	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564378.3349	4818771.1234	
1246	*Pinus nigra*	Austrian Pine	25						01-03	05-10	Medium	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564378.8017	4818776.3671	
1247	*Pinus nigra*	Austrian Pine	30						03-05	05-10	High	High	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564378.6835	4818777.0027	
1248	*Pinus nigra*	Austrian Pine	20	10					01-03	10-15	Medium	High	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564378.9197	4818779.4010	
1249	*Pinus nigra*	Austrian Pine	14						01-03	05-10	High	Low	Low	Non-native	No	Remove	Yes	No	Yes	Plantation	564378.7772	4818783.1947	spindley
1250	*Pinus nigra*	Austrian Pine	18	8					01-03	05-10	Medium	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564380.1941	4818785.4769	
1251	*Pinus nigra*	Austrian Pine	35						03-05	10-15	Medium	High	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564378.6378	4818788.8720	
1252	*Pinus nigra*	Austrian Pine	25						03-05	05-10	Medium	High	Medium	Non-native	No	Preserve If Possible	N/A	N/A	Yes	Plantation	564374.6976	4818793.3182	
1253	*Pinus nigra*	Austrian Pine	30						03-05	10-15	High	High	Medium	Non-native	No	Preserve If Possible	N/A	N/A	Yes	Plantation	564372.5351	4818792.8539	nest in top of tree
1254	*Pinus nigra*	Austrian Pine	18						01-03	05-10	Medium	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564375.1384	4818792.4180	
1255	*Pinus nigra*	Austrian Pine	20						01-03	05-10	Medium	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564374.2652	4818792.0573	
1256	*Pinus nigra*	Austrian Pine	25						01-03	05-10	Medium	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564375.2032	4818788.7404	
1257	*Pinus nigra*	Austrian Pine	14						01-03	05-10	Low	Medium	Low	Non-native	No	Remove	No	No	Yes	Plantation	564376.6552	4818785.8028	
1258	*Pinus nigra*	Austrian Pine	25						05-10	01-03	Medium	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564374.9253	4818782.6874	
1259	*Pinus nigra*	Austrian Pine	20						03-05	10-15	High	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564374.5726	4818782.5518	
1260	*Pinus nigra*	Austrian Pine	18						01-03	10-15	High	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564374.3120	4818781.2443	
1261	*Pinus nigra*	Austrian Pine	30						03-05	10-15	High	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564371.7606	4818783.0035	
1262	*Pinus nigra*	Austrian Pine	16						01-03	10-15	Medium	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564375.7829	4818782.2978	
1263	*Pinus nigra*	Austrian Pine	20						01-03	10-15	High	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564373.8450	4818779.7929	
1264	*Pinus nigra*	Austrian Pine	20						01-03	10-15	Medium	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564372.3071	4818778.0323	
1265	*Pinus nigra*	Austrian Pine	17						01-03	05-10	Medium	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564372.0075	4818776.2605	
1266	*Pinus nigra*	Austrian Pine	25						01-03	10-15	High	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564370.4711	4818781.4328	some small holes present in trunk
1267	*Pinus nigra*	Austrian Pine	17						01-03	05-10	Low	Low	Low	Non-native	No	Remove	No	No	Yes	Plantation	564380.8986	4818787.7649	
1268	*Pinus nigra*	Austrian Pine	20						01-03	10-15	Medium	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564381.9653	4818789.7878	

Appendix D: Tree Inventory Data Table

Tree Tag #	Scientific Name	Common Name	DBH1 [1] (cm)	DBH2 (cm)	DBH3 (cm)	DBH4 (cm)	DBH5 (cm)	DBH6 (cm)	Crown Reserve [2] (m)	Height [3] (m)	Structural Condition [4]	Biological Health [5]	Preservation Priority [6]	Native Status [7]	Invasive [8]	Proposed Action [9]	Removal Permit Required [10]	Compensation Required [11]	Dunsire Property [12]	Location [13]	X Coordinate	Y Coordinate	Comments
1269	*Pinus nigra*	Austrian Pine	30						01-03	10-15	Medium	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564381.3547	4818792.8910	
1270	*Pinus nigra*	Austrian Pine	17						01-03	05-10	Medium	Low	Low	Non-native	No	Remove	Yes	No	Yes	Plantation	564381.3327	4818795.3009	
1271	*Pinus nigra*	Austrian Pine	20						01-03	10-15	Medium	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564383.1629	4818792.0981	
1272	*Pinus nigra*	Austrian Pine	20						01-03	10-15	Medium	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564382.7295	4818791.6130	
1273	*Pinus nigra*	Austrian Pine	20						01-03	10-15	Medium	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564385.3465	4818790.8093	
1274	*Pinus nigra*	Austrian Pine	17						01-03	10-15	Medium	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564384.4187	4818787.6075	
1275	*Pinus nigra*	Austrian Pine	16						01-03	10-15	High	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564382.5829	4818789.3918	
1276	*Pinus nigra*	Austrian Pine	19						01-03	10-15	High	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564381.4142	4818787.7479	
1277	*Pinus nigra*	Austrian Pine	25						03-05	05-10	High	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564385.7383	4818783.7347	
1278	*Pinus nigra*	Austrian Pine	20						03-05	05-10	Medium	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564388.1656	4818786.5712	
1279	*Pinus nigra*	Austrian Pine	16						01-03	05-10	Medium	Low	Low	Non-native	No	Remove	Yes	No	Yes	Plantation	564386.9656	4818788.2580	
1280	*Pinus nigra*	Austrian Pine	25						03-05	10-15	Medium	High	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564388.6786	4818790.8248	
1281	*Pinus nigra*	Austrian Pine	20						01-03	05-10	Medium	Low	Low	Non-native	No	Remove	Yes	No	Yes	Plantation	564390.3136	4818792.7451	
1282	*Picea glauca*	White Spruce	13						03-05	05-10	Medium	High	Medium	Native	No	Remove	Yes	Yes	Yes	Plantation	564392.0091	4818789.3315	
1283	*Picea glauca*	White Spruce	14						03-05	05-10	High	High	High	Native	No	Remove	Yes	Yes	Yes	Plantation	564397.1473	4818787.9540	
1284	*Pinus nigra*	Austrian Pine	16						01-03	05-10	Medium	Low	Low	Non-native	No	Remove	Yes	No	Yes	Plantation	564399.4848	4818787.6832	disease signs on trunk, girdled, canker like growth
1285	*Pinus nigra*	Austrian Pine	17						01-03	05-10	Medium	Low	Low	Non-native	No	Remove	Yes	No	Yes	Plantation	564400.2609	4818788.1811	
1286	*Pinus nigra*	Austrian Pine	20						01-03	05-10	Medium	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564399.9604	4818789.7736	
1287	*Pinus nigra*	Austrian Pine	30						03-05	10-15	Medium	High	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564400.1384	4818792.0832	
1288	*Pinus nigra*	Austrian Pine	11						01-03	05-10	Medium	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564401.0886	4818791.0267	
1289	*Pinus sylvestris*	Scotch Pine	20						01-03	05-10	High	High	Low	Non-native	Yes	Remove	Yes	No	Yes	Plantation	564401.4117	4818790.3737	
1290	*Pinus nigra*	Austrian Pine	20						01-03	10-15	High	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564402.0338	4818792.9583	
1291	*Pinus nigra*	Austrian Pine	20						01-03	05-10	Medium	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564404.8393	4818793.9943	
1292	*Pinus nigra*	Austrian Pine	25						03-05	05-10	Medium	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564404.2839	4818789.6561	
1293	*Pinus nigra*	Austrian Pine	30						03-05	05-10	Medium	High	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564405.9548	4818794.4310	
1294	*Pinus nigra*	Austrian Pine	10						01-03	05-10	Medium	Low	Low	Non-native	No	Remove	Yes	No	Yes	Plantation	564409.3251	4818792.7064	topped, sparse leaves
1295	*Pinus nigra*	Austrian Pine	25						03-05	05-10	Medium	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564411.7806	4818796.3458	
1296	*Pinus nigra*	Austrian Pine	13						01-03	05-10	High	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564409.8950	4818795.2944	
1297	*Pinus nigra*	Austrian Pine	15						01-03	05-10	Medium	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564408.4990	4818796.4430	
1298	*Pinus nigra*	Austrian Pine	14						01-03	05-10	Medium	Low	Low	Non-native	No	Remove	Yes	No	Yes	Plantation	564409.4437	4818797.7463	
1299	*Pinus nigra*	Austrian Pine	16						01-03	05-10	High	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564407.3845	4818799.7471	
1300	*Pinus nigra*	Austrian Pine	17						01-03	05-10	Medium	Medium	Medium	Non-native	No	Preserve	N/A	N/A	Yes	Plantation	564408.6479	4818802.3362	
1301	*Pinus nigra*	Austrian Pine	20						03-05	05-10	Low	Medium	Low	Non-native	No	Remove	No	No	Yes	Plantation	564415.7973	4818795.8811	
1302	*Pinus nigra*	Austrian Pine	16						01-03	05-10	Medium	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564414.1766	4818796.2046	
1303	*Pinus nigra*	Austrian Pine	15						01-03	05-10	Medium	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564411.7721	4818797.2292	
1304	*Pinus nigra*	Austrian Pine	16						01-03	05-10	Low	Medium	Low	Non-native	No	Remove	No	No	Yes	Plantation	564409.9490	4818800.3810	
1305	*Pinus nigra*	Austrian Pine	12						01-03	05-10	Low	Medium	Low	Non-native	No	Remove	No	No	Yes	Plantation	564415.3199	4818801.9192	
1306	*Pinus nigra*	Austrian Pine	17						01-03	05-10	Low	Medium	Low	Non-native	No	Remove	No	No	Yes	Plantation	564413.5306	4818803.4240	
1307	*Pinus nigra*	Austrian Pine	16						01-03	05-10	High	Medium	Medium	Non-native	No	Preserve	N/A	N/A	Yes	Plantation	564410.9468	4818803.3172	
1308	*Pinus nigra*	Austrian Pine	18						03-05	05-10	Medium	Medium	Medium	Non-native	No	Preserve	N/A	N/A	Yes	Plantation	564410.5106	4818805.0380	
1309	*Pinus nigra*	Austrian Pine	20						01-03	05-10	Medium	Low	Low	Non-native	No	Remove	Yes	No	Yes	Plantation	564409.8432	4818808.9125	
1310	*Pinus nigra*	Austrian Pine	13						01-03	05-10	Medium	Low	Low	Non-native	No	Remove	Yes	No	Yes	Plantation	564407.8614	4818807.0055	
1311	*Pinus nigra*	Austrian Pine	11						01-03	05-10	High	Low	Low	Non-native	No	Remove	Yes	No	Yes	Plantation	564402.7746	4818803.2401	
1312	*Pinus nigra*	Austrian Pine	17						03-05	05-10	High	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564401.4758	4818801.3016	
1313	*Pinus nigra*	Austrian Pine	19						01-03	05-10	Medium	Medium	Medium	Non-native	No	Preserve	N/A	N/A	Yes	Plantation	564400.1172	4818804.3021	
1314	*Pinus nigra*	Austrian Pine	14						01-03	05-10	High	Low	Low	Non-native	No	Remove	Yes	No	Yes	Plantation	564398.4436	4818798.1284	
1315	*Pinus nigra*	Austrian Pine	20						01-03	05-10	Medium	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564396.5034	4818796.1821	
1316	*Pinus nigra*	Austrian Pine	16						01-03	05-10	High	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564391.2551	4818795.8465	
1317	*Pinus nigra*	Austrian Pine	15						01-03	05-10	High	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564387.9852	4818795.4781	
1318	*Pinus nigra*	Austrian Pine	20						01-03	05-10	Medium	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564387.8108	4818801.3353	
1319	*Pinus nigra*	Austrian Pine	25						03-05	10-15	Medium	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564385.6515	4818801.7135	
1320	*Pinus nigra*	Austrian Pine	15						01-03	05-10	High	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564382.6658	4818800.4386	
1321	*Pinus nigra*	Austrian Pine	15						01-03	05-10	High	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564386.9390	4818805.7244	
1322	*Pinus nigra*	Austrian Pine	17						01-03	10-15	Medium	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564390.8418	4818802.2430	
1323	*Pinus nigra*	Austrian Pine	20						03-05	10-15	High	High	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564392.8972	4818801.5836	
1324	*Pinus nigra*	Austrian Pine	20						01-03	05-10	Medium	Low	Low	Non-native	No	Remove	Yes	No	Yes	Plantation	564390.8399	4818802.4666	
1325	*Pinus nigra*	Austrian Pine	20						01-03	10-15	Medium	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564393.4905	4818800.9246	
1326	*Pinus nigra*	Austrian Pine	14						01-03	05-10	High	Medium	Medium	Non-native	No	Remove	Yes	Yes	Yes	Plantation	564394.5997	4818801.2700	
1327	*Pinus nigra*	Austrian Pine	20						01-03	10-15	Medium	Medium	Medium	Non-native	No	Preserve	N/A	N/A	Yes	Plantation	564394.2084	4818803.6581	
1328	*Pinus nigra*	Austrian Pine	17						01-03	05-10	Medium	Medium	Medium	Non-native	No	Preserve	N/A	N/A	Yes	Plantation	564394.3176	4818805.2071	
1329	*Pinus nigra*	Austrian Pine	14						01-03	05-10	Medium	Low	Low	Non-native	No	Remove	Yes	No	Yes	Plantation	564392.6430	4818806.0974	
1330	*Pinus nigra*	Austrian Pine	20						03-05	10-15	High	Medium	Medium	Non-native	No	Preserve	N/A	N/A	Yes	Plantation	564395.6140	4818807.3615	
1331	*Pinus nigra*	Austrian Pine	18						01-03	10-15	High	Medium	Medium	Non-native	No	Preserve	N/A	N/A	Yes	Plantation	564398.8673	4818807.0961	
1332	*Pinus nigra*	Austrian Pine	16						01-03	10-15	High	Medium	Medium	Non-native	No	Preserve	N/A	N/A	Yes	Plantation	564399.7563	4818805.4551	
1333	*Pinus nigra*	Austrian Pine	25						01-03	10-15	Medium	Medium	Medium	Non-native	No	Preserve	N/A	N/A	Yes	Plantation	564401.6625	4818804.5533	
1334	*Pinus nigra*	Austrian Pine	16						01-03	10-15	High	High	Medium	Non-native	No	Preserve	N/A	N/A	Yes	Plantation	564401.3992	4818806.3127	
1335	*Pinus nigra*	Austrian Pine	16	9					01-03	05-10	Medium	Medium	Medium	Non-native	No	Preserve	N/A	N/A	Yes	Plantation	564400.8617	4818808.3843	
1336	*Pinus nigra*	Austrian Pine	14	9					01-03	05-10	Medium	Medium	Medium	Non-native	No	Preserve	N/A	N/A	Yes	Plantation	564400.8247	4818810.8912	
1337	*Pinus nigra*	Austrian Pine	11						01-03	05-10	High	Medium	Medium	Non-native	No	Preserve	N/A	N/A	Yes	Plantation	564402.4453	4818809.2332	

Appendix D: Tree Inventory Data Table

Tree Tag #	Scientific Name	Common Name	DBH1 [1] (cm)	DBH2 (cm)	DBH3 (cm)	DBH4 (cm)	DBH5 (cm)	DBH6 (cm)	Crown Reserve [2] (m)	Height [3] (m)	Structural Condition [4]	Biological Health [5]	Preservation Priority [6]	Native Status [7]	Invasive [8]	Proposed Action [9]	Removal Permit Required [10]	Compensation Required [11]	Dunsire Property [12]	Location [13]	X Coordinate	Y Coordinate	Comments
1338	*Pinus nigra*	Austrian Pine	18						01-03	05-10	Medium	Medium	Medium	Non-native	No	Preserve	N/A	N/A	Yes	Plantation	564398.9219	4818811.2990	
1339	*Pinus nigra*	Austrian Pine	19						01-03	05-10	High	Medium	Medium	Non-native	No	Preserve	N/A	N/A	Yes	Plantation	564397.6886	4818810.4513	
1340	*Pinus nigra*	Austrian Pine	17						01-03	10-15	High	Medium	Medium	Non-native	No	Preserve	N/A	N/A	Yes	Plantation	564396.3429	4818805.6112	
1341	*Pinus nigra*	Austrian Pine	25						03-05	05-10	Medium	High	Medium	Non-native	No	Preserve	N/A	N/A	Yes	Plantation	564397.2623	4818813.5937	
1342	*Pinus nigra*	Austrian Pine	18						01-03	05-10	High	High	Medium	Non-native	No	Preserve	N/A	N/A	Yes	Plantation	564395.6251	4818815.5412	
1343	*Salix alba*	White Willow	50						05-10	05-10	Low	Low	Low	Non-native	Yes	Preserve	N/A	N/A	No	Torrance Creek PSW / Significant Woodlot	564350.4797	4818859.0758	rot in trunk, signs of insect infestation - sawdust, holes
1344	*Salix alba*	White Willow	50						05-10	10-15	Low	High	Low	Non-native	Yes	Preserve	N/A	N/A	No	Torrance Creek PSW / Significant Woodlot	564353.6358	4818857.6826	
1345	*Salix alba*	White Willow	50						05-10	10-15	Low	High	Low	Non-native	Yes	Preserve	N/A	N/A	No	Torrance Creek PSW / Significant Woodlot	564355.6463	4818855.1586	
1346	*Prunus serotina*	Wild Black Cherry	25						03-05	05-10	Medium	High	High	Native	No	Preserve	N/A	N/A	No	Torrance Creek PSW / Significant Woodlot	564360.2840	4818850.3940	
1347	*Salix alba*	White Willow	35						05-10	10-15	Medium	Medium	Low	Non-native	Yes	Preserve	N/A	N/A	No	Torrance Creek PSW / Significant Woodlot	564362.3888	4818848.8232	sapsucker holes
1348	*Salix alba*	White Willow	40						05-10	10-15	Medium	Medium	Low	Non-native	Yes	Preserve	N/A	N/A	No	Torrance Creek PSW / Significant Woodlot	564366.5903	4818844.9507	sapsucker holes
1349	*Betula papyrifera*	Paper Birch	17						03-05	10-15	Medium	High	Medium	Native	No	Preserve	N/A	N/A	No	Torrance Creek PSW / Significant Woodlot	564369.2661	4818841.3027	
1350	*Salix alba*	White Willow	30						05-10	05-10	Low	Medium	Low	Non-native	Yes	Preserve	N/A	N/A	No	Torrance Creek PSW / Significant Woodlot	564371.3041	4818839.5460	rot in trunk
1351	*Juniperus communis*	Ground Juniper	17	10	9	7			05-10	03-05	Medium	Medium	High	Native	No	Preserve	N/A	N/A	No	Torrance Creek PSW / Significant Woodlot	564382.3016	4818831.1409	juniper, sample collected, exposed roots due to erosion
1352	*Populus tremuloides*	Trembling Aspen	19						03-05	10-15	Low	Medium	Low	Native	No	Preserve	N/A	N/A	No	Torrance Creek PSW / Significant Woodlot	564390.8207	4818834.7349	basal rot
1353	*Acer negundo*	Box Elder	40	20	15				10-15	05-10	Low	Low	Low	Native	Yes	Preserve	N/A	N/A	No	Torrance Creek PSW / Significant Woodlot	564393.3814	4818835.3391	rot in main trunk, codominant trunk
1354	*Malus sp*	Apple Species	20	18	16	15			05-10	05-10	Medium	High	Medium	Genus	No	Preserve	N/A	N/A	No	Torrance Creek PSW / Significant Woodlot	564394.4499	4818827.6009	
1355	*Robinia pseudoacacia*	Black Locust	50						05-10	10-15	Medium	Medium	Low	Non-native	Yes	Preserve	N/A	N/A	No	Torrance Creek PSW / Significant Woodlot	564400.5692	4818831.0371	some dead branches
1356	*Salix alba*	White Willow	50	35					10-15	10-15	Low	Medium	Low	Non-native	Yes	Preserve	N/A	N/A	No	Torrance Creek PSW / Significant Woodlot	564404.8561	4818840.4343	dead codominant trunk
1357	*Populus balsamifera ssp. balsamifera*	Balsam Poplar	15	13					01-03	10-15	Medium	Medium	Low	Native	No	Preserve	N/A	N/A	Yes	Torrance Creek PSW / Significant Woodlot	564411.3661	4818829.3326	leaning, machine damage, exposed roots
1358	*Populus balsamifera ssp. balsamifera*	Balsam Poplar	17						01-03	10-15	Medium	Medium	Medium	Native	No	Preserve	N/A	N/A	Yes	Torrance Creek PSW / Significant Woodlot	564415.4863	4818824.7275	machine damage, lopsided
1359	*Acer negundo*	Box Elder	11	10	9	6			03-05	05-10	Medium	Medium	Low	Native	Yes	Remove	Yes	No	No	Torrance Creek PSW / Significant Woodlot	564427.3658	4818819.0574	machine damage, some dead branches
1360	*Betula papyrifera*	Paper Birch	25						03-05	10-15	Medium	Medium	Medium	Native	No	Preserve	N/A	N/A	No	Torrance Creek PSW / Significant Woodlot	564442.6529	4818816.6421	leaning, signs of diseased lower branches
1361	*Acer negundo*	Box Elder	11						03-05	05-10	Low	Medium	Low	Native	Yes	Remove	No	No	No	Torrance Creek PSW / Significant Woodlot	564452.2379	4818813.4314	
1362	*Thuja occidentalis*	Eastern White Cedar	18	12					01-03	03-05	Low	Low	Low	Native	No	Preserve	N/A	N/A	No	Torrance Creek PSW / Significant Woodlot	564451.5839	4818813.1686	fallen but still living
1363	*Thuja occidentalis*	Eastern White Cedar	25						00-01	00-01	Low	Low	Low	Native	No	Preserve	N/A	N/A	No	Torrance Creek PSW / Significant Woodlot	564452.0237	4818812.4738	rot in trunk, fallen but living
1364	*Thuja occidentalis*	Eastern White Cedar	20	18					03-05	10-15	Medium	Medium	High	Native	No	Preserve	N/A	N/A	No	Torrance Creek PSW / Significant Woodlot	564454.8393	4818809.7677	leaning
1365	*Thuja occidentalis*	Eastern White Cedar	20	20					01-03	05-10	Medium	Medium	High	Native	No	Preserve	N/A	N/A	No	Torrance Creek PSW / Significant Woodlot	564456.5086	4818810.3620	dense stand of cedar trees
1366	*Thuja occidentalis*	Eastern White Cedar	20						01-03	05-10	Medium	Medium	High	Native	No	Preserve	N/A	N/A	No	Torrance Creek PSW / Significant Woodlot	564455.8851	4818809.3982	dense stand of cedar trees
1367	*Thuja occidentalis*	Eastern White Cedar	20						01-03	05-10	Medium	Medium	High	Native	No	Preserve	N/A	N/A	No	Torrance Creek PSW / Significant Woodlot	564456.3846	4818808.5688	dense stand of cedar trees
1368	*Thuja occidentalis*	Eastern White Cedar	20						01-03	05-10	Medium	Medium	High	Native	No	Preserve	N/A	N/A	No	Torrance Creek PSW / Significant Woodlot	564457.9557	4818810.0422	dense stand of cedar trees
1369	*Thuja occidentalis*	Eastern White Cedar	14						01-03	05-10	Medium	Medium	High	Native	No	Preserve	N/A	N/A	No	Torrance Creek PSW / Significant Woodlot	564455.4282	4818803.6662	crowded
1370	*Populus balsamifera ssp. balsamifera*	Balsam Poplar	30	17	16				03-05	05-10	Medium	Medium	Medium	Native	No	Preserve	N/A	N/A	No	Torrance Creek PSW / Significant Woodlot	564454.1664	4818798.3097	multistemmed, some dead branches
1371	*Acer negundo*	Box Elder	18						01-03	05-10	Low	Medium	Low	Native	Yes	Remove	No	No	No	Torrance Creek PSW / Significant Woodlot	564455.9429	4818793.8115	drastically leaning, epicormics
1372	*Malus sp*	Apple Species	35						05-10	05-10	Low	Medium	Low	Genus	No	Preserve	N/A	N/A	No	Torrance Creek PSW / Significant Woodlot	564470.6476	4818786.3813	rot in trunk, some dead branches
1373	*Acer negundo*	Box Elder	12						03-05	05-10	Medium	Medium	Low	Native	Yes	Remove	Yes	No	No	Torrance Creek PSW / Significant Woodlot	564467.4690	4818783.3256	some dead branches
1374	*Acer negundo*	Box Elder	20	14					03-05	05-10	Low	Medium	Low	Native	Yes	Remove	No	No	No	Torrance Creek PSW / Significant Woodlot	564477.5547	4818780.6774	leaning
1375	*Prunus serotina*	Wild Black Cherry	60						05-10	10-15	Medium	Medium	High	Native	No	Preserve	N/A	N/A	No	Torrance Creek PSW / Significant Woodlot	564483.6789	4818774.6082	codominant leaders, some dead branches
1376	*Populus tremuloides*	Trembling Aspen	20						03-05	10-15	High	Medium	Medium	Native	No	Preserve	N/A	N/A	No	Torrance Creek PSW / Significant Woodlot	564488.1569	4818773.3335	unclosed wound in main trunk
1377	*Acer negundo*	Box Elder	13						03-05	05-10	Medium	Medium	Low	Native	Yes	Remove	Yes	No	No	Torrance Creek PSW / Significant Woodlot	564491.8589	4818759.6862	leaning
1378	*Populus tremuloides*	Trembling Aspen	14						03-05	05-10	High	Medium	Medium	Native	No	Preserve	N/A	N/A	No	Torrance Creek PSW / Significant Woodlot	564497.0197	4818755.6700	some dead branches
1379	*Populus tremuloides*	Trembling Aspen	12						03-05	05-10	High	Medium	Medium	Native	No	Preserve	N/A	N/A	No	Torrance Creek PSW / Significant Woodlot	564499.5260	4818751.5415	some dead branches

Appendix D: Tree Inventory Data Table

Tree Tag #	Scientific Name	Common Name	DBH1 [1] (cm)	DBH2 (cm)	DBH3 (cm)	DBH4 (cm)	DBH5 (cm)	DBH6 (cm)	Crown Reserve [2] (m)	Height [3] (m)	Structural Condition [4]	Biological Health [5]	Preservation Priority [6]	Native Status [7]	Invasive [8]	Proposed Action [9]	Removal Permit Required [10]	Compensation Required [11]	Dunsire Property [12]	Location [13]	X Coordinate	Y Coordinate	Comments
1380	*Populus tremuloides*	Trembling Aspen	18						03-05	10-15	High	Medium	Medium	Native	No	Preserve	N/A	N/A	No	Torrance Creek PSW / Significant Woodlot	564499.9023	4818750.8823	some dead branches
1381	*Populus tremuloides*	Trembling Aspen	13						03-05	05-10	High	Medium	Medium	Native	No	Preserve	N/A	N/A	No	Torrance Creek PSW / Significant Woodlot	564499.2273	4818751.1582	some dead branches
1382	*Populus tremuloides*	Trembling Aspen	20						03-05	10-15	High	Medium	Medium	Native	No	Preserve	N/A	N/A	No	Torrance Creek PSW / Significant Woodlot	564498.4288	4818749.9782	some dead branches
1383	*Populus tremuloides*	Trembling Aspen	20						03-05	10-15	Medium	Medium	Medium	Native	No	Preserve	N/A	N/A	No	Torrance Creek PSW / Significant Woodlot	564498.6832	4818748.1781	some dead branches, leaning
1384	*Populus tremuloides*	Trembling Aspen	14						03-05	05-10	Medium	Medium	Medium	Native	No	Preserve	N/A	N/A	No	Torrance Creek PSW / Significant Woodlot	564499.6537	4818748.0438	some dead branches, leaning
1385	*Populus tremuloides*	Trembling Aspen	13						03-05	05-10	Medium	Medium	Medium	Native	No	Preserve	N/A	N/A	No	Torrance Creek PSW / Significant Woodlot	564501.1761	4818747.5996	some dead branches, leaning
1386	*Populus tremuloides*	Trembling Aspen	14						03-05	05-10	Medium	Medium	Medium	Native	No	Preserve	N/A	N/A	No	Torrance Creek PSW / Significant Woodlot	564502.4574	4818749.5666	some dead branches, leaning
1387	*Populus tremuloides*	Trembling Aspen	25						03-05	10-15	Medium	Medium	Medium	Native	No	Preserve	N/A	N/A	No	Torrance Creek PSW / Significant Woodlot	564501.1003	4818747.0846	some dead branches, leaning
1388	*Populus tremuloides*	Trembling Aspen	20						03-05	10-15	Medium	Medium	Medium	Native	No	Preserve	N/A	N/A	No	Torrance Creek PSW / Significant Woodlot	564505.2425	4818744.9335	some dead branches, leaning, lopsided
1389	*Betula papyrifera*	Paper Birch	20						05-10	10-15	Medium	High	Medium	Native	No	Preserve	N/A	N/A	No	Torrance Creek PSW / Significant Woodlot	564515.3086	4818738.9977	metal object imbedded in trunk, leaning
1390	*Betula papyrifera*	Paper Birch	25						05-10	10-15	Medium	Medium	Medium	Native	No	Preserve	N/A	N/A	No	Torrance Creek PSW / Significant Woodlot	564517.4266	4818738.5224	leaning, sapsucker holes
1391	*Acer negundo*	Box Elder	20	16					05-10	05-10	Low	Medium	Low	Native	Yes	Remove	No	No	No	Torrance Creek PSW / Significant Woodlot	564529.7531	4818739.4228	included bark at main junction, some dead branches
1392	*Populus tremuloides*	Trembling Aspen	18						03-05	10-15	High	High	Medium	Native	No	Preserve	N/A	N/A	No	Torrance Creek PSW / Significant Woodlot	564535.7268	4818736.1380	grape climbing trunk
1394	*Populus tremuloides*	Trembling Aspen	14						03-05	05-10	High	Medium	Medium	Native	No	Preserve	N/A	N/A	No	Torrance Creek PSW / Significant Woodlot	564540.3802	4818740.5841	overrun with grape
1395	*Fraxinus sp*	Ash Species	15						03-05	05-10	Medium	Low	Low	Genus	No	Preserve	N/A	N/A	No	Torrance Creek PSW / Significant Woodlot	564548.0802	4818747.1476	signs of emerald ash borer
1396	*Thuja occidentalis*	Eastern White Cedar	25	20	15	15	12	11	05-10	05-10	Medium	Medium	Medium	Native	No	Remove	Yes	Yes	Yes	Hedgerow	564393.5307	4818711.1162	multistemmed
1397	*Picea abies*	Norway Spruce	60						10-15	15-20	High	High	Medium	Non-native	No	Remove	Yes	Yes	Yes	Hedgerow	564397.0171	4818706.4405	part of screen planting
1398	*Picea glauca*	White Spruce	45						05-10	10-15	Medium	High	High	Native	No	Remove	Yes	Yes	Yes	Hedgerow	564398.5941	4818706.8233	double leader, shared canopy zone with neighboring p. abies
1399	*Picea glauca*	White Spruce	35						05-10	10-15	High	Medium	Medium	Native	No	Preserve If Possible	N/A	N/A	Yes	Hedgerow	564399.3030	4818703.2364	some dead branches, sparse leaves, screen
1400	*Picea glauca*	White Spruce	45						05-10	15-20	High	Medium	High	Native	No	Preserve If Possible	N/A	N/A	Yes	Hedgerow	564403.2084	4818698.8224	some girdling roots, screen
1401	*Picea glauca*	White Spruce	50						05-10	15-20	High	Medium	High	Native	No	Preserve If Possible	N/A	N/A	Yes	Hedgerow	564406.4029	4818696.4649	some girdling roots, screen
1402	*Picea glauca*	White Spruce	50						05-10	15-20	High	Medium	Medium	Native	No	Remove	Yes	Yes	Yes	Hedgerow	564408.6949	4818693.8009	screen, sparse leaves, some dead branches
1403	*Picea glauca*	White Spruce	17						03-05	10-15	High	Low	Low	Native	No	Remove	Yes	No	Yes	Hedgerow	564411.9562	4818692.7575	few live branches at top
1404	*Picea abies*	Norway Spruce	50						05-10	15-20	High	High	High	Non-native	No	Remove	Yes	Yes	Yes	Hedgerow	564414.9957	4818688.5746	screen planting
1405	*Pinus resinosa*	Red Pine	18						03-05	10-15	Medium	Medium	Medium	Native	No	Preserve	N/A	N/A	No	Hedgerow	564426.3607	4818675.0327	sparse branches, leaning, screen
1406	*Pinus sylvestris*	Scotch Pine	25						03-05	05-10	Low	Medium	Low	Non-native	Yes	Preserve	N/A	N/A	No	Hedgerow	564429.8029	4818672.8763	screen, twisted trunk
1407	*Pinus sylvestris*	Scotch Pine	14						03-05	05-10	Medium	Medium	Low	Non-native	Yes	Preserve	N/A	N/A	No	Hedgerow	564432.4366	4818675.5092	sparse leaves, screen
1408	*Pinus sylvestris*	Scotch Pine	16						03-05	05-10	High	Medium	Low	Non-native	Yes	Preserve	N/A	N/A	No	Hedgerow	564433.1087	4818676.2018	sparse leaves, screen
1409	*Tilia cordata*	Little-leaf Linden	13	10					03-05	03-05	Medium	Medium	Medium	Non-native	No	Preserve	N/A	N/A	No	Hedgerow	564433.7683	4818677.0298	double leader, crowded
1410	*Pinus sylvestris*	Scotch Pine	25						03-05	05-10	Medium	Medium	Low	Non-native	Yes	Preserve	N/A	N/A	Yes	Hedgerow	564433.9287	4818678.2322	sparse leaves, insect holes, screen, crowded
1411	*Tilia cordata*	Little-leaf Linden	60						05-10	10-15	Medium	Medium	Medium	Non-native	No	Preserve	N/A	N/A	Yes	Hedgerow	564375.9974	4818640.7846	double leader, dieback, heavily pruned due to hydro wires
1412	*Picea pungens*	Blue Spruce	25						03-05	05-10	High	High	Medium	Non-native	No	Remove	Yes	Yes	Yes	Hedgerow	564373.3833	4818647.1729	
1413	*Picea pungens*	Blue Spruce	20						03-05	05-10	High	High	Medium	Non-native	No	Remove	Yes	Yes	Yes	Hedgerow	564374.6473	4818654.0460	
1414	*Sorbus sp*	Mountain-ash Species Mountain-ash Species	14	11	11	10			03-05	05-10	Medium	Medium	Medium	Genus	No	Remove	Yes	Yes	Yes	Hedgerow	564396.5445	4818671.5916	sample collected, multistemmed, some dead branches
1415	*Acer rubrum*	Red Maple	30						05-10	10-15	Medium	Medium	Medium	Native	No	Preserve	N/A	N/A	Yes	Hedgerow	564411.8745	4818682.3315	epidemics, some dead branches
1416	*Betula papyrifera*	Paper Birch	11						01-03	05-10	High	Medium	Medium	Native	No	Remove	Yes	Yes	Yes	Hedgerow	564407.2915	4818687.8021	twine incorporated into trunk - girdling
1417	*Picea glauca*	White Spruce	19						01-03	05-10	High	Medium	High	Native	No	Remove	Yes	Yes	Yes	Hedgerow	564411.8497	4818687.1233	some dead branches
1418	*Thuja occidentalis*	Eastern White Cedar	25						03-05	05-10	High	High	High	Native	No	Preserve	N/A	N/A	Yes	Hedgerow	564414.3905	4818685.6759	
1419	*Picea glauca*	White Spruce	25						10-15	03-05	High	Medium	High	Native	No	Preserve	N/A	N/A	Yes	Hedgerow	564415.8243	4818683.7289	lots of dead branches, crowded
1420	*Pinus strobus*	Eastern White Pine	60						05-10	15-20	High	High	High	Native	No	Preserve	N/A	N/A	Yes	Hedgerow	564415.9749	4818681.7416	
1421	*Thuja occidentalis*	Eastern White Cedar	14						01-03	05-10	Medium	Medium	Medium	Native	No	Preserve	N/A	N/A	Yes	Hedgerow	564415.4724	4818685.8579	part of hedge
1422	*Thuja occidentalis*	Eastern White Cedar	11						01-03	05-10	Medium	Low	Low	Native	No	Remove	Yes	No	Yes	Hedgerow	564416.0812	4818684.5656	part of hedge, peeling -trunk wood exposed
1423	*Thuja occidentalis*	Eastern White Cedar	17						01-03	05-10	Medium	Medium	Medium	Native	No	Preserve	N/A	N/A	Yes	Hedgerow	564416.5906	4818684.5042	part of hedge, crowded
1424	*Thuja occidentalis*	Eastern White Cedar	13						01-03	05-10	Medium	Medium	Medium	Native	No	Preserve	N/A	N/A	Yes	Hedgerow	564418.9238	4818683.1484	part of hedge
1425	*Thuja occidentalis*	Eastern White Cedar	20						01-03	05-10	Medium	Medium	Medium	Native	No	Preserve	N/A	N/A	Yes	Hedgerow	564419.1404	4818681.2373	part of hedge, crowded by pinus strobus
1426	*Thuja occidentalis*	Eastern White Cedar	18						01-03	05-10	Medium	Medium	Medium	Native	No	Preserve	N/A	N/A	Yes	Hedgerow	564421.3245	4818680.3228	part of hedge
1427	*Thuja occidentalis*	Eastern White Cedar	18						01-03	05-10	Medium	Medium	Medium	Native	No	Preserve	N/A	N/A	Yes	Hedgerow	564423.9370	4818679.9235	part of hedge
1428	*Thuja occidentalis*	Eastern White Cedar	13						01-03	05-10	Medium	Medium	Medium	Native	No	Preserve	N/A	N/A	Yes	Hedgerow	564423.0692	4818679.7798	part of hedge
1429	*Thuja occidentalis*	Eastern White Cedar	12						01-03	05-10	Medium	Medium	Medium	Native	No	Preserve	N/A	N/A	Yes	Hedgerow	564422.6912	4818679.7877	part of hedge
1430	*Tilia cordata*	Little-leaf Linden	50						05-10	10-15	Medium	High	Medium	Non-native	No	Preserve	N/A	N/A	Yes	Hedgerow	564423.0502	4818675.6560	double leader
1431	*Picea glauca*	White Spruce	13						01-03	05-10	Medium	Medium	Medium	Native	No	Preserve	N/A	N/A	Yes	Hedgerow	564411.2031	4818666.2458	leaning, crowded by neighboring trees

Appendix D: Tree Inventory Data Table

Tree Tag #	Scientific Name	Common Name	DBH1 [1] (cm)	DBH2 (cm)	DBH3 (cm)	DBH4 (cm)	DBH5 (cm)	DBH6 (cm)	Crown Reserve [2] (m)	Height [3] (m)	Structural Condition [4]	Biological Health [5]	Preservation Priority [6]	Native Status [7]	Invasive [8]	Proposed Action [9]	Removal Permit Required [10]	Compensation Required [11]	Dunsire Property [12]	Location [13]	X Coordinate	Y Coordinate	Comments
1432	*Thuja occidentalis*	Eastern White Cedar	13						01-03	05-10	Medium	Medium	Medium	Native	No	Preserve	N/A	N/A	Yes	Hedgerow	564407.5258	4818659.6120	exposed roots, double leader
1433	*Thuja occidentalis*	Eastern White Cedar	35						03-05	05-10	Medium	High	Medium	Native	No	Preserve	N/A	N/A	Yes	Hedgerow	564403.7441	4818654.1991	
1434	*Acer platanoides*	Norway Maple	10	9	9				03-05	05-10	Medium	Medium	Low	Non-native	Yes	Remove	Yes	No	Yes	Hedgerow	564403.4756	4818687.3377	leaning, tar spots on leaves
1435	*Picea glauca*	White Spruce	60						05-10	10-15	High	High	High	Native	No	Remove	Yes	Yes	Yes	Hedgerow	564400.7643	4818677.5056	
1436	*Picea glauca*	White Spruce	50						05-10	10-15	High	High	High	Native	No	Remove	Yes	Yes	Yes	Hedgerow	564393.8373	4818675.1638	
1437	*Tilia americana*	American Basswood	19						05-10	05-10	Low	Medium	Medium	Native	No	Remove	No	No	Yes	Hedgerow	564390.3338	4818671.6098	twisted trunk / poor structure
1438	*Tilia americana*	American Basswood	12						03-05	05-10	Medium	Medium	Medium	Native	No	Remove	Yes	Yes	Yes	Hedgerow	564390.2238	4818670.6210	leaning, crowded by pinus strobus
1439	*Tilia americana*	American Basswood	17						03-05	05-10	Medium	Medium	Medium	Native	No	Remove	Yes	Yes	Yes	Hedgerow	564386.5823	4818671.1943	multistemmed , crooked main trunk, crowded by pine
1440	*Pinus strobus*	Eastern White Pine	60						05-10	10-15	High	High	High	Native	No	Remove	Yes	Yes	Yes	Hedgerow	564389.2921	4818667.2937	
1441	*Tilia americana*	American Basswood	17						01-03	05-10	Medium	Medium	Medium	Native	No	Remove	Yes	Yes	Yes	Hedgerow	564388.4921	4818671.1875	double leader, crowded
1442	*Tilia cordata*	Little-leaf Linden	16						05-10	05-10	Low	Low	Low	Non-native	No	Remove	No	No	Yes	Hedgerow	564387.3766	4818667.2486	leaning, crowded by neighboring pine
1443	*Thuja occidentalis*	Eastern White Cedar	20						01-03	10-15	Medium	High	Medium	Native	No	Preserve	N/A	N/A	Yes	Hedgerow	564399.8750	4818648.7709	
1444	*Thuja occidentalis*	Eastern White Cedar	14						01-03	05-10	Medium	Low	Low	Native	No	Preserve	N/A	N/A	No	Hedgerow	564398.2181	4818649.1917	tagged with flagging tape; dead branches
1445	*Picea glauca*	White Spruce	30						05-10	15-20	High	High	High	Native	No	Preserve	N/A	N/A	No	Hedgerow	564401.9673	4818650.9998	tagged with flagging tape
1446	*Pinus strobus*	Eastern White Pine	40	35					05-10	15-20	Medium	High	High	Native	No	Preserve	N/A	N/A	No	Hedgerow	564404.1761	4818652.9127	tagged with flagging tape; double leader
1447	*Picea glauca*	White Spruce	40						05-10	15-20	High	High	High	Native	No	Preserve	N/A	N/A	No	Hedgerow	564405.8779	4818654.4877	tagged with flagging tape
1448	*Picea glauca*	White Spruce	45						05-10	15-20	High	High	High	Native	No	Preserve	N/A	N/A	No	Hedgerow	564406.4414	4818657.9190	tagged with flagging tape
1449a	*Thuja occidentalis*	Eastern White Cedar	18	15	15				05-10	10-15	Medium	Medium	Medium	Native	No	Preserve	N/A	N/A	No	Hedgerow	564411.2683	4818661.2728	tagged with flagging tape; sparse leaves, multistemmed
1449b	*Malus sp*	Apple Species	20	18					03-05	05-10	Medium	Low	Low	Genus	No	Preserve	N/A	N/A	No	Hedgerow	564411.1004	4818661.2647	tagged with flagging tape; rot in trunk, poor structure
1450	*Picea glauca*	White Spruce	30						05-10	15-20	High	High	High	Native	No	Preserve	N/A	N/A	No	Hedgerow	564413.5475	4818662.4804	tagged with flagging tape
1451	*Picea glauca*	White Spruce	30						05-10	15-20	High	Medium	High	Native	No	Preserve	N/A	N/A	No	Hedgerow	564415.0099	4818667.0710	tagged with flagging tape; crowded
1452	*Picea glauca*	White Spruce	25						05-10	10-15	Medium	Medium	Medium	Native	No	Preserve	N/A	N/A	No	Hedgerow	564415.0909	4818668.5588	tagged with flagging tape; poor structure
1453	*Picea glauca*	White Spruce	25						05-10	15-20	High	High	High	Native	No	Preserve	N/A	N/A	No	Hedgerow	564418.3927	4818671.3089	tagged with flagging tape
1454	*Picea glauca*	White Spruce	30						05-10	10-15	High	Medium	Medium	Native	No	Preserve	N/A	N/A	No	Hedgerow	564422.1260	4818672.6928	tagged with flagging tape; crowded, lopsided branches due to crowding

Appendix D: Tree Inventory Data Table

Tree Tag #	Scientific Name	Common Name	DBH1 [1] (cm)	DBH2 (cm)	DBH3 (cm)	DBH4 (cm)	DBH5 (cm)	DBH6 (cm)	Crown Reserve [2] (m)	Height [3] (m)	Structural Condition [4]	Biological Health [5]	Preservation Priority [6]	Native Status [7]	Invasive [8]	Proposed Action [9]	Removal Permit Required [10]	Compensation Required [11]	Dunsire Property [12]	Location [13]	X Coordinate	Y Coordinate	Comments

Tree Assessment Criteria

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

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

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

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

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

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

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

8. Invasive:
   Yes – Species which poses a threat to the biological health of the ecosystem
   No – species which does not pose a threat to the biological health of the ecosystem

9. Proposed Tree Action: A recommendation to preserve or remove a tree based on i) anticipated impacts from proposed development, and ii) the tree's current biological health and structural condition including hazard potential.
   Preserve - Trees that have a dripline that is substantially outside the limits of disturbance (30% of the crown or greater will not be impacted) and having moderate to high biological health and moderate to high ranking structural condition. Tree is likely to survive at least 3-5 years.
   Remove – Trees for which at least 30% of the dripline is within the limits of disturbance, having low biological health, and/or severe structural defects, and is not likely to survive more than 1-3 years, and/or will not survive proposed development.
   Preserve If Possible - Proximity to a building envelope or limits of disturbance due to grading may result in damage the root zone to the detriment of the tree; preserve if possible to be determined at the time of construction. Recommendations on pruning are to be provided as part of detailed design.

10. Removal Permit Required:
    Yes – Tree is protected under City of Guelph By-law (2010) 19058 and requires a permit to be destroyed or injured.
    No - Tree is exempt from a permit under City of Guelph By-law (2010) 19058 Section IV due to being dead or hazardous. Hazardous status is based on D&A Structural Condition rank and includes all "Low" ranking trees.

11. Compensation Required: Trees that are proposed for removal, are protected under City of Guelph Tree By-law (2010) 19058 (i.e. tree is alive and structurally sound), and qualify for compensation as per City of Guelph Official Plan Amendment 42 (under appeal).
    Yes –Tree is a non-invasive species, is structurally sound (Structural Condition rank of "Medium – High"), and it is healthy based on D&A Biological Health rank (Moderate-High).
    No – Tree is an invasive species, is hazardous (Structural Condition rank of "Low"), or it is not healthy (D&A Biological Health rank of "Low").

12. Dunsire Property:
    Yes – Tree is located on Dunsire Property
    No – Tree is not located on Dunsire Property

13. Location: Feature with which the tree is associated (i.e. Plantation, Hedgerow, Significant Woodland).

Appendix E. Staff Report

December 4th, 2013
Environmental Advisory Committee

Item 1 **Lots 24, 26, 28 and 32 Landsdown Drive**

Proposed Terms of Reference for an Environmental Impact Study prepared by Dougan and Associates

Proposal

The applicant is preparing to propose a Zoning By-law Amendment and a Draft Plan of Condominium application to support the development of 25 single-family lots on a common element road at Lots 24, 26, 28 and 32 Landsdown Drive.

The Proposed Scoped Environmental Impact Study Terms of Reference is the focus of this review.

Total area of the site is approximately 2 hectares.

Location

The subject property is located in the southeast quadrant of the Gordon Street & Clair Road intersection. Phase 2 lands are south of Poppy Drive East (see Location Map).

Background

- The subject lands are located within the Torrence Creek Subwatershed.
- The subject lands are located within the Grand River Conservation Authority's regulation limit.
- The current OP identifies these lands as General Residential and Non-Core Greenlands with a minute portion as Core Greenlands. Adjacent lands are identified as Core Greenlands (PSW). The subject property is currently zoned R.1B (Residential).
- OPA 42 identifies the adjacent feature as a Significant Natural Area based on the PSW, Significant Woodlands and Significant Wildlife Habitat attributes including overwintering habitat for deer (Stratum II Deer Yard) and habitat for a locally significant species. The coniferous patch of trees within the site is identified as a cultural thicket in the City's Natural Heritage Strategy ELC.

Comments

Staff have reviewed the proposed Terms of Reference for a Scope Environmental Impact Study prepared by Dougan and Associates and provide the following comments:

- The GRCA provided comment (letter dated November 7th, 2013) and indicated conditional support for the Terms of Reference requesting that a minimum 2 season study (spring-summer) be included, that the ToR recognize that buffer widths discussed in section 1 are minimum widths and that there is potential for features to require larger buffers, that the Coefficient of Conservation be included within the inventory table and that the Torrence Creek Subwatershed Study be utilized as background information.
- A suggested tabular format is attached to aid in screening for Significant Wildlife Habitat.
- The EIS is to include delineation of feature boundaries including significant woodlands. Significant woodland boundaries are to be reviewed in the field by City staff.
- It should be noted that there is information in the EIS that is better suited to the EIS, such as the alignment of trails and placement of stormwater management

facility which depends on the conclusions and recommendations of the scope EIS. For clarity, note that this is the proposed development concept which requires the Scoped EIS analysis in order to confirm development constraints and opportunities and hence, the compatibility of the plan with the current site functions.

- Based on the concept plan, the trail appears to end in the PSW. Staff are doubtful that the EIS will be able to demonstrate that this approach has no negative impacts to the PSW.
- Should tree removal be proposed, a tree compensation approach should be provided in the EIS.
- It is expected that the wetland water balance will address both surface and subsurface contributions.

Suggested Motion

Staff recommend that the Environmental Advisory Committee conditionally support the proposed Terms of Reference for a Scoped Environmental Impact Study prepared by Dougan and Associates provided that:

- a minimum 2 season study (spring-summer) be included;
- the Coefficient of Conservation be included within the inventory table;
- the Torrence Creek Subwatershed Study, Natural Heritage Strategy, Urban Forest Management Plan, Guelph Trail Master Plan be utilized as background information;
- that feature delineation be included in the scope of work;
- an approach to tree compensation be included; and
- the EIS recognize that all development conceptually proposed within proximity of the significant features be examined in the Scoped EIS to determine whether or not they are compatible uses and no negative impacts can be demonstrated.


GORDON ST
LANDSDOWN DR
VALLEY RD
The City of Guelph, its employees and agents, do not undertake to guarantee the validity of the contents of the digital or hardcopy map files, and will not be liable for any claims for damages or loss arising from their application or interpretation, by any party. It is not intended to replace a survey or be used for legal description. This map may not be re-produced without the permission of the City of Guelph. Please contact the City of Guelph's GIS group for additional information at 519-822-1260.
Legend
Subject Lands
Natural Heritage System
Significant Natural Areas
Ecological Linkages
Restoration Areas
Natural Areas
50 25 0 50
m
Produced by the City of Guelph
Planning & Building, Engineering and Environment
May 2012
Data Sources: Dougan and Associates (2009), City of Guelph (2009)
Natural Heritage System
Natural Heritage System
As adopted by Council July 27th, 2010 and
Approved by the Ministry of Municipal Affairs and Housing February 22nd, 2011
Landsdown Drive
Spring 2012 Aerial Photography

Appendix F. Vascular Plant Inventory

APPENDIX F: VASCULAR PLANT SPECIES & STATUS LIST

#	Species	Current Common Name (NHIC 2011)	G RANK	S RANK	CC	CW	COSEWIC (2007)	OMNR (2009)	Wellington County (2009)	Native Status	Polygon No.	Vegetation Type	ELC Code
1	*Abies balsamea*	Balsam Fir	G5	S5	5	-3				N	7	White Cedar - Conifer Organic Coniferous Swamp	SWC3-2
2	*Acer negundo*	Manitoba Maple	G5	S5	0	-2				N	6,7	Mineral Cultural Woodland Ecosite, White Cedar - Conifer Organic Coniferous Swamp	CUW1, CUP3
3	*Acer platanoides*	Norway Maple	GNR	SNA		5				I	2	Hedgerow	HR
4	*Acer rubrum*	Red Maple	G5	S5	4					N	2	Hedgerow	HR
5	*Achillea millefolium*	Yarrow	G5	S5	0	3				N	1,8	Dry-Moist Old Field Meadow, Coniferous Plantation Ecosite	CUM1-1, CUP3
6	*Aegopodium podagraria*	Goutweed	GNR	SNA		0				I	6,8	Mineral Cultural Woodland Ecosite, Coniferous Plantation Ecosite	CUW1, CUP3
7	*Agrimonia gryposepala*	Tall Hairy Groovebur	G5	S5	2	2				N	6	Mineral Cultural Woodland Ecosite	CUW1
8	*Ajuga reptans*	Creeping Bugleweed	G?	SE2						I	6,8	Mineral Cultural Woodland Ecosite, Coniferous Plantation Ecosite	UW1, CUP3
9	*Alliaria petiolata*	Garlic Mustard	GNR	SNA						I	2	Hedgerow	HR
10	*Antennaria sp*	Pussytoes Species									1	Dry-Moist Old Field Meadow	CUM1-1
11	*Arctium minus*	Lesser Burdock	GNR	SNA		5				I	6	Mineral Cultural Woodland Ecosite	CUW1
12	*Arisaema triphyllum*	Jack-in-the-pulpit	G5	S5	5	-2				N	6,7	Mineral Cultural Woodland Ecosite, White Cedar - Conifer Organic Coniferous Swamp	CUW1, SWC3-2
13	*Asclepias syriaca*	Kansas Milkweed	G5	S5	0	5				N	1	Dry-Moist Old Field Meadow	CUM1-1
14	*Asparagus officinalis*	Garden Asparagus-fern	G5?	SNA		3				I	1,8	Dry-Moist Old Field Meadow, Coniferous Plantation Ecosite	CUM1-1, CUP3
15	*Athyrium filix-femina*	Ladyfern	G5	S5	4	0				N	7	White Cedar - Conifer Organic Coniferous Swamp	SWC3-2
16	*Barbarea vulgaris*	Yellow Rocket	GNR	SNA						I	1	Dry-Moist Old Field Meadow	CUM1-1
17	*Betula papyrifera*	Paper Birch	G5	S5	2	2				N	2,6,7	Hedgerow, Mineral Cultural Woodland Ecosite, White Cedar - Conifer Organic Coniferous Swamp	HR, SWC3-2
18	*Betula pendula*	European White Birch	GNR	SNA		-4				I	6	Mineral Cultural Woodland Ecosite	CUW1
19	*Bidens sp*	Beggar's Ticks Species									7	White Cedar - Conifer Organic Coniferous Swamp	SWC3-2
20	*Brassica nigra*	Black Mustard	GNR	SNA		5				I	1	Dry-Moist Old Field Meadow	CUM1-1
21	*Bromus inermis*	Awnless Brome	GNR	SNA						I	1,4	Dry-Moist Old Field Meadow	CUM1-1
22	*Calystegia sepium*	Hedge Bindweed	G5	S5	2	0				N	1	Dry-Moist Old Field Meadow	CUM1-1
23	*Carex sp*	Sedge Species									7	White Cedar - Conifer Organic Coniferous Swamp	SWC3-2
24	*Centaurea jacea*	Brown Starthistle	GNR	SNA		5				I	1, 4	Dry-Moist Old Field Meadow	CUM1-1
25	*Circaea lutetiana*	Southern Broadleaf Enchanter's Nightshade	G5	S5	3	3				N	6,7	Mineral cultural Woodland Ecosite, White Cedar - Coifer Organic Swamp	ANTH, CUW1, SWC3-2
26	*Cirsium arvense*	Canada Thistle	GNR	SNA		3				I	1,8	Dry-Moist Old Field Meadow, Coniferous Plantation Ecosite	CUM1-1, CUP3
27	*Clematis virginiana*	Virginia Virgin-bower	G5	S5	3					N	6	Mineral Cultural Woodland Ecosite	CUW1
28	*Convallaria majalis*	European Lily-of-the-valley	G5	SNA		5				I	8	Coniferous Plantation Ecosite	CUP3
29	*Cornus alternifolia*	Alternate-leaf Dogwood	G5	S5	6	5				N	2,8	Hedgerow, Coniferous Plantation Ecosite	HR, CUP3
30	*Cornus racemosa*	Stiff Dogwood	G5?	S5	2	-2				N	6,7	Mineral Cultural Woodland Ecosite, White Cedar - Conifer Organic Coniferous Swamp	CUW1, SWC3-2
31	*Cornus sericea*	Red-osier Dogwood	G5	S5	2	-3				N	8	Coniferous Plantation Ecosite	CUP3
32	*Crataegus sp*	Hawthorn Species									6	Mineral Cultural Woodland Ecosite	CUW1
33	*Dactylis glomerata*	Orchard Grass	GNR	SNA		3				I	1	Dry-Moist Old Field Meadow	CUM1-1
34	*Daucus carota*	Wild Carrot	GNR	SNA		5				I	1,6,8	Dry-Moist Old Field Meadow, Mineral Cultural Woodland Ecosite, Coniferous Plantation Ecosite	CUM1-1, CUW1, CUP3
35	*Echinocystis lobata*	Wild Mock-cucumber	G5	S5	3	-2				N	8	Coniferous Plantation Ecosite	CUP3
36	*Echium vulgare*	Common Viper's-bugloss	GNR	SNA		5				I	1	Dry-Moist Old Field Meadow	CUM1-1
37	*Equisetum arvense*	Field Horsetail	G5	S5						N	6,7	Mineral Cultural Woodland Ecosite, White Cedar - Conifer Organic Coniferous Swamp	CUW1, SWC3-2
38	*Erigeron philadelphicus*	Philadelphia Fleabane	G5	S5	1					N	1	Dry-Moist Old Field Meadow	CUM1-1
39	*Eupatorium maculatum*	Spotted Joe-pye Weed	G5	S5	3	-5				N	7	White Cedar - Conifer Organic Coniferous Swamp	SWC3-2
40	*Eupatorium perfoliatum*	Common Boneset	G5	S5	2	-4				N	7	White Cedar - Conifer Organic Coniferous Swamp	SWC3-2
41	*Fragaria virginiana*	Virginia Strawberry	G5	S5	2	1				N	1,7,8	Dry-Moist Old Field Meadow, White Cedar - Conifer Organic Coniferous Swamp, Coniferous Plantation Ecosite	CUM1-1, SWC3-2, CUP3
42	*Frangula alnus*	Glossy Buckthorn	GNR	SNA		-1				I	6,8	Mineral Cultural Woodland Ecosite, Coniferous Plantation Ecosite	CUW1, CUP3
43	*Fraxinus sp*	Ash Species									6	Mineral Cultural Woodland Ecosite	CUW1
44	*Galium sp*	Bedstraw Species									8	Coniferous Plantation Ecosite	CUP3
45	*Geranium sp*	Crane's-bill Species									2,7,8	Hedgerow, White Cedar - Conifer Organic Coniferous Swamp, Coniferous Plantation Ecosite	HR, SWC3-2, CUP3
46	*Geum sp*	Avens Species									2,6,7,8	Hedgerow, Mineral Cultural Woodland Ecosite, White Cedar - Conifer Organic Coniferous Swamp, Coniferous Plantation Ecosite	HR, CUW1, SWC3-2, CUP3
47	*Glechoma hederacea*	Ground Ivy	GNR	SNA		3				I	2,6,8	Hedgerow,Mineral Cultural Woodland Ecosite, Coniferous Plantation Ecosite	HR, CUW1, CUP3
48	*Glyceria striata*	Fowl Manna-grass	G5	S5	3	-5				N	7	White Cedar - Conifer Organic Coniferous Swamp	SWC3-2
49	*Gymnocarpium dryopteris*	Oak Fern	G5	S5	7					N	7	White Cedar - Conifer Organic Coniferous Swamp	SWC3-2
50	*Hemerocallis fulva*	Orange Daylily	GNA	SNA						I	6	Mineral Cultural Woodland Ecosite	CUW1
51	*Hieracium sp*	Hawkweed Species									1	Dry-Moist Old Field Meadow	CUM1-1
52	*Hypericum perforatum*	A St. John's-wort	GNR	SNA		5				I	8	Coniferous Plantation Ecosite	CUP3
53	*Impatiens capensis*	Spotted Jewel-weed	G5	S5	4	-3				N	6,7	Mineral Cultural Woodland Ecosite, White Cedar - Conifer Organic Coniferous Swamp	CUW1, SWC3-2
54	*Juglans nigra*	Black Walnut	G5	S4	5	3				N	1,2,8	Dry-Moist Old Field Meadow, Hedgerow, Coniferous Plantation Ecosite	CUM1-1,HR, CUP3
55	*Leucanthemum vulgare*	Oxeye Daisy	GNR	SNA		5				I	1,8	Dry-Moist Old Field Meadow, Coniferous Plantation Ecosite	CUM1-1, CUP3
56	*Lonicera tatarica*	Tartarian Honeysuckle	GNR	SNA		3				I	6,8	Mineral Cultural Woodland Ecosite, Coniferous Plantation Ecosite	CUW1, CUP3
57	*Lotus corniculatus*	Birds-foot Trefoil	GNR	SNA		1				I	1	Dry-Moist Old Field Meadow	CUM1-1
58	*Lysimachia nummularia*	Creeping Charlie	GNR	SNA		-4				I	6,7	Mineral Cultural Woodland Ecosite, White Cedar - Conifer Organic Coniferous Swamp	CUW1, SWC3-2
59	*Maianthemum canadense*	Wild-lily-of-the-valley	G5	S5	5					N	7	White Cedar - Conifer Organic Coniferous Swamp	SWC3-2
60	*Malus pumilla*	Common Apple	G5	SNA						I	1	Dry-Moist Old Field Meadow	CUM1-1
61	*Malus sp.*	Apple Species									2	Hedgerow	HR

APPENDIX F: VASCULAR PLANT SPECIES & STATUS LIST

#	Species	Current Common Name (NHIC 2011)	G RANK	S RANK	CC	CW	COSEWIC (2007)	OMNR (2009)	Wellington County (2009)	Native Status	Polygon No.	Vegetation Type	ELC Code
62	*Malva moschata*	Musk Cheeseweed	GNR	SNA		5				I	1	Dry-Moist Old Field Meadow	CUM1-1
64	*Medicago lupulina*	Black Medic	GNR	SNA		1				I	1	Dry-Moist Old Field Meadow	CUM1-1
65	*Medicago sativa*	Alfalfa	GNR	SNA						I	1	Dry-Moist Old Field Meadow	CUM1-1
66	*Melilotus albus*	White Sweet Clover	G5	SNA						I	1	Dry-Moist Old Field Meadow	CUM1-1
67	*Melissa officinalis*	Garden Balm	GNR	SNA						I	6	Mineral Cultural Woodland Ecosite	CUW1
68	*Mentha arvensis*	Corn Mint	G5	S5	3	-3				N	7	White Cedar - Conifer Organic Coniferous Swamp	SWC3-2
69	*Myosotis arvensis*	Rough Forget-me-not	GNR	SNA						I	2	Hedgerow	HR
70	*Oenothera biennis*	Common Evening Primrose	G5	S5	0	3				N	1	Dry-Moist Old Field Meadow	CUM1-1
71	*Onoclea sensibilis*	Sensitive Fern	G5	S5	4	-3				N	6,7	Mineral Cultural Woodland Ecosite, White Cedar - Conifer Organic Coniferous Swamp	CUW1, SWC3-2
72	*Panicum capillare*	Old Witch Panic-grass	G5	S5	6	-1				N	1	Dry-Moist Old Field Meadow	CUM1-1
73	*Parthenocissus vitacea*	Virginia Creeper	G5	S5	3	3				N	6,7,8	Mineral Cultural Woodland Ecosite, Coniferous Plantation Ecosite, White Cedar - Conifer Organic Coniferous Swamp	CUP3
74	*Phalaris arundinacea*	Reed Canary Grass	G5	S5	0	-4				N	6	Mineral Cultural Woodland Ecosite	CUW1
75	*Phleum pratense*	Meadow Timothy	GNR	SNA		3				I	1	Dry-Moist Old Field Meadow	CUM1-1
76	*Physalis heterophylla*	Clammy Ground-cherry	G5	S4	3	5				N	1	Dry-Moist Old Field Meadow	CUM1-1
77	*Physocarpus opulifolius*	Eastern Ninebark	G5	S5	5	-2				N	8	Coniferous Plantation Ecosite	CUP3
78	*Picea abies*	Norway Spruce	G5	SNA		5				I	2	Hedgerow	HR
79	*Picea glauca*	White Spruce	G5	S5	6	3				N	2,8	Hedgerow, Coniferous Plantation Ecosite	HR, CUP3
80	*Picea pungens*	Blue Spruce	G5	SNA						I	2	Hedgerow	HR
81	*Pinus nigra*	Austrian Pine	GNR	SNA		-5				I	2,8	Hedgerow, Coniferous Plantation Ecosite	HR, CUP3
82	*Pinus resinosa*	Red Pine	G5	S5	8	3				N	2	Hedgerow	HR
83	*Pinus strobus*	Eastern White Pine	G5	S5	4	3				N	2	Hedgerow	HR
84	*Pinus sylvestris*	Scotch Pine	GNR	SNA		5				I	2,8	Hedgerow, Coniferous Plantation Ecosite	HR, CUP3
85	*Plantago lanceolata*	English Plantain	G5	SNA						I	1	Dry-Moist Old Field Meadow	CUM1-1
86	*Plantago major*	Nipple-seed Plantain	G5	S5		-1				N	1	Dry-Moist Old Field Meadow	CUM1-1
87	*Poa pratensis*	Kentucky Bluegrass	G5	S5	0	1				N	1	Dry-Moist Old Field Meadow	CUM1-1
88	*Polygonum sp*	Smartweed Species									1	Dry-Moist Old Field Meadow	CUM1-1
89	*Populus tremuloides*	Trembling Aspen	G5	S5	2					N	6,7	Mineral Cultural Woodland Ecosite, White Cedar - Conifer Organic Coniferous Swamp	CUW1, SWC3-2
90	*Potentilla recta*	Sulphur Cinquefoil	GNR	SNA		5				I	8	Coniferous Plantation Ecosite	CUP3
91	*Potentilla sp*	Cinquefoil Species									1	Dry-Moist Old Field Meadow	CUM1-1
92	*Prunella vulgaris*	Self-heal	G5	S5		5				I	6	Mineral Cultural Woodland Ecosite	CUW1
93	*Prunus serotina*	Wild Black Cherry	G5	S5	3	3				N	6	Mineral Cultural Woodland Ecosite	CUW1
94	*Prunus sp*	Cherry Species									7	White Cedar - Conifer Organic Coniferous Swamp	SWC3-2
95	*Prunus virginiana*	Choke Cherry	G5	S5						N	2	Hedgerow	HR
96	*Quercus macrocarpa*	Mossy-cup Oak	G5	S5	5	1				N	2,6,7,8	Hedgerow, Mineral Cultural Woodland Ecosite, White Cedar - Conifer Organic Coniferous Swamp, Coniferous Plantation Ecosite	HR, CUW1, SWC3-2, CUP3
97	*Rhamnus cathartica*	Buckthorn	GNR	SNA		3				I	2,6,8	Hedgerow,Mineral Cultural Woodland Ecosite, Coniferous Plantation Ecosite	HR, CUW1, CUP3
98	*Ribes sp*	Currant Species									2,6,7,8	Hedgerow, Mineral Cultural Woodland Ecosite, White Cedar - Conifer Organic Coniferous Swamp, Coniferous Plantation Ecosite	HR, CUW1, SWC3-2, CUP3
99	*Robinia pseudoacacia*	Black Locust	G5	SNA						I	1	Dry-Moist Old Field Meadow	CUM1-1
100	*Rubus idaeus ssp. strigosus*	Common Red Raspberry	G5T5	S5	0	-2				N	6,7	Mineral Cultural Woodland Ecosite, White Cedar - Conifer Organic Coniferous Swamp	CUW1, SWC3-2
101	*Rubus occidentalis*	Black Raspberry	G5	S5	2	5				N	6	Mineral Cultural Woodland Ecosite	CUW1
102	*Rubus sp*	Raspberry sp									7	White Cedar - Conifer Organic Coniferous Swamp	SWC3-2
103	*Rudbeckia hirta*	Black-eyed Susan	G5	S5	0	3				N	1,4	Dry-Moist Old Field Meadow	CUM1-1
104	*Rumex crispus*	Curly Dock	GNR	SNA		-1				I	1,4	Dry-Moist Old Field Meadow	CUM1-1
105	*Salix alba*	White Willow	G5	SNA		-3				I		Mineral Cultural Woodland Ecosite	CUW1
106	*Silene vulgaris*	Maiden's Tears	GNR	SNA		5				I	8	Coniferous Plantation Ecosite	CUP3
107	*Solanum dulcamara*	Climbing Nightshade	GNR	SNA						I	7	White Cedar - Conifer Organic Coniferous Swamp	SWC3-2
108	*Solidago canadensis*	Canada Goldenrod	G5	S5	1	3				N	1,2,6,8	Dry-Moist Old Field Meadow, Hedgerow, Coniferous Plantation Ecosite	CUM1-1, HR, CUW1, CUP3
109	*Solidago nemoralis*	Field Goldenrod	G5	S5						N	1	Dry-Moist Old Field Meadow	CUM1-1
110	*Solidago rugosa*	Rough-leaf Goldenrod	G5	S5	4	-1				N	7,8	White Cedar - Conifer Organic Coniferous Swamp, Coniferous Plantation Ecosite	SWC3-2, CUP3
111	*Sonchus arvensis*	Field Sowthistle	GNR	SNA						I	1	Dry-Moist Old Field Meadow	CUM1-1
112	*Sorbus sp*	Mountain-ash Species									2	Hedgerow	HR
113	*Symphyotrichum novae-angliae*	New England Aster	G5	S5	2	-3				N	1	Dry-Moist Old Field Meadow	CUM1-1
114	*Taraxacum officinale*	Brown-seed Dandelion	G5	SNA		3				I	1,2,8	Dry-Moist Old Field Meadow, Hedgerow, Coniferous Plantation Ecosite	CUM1-1, HR, CUP3
115	*Thuja occidentalis*	Eastern White Cedar	G5	S5	4	-3				N	2,7	Hedgerow, White Cedar - Conifer Organic Coniferous Swamp	HR, SWC3-2
116	*Tilia americana*	American Basswood	G5	S5	4	3				N	2	Hedgerow	HR
117	*Tilia cordata*	Little-leaf Linden	GNR	SNA						I	2,6	Hedgerow, Mineral Cultural Woodland Ecosite	HR, CUW1
118	*Toxicodendron radicans*	Poison Ivy	G5	S5	5	1				N	7	White Cedar - Conifer Organic Coniferous Swamp	SWC3-2
119	*Tragopogon dubius*	Meadow Goat's-beard	GNR	SNA		5				I	1	Dry-Moist Old Field Meadow	CUM1-1
120	*Triosteum aurantiacum*	Coffee Tinker's-weed	G5	S5	7	5			R3	N	6	Mineral Cultural Woodland Ecosite	CUW1
121	*Ulmus americana*	American Elm	G5?	S5	3	-2				N	6	Mineral Cultural Woodland Ecosite	CUW1
122	*Verbascum thapsus*	Great Mullein	GNR	SNA		5				I	1	Dry-Moist Old Field Meadow	CUM1-1
123	*Viburnum opulus*	Guelder-rose Viburnum	G5	SNA						I	6,7,8	Mineral Cultural Woodland Ecosite, White Cedar - Conifer Organic Coniferous Swamp, Coniferous Plantation Ecosite	CUW1, SWC3-2, CUP3
124	*Vicia cracca*	Tufted Vetch	GNR	SNA		5				I	1	Dry-Moist Old Field Meadow	CUM1-1
125	*Viola blanda*	Smooth White Violet	G4G5	S4S5	6	-2				N	7	White Cedar - Conifer Organic Coniferous Swamp	SWC3-2
126	*Viola cucullata*	Marsh Blue Violet	G4G5	S5	5	-5				N	7	White Cedar - Conifer Organic Coniferous Swamp	SWC3-2
127	*Vitis riparia*	Riverbank Grape	G5	S5	0	-2				N	1,2,6,8	Dry-Moist Old Field Meadow, Hedgerow, Mineral Cultural Woodland Ecosite, Coniferous Plantation Ecosite	CUM1-1, HR, CUW1, CUP3

Legend			
Parameter		**Source**	**Legend**
G_Rank		**NHIC (Natural Heritage Information Centre). 2011.**	G1 critically imperiled on a global scale; G2 imperiled
S_Rank		**NHIC (Natural Heritage Information Centre). 2011.**	SX Presumed Extirpated; SH Possibly Extirpated
COSEWIC	**NHIC (Natural Heritage Information Centre). 2011.** Ontario Vascular Plant Species List. Biodiversity Explorer Online Database. Ontario Ministry of Natural Resources.	**NHIC (Natural Heritage Information Centre). 2011.** Ontario Vascular Plant Species List. Biodiversity Explorer Online Database. Ontario Ministry of Natural Resources.	NAR Not At Risk, a wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances; SC Special Concern, a wildlife species that may become threatened or endangered because of a combination of biological characteristics and identified threats; T Threatened, a wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction; E Endangered, a wildlife species facing imminent extirpation or extinction; XT Extirpated, a wildlife species that no longer exists in the wild in Canada, but exists elsewhere; X Extinct, a wildlife species that no longer exists.
Wellington County		**Frank, R. and A. Anderson. 2009.** The Flora of Wellington County. Wellington County Historical Society, Fergus Ontario. 145 pp.	Defined by the number of survey sites where the species was found. R1 1-3 sites; R2 4-6 sites; R3 6-10 sites.
Native Status		**NHIC (Natural Heritage Information Centre). 2009.** Ontario Vascular Plant Species List. Biodiversity	N native; I introduced

Appendix G. Screening for Known or Candidate Significant Wildlife Habitat

Appendix G. Screening for Known or Candidate Significant Wildlife Habitat

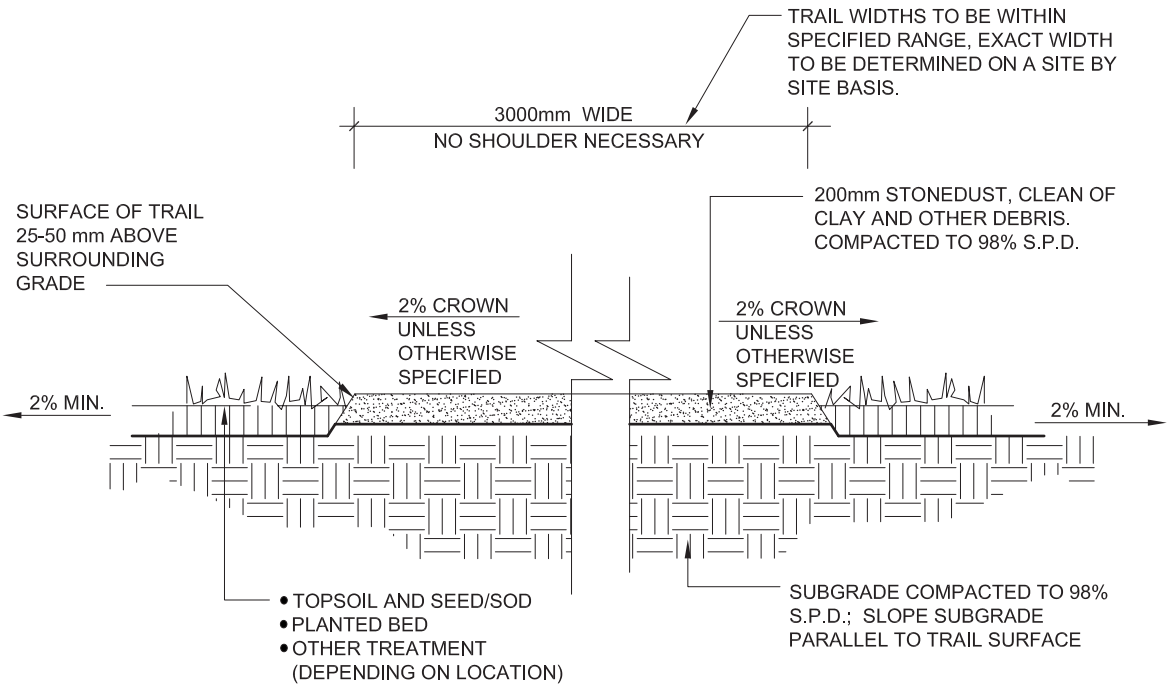
Significant Wildlife Habitat Type	Known or Candidate SWH present?	Rationale (Habitat Presence or Absence)	Field studies required?
Seasonal Concentration Areas			
Deer Yarding Areas (as identified by MNR)	No	No habitat available on site; none identified by MNR.	No
Deer Winter Concentration Areas (as identified by MNR)	No	No habitat available on site; none identified by MNR.	No
Colonial Bird Nesting Habitat: Herons (tree/shrub)	No	No habitat available on site.	No
Colonial Bird Nesting Habitat: Terns (ground)	No	No habitat available on site.	No
Colonial Bird Nesting Habitat: Swallows (Cliff/Bank)	No	No habitat available on site.	No
Waterfowl Stopover and Staging: Aquatic	No	No habitat available on site.	No
Waterfowl Stopover and Staging: Terrestrial	No	No habitat available on site.	No
Waterfowl Over Wintering Areas (as identified by MNR District Office)	No	No habitat available on site; none identified by MNR.	No
Raptor Winter Feeding/Roosting	No	No habitat available on site.	No
Reptile Hibernacula	No	No habitat available on site.	No
Bat Hibernacula	No	No habitat available on site.	No
Bat Maternity Colonies	No	No habitat available on site.	No
Rare Vegetation Communities			
Alvar	No	None identified on site.	No
Prairie	No	None identified on site.	No
Savannah	No	None identified on site.	No
Rare Forest Types	No	None identified on site.	No
Cliff/ Talus	No	None identified on site.	No
Rock Barrens	No	None identified on site.	No

Significant Wildlife Habitat Type	Known or Candidate SWH present?	Rationale (Habitat Presence or Absence)	Field studies required?
Sand Barrens	No	None identified on site.	No
Rare ELC communities	No	None identified on site.	No
Specialized Habitats for Wildlife			
Woodland Area Sensitive (Interior Forest) Breeding Bird Habitat	No	No habitat available on site.	No
Open Country Breeding Bird Habitat	No	No habitat available on site.	No
Old Growth Forest	No	No habitat available on site.	No
Mast Areas	No	No habitat available on site.	No
Forests of High Diversity	No	No habitat available on site.	No
Amphibian Woodland Breeding Habitat	No	No habitat available on site.	No
Amphibian Wetland Breeding (includes Bullfrog concentration areas) Habitat	No	No habitat available on site.	No
Turtle Nesting Habitat	No	No habitat available on site.	No
Turtle Overwintering Habitat	No	No habitat available on site.	No
Woodland/Specialized Raptor Nesting Habitat	No	No habitat available on site.	No
Bald Eagle Nesting Habitat	No	No habitat available on site.	No
Osprey Nesting Habitat	No	No habitat available on site.	No
Bald Eagle Wintering Areas	No	No habitat available on site.	No
Seeps and Springs	No	No habitat available on site.	No
Waterfowl Nesting Habitat	No	No habitat available on site.	No
Marsh Breeding Bird Habitat	No	No habitat available on site.	No
Wildlife Movement Corridors			
Deer Movement Corridors	No	No habitat available on site.	No
Amphibian Movement Corridors	No	No habitat available on site.	No
Habitats of Species of Conservation Concern			
Declining Guilds: Shrub land bird habitat	No	No habitat available on site.	No
Terrestrial Crayfish Habitat	No	No habitat available on site.	No

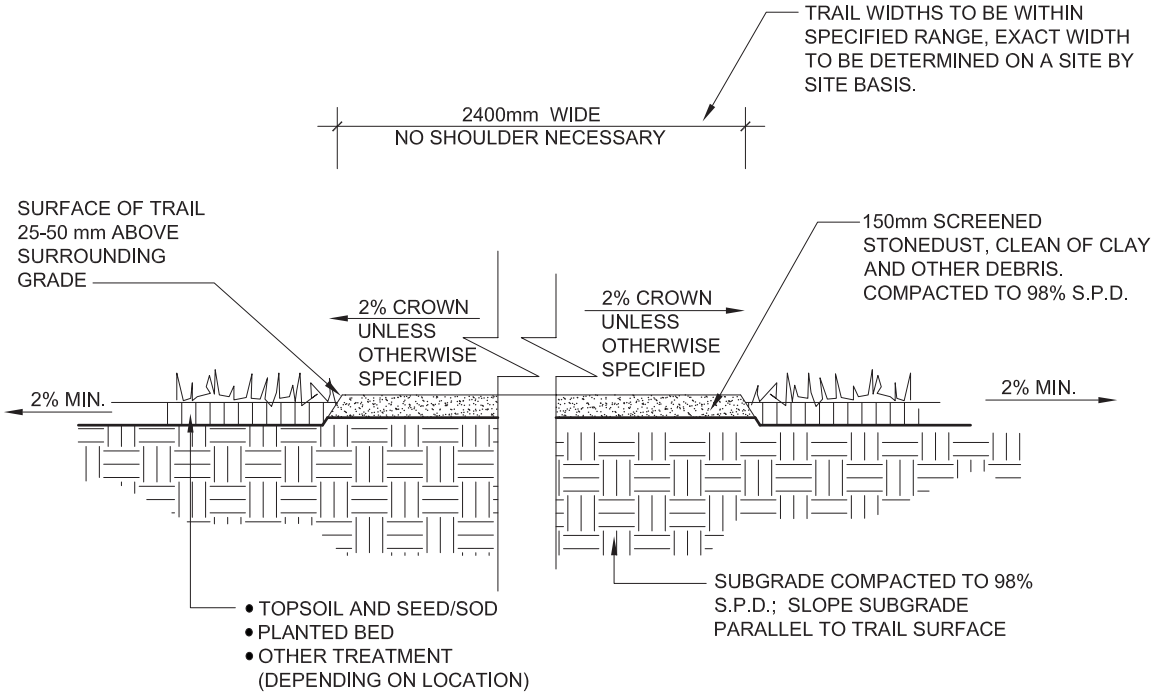
Significant Wildlife Habitat Type	Known or Candidate SWH present?	Rationale (Habitat Presence or Absence)	Field studies required?
ESA Special Concern Species			
	No	Eastern Ribbonsnake and Snapping Turtle may occur in adjacent PSW but would not likely occur on site due to a lack of suitable breeding or foraging habitat. Monarch may occur occasionally as a migrant but not in significant numbers nor as a breeder.	No
S1 – S3 Provincially Ranked Species			
	No	Eastern Ribbonsnake, Snapping Turtle, Blanding's Turtle and Western Chorus Frog may occur in adjacent PSW but would not likely occur on site due to a lack of suitable breeding or foraging habitat. No other S1-S3 species are likely to occur as breeders on the site.	No
G1 – G3 Globally Ranked Species			
	No	No G1-G3 Globally Ranked Species were identified on site and none are expected to occur.	No
Locally Significant Species			
	No	No Locally Significant Species were identified on site nor are any expected to be breeding due to a lack of suitable habitat. Several species that are considered rare in Wellington County may breed in the adjacent PSW but would not be present on the site.	No

Appendix H. Guelph Trail Master Plan

PRIMARY OFF-ROAD TRAIL IN MINOR CITY PARKS AND STORMWATER MANAGEMENT AREAS



SECONDARY OFF-ROAD TRAIL IN MINOR CITY PARKS AND STORMWATER MANAGEMENT AREAS



scale 1:50 mm 200 500 1000 2000

Fig. 5-4 Off-Raod Trail Detail: Minor City Parks and Stormwater Management Areas

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City of Guelph

Marshall Macklin Monaghan

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Appendix I. Vegetation Compensation Plan Plant List

TREATMENT AREAS 1, 2 AND 3: MANTLE - **Proposed Conditions:** *Polygon 6 and edge of Polygons 1 and 9 to undergo invasive species removal and biodiversity enhancement plantings including both fast growing early successional tree and shrub species as well as mid-successional tree species to speed canopy development and stabilize edge conditions. Deterrent species planting near SAUM edge to minimize intrusion by domestic pets and humans.*				Early Successional	Mid-Successional	Wildlife Habitat	Deterrent	Diversity Enhancement
Species	**Current Common Name (NHIC 2011)**	**Native Status**	**CC**					
Existing Invasive Species to be removed*								
Acer negundo	Box Elder	I	0					
Betula pendula	European White Birch	I	0					
Frangula alnus	Glossy Buckthorn	I	0					
Lonicera tatarica	Tartarian Honeysuckle	I	0					
Rhamnus cathartica	Buckthorn	I	0					
Existing Species to be retained								
Aegopodium podagraria	Goutweed	I	0					
Agrimonia gryposepala	Tall Hairy Groovebur	N	2					
Arctium minus	Lesser Burdock	I	0					
Arisaema triphyllum	Jack-in-the-pulpit	N						
Circaea lutetiana	Southern Broadleaf Enchanter's Nightshade	N						
Clematis virginiana	Virginia Virgin-bower	N	3					
Crataegus sp	Hawthorn Species							
Geum sp	Avens Species							
Glechoma hederacea	Ground Ivy	I	0					
Phalaris arundinacea	Reed Canary Grass	N						
Prunella vulgaris	Self-heal	N						
Quercus macrocarpa	Mossy-cup Oak	N	5					
Sanguinaria canadensis	Bloodroot	N	5					
Solidago canadensis	Canada Goldenrod	N	1					
Symphyotrichum novae-angliae	New England Aster	N	2					
Triosteum aurantiacum	Coffee Tinker's-weed	N	7					
Ulmus americana	American Elm	N	3					
Viburnum opulus	Guelder-rose Viburnum	I	0					
Vitis riparia	Riverbank Grape	N						
**Invasive status determined by consulting Credit Valley Conservation (CVC). 2012. Appendix 1: Invasive Species Lists and Fact Sheets. Available at: http://www.creditvalleyca.ca/wp-content/uploads/2012/09/cvc-appendix-landowners-guide-to-invasives.pdf and Environment Canada (EC). 1999. Invasive Plants of Natural Habitats in Canada. Available at: http://www.grandriver.ca/forestry/invasives.pdf.*								
Proposed Species - Trees								
Abies balsamea	Balsam Fir	N	5					
Acer rubrum	Red Maple	N	4					
Acer saccharinum	Silver Maple	N	5					
Sorbus decora	Northern Mountain Ash	N	8					
Picea glauca	White Spruce	N	6					
Pinus strobus	Eastern White Pine	N	4					
Populus tremuloides	Trembling Aspen	N	2					
Prunus serotina	Wild Black Cherry	N	3					
Prunus virginiana	Choke Cherry	N						
Quercus rubra	Northern Red Oak	N	6					
Tilia americana	American Basswood	N	4					

TREATMENT AREAS 1, 2 AND 3: MANTLE (continued) - **Proposed Conditions:** *Polygon 6 and edge of Polygons 1 and 9 to undergo invasive species removal and biodiversity enhancement plantings including both fast growing early successional tree and shrub species as well as mid-successional tree species to speed canopy development and stabilize edge conditions. Deterrent species planting near SAUM edge to minimize intrusion by domestic pets and humans.*				Early Successional	Mid-Successional	Wildlife Habitat	Deterrent	Diversity Enhancement
Species	**Current Common Name (NHIC 2011)**	**Native Status**	**CC**					
Proposed Species - Interior Shrubs								
Cornus alternifolia	Alternate-leaf Dogwood	N	6					
Cornus racemosa	Stiff Dogwood	N	2					
Cornus sericea	Red-osier Dogwood	N						
Diervilla lonicera	Northern Bush-honeysuckle	N	5					
Parthenocissus quinquefolia	Virginia Creeper	N	6					
Ribes americanum	Wild Black Currant	N						
Rosa blanda	Smooth Rose	N	3					
Rosa palustris	Swamp Rose	N	7					
Rubus allegheniensis	Allegheny Blackberry	N	2					
Rubus idaeus ssp. strigosus	Common Red Raspberry	N						
Rubus occidentalis	Black Raspberry	N	2					
Rubus odoratus	Purple Flowering Raspberry	N	3					
Sambucus racemosa ssp. pubens	Red Elderberry	N						
Viburnum lentago	Nannyberry	N	4					
Proposed Species - Edge Shrubs								
Juniperus communis	Ground Juniper	N						
Parthenocissus quinquefolia	Virginia Creeper	N	6					
Physalis heterophylla	Clammy Ground-cherry	N	3					
Rosa blanda	Smooth Rose	N	3					
Rosa palustris	Swamp Rose	N	7					
Rubus allegheniensis	Allegheny Blackberry	N	2					
Rubus occidentalis	Black Raspberry	N	2					
Rubus odoratus	Purple Flowering Raspberry	N	3					
	Mean CC (incl. introduced species):		**2.56**					

TREATMENT AREA 4a): PROPOSED SAUM - **Proposed Conditions:** *Polygon 9 and Edge of Polygon 1 forming wetland buffer to be characterized by herbaceous cover and canopy trees. Native deciduous caliper trees will be planted for biodiversity and aesthetic enhancement (eg. fall colours and spring flowering) to trail and adjoining property. Coniferous trees are provided for screening purposes. Soil preparation and native meadow seeding provide biodiversity enhancement.*				Early Successional	Mid-Successional	Wildlife Habitat	Deterrent	Diversity Enhancement
Species	**Current Common Name (NHIC 2011)**	**Native Status**	**CC**					
Proposed Species - Native Meadow Seed Mix								
Andropogon gerardii	Big Bluestem	N	7					
Aster ericoides or pilosus	Frost Aster	N						
Aster laevis	Smooth Aster	N						
Aster novae-angliae	New England Aster	N	2					
Aster puniceus	Purple-Stemmed Aster	N						
Aster sagittifolius	Arrow-Leaved Aster	N	6					
Aster simplex (lanceolatus)	Tall White (Panicled) Aster	N						
Desmodium canadense	Hoary (Canada) Tick-Trefoil	N	5					
Elymus canadensis	Canada Wild-Rye	N	8					
Lespedeza hirta	Hairy Bushclover	N	9					
Monarda fistulosa	Wild Bergamot	N	6					
Oenothera biennis	Common Evening-primrose	N						
Panicum capillare	Old Witch Panic-grass	N	6					
Potentilla arguta	Tall Cinquefoil	N	7					
Rudbeckia hirta	Black-eyed Susan	N	3					
Schizachyrium scoparium	Little Bluestem	N	7					
Solidago (Euthamia) graminifolia	Grass-Leaved Goldenrod	N	2					
Solidago canadensis	Canada Goldenrod	N	1					
Solidago nemoralis	Field Goldenrod	N						
Solidago rugosa	Rough Goldenrod	N						
Sorghastrum nutans	Indiangrass	N	8					

TREATMENT AREA 4a): PROPOSED SAUM (continued) - Proposed Conditions: *Polygon 9 and Edge of Polygon 1 forming wetland buffer to be characterized by herbaceous cover and canopy trees. Native deciduous caliper trees will be planted for biodiversity and aesthetic enhancement (eg. fall colours and spring flowering) to trail and adjoining property. Coniferous trees are provided for screening purposes. Soil preparation and native meadow seeding provide biodiversity enhancement.*				Early Successional	Mid-Successional	Wildlife Habitat	Deterrent	Diversity Enhancement
Species	**Current Common Name (NHIC 2011)**	**Native Status**	**CC**					
Proposed Species - Caliper Trees								
Acer rubrum	Red Maple	N	4					
Acer saccharinum	Silver Maple	N	5					
Sorbus decora	Northern Mountain Ash	N	8					
Quercus rubra	Northern Red Oak	N	6					
Thuja occidentalis	Eastern White Cedar	N	4					
Ostrya virginia	Eastern Hop-hornbeam	N	4					
Picea glauca	White Spruce	N	6					

TREATMENT AREA 4b): SLOPE STABILIZATION PLANTING - Proposed Conditions: *Grade of Polygon 1to be raised to accommodate infiltration galleries creating a 3:1 slope. This area is to be planted with slope stabilizing shrubs in addition to trees and herbaceous cover proposed for Treatment Area 4a).*				Early Successional	Mid-Successional	Wildlife Habitat	Deterrent	Diversity Enhancement
Species	**Current Common Name (NHIC 2011)**	**Native Status**	**CC**					
Proposed Species - Shrubs								
Cornus racemosa	Stiff Dogwood	N	2					
Cornus sericea	Red-osier Dogwood	N						
Diervilla lonicera	Northern Bush-honeysuckle	N	5					
Rubus odoratus	Purple Flowering Raspberry	N	3					
Sambucus canadensis	Common Elderberry	N	5					
Parthenocissus quinquefolia	Virginia Creeper	N	6					
	Mean CC (incl. introduced species):		**3.97**					

Polygon 2. Hedgerow - *Species to be preserved*			
Species	**Current Common Name (NHIC 2011)**	**Native Status**	**CC**
Picea glauca	White Spruce	N	6
Pinus resinosa	Red Pine	N	8
Pinus sylvestris	Scotch Pine	I	0
Tilia cordata	Little-leaf Linden	I	0
Acer rubrum	Red Maple	N	4
Thuja occidentalis	Eastern White Cedar	N	4
Pinus strobus	Eastern White Pine	N	4
Malus sp	Apple species		0
	Mean CC (incl. introduced species):		**3.71**

Polygon 4. Dry-Moist Old Field Meadow - *Proposed Removal*			
Species	**Current Common Name (NHIC 2011)**	**Native Status**	**CC**
-	-	-	-
	Mean CC (incl. introduced species):		**n/a**

Polygon 7. White Cedar - Conifer Organic Coniferous Swamp - *No proposed alterations*			
Species	**Current Common Name (NHIC 2011)**	**Native Status**	**CC**
Abies balsamea	Balsam Fir	N	5
Athyrium filix-femina	Ladyfern	N	4
Arisaema triphyllum	Jack-in-the-pulpit	N	5
Betula papyrifera	Paper Birch	N	2
Bidens sp	Beggar's Ticks Species		
Carex sp	Sedge Species		
Circaea lutetiana	Southern Broadleaf Enchanter's Nightshade	N	3
Cornus racemosa	Stiff Dogwood	N	2

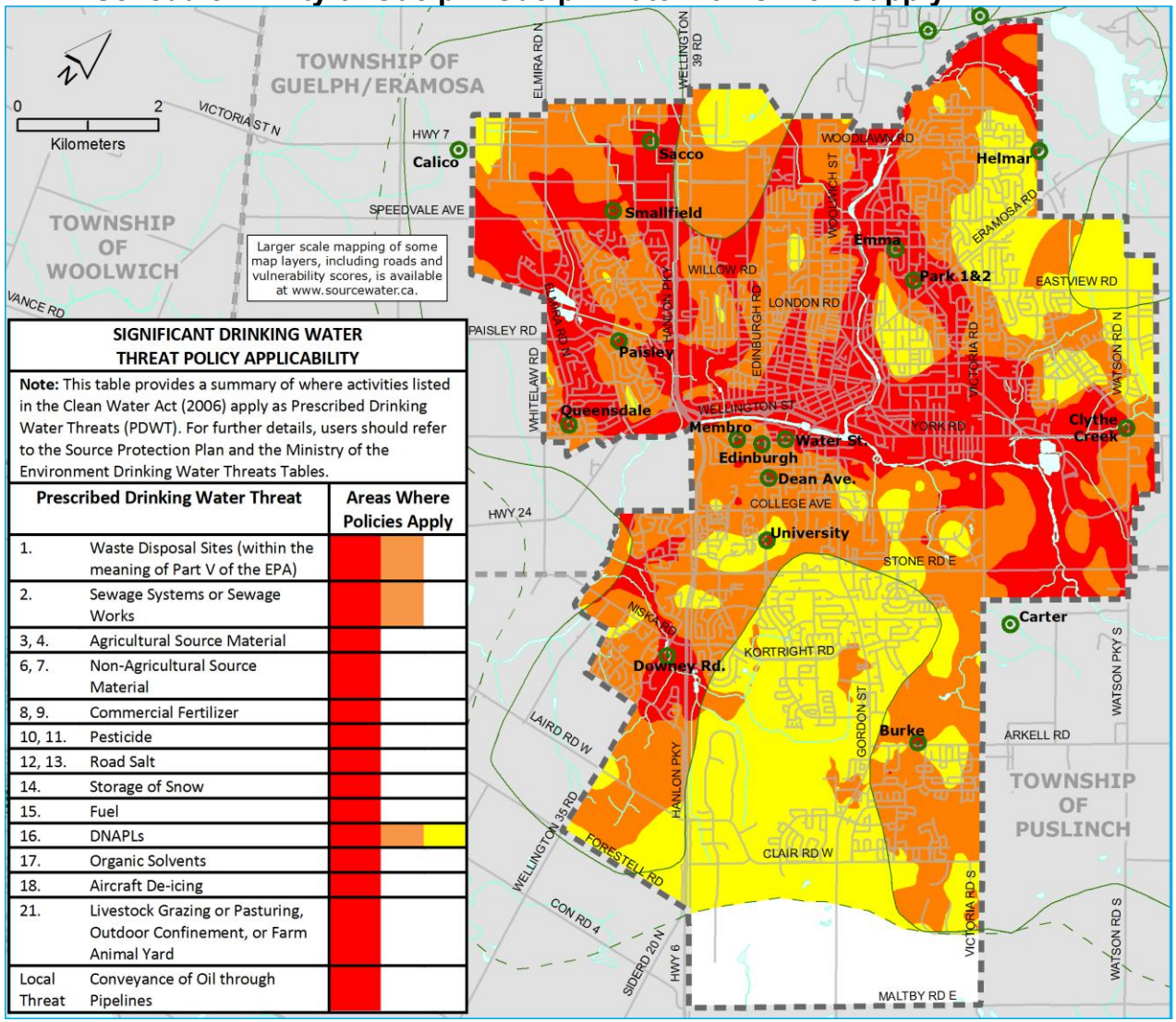
Polygon 7 (continued) White Cedar - Conifer Organic Coniferous Swamp - *No proposed alterations*			
Species	**Current Common Name (NHIC 2011)**	**Native Status**	**CC**
Equisetum arvense	Field Horsetail	N	
Eupatorium maculatum	Spotted Joe-pye Weed	N	3
Eupatorium perfoliatum	Common Boneset	N	2
Fragaria virginiana	Virginia Strawberry	N	2
Geranium sp	Crane's-bill Species		
Geum sp	Avens Species		
Glyceria striata	Fowl Manna-grass	N	3
Gymnocarpium dryopteris	Oak Fern	N	7
Lysimachia nummularia	Creeping Charlie	I	
Impatiens capensis	Spotted Jewel-weed	N	4
Maianthemum canadense	Wild-lily-of-the-valley	N	5
Mentha arvensis	Corn Mint	N	3
Onoclea sensibilis	Sensitive Fern	N	4
Parthenocissus vitacea	Virginia Creeper	N	3
Populus tremuloides	Trembling Aspen	N	2
Prunus sp	Cherry Species		
Quercus macrocarpa	Mossy-cup Oak	N	5
Ribes sp	Currant Species		
Rubus idaeus ssp. strigosus	Common Red Raspberry	N	0
Rubus sp	Raspberry sp		
Solanum dulcamara	Climbing Nightshade	I	
Solidago rugosa	Rough-leaf Goldenrod	N	4
Thuja occidentalis	Eastern White Cedar	N	4
Toxicodendron radicans	Poison Ivy	N	5
Viburnum opulus	Guelder-rose Viburnum	I	
Viola blanda	Smooth White Violet	N	6
Viola cucullata	Marsh Blue Violet	N	5
	Mean CC (incl. introduced species):		**3.14**

Polygon 8. Coniferous Plantation Ecosite - *Remaining trees*			
Species	**Current Common Name (NHIC 2011)**	**Native Status**	**CC**
Pinus nigra	Austrian Pine	I	-
	Mean CC (incl. introduced species):		**0.00**

Note: All species on the Proposed Compensation Plan Plant List have been verified as regionally native according to Richard Frank and Allan Anderson, 2006. "The Flora of Wellington County from Primeval to Present - 2005". Wellington County Historical Society.

Appendix J. City of Guelph: Guelph Waterworks Well Supply

7.7 Schedule A: City of Guelph: Guelph Waterworks Well Supply



SIGNIFICANT DRINKING WATER THREAT POLICY APPLICABILITY

Note: This table provides a summary of where activities listed in the Clean Water Act (2006) apply as Prescribed Drinking Water Threats (PDWT). For further details, users should refer to the Source Protection Plan and the Ministry of the Environment Drinking Water Threats Tables.

Prescribed Drinking Water Threat		Areas Where Policies Apply
1.	Waste Disposal Sites (within the meaning of Part V of the EPA)	
2.	Sewage Systems or Sewage Works	
3, 4.	Agricultural Source Material	
6, 7.	Non-Agricultural Source Material	
8, 9.	Commercial Fertilizer	
10, 11.	Pesticide	
12, 13.	Road Salt	
14.	Storage of Snow	
15.	Fuel	
16.	DNAPLs	
17.	Organic Solvents	
18.	Aircraft De-icing	
21.	Livestock Grazing or Pasturing, Outdoor Confinement, or Farm Animal Yard	
Local Threat	Conveyance of Oil through Pipelines	

DRINKING WATER SOURCE PROTECTION
ACT FOR CLEAN WATER

Significant Drinking Water Threat Policy Applicability Map

City of Guelph:
Guelph Waterworks Well Supply

- Well
- Main Roads
- Minor Rivers
- Lakes / Main Rivers
- City of Guelph Boundary
- Municipal Boundary

Wellhead Protection Zones:
- WHPA-A
- WHPA-B
- WHPA-C

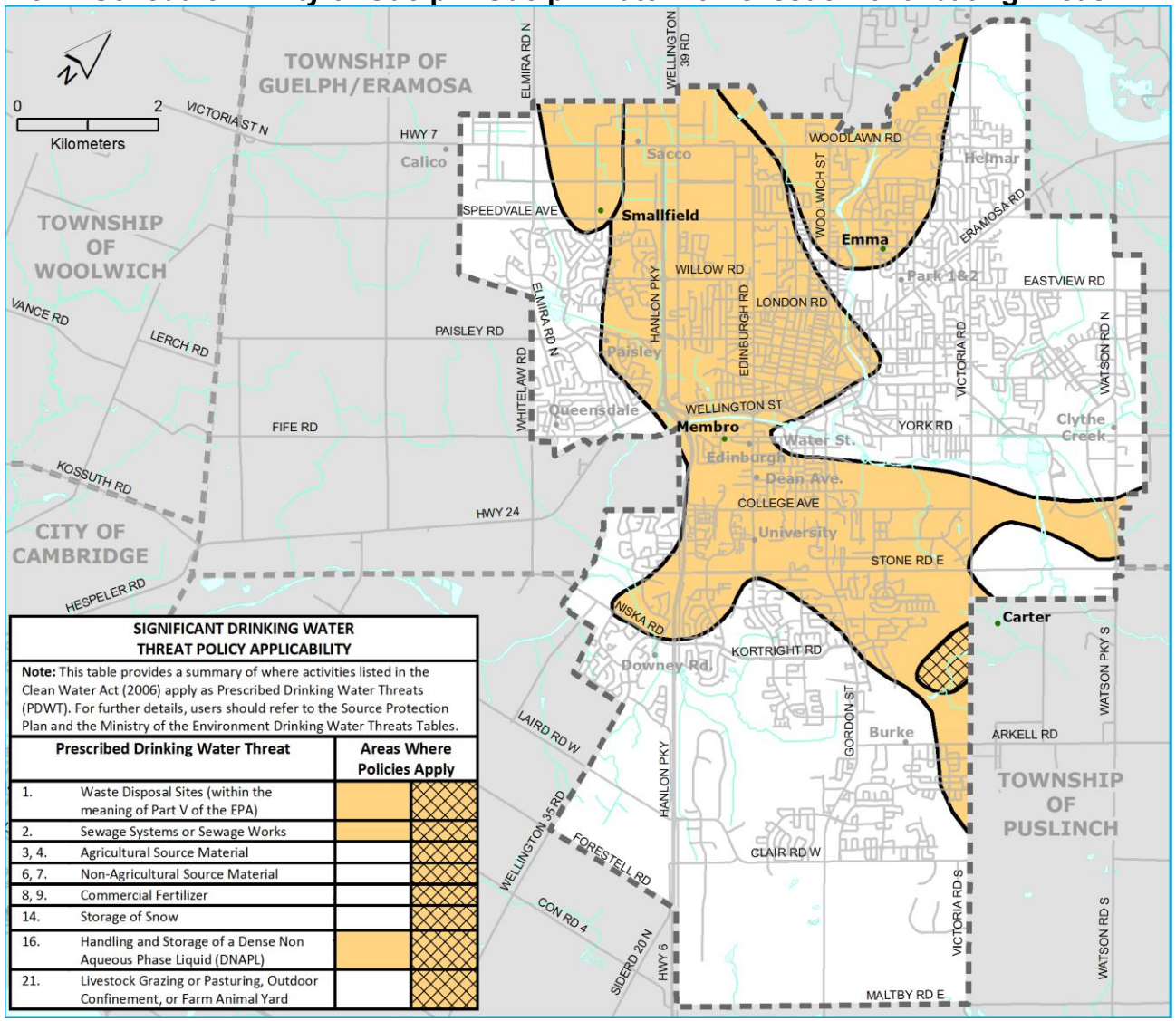
Vulnerability Score:
- 10
- 8
- 2, 4, 6

Lake Erie Source Protection Region
www.sourcewater.ca
Grand River Source Protection Area

Ontario

Produced by GRCA on behalf of the Lake Erie Source Protection Committee, June 5, 2012

7.8 Schedule B: City of Guelph: Guelph Waterworks Issue Contributing Areas



SIGNIFICANT DRINKING WATER THREAT POLICY APPLICABILITY

Note: This table provides a summary of where activities listed in the Clean Water Act (2006) apply as Prescribed Drinking Water Threats (PDWT). For further details, users should refer to the Source Protection Plan and the Ministry of the Environment Drinking Water Threats Tables.

Prescribed Drinking Water Threat		Areas Where Policies Apply	
1.	Waste Disposal Sites (within the meaning of Part V of the EPA)		
2.	Sewage Systems or Sewage Works		
3, 4.	Agricultural Source Material		
6, 7.	Non-Agricultural Source Material		
8, 9.	Commercial Fertilizer		
14.	Storage of Snow		
16.	Handling and Storage of a Dense Non Aqueous Phase Liquid (DNAPL)		
21.	Livestock Grazing or Pasturing, Outdoor Confinement, or Farm Animal Yard		

DRINKING WATER SOURCE PROTECTION
ACT FOR CLEAN WATER

Significant Drinking Water Threat Policy Applicability Map

City of Guelph:
Guelph Waterworks
Issue Contributing Areas (ICA)

- Well
- Well with ICA
- Main Roads
- Minor Rivers
- Lakes / Main Rivers
- City of Guelph Boundary
- Municipal Boundary

Issue Contributing Areas:

- TCE
- TCE & Nitrate

Lake Erie
Source Protection Region
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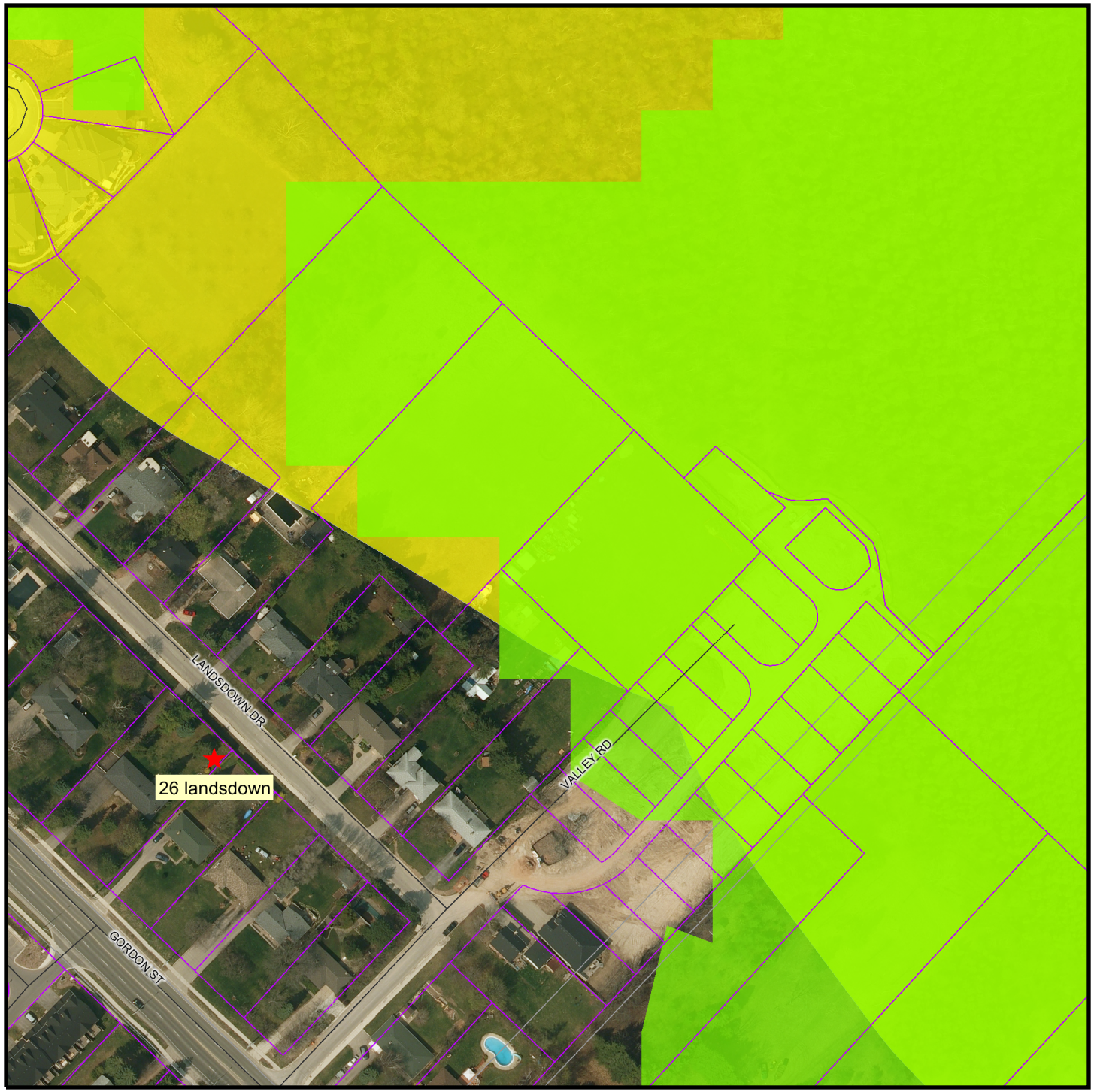
Grand River
Source Protection Area

Ontario

Grand River Conservation Authority

Produced by GRCA on behalf of the Lake Erie Source Protection Committee, July 27, 2012

Appendix K. Study Area SGRA Vulnerability



Grand River Conservation Authority

Map created: December 18, 2013

SGRA Vulnerability

LEGEND

- WATERSHED MASK
- SURFACE WATER INTAKE (SWP)
- MUNICIPAL WELL (SWP)
- WATERSHED BOUNDARY (GRCA)
- ROADS-ADDRESSED (MNR)
- PARCELS-ASSESSMENT (MPAC)
- LOTS (NRVIS)
- SGRA-VULNERABILITY (GRCA)
  - 6
  - 4
  - 2
- WHPA-GUDI VULNERABILITY (SWP)
  - 10
  - 8 - 9.9
  - 6 - 7.9
  - 4 - 5.9
  - 0 - 3.9
- 2010 ORTHO (ONT)

GRCA Disclaimer

This map is for illustrative purposes only. Information contained hereon is not a substitute for professional review or a site survey and is subject to change without notice. The Grand River Conservation Authority takes no responsibility for, nor guarantees, the accuracy of the information contained on this map. Any interpretations or conclusions drawn from this map are the sole responsibility of the user.

The source for each data layer is shown in parentheses in the map legend. For a complete listing of sources and citations go to:

http://grims.grandriver.ca/docs/SourcesCitations2.htm

0 23 46 69 92 m.

NAD 1983, UTM Zone 17 Scale 1:2,000

N

THIS MAP IS NOT TO BE USED FOR NAVIGATION

Appendix L. Agency Comments + Responses

24, 26, 28 and 30 Landsdown Drive Environmental Impact Study
Consolidated Comments + Actions

#	Comment	Action/ Notes	Reference
May 14, 2014 - Environmental Advisory Committee			
1	**Provincially Significant Wetlands:** The City supports GRCA comments (letter dated April 29, 2014) indicating concern with the wetland water balance. The proposal includes an increase in runoff to the PSW which presents potential impacts to the ecological and hydrological functions of the PSW. Please revise the proposal to mitigate potential impacts.	Addressed via GRCA comments dated April 29, 2014 (later in this table).	EIS
2a	**Stormwater Management:** The EIS indicates that development is limited to outside the PSW and its 30 m buffer; however it should be acknowledged that stormwater management is proposed within 15m of the PSW. Revise the EIS accordingly (ex. page 4 section 1.3.3).	Edits completed in report.	EIS Section 1.3.3, and Table 11.
2b	**Stormwater Management:** According to the OPA 42 policy framework and as indicated on page 34, SWM facilities may be considered within the outer 15m of a PSW buffer provided that: • An EIS is provided which demonstrates no negative impacts; and • No feasible alternative exists; and • Low Impact Development measures have been implemented to the extent feasible, outside of the buffer. This application has not demonstrated that it meets these three criteria and as such the proposal should be revised.	Edits to text have identified: a) that there are no negative impacts to the PSW, b) alternative locations have been explored and there aren't any, and c) LID measures have been implemented in the site plan.	EIS Section 3.3.2.2 Under 6A.1.2 General Permitted Uses
2c	**Stormwater Management:** Staff support the GRCA comments which suggest that infiltration measures should be incorporated into the proposal should soil conditions be conducive.	Infiltration trenches have been incorporated into proposal.	Please see SWM Report-Section 5 and Appendices B, D, & E
3a	**Hydrogeology:** The GRCA has advised that the nearby development encountered issues with groundwater elevations as it relates to basement elevations. As well, basements within the groundwater table may present potential impacts to the natural heritage system. As such, the City requests the applicant monitor groundwater elevations on site to inform the proposal and ensure that basement elevations are appropriately considered. The assessment should provide a conclusion as to whether or not there are anticipated impacts to the NHS	Seasonal high groundwater elevation ranging from 1.37 m to 2.16 m below existing ground elevation.	SWM Report Section 3.4 & EIS – summary in Section 3.4.4.
3b	**Hydrogeology:** Page 21 of the EIS indicates that the water table is 33 cm below ground surface within the cedar swamp community. Please clarify how this conclusion was reached. If it is based on soil augers from ELC, please clarify whether 33 cm represents observations of mottles and/or gley to clarify a seasonal vs. permanent groundwater table elevation.	ELC data sheet for community #7 (SWC3-2) was reviewed (data sheet available upon request). Edits completed in report.	EIS Section 3.2.1.1 Ecological Land Classification: SWC3-2
4	**Significant Wildlife Habitat:** The SWH screening exercise has screened for SWH within the limits of the proposed development but has not considered SWH within 120 m of the proposal. Please revise to appropriately account for SWH functions on adjacent lands and provide an analysis indicating whether the proposal has potential impacts to these features and functions and how they can be mitigate (ex. Woodland area-sensitive breeding bird habitat, deer wintering area).	Lands within 120 m of proposed development were considered for SWH. Edits completed in text.	EIS Sections 2.2.3.4, 3.2.3.3 and Appendix G.
5a	**Significant Woodlands**: Page 12 of the EIS runs through the criteria for determining the limits of significant woodland and particularly how it relates to the Austrian Pine community. This analysis is better suited in the policy analysis section of the report. The determination of excluding the Austrian Pine community from significant woodlands is based on definitions and criteria set out in the City's current OP, Provincial Natural Heritage Reference Manual and with regard for OPA 42.	Moved to appropriate section in EIS document.	EIS Section 3.3.2.2. Under 6A1.1, and Section 5.3.2.
5b	**Significant Woodlands**: Staff agree that narrow treed areas can be excluded from Significant Woodlands based on the minimum patch width criteria which is described on page 72 of the Natural Heritage Reference Manual. However, in this case it is unclear whether the criteria for exclusion have been met. The report indicates the width of the patch to be 10-14 m, in which instance staff would agree that exclusion is appropriate. However, based on our review the width seems to be between 20 -30 m. Please clarify the significant woodland boundary.	The Austrian Pine Plantation was screened for its potential to qualify as an extension of the Significant Woodland. The Natural Heritage Resource Manual states that "A bisecting opening 20 metres or less in width between crown edges is not considered to divide a woodland into two separate woodlands"(2010 NHRM, p. 72). Polygon 8 is separated from the Significant Woodland associated with the Torrance Creek Wetland Complex by approximately 10 to 12 metres. It is therefore considered to be contiguous with or a part of the Significant Woodland.	EIS Section 3.4.3.
5c	**Significant Woodlands**: Under the current OP, development may be proposed within significant woodlands, provided that there are no negative impacts on the feature or its ecological function. Please revise the Significant Woodland analysis to address these comments and city policies.	Revised and addressed in EIS Report	EIS Section 3.2.3.1, Section 3.3.1.6, Section 3.3.2.1, Section 3.3.2.2 Under 6A1.1, Section 3.4.1., Section 3.4.3.
6a	**Tree Inventory & Tree Compensation:** It is not clear whether the proposal has considered preservation of parts of the southwest Hedgerow (Vegetation Unit 2). Within this hedgerow, 60 trees are found including some trees over 50 cm DBH. The City's encourages preservation of healthy, non-invasive trees within this hedgerow as they add value to the Urban Forest, and provides screening between the development proposal and existing residences. Please revise the proposal accordingly. Particularly examine opportunities to retain: 1396 to 1402 and 1415, 1418, 1420, 1421, 1423 to 1427 and 1429, 1430.	<u>Trees to be Preserved:</u> 1415, 1418, 1420, 1421, 1423 to 1427, 1429, 1430 <u>Trees to be Preserved if Possible:</u> 1399-1401; Proximity to the building envelope may damage the root zone. Preservation to be determined at the time of	EIS Appendix D & Figure 18. Tree Preservation Plan

#	Comment	Action/ Notes	Reference
		construction. Recommendations on pruning to be provided as part of detailed design. <u>Trees to be Removed:</u> 1396 – 1398; Cannot be saved due to the close proximity to the building envelope in Lot 20 or 1402 cannot be saved due to proximity to road.	
6b	**Tree Inventory & Tree Compensation:** Also, examine opportunity to retain trees: 1443 to1449 and 1450 to 1454.	<u>Trees to be Preserved:</u> 1443 to 1449 have been reassessed and changed to "preserve". 1450 to 1454 were proposed to be preserved in the EIS submission, which has not changed.	EIS Appendix D & Figure 18. Tree Preservation Plan
6c	**Tree Inventory & Tree Compensation:** It should be noted that as per the City's current OP (section 6.8), the Urban Forest Management Plan as well as OPA 42, the City values non-native trees for their contribution to the urban forest and thus it is not supportable from the City's perspective that all non-native trees receive low preservation priority ranking. The City's policy direction in OPA 42 clearly indicates that healthy, non-invasive trees are encouraged to be retained and integrated into the proposal	Agreed: all non-native trees that are healthy and non-invasive have been updated with respect to preservation priority. Healthy, non-invasive and structurally sound trees are retained where possible.	EIS Appendix D & Section 4.1.1.
6d	**Tree Inventory & Tree Compensation:** Provide an "overall condition" column in the Tree Inventory Table that considers biological health, structural condition and any other assessment results. Compensation is required for all trees in fair to excellent (medium to high) condition.	Overall condition is essentially what the "preservation priority" column is intended to be. Criteria used to determine compensation are provided in EIS Appendix D and in the EIS report text.	EIS Appendix D. & Section 4.1.1 of report.
6e	**Tree Inventory & Tree Compensation:** The EIS indicates that the Private Tree Protection Bylaw states a replacement ratio of 1:1. In fact, the Private Tree Protection By-law states "that each tree destroyed or injured be replaced with one or more replacement trees…" Furthermore, the current OP, Urban Forest management Plan and OPA 42 provide the policy framework for the City to maintain and increase tree canopy cover in the City. Consistent with the City's Bylaw, current OP (section 6.8), Urban Forest Management Plan and with regard for OPA 42 (sections 4.1.8 & 4.1.9); the City's general practice is to replace tree loss using a 3:1 replacement ratio with consideration for site-specific characteristics.	The Compensation Plan includes the installation of 236 caliper trees of various diameters, which represents a 2:1 removal / replacement ratio. In addition to caliper replacement trees, additional quantifiable enhancements are included in the Compensation Plan. This is summarized as follows: • Caliper Trees - 2:1 replacement • Tree whips – 70 additional native trees • Shrubs – 892 additional native shrubs • Groundcover – 1951 m^2. additional native herbaceous groundcover • CC Value – from 1.56 to 3.15	EIS Section 5.3.1
6f	**Tree Inventory & Tree Compensation:** Utilize City standards SD-90 a and SD-90 c for tree protection (page 59). These specifications can be found online at: *http://guelph.ca/wp-content/uploads/PartB_Standard_Contract_Specifications_2014.pdf*	EIS report revised to refer the reader to City standards	EIS Section 5.1.4
6g	**Tree Inventory & Tree Compensation:** The City supports the management of invasive species. This enhancement is valuable to the long-term integrity of the natural heritage system.	Agreed. Invasive species removal addressed.	EIS Section 5.2 Compensation Plan
6h	**Tree Inventory & Tree Compensation:** While the principles of the compensation plan, which are to consolidate, link and enhance the available habitat and increase quantity and quality of vegetation, are supported the proposed compensation plan does not adequately replace the proposed loss of (potentially significant) woodland, trees and/or canopy.	The Compensation Plan includes the installation of 236 caliper trees of various diameters, which represents a 2:1 removal / replacement ratio. In addition to caliper replacement trees, additional quantifiable enhancements are included in the Vegetation Compensation Plan. This is summarized as follows: • Caliper Trees - 2:1 replacement • Tree whips – 70 additional native trees • Shrubs – 892 additional native shrubs • Groundcover – 1951 m^2. additional native herbaceous groundcover • CC Value – from 1.56 to 3.15 • Qualitative improvements to woodland interior, resiliency to encroachment, and wildlife cover enhancement.	EIS Section 5.3.1
6i	**Tree Inventory & Tree Compensation:** Staff suggest that the age class of trees proposed as compensation needs to be more diverse and better balanced across the spectrum of caliper trees to whips (i.e., use some 60 mm caliper, some 40 mm caliper, 1-2 m height, some smaller material, etc.) and overall, an increased number of caliper trees is needed, particularly within the "existing saum" as well as the entire buffer area which is not currently treed.	Revisions to Vegetation Compensation Plan and text to include more caliper trees and variable sizes of trees (40 and 50-60mm) as well as tree whips (1.5-2m height).	EIS Section 5.2.1, Figure 21.

#	Comment	Action/ Notes	Reference
6j	**Tree Inventory & Tree Compensation:** Please revise the proposal with consideration for opportunities to reduce the amount of proposed tree removals and to at minimum maintain and preferably increase tree canopy cover. The outcome of the significant woodland analysis will be important in establishing compensation.	The amount of proposed tree removals has been reduced. See 6a and 6b Action Comments.	
7	**Trails:** The EIS indicates that the City of Guelph's Trail Master Plan (GTMP) proposes a trail within the PSW buffer, however this isn't accurate. The City's GTMP identifies the overall conceptual trail system but does not identify trail alignments on a site-specific basis. It is the City's expectation that the EIS will recommend a trail alignment for the segment of trail that is conceptually identified through this area in the City's GTMP and that the EIS will include an impact assessment to demonstrate it will not negatively impact the natural heritage system. This is to be done in consultation with the Parks Planner. Please address.	EIS text revised to reflect the recommended trail alignment and potential impacts.	EIS Section 3.3.2.1, 4.1.3, 4.1.7, and Table 11
8a	**Other:** The Terms of Reference included a spring flora survey however the flora survey was undertaken in summer only. Please include a spring survey and results (section 2.2.1.1).	Survey done by D&A on May 20, 2014, including: - ID of samples collected in the field - Input of data into the existing data - Double-checking of existing data, including correcting CC values - Recalculating CC values (mean native C, mean C with non-natives, native FQI, and FQI with non-natives) as per the Oldham et al. 1995 Floristic Quality Assessment System for Southern Ontario - Ensured that the charts generated by the data are accurate (i.e. # of native, non-native, and ID to genus level only pie charts)	EIS Section 3.2.1.1, 3.2.1.2, and Appendix F
8b	**Other:** Discuss the need for a monitoring plan including baseline, during and post construction and provide recommendations.	EIS text revised to provide monitoring plans including baseline, during and post construction monitoring provided.	EIS Section 6.1: Table 14
8c	**Other:** It is more appropriate to use agencies names and not names of individuals in the EIS report. Please revise section 2.1.2 accordingly.	Edits completed in report.	EIS section 2.1.2
8d	**Other:** Figure 3, referenced on page 40 was not included in the submission	This figure has been omitted in the revised EIS report. It has been replaced with reference to Schedule 1 & 2 of the City of Guelph Official Plan	EIS Section 3.3.2.1
8e	**Other:** Provide a figure which illustrates development constraints and opportunities, meaning significant natural heritage features, their limits and buffers on an aerial using a transparent identifier and the proposed development layout. Figure 2 is good for ELC however the underlying aerial cannot be seen.	Figure developed for inclusion in report.	EIS Figure 20.
8f	**Other:** Ensure the figures are provided at a resolution that is legible.	Figures developed at resolution that is legible. Originally this was a printing problem.	EIS Figures 16-21 and Appendix L.
8g	**Other:** Provide a concise summary list of the EIS recommendations in a concluding statement to give an indication of what needs to be done in future stages of planning and development.	EIS text revised to provide recommendations.	EIS Section 6.1
April 29, 2014 - Grand River Conservation Authority (GRCA)			
1a	**Stormwater Management:** The Torrance Creek Subwatershed Study did not identify this site or the west side of the wetland as a local recharge area to sustain baseflow to Torrance Creek. The study does outline that the wetland "would probably benefit from the implementation of infiltration measures" and maintaining existing infiltration volumes is an objective of the study. Although it is possible that site soils are unfavourable to infiltration measures we feel that there has been insufficient assessment of soil permeability to confirm this. The adjacent Valley Road Estates development located in identical surficial geology included the installation of infiltration galleries throughout its site. Any surcharge of these facilities is conveyed to a SWM block. Also, infiltration could potentially be utilized to address comments concerning wetland hydrology below.	Infiltration trenches are proposed to support infiltration that would be beneficial to the wetland. The results show that by implementing infiltration trenches, postdevelopment infiltration is higher than pre-development infiltration.	Please see SWM Report Section 5 and Appendices B, D, & E
1b	**Stormwater Management:** If infiltration measures are proposed with the revised submission, please revise the appended water balance calculations to provide estimations of annual infiltration volumes. As a reference for determining infiltration rates from hydraulic conductivity we suggest Appendix C of the LID SWM Planning and Design guide available from http://sustainabletechnologies.calwp.	Average annual infiltrations volumes are included in the water balance calculations. Infiltration rates were determined based Appendix C of the LID SWM Planning and Design Guide.	Please see SWM Report Section 5 and Appendices D & E.
1c	**Stormwater Management:** FSR Section 4.6 Water Budget, the report identifies a substantial increase in seasonal runoff volumes. Prior to advancing to the detailed design stage, additional studies should be submitted to evaluate the potential impacts of the alterations on the receiving wetland hydrology and ecology. The report identifies a 125% increase in runoff from this small development and that the receiving wetland is much larger. This is inadequate summation and does not adequately support the development impacts.	By implementing infiltration trenches, post-development average annual runoff is balanced with the pre-development levels.	Please see SWM Report Section 5 and Appendices D & E.
1d	**Stormwater Management:** Section 3.2.4.2 Water Budget within the EIS, the post development conditions will result in a 125% increase in runoff from the site into the adjacent Provincially Significant Wetland. The EIS has not adequately assessed the impacts of the identified increase in runoff and as noted above a more detailed and amended EIS and hydrogeological study to determine the wetland's ability to assimilate the altered water levels should be carried out. Adjacent to this site is a proposed development at 44-56, 76 Arkell Rd., which if carried forward would have an acknowledged impact on the same wetland's hydrology. The adjacent proposed development of a 2.3ha site has been assessed to result in a 1cm	By implementing infiltration trenches, post-development average annual runoff is balanced with the pre-development levels.Accordingly, no negative impact to overwhelm the wetland and its established vegetation communities is anticipated	Section 3.2.4.1 Water Budget within the EIS; Sections 3.3.1.6 and 3.3.2.1 of the EIS

#	Comment	Action/ Notes	Reference
	rise in water levels over the 50ha provincially significant wetland. The cumulative impacts of these as proposed may alter the natural wetland hydrology and overwhelm the wetland and its established vegetation communities. This has the potential to drown the wetland and kill off the existing wetland community, which is not an acceptable impact. As a result, the statements in Sections 3.3.1 .6 and 3.3.2.1 of the EIS related to no negative impacts are premature until the additional studies are completed to address this comment.		Please see SWM Report Section 5 and Appendices D & E.
1e	**Stormwater Management:** Table 10 shows that the post development runoff volume percentage change will be greatest during July through October which will stress the existing wetland vegetation community and its ability to assimilate the revised water levels. Torrance Creek PSW is a recharge wetland system and it will not be able to deal with the proposed water quantity which will result in a higher water level within the wetland area. An ecosystem approach to the proposed cumulative impacts should be taken.	By implementing infiltration trenches, post-development runoff volumes in August, September and October is lower than the pre-development runoff volumes. An increase in post-development runoff volumes in June and July is 10.3% and 46.3%, respectively, which is significantly less than the post- to pre-development increase without implementation of infiltration measures.	Please see SWM Report Section 5 and Appendices D & E.
1f	**Stormwater Management:** Any external drainage entering the site from lots along Landsdown Drive should be included in design considerations.	External drainage areas E1 & E2 along Landsdown Drive are included in the design considerations.	Please see SWM Report Sections 5 & 6 and Appendices A, D, E, F, G, & H.
1g	**Stormwater Management:** Please use variable discharge rates in a stage storage discharge table rather than fixing it at the existing conditions 100-year rate.	Trenches and SWM modeled using a stage storage discharge curve with variable discharge rates for the 2-yr, 5 yr, 25 yr. and 100 yr design storm events have been incorporated	Please see SWM Report Sections 5 & 6 and Appendices A, D, E, F, G, & H
1i	**Stormwater Management:** A spreader swale/berm is needed to disperse SWM facility discharge along the edge of the wetland buffer. The concept needs to be included at this stage, with details provided at the next planning stage.	A spreader swale at the storm outlet into the PSW has been incorporated into the design	Please see SWM Report Section 6 and Appendix A.
1j	**Stormwater Management:** If it helps with pond sizing, some clean runoff from lots adjacent to the wetland buffer may be directed to the buffer.	Acknowledged. However, runoff from the lots adjacent to the wetland buffer are directed to the site storm system for quantity control.	Please see SWM Report Section 6 and Appendix A.
1k	**Stormwater Management:** Please explain how the water budget table in Section 4.6 has virtually identical recharge volumes for the existing and proposed conditions without the use of infiltration galleries.	Infiltration trenches have been implemented and the water budget calculations updated.	Please see SWM Report Section 5 and Appendices D & E
1l	Stormwater Management: At detailed design please use a hydrologic model, such as MIDUSS, using the Horton Infiltration Method and City of Guelph standard infiltration parameters. Also, in our experience the Modified Rational Method has large uncertainties in the estimation of storage volumes required for the design of stormwater management facilities.	MIDUSS Modelling (using the Horton Infiltration Method) and City of Guelph standard infiltration parameters are used in this submission.	Please see SWM Report Section 6 and Appendices F, G, & H.
1m	**Stormwater Management:** FSR Section 5 Sediment and Erosion Control Plan, the FSR should note that an inspection and report program will be part of the E&S control plan at detailed design. It should also note that additional materials should be kept on site for contingency purposes.	Suggested notes have been incorporated. An inspection and report program is part of the E&S control plan as per the provided example on the GRCA website.	Please see SWM Report Section 7.
2a	**Environmental Impact:** Section 3.3.1.1 Endangered Species Act (2007), the EIS background review identified that Snapping Turtle a species ranked as Special Concern is found within the PSW and area. No field studies/inventories were undertaken to help confirm presence/absence were carried out. Field studies should be carried out to confirm and support the EIS conclusion that this species of Special Concern will not be impacted.	Screening for species at risk was undertaken during a site visit on Nov 17, 2013. With respect to Snapping Turtle the wildlife ecologist reported that "it is not likely that this species uses the site as nesting as there is no suitable habitat."	EIS Section 3.1.2.2.2 Fauna and Section 3.3.1.1 Endangered Species Act
2b	**Environmental Impact:** Figure #4 Conceptual Compensation Plan, it is difficult to identify and differentiate the flagged wetland and its assigned 30m buffer. Also the scale and resolution of the planting treatment is not legible.	Drawing has been revised to clarify graphic for flagged wetland and buffer. The Vegetation Compensation Plan Plant List is included as an appendix rather than as part of the drawing to avoid legibility issues.	EIS Figure #21 Vegetation Compensation Plan (Conceptual) and Appendix I.
2c	**Environmental Impact:** The Vegetation Compensation Plan should be shown independently so that the species make up can be reviewed.	Vegetation Compensation Plan Plant list included in Appendix I	EIS Appendix I
2d	**Environmental Impact:** Section 4.1.3 Servicing, the EIS has not provided any discussion on groundwater elevation and possible requirement for dewatering during installation of servicing. This information should be amended.	Edits completed in report	EIS Section 4.1.3 Servicing and SWM Report Subsection 3.4,sections 4.6 and 7, and Appendix B
2f	**Environmental Impact:** Section 4.1.5 Human Occupation, the EIS should identify that all rear yards backing onto natural heritage buffers should have a rear yard fence with no gates to reduce incidental impacts to the wetland (encroachment, dumping of yard waste, vegetation removal, trampling, and release of domestic animals).	Fence included on Vegetation Compensation Plan. Property demarcation fencing as per City of Guelph's Demarcation Policy is recommended.	EIS Figure 21, Section 4.1.6 Human Occupation and Section 6.1 Recommendations

#	Comment	Action/ Notes	Reference
2g	**Environmental Impact:** Section 4.1.6 Recreational Trail, the EIS report states that "the route and design of the trail are considered as part of the application in order to assess impact of the trail on the PSW". The EIS does not assess any impact to the trail or provide any specifications on the proposed trail. To assess the route and impact of the trail on the PSW at this planning stage, the EIS should be amended.	Trail alignment located outside the inner 15m buffer to greatest extent possible while avoiding tree removal in the plantation (polygon 8). EIS report has been revised to address trail development activities, trail related impacts, and mitigation/compensation strategies.	EIS Section 4.1.7 Recreational Trail, SBM Grading Plan (EIS Appendix L), Table 11 Impact summary matrix, and Section 5.1.1.
2h	**Environmental Impact:** Table #12 Impact Summary Matrix, Vegetation Removal, Construction disturbance of Wildlife, the report states that the breeding bird season in Guelph corresponds roughly to the period between April 1 to June 30. The accepted breeding bird season window is May 25 to July 30. Alternatives to this window are possible but require site specific investigation by qualified biologists. The correct breeding bird season should be updated in all relevant categories of the table and EIS (Section 4.2.13).	Edits completed in report.	EIS Section 3.3.1.1, 5.1.3 and Table 11.
3	**General - Plans:** FSR, the engineering plans and draft plan of condominium are too fine a scale and not legible. The information should be provided in a larger format. Notwithstanding the comments above, the general stormwater management concept appears to be appropriate for the site but, we are unable to confirm that the proposed development will satisfy essential regulatory requirements due to the scale of the drawings.	Full size drawings are provided with this submission	SWM Report Appendix A
4a	**Advisory Comments to the Municipality:** Section 3.3 .1.5 of the EIS - Clean Water Act, the site is within Wellhead Protection Zone WHPAC and the proposed development would result in an increase of surface runoff into the PSW of 125%. This area of the wetland contributes to seasonal groundwater recharge and the increased runoff may contribute to reduced water quality in nearby water supply wells.	By implementing infiltration trenches, post-development average annual runoff is balanced with the pre-development levels.	Please see SWM Report Section 5 and Appendices D & E.
4b	**Advisory Comments to the Municipality:** The establishment of a community trail will require a separate EIS to identify appropriate site locations. All trails should be located to the outer extent of the identified natural heritage buffers wherever possible.	Trail alignment located outside the inner 15m buffer to greatest extent possible while avoiding tree removal in the plantation (polygon 8). EIS report has been revised to address trail development activities, trail related impacts, and mitigation/compensation strategies.	EIS Section 4.1.7 Recreational Trail, SBM Grading Plan (EIS Appendix L), Table 11 Impact summary matrix, and Section 5.1.1.
4c	**Advisory Comments to the Municipality:** Groundwater is expected to impact basements in this development. Observations at the time of borehole drilling in the very dry summer of2013 (August 6) suggest perched groundwater at relatively shallow depths. Normally seasonal high groundwater observations are established prior to setting basement elevations. We recommend that this be done during this year's spring thaw and that basement elevations be adjusted accordingly. For an adjacent development in the vicinity, groundwater levels were considerably higher than anticipated at detailed design and resulted in difficultly with dewatering during construction. This also led to raising building foundation elevations considerably after the initial design review.	Buildings have been raised above the seasonal high water table.	EIS Section 4.1.1 and Servicing and SWM Report Subsections 3.4 and 4.1 and Appendix B
4d	**Advisory Comments to the Municipality:** Inspec-Sols borehole logs need geodetic elevations.	Acknowledged and completed	SWM Report Subsection 3.4 and Appendix B
4e	**Advisory Comments to the Municipality:** Section 4.5.2 specifies maximization of topsoil with a minimum 100mm depth. On a disturbed site the proposed minimum depth will not be sufficient to support healthy vegetation needed to enhance infiltration and treat runoff in the swales. This is discussed in another Sustainable Technologies document: Preserving and Restoring Healthy Soil: Best Practices for Urban Construction.	150 mm of topsoil is proposed and, in our opinion, is sufficient to support healthy vegetation needed to facilitate infiltration and treatment of runoff in swales, noting that infiltration trenches and an oil/grit separator are also proposed to help facilitate these features.	SWM Report Subsection 6.4.2. and Appendix A
May 12, 2014 – City of Guelph: Parks & Recreation			
1	Identify the proposed trail link through the subject property.	Shown on SBM Grading Plan	SWM Report Appendix A and EIS Appendix C.
2	Assess the impact of the trail development on the adjacent PSW.	Trail alignment located outside the inner 15m buffer to greatest extent possible while avoiding tree removal in the plantation (polygon 8). EIS report has been revised to address trail development activities, trail related impacts, and mitigation/compensation strategies.	EIS Section 4.1.7 Recreational Trail, SBM Grading Plan (EIS Appendix L), Table 11 Impact summary matrix, and Section 5.1.1.
3	If the trail link is recommended through the PSW buffer provide a justification and discuss the benefits of locating trails within the natural feature buffers.	Trail alignment located outside the inner 15m buffer to greatest extent possible while avoiding tree removal in the plantation (polygon 8). EIS report has been revised to address trail development activities, trail related impacts, and mitigation/compensation strategies.	EIS Section 4.1.7 Recreational Trail, SBM Grading Plan (EIS Appendix L), Table 11 Impact summary matrix, and Section 5.1.1.
4	Amend the EIS to address Parks' comments (dated December 2013) on EIS-TOR in its entirety including recommendations on preparation of an Environmental Implementation Report and submission of detailed trail design as per City's standards and background resources.	Edits completed in report and Vegetation Compensation Plan	EIS 6.1 and Figure 21

#	Comment	Action/ Notes	Reference
5	The grading plans show a 1.2 metre wide trail within the 30 metre wetland buffer. The trail width doesn't meet the City's standard for a multi-use trail.	Trail width has been revised and standards for trail development are cited in the report	SWM Report Appendix A & EIS Section 4.1.7, and Appendix H
6	Revise the Site Grading Plan to include 2.5 metre wide trail in conjunction with the EIS.	Trail width has been revised	SWM Report Appendix A & EIS Figure 21.
7	Provide preliminary grades on the trail to demonstrate that the trails can be designed to meet City standards (Guelph Trail Masterplan, Design Principles for Storm Water Management Facilities, Facility Accessibility Design Manual etc.)	Preliminary grades provided	SWM Report Appendix A & EIS Section 5.1.1. and Appendix C.
8	The trail will be located within a public open space and should be designed in such a way that a separate trail parcel can be created.	Edits completed in report	SWM Report Appendix A & EIS Section 1.4
December 2, 2014 - City of Guelph: Parks & Recreation			
1	**Trail Network:** Guelph Trail Network identifies an important north-south secondary route trail connection along the west side of significant Torrance Creek PSW Complex. Please refer to the attached contextual and conceptual sketch for the proposed location of trail on and adjacent to the subject property (Appendix 1). The trail connection has been proposed on the edge of the environmentally sensitive lands in order to protect the wetlands from any further damage due to existing or potential ad-hoc trails through these protected areas in absence of a formal trail. The scoped EIS should address the following:	No action required.	
1a	**Trail Network:** Identification of existing foot trails and potential ad-hoc trails	Addressed in EIS report – no existing ad-hoc trails	EIS Section 4.1.7
1b	**Trail Network:** Identification of Preliminary trail alignment in consultation with Parks Planning and Environmental Planning Staff. The desirable trail route is to be flagged on site for staff review.	Preliminary trail alignment provided in SWM report and EIS.	SWM Report Appendix A & EIS Figures 16-20.
1c	**Trail Network:** Assessment of the environmental impact of development of the proposed trail and recommendations on measures to mitigate impacts	Trail alignment located outside the inner 15m buffer to greatest extent possible while avoiding tree removal in the plantation (polygon 8). EIS report has been revised to address trail development activities, trail related impacts, and mitigation/compensation strategies.	EIS Section 4.1.7 Recreational Trail, SBM Grading Plan (EIS Appendix L), Table 11 Impact summary matrix, and Section 5.1.1.
2	Recommendations on the installation of educational interpretive signage along the trail route adjacent to protected features	Addressed in EIS report	EIS Section 5.1.5 and Section 6.1.
3	Recommendations on the cleanup of debris and waste within the natural heritage features and their identified buffers as necessary	Property has been well maintained and existing debris is not a concern. Construction debris to be removed to keep the alignment in a natural condition.	EIS Section 4.1.7 and Section 6.1.
4	Recommendations for management of the vegetation within the natural open space along the trail route including removal of hazard trees and invasive species	Addressed in EIS Report (Vegetation Removal, Vegetation Compensation Plan)	EIS Section 4.1.1., Section 6.1, and Figure 21.
5	Recommendations on the timing of site preparation and grading for trail construction within the open space. Based on the location of the trails within natural open space it would be beneficial to implement the trails at the same time as other area features (planting, demarcation, etc). This would consolidate timing of construction activity close to sensitive habitats and avoid re-disturbance of regenerating buffer areas. It would also avoid home buyer concerns and related further delay in trail installation typically associated with later trail development.	Addressed in EIS Report	EIS Section 6.1.
6	**Environmental Education**: The EIS should make a recommendation on distribution of the City's standard environmental homeowner manual to all home buyers. Environmental interpretive signage will be provided adjacent to natural heritage features along the trail route to provide resident education on the area's environmental features and trail rules signage will be provided at all trail access points in the subdivision to address many of the common resident impact items including dumping of yard waste, encroachments, pet waste, etc.	Distribution of homeowner manual and interpretive signage recommended in report. Trail rules signage recommended.	EIS Section 5.1.5 and Section 6.1.
7	**Demarcation:** In accordance with the City's policy on Property Demarcation fencing is required to demarcate city property line. The scoped EIS The final configuration of the fencing will be determined during the detailed design stage and presented in the Environmental Implementation Report which will include a demarcation plan.	Fence included on Vegetation Compensation Plan. Property demarcation fencing as per City of Guelph's Demarcation Policy is recommended.	EIS Figure 21, Section 4.1.6 Human Occupation and Section 6.1 Recommendations
8	**Open Space Works and Restoration:** Based on the inventory of existing trees, provide recommendations on the management of the trees within natural open space behind the proposed residential lots including removal of hazard trees and invasive species. Provide recommendation on the choice of Native Trees and shrubs to be planted to enhance the open space system. The proposed locations for compensation planting should be finalized in consultation with the Parks and Open Space and Forestry divisions.	Management of tree resources and vegetation compensation are addressed in EIS. Recommendation to finalize proposed locations for compensation planting with Parks and Open Space and Forestry divisions are provided.	EIS Section 4.1.1., Figure 21, and Section 6.1.
9	Environmental Implementation Report: A recommendation on preparation of an Environmental Implementation Report (EIR) be included. The EIR will 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 demarcation, 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 educational/ interpretive 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 consistent with Guelph Trail Master Plan standards. The trail design will be consistent with (Guelph Trail Master Plan)	Addressed in items 1-8.	

#	Comment	Action/ Notes	Reference
	GTMP standards as appropriate to the site conditions and other City Guidelines i.e. Facility Accessibility Design Manual. The trail plan, design and construction will follow all relevant regulations applicable to trail management made under the Accessibility for Ontarians with Disabilities Act, 2005.		
May 14, 2014 – Nature Guelph			
1a	Identify Carex to species	Specimens observed during the 2013 survey were not identifiable. Efforts were made to locate samples during the spring 2014 survey but specimens were not located. The identification for this specimen remains at the genus level. The 2013 sample was discovered within the wetland and is not subject to disturbance as part of the development proposal. Efforts will be made to relocate during monitoring.	EIS Appendix F.
1b	Mean Coefficient of Conservatism were low – if non-natives are included, please indicate	EIS report has been revised to indicate that non-natives were included.	EIS Table 3 and Table 13.
1c	Check over species list as some Mean Coefficient of Conservatism are incorrect	Species list was reviewed, corrected and updated with spring 2014 data	EIS Appendix F, Table 3, and Table 13.
1d	Page numbers and Appendices do not line up	Reviewed and corrected	EIS - throughout
1e	Review plant names for accuracy	Reviewed and corrected, nomenclature follows NHIC standards	EIS - throughout
1f	For large Tables, repeat the headings on each page	Revised as noted	EIS - throughout
2a	A 3 season survey should be done.	Terms of Reference stipulated single season survey; nonetheless, D&A staff completed a spring 2014 vegetation survey and updated the report accordingly.	EIS Section 3.2.1
2b	Do breeding bird surveys.	This was not a requirement in the Terms of Reference. A rationale is provided in the methodologies section and approved Terms of Reference.	EIS Section 2.2.2 and Appendix B.
2c	The current Compensation Plan Plant List has a lot of species not native to this area. Only use native plant list to this area.	The Vegetation Compensation Plan Plant list has been reviewed with respect to Flora of Wellington County (Frank and Anderson, 2009) and amended accordingly.	EIS Appendix I.
2d	Date of TOR Review by EAC was December 2013 which is coincident with the EIS Report Date.	Not actionable	n/a
3	"That the Environmental Advisory Committee defer the Scoped Environmental Impact Study prepared by Dougan and Associates until such time:		
3a	That it is demonstrated that there are no negative impacts to the PSW and SWH;	Addressed in Net Effects section of EIS	EIS
3b	That an alternative SWM plan is considered and groundwater elevations are confirmed;	Addressed in SBM Inc.'s SWM Report and included in EIS	SWM Report and EIS Appendix C.
3c	That the limits of Significant Woodlands are confirmed;	The Austrian Pine Plantation was screened for its potential to qualify as an extension of the Significant Woodland. The Natural Heritage Resource Manual states that "A bisecting opening 20 metres or less in width between crown edges is not considered to divide a woodland into two separate woodlands"(2010 NHRM, p. 72). Polygon 8 is separated from the Significant Woodland associated with the Torrance Creek Wetland Complex by approximately 10 to 12 metres. It is therefore considered to be contiguous with or a part of the Significant Woodland.	EIS Section 3.4.3.
3d	That opportunity for tree retention is further examined and an appropriate compensation plan is provided;	Opportunities for tree retention were examined and revisions were made to the vegetation removals and compensation sections of the EIS report	EIS Section 4.1.1, 5.2, Figure 18, and Figure 21.
3e	That recommendations with respect to monitoring are provided;	Included in EIS report	EIS 6.1
3f	That an appropriate trail alignment is recommended;	Included in SWM Report	SWM Report Appendix A
3g	That a minimum 2 season Botanical Study (Spring/Summer) be included; and	Surveys completed and EIS Report updated	EIS Section 3.4.1. and Appendix F.
3h	That Nature Guelph comments be addressed and rationale be provided."	Completed.	EIS Appendix L.