

APPENDIX C
NATURAL ENVIRONMENT REVIEW

MEMORANDUM

TO: McCormick Rankin Corporation (Martin Scott)

DATE: January 14, 2008

FROM: Ecoplans Limited (Steve Dinka/Heather Drost)

RE: Kerr Street at CNR Grade Separation Class Environmental Assessment Study (File: 3355)

1.0 INTRODUCTION

The Town of Oakville has initiated a Class Environmental Assessment (Class EA) Study for the proposed grade separation at the Kerr Street and CNR Oakville Subdivision crossing between Speers Road and the QEW. The daily traffic volume on Kerr Street north of Speers Road combined with the amount of train movements on the CNR Oakville Subdivision rail line impacts the operation of the roadway and warrants a grade separation. Furthermore, the Oakville Transportation Master Plan (2007) recommends that Kerr Street be reconstructed as a four lane roadway between Shepherd Road and Wycroft Road, and be grade separated with the CNR rail crossing to address long term traffic demands and associated operational issues on the roadway. The grade separation will also improve pedestrian and cycling safety crossing the railway, and widening will incorporate enhanced cycling and pedestrian facilities including bike lanes and sidewalks on both sides of Kerr Street. The drainage design of the improved road will require installation of a new stormwater outlet pipe structure on the southwest bank of the Sixteen Mile Creek. This structure will replace an existing stormwater outlet, and will incorporate design elements to reduce impacts to the creek associated with the existing structure.

The study area lies within an urban area of the Town of Oakville bordering the Sixteen Mile Creek Valley ESA, a large, relatively undisturbed river valley that is one of the largest natural areas within Halton Region.

Ecoplans Limited (Ecoplans) was retained by the Town of Oakville to undertake the natural environment component of the Class EA. This memorandum summarizes the existing conditions, anticipated effects of the undertaking and mitigation recommendations.

For the purposes of this report, the study area is defined as approximately 50 m on either side of Kerr Street from Speers Road, to approximately 200 m beyond (north of) the QEW overpass.

2.0 APPROACH

Prior to the initiation of field investigations, background information was gathered and reviewed. Background information reviewed includes:

- 1:50,000 Topographic Mapping (NTS 30 M/4)
- 1:10,000 Ontario Base Mapping
- The Natural Heritage Information Centre (NHIC) website – for Element Occurrence (EO) records (2008)
- The Halton Natural Areas Inventory 2006 (Dwyer 2006)
- The Town of Oakville Official Plan (2006)

In addition the Halton Region Conservation Authority (HRCA) has supplied natural environment data and comments on the study area (HRCA 2007).

Site visits were conducted on November 23 and December 8, 2006, and on August 27, October 8, and October 22, 2008. The field review focused on the natural communities located within the Sixteen Mile Creek Valley northeast of Kerr Street in the northern portion of the study area, and aquatic features surrounding the proposed location of the stormwater outlet pipe on the west bank of the Sixteen Mile Creek.

Vegetation communities were classified using a modified version of the *Ecological Land Classification (ELC) System for Southern Ontario* (Lee et. al. 1998). Information was collected on vegetation communities, species associations, relative age, wildlife habitat and condition/level of disturbance. Vegetation community significance was evaluated based on *Natural Heritage Resources of Ontario: Vegetation Communities of Southern Ontario* (Bakowsky 1996; NHIC 2008). Planted trees and manicured landscapes were also noted and photographed. A summary of the findings is provided below with a photographic appendix for visual reference. Additional details (ELC sheets, plant list, additional photographs) are on file at Ecoplans Limited.

Aquatic information was collected for the area immediately upstream and downstream of the proposed stormwater pipe outlet. The channel parameters measured included:

- Flow condition, clarity, general gradient and velocities;
- Channel dimensions and general character;
- Morphology (e.g. riffles, pools);
- Cover opportunities (i.e. woody debris, undercut banks, boulders, aquatic vegetation);
- Substrate type;
- Bank height, character and stability/evidence of erosion);
- Riparian vegetation;
- Physical barriers to fish movement;

- Potential specialized and important habitat areas including potential spawning habitat, good nursery cover, holding habitat (deeper refuge pools);
- Evidence of groundwater discharge; and,
- Disturbances, habitat limitations and potential habitat enhancement opportunities.

A site walk with members of MRC, Ecoplans, HRCAs staff, and the Town of Oakville was conducted on August 27, 2008 and notes from this meeting have been considered in the preparation of this report.

3.0 SUMMARY OF FINDINGS

Designated Areas

A small portion of the Sixteen Mile Creek Valley Environmentally Sensitive Area (ESA #16) abuts the northeast side of Kerr Street in the northern half of the study area (Figure 1). The ESA encompasses the deeply incised valley of Sixteen Mile Creek, which cuts through the Queenston and Georgian Bay formation shales and supports a wide variety of bottomland, slope and tableland vegetation communities (Halton Region and North South Environmental Inc. 2005, Dwyer 2006).

The ESA is recognized as one of the largest natural areas in Halton Region, stretching from the shores of Lake Ontario in the Town of Oakville to Britannia Road in the Town of Milton. It supports a significant number of native plant and wildlife species, including nationally, provincially, and locally rare species, and functions as a wildlife movement corridor for terrestrial and aquatic species. A detailed description of the portion of the ESA found within the study area limits is provided in the following sections.

The Sixteen Mile Creek regionally significant Life Science Area of Natural and Scientific Interest (ANSI) is located more than 2 km upstream of the study area, north of Upper Middle Road. This ANSI was selected for its representation of valley and bottomland forests, riparian wetland, prairie bluffs and associated tableland forests (OMNR 2006). It is currently being considered for upgrade to provincially significant status. No impacts to the ANSI are anticipated.

The Oakville Marsh, a non-provincially significant coastal wetland complex, is located several kilometres downstream of the study area. It includes three individual wetlands and is composed of approximately 27% swamp and 73% marsh. No direct impacts to this wetland are anticipated.

Fisheries and Aquatic Habitat

The study area is located within the Main Branch sub-watershed of the 357 km² Sixteen Mile Creek watershed, and includes a portion of the main branch of Sixteen Mile Creek just south of the Queen Elizabeth Highway (QEW) in the south central portion of the HRCAs jurisdiction. Sixteen Mile Creek is a permanent watercourse that flows through a deep, well defined forested valley. The creek is

described as a “perennial stream with natural channel form” in the Subwatershed Study (Philips Planning and Engineering Limited, 2000). Sixteen Mile Creek is classified as warmwater sportfish habitat with migratory function for salmon and trout.

Drainage within the study area drains in a north-easterly direction towards the Sixteen Mile Creek valley. In the northeast quadrant of the study area where Kerr Street abuts the Sixteen Mile Creek valley, stormwater is conveyed beneath Kerr Street via 150 cm, 60 cm and 30 cm corrugated steel pipes (CSP) that discharge at the top of the valley slope east of Kerr street (CSP1, CSP2, and CSP3, respectively, Figure 1). Intermittent stormwater outflow from the CSPs is conveyed via steeply sloping eroded channels/gullies up to 2 m deep and 2 m wide to a floodplain area at the base of the valley slope (Vegetation Unit 2). These channels are too steep to provide direct fish habitat. Flooding was observed within the floodplain during a field visit that coincided with a rain event on October 8, 2008.

A fourth CSP (CSP4, Figure 1) discharges stormwater directly into Sixteen Mile Creek at the outside bank of a 180° bend in the river. Replacement of CSP4 is required as part of the proposed improvements to Kerr Street. The existing CSP4 will be left in place to avoid additional disturbance to the valley slope. This is the only component of the proposed works that may have direct impacts to fisheries and aquatic habitat, and thus a description of the aquatic habitat features of the Sixteen Mile Creek is limited to the reaches immediately upstream and downstream of the proposed stormwater outlet and a general description of this portion of the Sixteen Mile Creek.

Sixteen Mile Creek – The portion of Sixteen Mile Creek located within the study area flows south and roughly parallel to Kerr Street before bending sharply eastward away from Kerr Street just north of the CN Railway tracks. Photographs 1 and 2 (Figure 2) provide an overview of the area immediately upstream and downstream of CSP4.

Wetted widths range from 10 – 15 m, with bankfull depths up to approximately 2 m. Water depth during field data collection in October 2008 ranged from approximately 30 cm up to 1 m, with relatively fast flows upstream and downstream of CSP4. A broad floodplain ranging from 15-45 m wide is present on the east bank of the creek opposite CSP4 and is dominated by Reed Canary Grass (*Phalaris arundinaceae*). No floodplain zone is present on the west bank.

Riparian vegetation found along the west bank of the creek includes ash (*Fraxinus* sp.), Sugar Maple (*Acer saccharum* ssp. *saccharum*), Riverbank Grape (*Vitis riparia*), Tartarian Honeysuckle (*Lonicera tatarica*), Staghorn Sumac (*Rhus typhina*), Buckthorn (*Rhamnus cathartica*) Purple-flowering Raspberry (*Rubus odoratus*), Red-osier Dogwood (*Cornus stolonifera*), Garlic Mustard (*Alliaria petiolata*), Spotted Jewel-weed (*Impatiens capensis*), and grass species. No vegetation is present within the channel of the creek.

Channel banks are approximately 0.5 m to 1 m high on the east and west banks surrounding CSP4, exhibiting some moderate bank erosion and scouring on the west bank which has caused failure of the Gabion baskets supporting the bank at CSP4 and slumping of the valley slope just north of the rip rap slope. Large woody debris was observed within the channel just upstream of CSP4.

Substrates are mostly shale and cobble, with some pockets of gravel and silt. Large concrete blocks were observed at the CSP4 outlet. This portion of the channel is partially shaded by overhanging branches and trees along the west bank of the creek. Channel morphology includes a riffle zone upstream of CSP4 that transitions to a long flat section just downstream of CSP4. No seepage along the banks was observed (although seepage was observed along the west valley slope).

Terrestrial and Wetland Habitat

The Sixteen Mile Creek Valley is the only natural feature found within the study area limits. This feature is briefly described below and is mapped on Figure 1. The remainder of the vegetation within the study area consists of street trees, manicured lawn, and landscape plantings associated with the commercial and light industrial properties found along this section of Kerr Street. The groundcover along the ROW is primarily either manicured lawn or a mix of typical old field species.

Vegetation Communities

The following vegetation community descriptions reflect data collected during winter, late summer, and fall field visits focused within approximately 50 m of the current ROW on the northeast side of Kerr Street, and the area surrounding the proposed stormwater pipe outlet to Sixteen Mile Creek. This level of survey detail captured the majority of the lands found between Sixteen Mile Creek and the existing Kerr Street ROW, and was considered adequate given the anticipated localization of impacts adjacent to the existing Kerr Street corridor. The vegetation communities observed are common and secure in Ontario (Bakowsky 1996; NHIC 2008).

Unit 1- Dry-Fresh Oak Hardwood Deciduous Forest Type (FOD2-4) – The steep valley slope adjacent to the Kerr Street ROW is occupied by a mid-aged deciduous forest community of moderate quality. Frequent areas of groundwater discharge were observed along the slope, and 3 eroded channels (up to 2 m deep by 2 m wide) have developed from downcutting stormwater discharging at the top of the valley slope. The forest edge where it abuts the Kerr Street ROW is relatively open and disturbed, with canopy gaps, tree dieback, and invasive species including abundant Buckthorn, especially towards the northeastern limit of the unit. Trees range in size from less than 10 cm diameter at breast height (DBH) up to 50 cm DBH and larger, with the dominant size class between 10 and 24 cm DBH. Occasional snags and deadfall logs were present throughout the unit. A large disturbed area previously cleared from this unit for placement of drainage structures was back-filled with riprap and remains essentially

barren with the exception of a few young saplings and disturbance tolerant old-field species (see area labelled as 'Riprap Slope' on Figure 1).

The canopy includes frequent White Oak (*Quercus alba*), White Ash (*Fraxinus americana*), and Sugar Maple, with Northern Red Oak (*Quercus rubra*), Bur Oak (*Quercus macrocarpa*), American Basswood (*Tilia americana*), American Beech (*Fagus grandifolia*) and Black Cherry (*Prunus serotina*) also observed. An area with occasional Eastern White Pine (*Pinus strobus*) and Horse Chestnut (*Aesculus hippocastanum*) was observed near the northeastern limit of the unit approximately midway down the valley slope, and scarce Yellow Birch (*Betula alleghaniensis*) were noted at the foot of the slope at the intersection of Unit 1 and Unit 2. A single Butternut (*Juglans cinerea*) was observed east of the residential property at 623 Kerr St., outside of the area of anticipated impacts (Figure 1)

The sub canopy is composed of occasional Eastern Hop-hornbeam (*Ostrya virginiana*), Blue Beech (*Carpinus caroliniana* ssp. *virginiana*), American Elm, and Sugar Maple, with Manitoba Maple (*Acer negundo*) noted along the forest edge at Kerr Street and occasional Eastern Hemlock (*Tsuga canadensis*) restricted to the lower portions of the slope.

The understory is dense in spots with pockets dominated by Western Poison Ivy (*Rhus radicans* ssp. *rydbergii*), and occasional ash and Sugar Maple sapling regeneration. Other species observed include Riverbank Grape, Thicket Creeper (*Parthenocissus inserta*), currant (*Ribes* sp), Purple-flowering Raspberry, Tartarian Honeysuckle, and Climbing Nightshade (*Solanum dulcamara*), with frequent Buckthorn, occasional hawthorn (*Crataegus* sp), and Staghorn Sumac also noted along the forest edge at Kerr Street.

The ground layer is generally sparse and includes avens (*Geum* sp), Enchanter's Nightshade (*Circaea lutetiana* ssp. *canadensis*), Virginia Stickseed (*Hackelia virginiana*), Wild-lily-of-the-valley (*Maianthemum canadense*), Starflower False Solomon's Seal (*Maianthemum stellatum*), White Baneberry (*Actaea pachypoda*), and Jack-in-the-pulpit (*Arisaema triphyllum* ssp. *triphyllum*). The slumped area north of the riprap slope (Figure 1) has been colonized by a dense layer of Colt's Foot (*Tussilago farfara*), Canada Goldenrod (*Solidago canadensis*), Purple-flowering Raspberry, Dame's Rocket (*Hesperis matronalis*) and Lesser Burdock (*Arctium minus* ssp. *minus*).

Typical old-field species are present in the ground layer along the edge of Kerr Street and encroaching into the forest edge, including abundant grasses and frequent Garlic Mustard.

Two Butternut specimens were observed in Unit 1 (Figure 1). Butternut is discussed further in the following sections of this report.

Unit 1 inclusion - Dry Fresh Sugar Maple-White Ash Deciduous Forest Type (FOD5-8) – The area surrounding the proposed location of the new storm water CSP outlet to Kerr Street was previously cleared for placement of the existing CSP. The area is currently occupied by a young partially closed

canopy deciduous forest community regenerating on riprap covered soils. The canopy and sub-canopy are composed of abundant Sugar Maple, with frequent White Ash and Staghorn Sumac. Buckthorn, White Mulberry (*Morus alba*) and Siberian Elm (*Ulmus pumila*) were also noted. The understory is sparse with denser pockets along the edges and in canopy gaps. Species observed include abundant Buckthorn, with Tartarian Honeysuckle, Purple-flowering Raspberry, Riverbank Grape, Thicket Creeper, Red-osier Dogwood, Wild Red Raspberry (*Rubus idaeus* ssp *melanolasius*) and regenerating Sugar Maple and White Ash saplings. The ground layer is sparse and is dominated by non-native species including frequent Garlic Mustard, Dame's Rocket, and Herb-robert (*Geranium robertianum*), with Bloodroot (*Sanguinaria canadensis*) also observed. Frequent Colt's Foot and occasional Spotted Jewel-weed were noted along the disturbed banks of Sixteen Mile Creek at this location.

Unit 2 - Fresh-Moist Ash Lowland Deciduous Forest Type (FOD7-2) – A mid-aged lowland deciduous forest community occupies the floodplain area south of the Queen Elizabeth Highway (QEW) - (Figure 1). The canopy and sub-canopy are composed of abundant Green Ash (*Fraxinus pennsylvanica*), with willow (*Salix* sp), American Elm, and Manitoba Maple also present. Occasional Red-osier Dogwood was observed in the understory. The ground layer includes frequent goldenrods (*Solidago* sp), with watercress (*Nasturtium* sp), Herb-robert, Reed Canary Grass, Ostrich Fern (*Matteuccia struthiopteris* var *pennsylvanica*), Field Horsetail (*Equisetum arvense*) and Marginal Wood Fern (*Dryopteris marginalis*) also observed. A narrow band of meadow marsh vegetation dominated by Reed Canary Grass, with goldenrods and Jerusalem Artichoke (*Helianthus tuberosus*) is found along the banks of the Sixteen Mile Creek (MAM2-2 on Figure 1). No impacts are anticipated to these units.

Unit 3 – Mineral Cultural Thicket (CUT1) – The northern portion of the forested valley slope east of Kerr Street is much more disturbed, with a sparse canopy of mid-aged trees and dense shrub and young tree regeneration in the understory. Buckhorn dominates, with hawthorn, Siberian Elm, and Choke Cherry (*Prunus virginiana* ssp *virginiana*) also noted. No ground layer vegetation was observed beneath the dense shrub layer. A swath of grass with typical old-field herbs including Chicory (*Cichorium intybus*) and Queen Anne's Lace (*Daucus carota*) are found between the forest edge and the road.

Unit 4 – Dry-Moist Old Field Meadow Type (CUM1-1) – The forested valley slope north of the QEW is set back from the existing Kerr Street edge of pavement by approximately 10 m or more and thus no direct impacts are anticipated to the deciduous forest community located there. A gravel access road/parking area is located immediately north of the QEW on the east side of Kerr Street and provides access to the area beneath the QEW bridge. The roadside vegetation is dominated by disturbance tolerant grasses such as Smooth Brome (*Bromus inermis* ssp *inermis*) and Timothy (*Phleum pratense*) with occasional common disturbance-tolerant herbs including Common Mullein (*Verbascum Thapsus*), Annual Ragweed (*Ambrosia artemisiifolia*), Leafy Spurge (*Euphorbia esula*), asters (*Aster* sp) and goldenrods. Sparse shrubs and trees including Siberian Elm, Buckthorn and Staghorn Sumac are scattered along the roadside berm. Several large Northern Red Oaks, with Siberian Elm, Sugar Maple, Alternate-leaf Dogwood (*Cornus alternifolia*) and Buckthorn are located approximately 10 m from the

existing Kerr Street edge of pavement on the north side of Kerr Street opposite the Kerr Street exit from the QEW.

Flora

In total 57 vascular plant species were recorded within the study area during field visits, with an additional 7 specimens identified only to Genus. Of the 57 species recorded, 55 (96%) have a provincial ranking of S5 or SE5 (secure in Ontario), 1 is ranked SU (status uncertain, Virginia Strawberry) and 1 is ranked S3? (vulnerable, Butternut). Of the species observed, 42 (74%) are native. The vascular plant list is on file at Ecoplans.

Two butternut specimens were observed in Unit 1, northeast of the residence at 623 Kerr Street, and north of the slumped area. Butternut is endangered provincially and federally and is discussed further in the Species of Conservation Concern section of this report. No other species at risk (SAR) were observed. Two species uncommon in Halton Region according to Varga et al. (1999) were observed: Jerusalem Artichoke and Virginia Stickseed. Jerusalem Artichoke is a provincially common exotic species (ranked SE5) observed along the banks of the Sixteen Mile Creek outside of the potential works zone in the MAM2-2 portion of Unit 2. Virginia Stickseed, ranked S5 (secure in Ontario) was occasionally present along the upper portions of the forested valley slope in Unit 1.

Wildlife and Wildlife Habitat

Wildlife resources were evaluated using background material (NHIC database) and the incidental wildlife observations that were made during Ecoplans' field visits on November 23, 2006 and on August 27, October 8, and October 22, 2008. Bird species observed include Northern Cardinal (*Cardinalis cardinalis*), Blue Jay (*Cyanocitta cristata*), American Robin (*Turdus migratorius*), and Hairy Woodpecker (*Picoides villosus*). White-tailed Deer (*Odocoileus virginianus*) tracks were noted on several visits and a well worn wildlife path running parallel to Kerr Street was noted approximately 10 m inside the forest edge. Grey Squirrels (*Sciurus carolinensis*), Raccoon tracks (*Procyon lotor*) and several Chipmunks (*Tamias striatus*) were also observed. These are primarily incidental wildlife observations made in the course of the field visits. The wildlife habitat quality of the valley system is already recognized.

Species of Conservation Concern

SAR records from the larger Sixteen Mile Creek valley system summarized in the Halton Natural Areas Inventory 2006: Volume 1, Site Summaries (Sixteen Mile Creek Valley and Extensions, NAI-16: Dwyer, 2006) did not provide specific geographic information for the records, applied to the entire system, and were not identified in the NHIC database in the vicinity of the study area. To provide a more localized understanding of SAR in the vicinity of the study area, the NHIC SAR database was reviewed element occurrences in and around the study area. Three element occurrences are listed for

the study area. Of these records 2 are historic, including Northern Bobwhite (*Colinus virginianus*), a provincially and federally endangered bird observed in 1904, and Bloater (*Coregonus hoyi*) a fish species listed as 'not at risk' by COSSARO and COSEWIC, observed in 1919. Northern Map Turtle (*Graptemys geographica*), listed by COSSARO and COSEWIC as a species of special concern, was observed in the vicinity of the study area as recently as 1990.

Northern Map Turtles are a distinctly aquatic species found in large rivers and lake shores. The turtles prefer slow currents, muddy substrates, abundant aquatic vegetation and basking sites with unobstructed views (Roche 2002). The absence of aquatic vegetation and muddy substrates, and the relatively fast currents of the Sixteen Mile Creek at this location likely make this portion of the river less preferable habitat for this species. This element occurrence may be associated with slower currents and abundant emergent aquatic vegetation of the Oakville Marsh located several kilometres downstream of the study area.

In addition to the species discussed above, two Butternut trees were observed in Unit 1. A 30 cm DBH Butternut infected with Butternut Canker was observed northeast of the residence at 623 Kerr Street (approximate location illustrated on Figure 1). Another smaller specimen infected with Butternut Canker and with substantial crown dieback was observed on the north edge of the slumped area on the lower third of the slope (Figure 1). This species is listed as endangered by COSSARO and COSEWIC due to recent population declines caused by the Butternut Canker. While both specimens are outside of the anticipated area of direct impacts, some mitigation strategies may be applicable to ensure that they are not accidentally harmed during construction. These strategies are discussed further in section 7.0 of this report.

4.0 PROPOSED WORKS

Although there are proposed improvements southeast of the Canadian National Railway (CNR) tracks, only those improvements identified north of the CNR tracks are discussed as these are the only improvements that have a bearing on the natural environment as outlined above. The specific improvements identified in the Oakville Transportation Master Plan (2007) call for widening of this portion of Kerr Street to four lanes of traffic, with bike lanes and sidewalks on either side of the street. The proposed works for the preferred alternative will involve the following:

- Shifting of a portion of Kerr Street west and addition of 2 lanes on the west side of the existing alignment between the CN railway and the QEW to minimize impacts to the Sixteen Mile Creek Valley and existing utilities.
- Construction of a retaining wall where the alignment abuts the Sixteen Mile Creek valley to minimize valley disturbance; and

- Installation of a new stormwater outlet pipe terminating on the southwest bank of the Sixteen Mile Creek near the northern property boundary of the residence at 623 Kerr Street.

5.0 ANTICIPATED EFFECTS

Direct Impacts

With the exception of the works occurring adjacent to and within the forested valley of the Sixteen Mile Creek, direct impacts to vegetation features will be largely be limited to the disturbance of mown lawns, street trees, and landscape plantings associated with the light industrial and commercial properties found here. These effects are not discussed further.

In the north portion of the study area, north of the CNR tracks, the preferred option will affect approximately 750 m² of valley slope along the southwest edge of Unit 1 as required for the construction of the retaining wall required for road improvements. This represents less than 7% of Unit 1. This area was calculated based on an assumption that a 2 m construction footprint would be required on the east side of the retaining wall, resulting in a maximum intrusion into the edge of the forest of approximately 8 m for an estimated distance of 90 m. There are two mature Northern Red Oaks and several mature Bur Oak in moderate to good health located within approximately 2 to 5 m of the road edge that may be affected by construction of the retaining wall. These trees range in size from approximately 35 cm to 50 cm DBH.

The new stormwater outlet on the west bank of the Sixteen Mile Creek will be located in the vicinity of CSP4 (Figure 1). The precise location of the storm water outlet will be dictated by the final road grades and gravity drainage requirements. This outlet will be installed through directional drilling to minimize valley disturbance. However, some clearing of forest vegetation in the immediate vicinity of the outlet may be required (minor removal from the previously disturbed Unit 1 inclusion), and some equipment access into the valley may be necessary to facilitate installation of the outlet structure. The direct impacts associated with heavy equipment access and construction of the outlet structure will be determined following finalization of the access plan and structure location during detail design. The disturbed riprap slope may provide an appropriate access point, and would minimize new disturbance to the valley.

For the most part, herbaceous species that are currently present within the ROW will rapidly re-colonize the ROW following disturbance by construction.

Indirect Impacts

In addition to direct impacts (i.e. localized vegetation removal), the improvement of Kerr Street has the potential to cause a number of indirect impacts to adjacent habitats. These potential indirect impacts include the following:

- Release of construction-generated sediment to adjacent habitats.
- Vegetation clearing/damage beyond the working area/ROW.
- Spills of contaminants, fuels and other materials that may reach natural areas and watercourses.
- Changes in drainage patterns (groundwater and/or surface runoff) that can impact dependant vegetation/wetland areas located either upgradient or downgradient of the ROW. Blocking of existing surface/subsurface drainage patterns can result in upstream and downstream vegetation dieback/condition changes. An increase in downstream runoff can result in erosion impacts on receiving vegetation and aquatic habitat.

These potential indirect impacts to vegetation and aquatic habitat features can be managed through implementation of standard mitigation measures, as outlined in the following section.

6.0 STANDARD MITIGATION MEASURES

Employing the standard mitigation strategies outlined below will minimize direct impacts to vegetation and associated habitat features within and along the ROW, as well as protect adjacent vegetation/habitat features from indirect impacts during construction. A select number of site-specific mitigation measures have also been recommended and are outlined in the following section.

The standard mitigation strategies that will be implemented include:

- Minimize clearing to that required for the construction of the road improvements and maintenance of the ROW.
- Ensure a clear delineation of vegetation clearing zones and vegetation retention zones in both the Contract documents and in the field to minimize the risk of unnecessary vegetation impacts and avoid incidental impacts as a result of temporary stockpiling, debris disposal and access.
- Identify the Sixteen Mile Creek valley lands as 'priority protection areas' (PPA) on Contract Drawings to restrict contractor activities in this area.
- Ensure the use of appropriate vegetation clearing techniques (e.g. trees to be felled away from the retained natural areas).

- Design and install stringent erosion and sediment control measures and maintain throughout construction. This includes installing sediment and erosion control fencing along the edge of the required working area to protect the edges of all retained natural areas.
- Re-stabilize and re-vegetate exposed surfaces as soon as possible, using an appropriate seed mix from OPSS 572.
- Ensure proper containment and filtering of all construction-generated sediment (whether from dewatering or soil exposure from clearing and grubbing).
- Ensure appropriate clearing and disposal of all construction-related debris following construction.
- Employ proper handling of potentially toxic construction materials and ensure proper spills management.
- Implement environmental inspection during construction to ensure that protection measures are implemented, maintained and repaired and remedial measures are initiated where warranted.

In addition to protecting vegetation, which in turn protects the associated habitat functions, it is necessary to ensure the protection of breeding birds (in accordance with the *Migratory Birds Convention Act* [MCBA]) that may nest or otherwise use areas where construction is proposed. Measures are also recommended for the protection of all wildlife generally. Specifically, the contractor will:

- Ensure that timing constraints are applied to avoid vegetation clearing during the breeding bird season (May 1st to July 31st)
- If clearing cannot avoid the breeding bird season, then an avian biologist will be employed to conduct a nest survey in the area to be cleared. If active nests of migratory birds are located then a mitigation plan will be developed and approved by Environment Canada prior to clearing. This may involve delays to allow for fledging.
- Ensure that no active nests will be removed/disturbed in accordance with the MBCA.
- Any wildlife incidentally encountered during construction will not be knowingly harmed.

The *Endangered Species Act, 2007* identifies and protects species that are at risk and their habitats, and promotes the recovery of species at risk. It also recommends protection of species of special concern through the implementation of appropriate management plans focused specifically on these species. The only endangered/threatened species identified within the study area occur outside of the footprint of

the proposed works (Butternut, Figure 1). Additional mitigation measures regarding Butternut are discussed in the following section.

7.0 SITE-SPECIFIC MITIGATION MEASURES

Although the precise location and design details of the stormwater outlet pipe have not been finalized, the following mitigation measures will reduce impacts associated with construction of this structure.

- While the Butternut observed northeast of the residence at 623 Kerr Street in Unit 1 is outside of the anticipated construction footprint, its location and status should be confirmed during detail design, identified on Contract Drawings, and flagged on site prior to the initiation of construction activities to limit the potential for accidental disturbance of this specimen. No impacts are anticipated to the Butternut located north of the slump area.
- Temporary vegetation protection fencing should be erected to isolate construction activities and prevent damage to vegetation outside of the area required for construction of the stormwater outlet structure.
- The access route for heavy equipment into the Sixteen Mile Creek valley should be clearly identified during detail design and mapped on Contract Drawings. If the route requires any additional vegetation removals beyond those described in the proposed works, additional ecological surveys should be completed to identify potentially sensitive natural features. Additional site-specific mitigation measures may be required, potentially including temporary vegetation protection fencing to protect vegetation communities adjacent to the proposed access route. It may also involve development of a detailed restoration plan to re-vegetate any disturbed areas using native vegetation, appropriate to the site conditions.
- The stormwater outlet will be designed to outlet in close proximity to, but outside of the main Sixteen Mile Creek channel and flow into the creek along a designed 'channel' with rock protection (scour protection) extending into the base of the creek. This will be an improvement over current conditions where the outlet plunges directly into the creek. This outfall will be designed by a qualified geomorphologist during detail design.

As previously noted some tree removals may be required along the southwest edge of Unit 1 at Kerr Street. The precise location of specimen trees within the footprint of the proposed Kerr Street alignment will be reviewed during detail design to determine if trees can be protected. Vegetation protection fencing should be erected at the edge of the clearing and grubbing zone to prevent damage to adjacent vegetation. Conservation Halton recommends construction of a permanent, impermeable fence at this location to help keep wildlife contained within the valley and reduce the amount of garbage dumped or blown into the valley (HRCA, 2007). A fence of this nature would be an appropriate vegetation

protection barrier. Details regarding the specifications and location of this fence will be determined at detail design. These and additional mitigation measures for this location are listed below.

- Implement edge management plan along Sixteen Mile Creek valley (Unit 1) to limit edge effects to remaining forest valley (e.g. vegetation buffer plantings, construction of a vegetation protection barrier, as outlined above). Details to be determined at detail design.
- Avoid roadway lighting that extends into adjacent wooded areas (i.e. no lighting or lighting design that minimizes the light footprint).
- Implement valley restoration / enhancement plan (e.g. restoration of exposed soils with native species)
- At detail design, review the locations of specimen trees within the footprint to determine if trees can be protected.

8.0 SUMMARY AND CONCLUSIONS

With the exception of the works occurring adjacent to and within the forested valley of the Sixteen Mile Creek, direct impacts to vegetation features will be limited to the disturbance of mown lawns, street trees, and landscape plantings associated with the light industrial and commercial properties found here.

Construction of a retaining wall beyond the cleared ROW on the east side of Kerr Street will require clearing and grubbing that will remove a narrow band of natural vegetation (estimated at 750 m²), including a number of mature trees from the edge of Unit 1. The effects of this removal along with any associated indirect impacts will be minimized through the implementation of the standard mitigation measures outlined above. Impacts to the Butternut specimen located east of the residence at 623 Kerr Street are not anticipated, but will be reviewed at detail design and appropriate mitigation measures will be confirmed at that time.

Potential impacts to terrestrial vegetation and fish/fish habitat within the Sixteen Mile Creek valley will be limited to the area surrounding the storm water outlet. The nature of these impacts is dependant on the final location and design of the proposed storm water outlet structure, the heavy equipment access route, and the construction methods used. Possible impacts to these features and development of additional site-specific mitigation measures will be reviewed following finalization of these elements of the project during detail design.

Finally, the implementation of all standard and site-specific mitigation measures will maximize protection of the valley system to the extent possible during construction.

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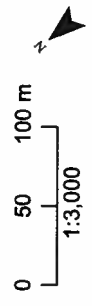
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Legend

- Corrugated Steel Pipe
- Approximate Butternut Locations
- Approximate Study Area
- Environmentally Sensitive Area
- Vegetation Units
- Water Flow Direction
- Vegetation Community Codes
- CUM – Cultural Meadow
- CUT – Cultural Thicket
- MMW – Meadow Marsh
- FOD – Deciduous Forest

ESA boundary source: NIRVIS Database

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Kerr Street at CNR Grade Separation
Town of Oakville
Natural Environment Setting and Features



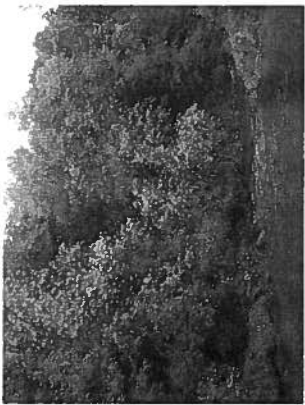


Photo 1: West bank of the Sixteen Mile Creek showing CSP4, Unit 1 inclusion (foreground) and Unit 1 (Background)

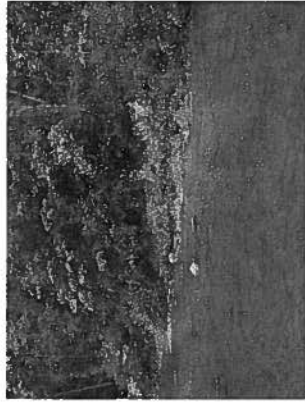


Photo 2: West bank of the Sixteen Mile Creek south of CSP4



Photo 3: Facing north along the east side of Kerr Street showing the residence at 623 Kerr Street



Photo 4: Facing north along the east side of Kerr Street showing the residence at 623 Kerr Street

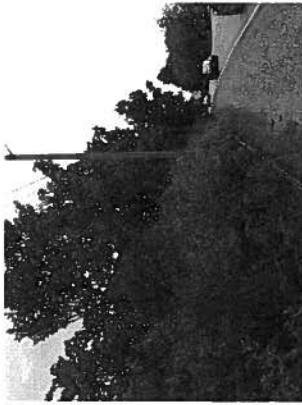


Photo 5: Facing south along the east side of Kerr Street, showing the edge of Unit 3 (Foreground) and Unit 1 (Background)

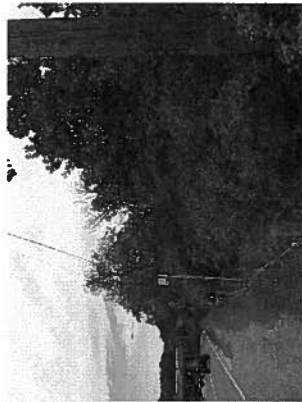


Photo 6: Facing north along the east side of Kerr Street from the border of Units 1 and 3



Photo 7: Unit 1 from the bottom of the valley slope



Photo 8: Slumped area vegetation community from the west bank of the Sixteen Mile Creek showing one of the Butternut specimens



Photo 9: Rip rap slope from the west bank of the Sixteen Mile Creek



Photo 10: Unit 1 inclusion understorey at the base of the rip rap slope, facing north west



Photo 11: Unit 4 facing west towards the QEW bridge



Photo 12: Unit 4 facing west towards the QEW bridge



Kerr Street at CNR Grade Separation Town of Oakville Natural Environment Setting and Features

Date: Jan. 2009
Project No: 50-3355
Figure No: 2