

Environmental Impact Statement for the Proposed Development of Site 1 of the National Capital Business Park at 4120 Russell Road, Ottawa, Ontario

Report

July 31, 2020

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List of Acronyms and Abbreviations

BBS – Breeding bird survey
DFO – Fishers and Oceans Canada
EIS – Environmental Impact Statement
ELC – Ecological Land Classification
ESA – *Endangered Species Act*
FLUDTA – Federal Land Use, Design, and Transaction Approval
KAL – Kilgour & Associates Ltd.
MECP – Ministry of Environment, Conservation and Parks
MNRF – Ministry of Natural Resources and Forestry
MMP – Marsh Monitoring Protocol
NCC – National Capital Commission
OWES – Ontario Wetland Evaluation System
RVCA – Rideau Valley Conservation Authority
SAR – Species at risk
SARA – *Species at Risk Act*
TCR – Tree Conservation Report



1.0 INTRODUCTION

Kilgour and Associates Ltd. (KAL) was retained by AVENUE31 to provide the necessary environmental studies to support the consideration of a change of land use from agricultural to commercial/industrial for a property owned by the National Capital Commission (NCC) located at 4055 and 4120 Russell Road in Ottawa, Ontario. An Environmental Impact Statement (EIS) prepared by KAL covering the entire site was submitted as part of the Master Site Plan required by the NCC and the City of Ottawa (hereafter referred to as “the City”; KAL, 2020). The change in land use to support the proposed commercial/industrial development by National Capital Business Park Inc. (operating under AVENUE31) is in progress via a Federal Land Use, Design, and Transaction Approval (FLUDTA) with the NCC at the Master Site level. The present EIS is in support of the detailed design-level FLUDTA for Site 1 (proposed Building C) within the proposed National Capital Business Park at 4120 Russell Road (Figure 1). In addition to the NCC, the City provides regulatory oversight for the project. In general, site alteration (as defined in the City’s Site Alteration By-law (2018a)) and Site Plan Applications must be supported by an EIS. Per Section 4.7.8 of the Official Plan (City of Ottawa, 2003) an EIS is required because the proposed development is planned to occur within and/or near potentially sensitive natural heritage features, including habitat potentially used by species at risk (SAR).

This document has been written to satisfy the requirements of the City of Ottawa (2015) and has also been scoped to support a FLUDTA application for detailed design project types, addressing points of interest and concerns raised by the NCC. This EIS is a revised version of the original EIS prepared for the Master Site Plan Control Application (KAL, 2020) and only includes information relevant to Site 1 of the proposed National Capital Business Park. In this document we identify natural heritage features on or adjacent to Site 1, potential impacts of the proposed development to those features, and mitigation measures to minimize or eliminate those impacts. This EIS also addresses comments provided by the City of Ottawa and Rideau Valley Conservation Authority (RVCA) on the Master-level EIS (KAL, 2020) relevant to Site 1.

1.1 Property Information and General Existing Conditions

Site 1 is composed of three parcels:

- The northeastern portion of 4120 Russell Road;
- The northeastern portion of the parcel directly southeast of 4120 Russell Road; and
- 4224 Russell Road.

In addition to the parcels above, Site 1 also includes the proposed location of an access road connecting Russell Road to Hunt Club Road along the northern and western boundaries of 4120 Russell Road and the right-of-way south of the western border of 4120 Russell Road to Hunt Club Road (Figure 1). Note that the southernmost portion of the road allowance falls on City of Ottawa lands; the rest of the site falls on NCC lands. For the purposes of this report, all three of the above parcels and the proposed location of the road will be referred to as “Site 1”. The portion of 4120 Russell Road west of Site 1 is the proposed location of Site 2 of the National Capital Business Park and will be referred to as such but is only discussed in this report in the context of adjacent lands. Proposed future development of Site 2 is not addressed by this report.



Site 1 is approximately 6 ha (including the road allowance) and is split into two zoning designations: IH – Heavy Industrial Zone and AG – Agricultural Zone. The Heavy Industrial Zone is intended for industrial development with a wide range of uses, and the Agricultural Zone is intended for agricultural, forestry, and related accessory uses. Site 1 is bordered by:

- Heavy industrial lands and Russell Road to the north;
- Hunt Club Road and agricultural and wooded lands to the east;
- A City-owned stormwater management pond to the south; and
- NCC-owned lands to the west (Site 2 of the proposed National Capital Business Park) dominated by fallow field.

At the time of writing this report, Site 1 predominantly consisted of fallow fields which were used for crops up until approximately 2012 (based on aerial imagery; geoOttawa, 2020; Google Earth Pro). Trees on Site 1 are limited to hedgerows/clusters along the periphery of the site. Most trees on Site are less than 60 years old, except for a few trees in a hedgerow on the northwestern edge of the site. Some of the trees in this hedgerow existed prior to 1965 and thus the original trees here are over 60 years old (geoOttawa, 2020).

No natural heritage elements are specifically named or described on or adjacent to Site 1 in publicly available information. There are no known Significant Valleylands, Significant Woodlands, or Life Science Areas of Natural and Scientific Interest nearby. The closest Provincially Significant Wetland, Mer Bleue, is ~3 km east of the site.

Site 1 and adjacent lands lie within the Ottawa River East subwatershed of the Rideau Valley watershed. Site 1 lies within the McEwan Creek catchment which is 24.9 km² and makes up 0.59% of the Rideau Valley watershed. Land cover in the McEwan Creek catchment is predominantly urban (64%), followed by forest (13%), meadow (8%), agriculture (7%), and wetland (6%; RVCA, 2016). Site 1 does not contain any headwater features.

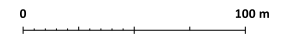




Figure 1 Map showing existing conditions of Site 1 at 4120 Russell Road, Ottawa

Legend

-  Site 1
-  Property Lines



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Universal Transverse Mercator - Zone 18 (N)
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2.0 METHODS

2.1 Review of Existing Information

Colour digital aerial photographs from geoOttawa and Google Earth Pro were used to initially identify natural environment features in the area through a desktop review (as with the general descriptions above). Additional background information in this report was obtained from a combination of studies and reports performed within the general area of Site 1 (cited throughout) to review relevant information and to guide field studies (below). The review of existing information also included a desktop assessment of species listed under the federal *Species at Risk Act* (SARA) and the provincial *Endangered Species Act* (ESA) having some potential to occur in the broader area (i.e., within 1 km of Site 1). Existing information was obtained from online sources, which include but are not limited to:

- Natural Heritage Information Centre (Ministry of Natural Resources and Forestry (MNRF), 2020);
- Fisheries and Oceans Canada (DFO) Aquatic Species at Risk Map (DFO, 2019);
- Species at Risk Public Registry (Government of Canada, 2020);
- Ontario Species at Risk list (Ministry of the Environment, Conservation and Parks (MECP), 2019a);
- McEwan Creek 2016 Summary Report (RVCA, 2016);
- Atlas of the Breeding Birds of Ontario 2001-2005 (Bird Studies Canada et al., 2009);
- Herp Atlas (Ontario Nature, 2019); and
- Bat Conservation International Species Profiles (BCI, 2016).

2.2 Field Studies

Detailed field studies were performed throughout the spring and early summer of 2019 and 2020 to document the existing ecological conditions of Site 1 (Table 1). These field studies included core surveys of flora and fauna. Standard and accepted methods were employed for all surveys (described in detail below).

Table 1 Summary of field visits to Site 1 in 2019 and 2020

Date	Purpose	Personnel	Average weather conditions
2019/05/06	Turtle survey #1	Clare Kilgour	23°C, 0-25% cloud cover, low wind
2019/05/07	Turtle survey #2	Anthony Francis and Heather Lindsay	16°C, 25-50% cloud cover, low wind
2019/05/08	Turtle survey #3	Heather Lindsay	14°C, 0-25% cloud cover, low wind
2019/05/21	Turtle survey #4	Heather Lindsay	12°C, 25-50% cloud cover, low wind



2019/05/22	Turtle survey #5	Clare Kilgour	16°C, 0-25% cloud cover, low wind
2019/05/31	Bird survey #1 and ELC	Anthony Francis, Katherine Black, and Ken Allison	15°C, 75-100% cloud cover, low wind
2019/06/17	Bird survey #2	Ken Allison	12°C, 0-25% cloud cover, low wind
2019/07/01	Bird survey #3	Ken Allison	18°C, 0-25% cloud cover, low wind
2019/08/29	General tree survey	Katherine Black and Heather Lindsay	22°C, 75-100% cloud cover, medium wind
2020/06/10	Bird survey/Barn Swallow nest search #1	Katherine Black and Nicholas Schulz	15°C, 40-60% cloud cover, medium wind
2020/06/25	Bird survey/Barn Swallow nest search #2 and detailed tree survey	Katherine Black and Nicholas Schulz	16°C, 75-100% cloud cover, medium wind
2020/07/10	Bird survey/Barn Swallow nest search #3 and detailed tree survey	Katherine Black and Nicholas Schulz	21°C, 0-10%, low wind

Table Notes: ELC – Ecological Land Classification

2.2.1 Ecological Land Classification, Vegetation Inventory, and Tree Inventory

Vegetation communities on Site 1 were documented on May 31, 2019 by Mr. Allison and Ms. Black and again on July 1, 2019 by Mr. Allison. Each community was identified and mapped in the field using the standard Ecological Land Classification (ELC) methods for Ontario (Lee *et al.*, 1998). This method results in a standardized description of each vegetation community, giving information on vegetation type and soils. Where possible, communities were mapped to the most detailed level of ‘vegetation type’. In some cases, where a suitable vegetation type did not exist, or mapping to this level did not provide a great deal of additional information, communities are described using the higher level of ‘ecosite’ type. Representative photos of each vegetation community were taken and are included with the community descriptions in this report.

During the visits to each vegetation community in 2019, a detailed vegetation inventory of all vascular plants was developed. Where identification was uncertain, specimens were collected and identified later using conventional taxonomic literature and detailed examination as required. Species and communities of significance (i.e., federal, provincial, or regional) were determined using accepted status lists and publications, including the federal Species at Risk Public Registry (Government of Canada, 2019), the Ontario Species at Risk list (MECP, 2019a), the Natural Heritage Information Centre (MNRF, 2016), and *Appendix A – Vascular Plants of the City of Ottawa, with the Identification of Significant Species* (Brunton, 2005).

On August 29, 2019 Ms. Black and Ms. Lindsay performed a preliminary tree survey for Site 1 during the early stages of concept plan development for the Master Site Plan to a) check for Butternut (*Juglans cinerea*; listed as Endangered under ESA and SARA); b) assess the potential for bat occurrence based on the presence of trees with cavities, dead leaf clusters, and/or snags ideal for bat roosting; and c) generally document trees that may be impacted by the proposed development. Following the production of a detailed concept design



for Site 1, a detailed tree survey for Site 1 was performed by Ms. Black and Mr. Nicholas Schulz on June 25 and July 10, 2020 following the City's Tree Conservation Report (TCR) guidelines (2018b). All trees with a diameter at breast height (DBH) ≥ 10 cm having potential to be removed under the proposed development were identified, enumerated, mapped, their DBH measured, and their general health and condition documented.

Incidental wildlife observations were recorded while conducting vegetation work.

2.2.2 Amphibians

Amphibian surveys were not conducted on Site 1 due to the lack of suitable habitat. Amphibian surveys were conducted for the broader (Master-level) site of the National Capital Business Park (KAL, 2020).

Any incidental observations of amphibians made during site visits were recorded. In most vegetation communities, particularly in wooded areas, rocks, fallen wood, and other debris were turned over to check for salamanders.

2.2.3 Turtle Surveys

Due to the presence of a stormwater management pond directly south of Site 1, five rounds of basking turtle surveys were performed in 2019 to assess the potential presence of at-risk turtles within the vicinity of Site 1. Visual encounter surveys were completed following MNRF's *Survey Protocol for Blanding's Turtle in Ontario* (2015a). Although this protocol is intended primarily for Blanding's Turtle, all turtle species generally occurring in the area would be detectable under this protocol.

This protocol requires that potential habitat for turtles be visited under the following conditions:

- After ice off, and no later than June 15;
- If air temperature is between 5 and 15°C, surveys are to take place during sunny periods, between 10:00am and 5:00pm, when basking sites are receiving full sunlight;
- If air temperature is between 15 and 25°C, surveys are to take place during sunny periods between 8:00am and 12:00pm, when basking sites are receiving full sunlight or during overcast periods from 9:00am until 4:00pm if air temperature is higher than water temperature; and
- Five surveys must be spread over a period of at least three weeks, at sites with no previous documentation of the species.

Turtle surveys were completed on foot along the stormwater management pond south of Site 1 (Figure 2). Surveyors stopped and scanned the area with binoculars from a distance of ~50 m to prevent any turtles from being startled before being observed. The limited vegetation present along the stormwater management pond in the spring and early summer allowed these features to be effectively scanned with binoculars from a distance. Specific dates and weather conditions of turtle surveys are shown in Table 1.



Rocks, fallen wood, and other debris on Site 1 were turned over to check for snakes throughout the field campaigns in 2019 and 2020. Potential basking sites for snakes were also investigated.

2.2.4 Bird Surveys

2.2.4.1 Surveys Conducted in 2019

Breeding bird surveys were performed in 2019 via point count surveys following the *Ontario Breeding Bird Atlas Guide for Participants* (Bird Studies Canada et al., 2001). Breeding bird surveys are to be completed from survey stations that, combined, provide suitable viewing of all habitats on a site on calm weather days with light wind (less than 3 on the Beaufort scale) and no precipitation.

Breeding bird surveys must take place between sunrise and five hours after sunrise between May 24 and July 10, with a minimum of 15 days between survey dates (Bird Studies Canada et al., 2001). This protocol calls for two surveys per year during the breeding bird window. However, an additional (third) bird survey is required under MNRF protocols for at-risk birds that use field habitats (e.g., MNRF's *Bobolink Survey Methodology*, undated). Since we believed Site 1 had the potential for at-risk birds that use field habitats (e.g., Barn Swallow, Bobolink, and Eastern Meadowlark), KAL biologists conducted three rounds of breeding bird surveys in 2019. Surveys were conducted from one station in the centre of Site 1 (BBS-1; Figure 2). All incidental observations were recorded while moving between survey points as well as during other site visits. Birds were identified by song and/or direct visual observation.

The designation of regionally rare bird species was based on an analysis of data from the Atlas of Breeding Birds of Ontario (Cadman *et al.*, 1987) based on Hill's Site Regions, now Ecoregions.

2.2.4.2 Surveys Conducted in 2020

Barn Swallows (listed as Threatened under ESA and SARA) were observed directly west and southwest of Site 1 on May 31 and July 1, 2019 (KAL, 2020). Despite these observations, no Barn Swallow nests were found within 200 m of Site 1 in 2019 (KAL, 2020). Only the area within 200 m of a Barn Swallow nest is protected under ESA as feeding (Category 3) habitat even though Barn Swallows can be found feeding beyond 200 m from their nests (Turner, 1980; MECP, 2019b). In 2019, KAL conducted searches for Barn Swallow nests on structures within the vicinity of the site to determine if the habitat that Barn Swallows were observed foraging in was legally protected habitat. However, the exact location of nests could not be determined in 2019, so KAL (2020) subsequently recommended additional searches to determine if Barn Swallow nests are located within 200 m of Site 1 before the commencement of site works.

To determine whether Barn Swallow nests are located within 200 m of Site 1, three rounds of breeding bird surveys were performed in 2020 following the same methods used in 2019 (described above). Surveys were conducted from four survey stations spanning suitable Barn Swallow foraging habitat on Site 1 and adjacent areas (Figure 2). If a Barn Swallow was observed during surveys, surveyors would follow its flight path on foot with the aim of identifying the approximate location of a nest.

Specific dates and weather conditions for bird surveys conducted in both 2019 and 2020 are shown in Table 1.



2.2.5 Mammals


The potential presence of bats was assessed during the general tree inventory and detailed tree surveys performed in 2019 and 2020, respectively, by actively looking for trees with cavities, snags, peeling bark, and dead leaf clusters ideal for bat roosting. No anthropogenic structures suitable for bat roosting or overwintering exist on Site 1. Detailed bat monitoring was not performed in treed areas on Site 1 due to the absence of potential maternity roosting habitat as defined in provincial bat monitoring guidelines (details in Section 3.4.5.1 below).

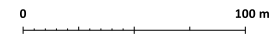
Incidental observations of other mammals were collected during all visits to Site 1. Mammal observations were limited to sightings of scat, tracks, and in some cases, direct observations.





Figure 2 Map showing the locations of survey stations for Site 1 at 4120 Russell Road, Ottawa

-  Site 1
-  Property Lines
-  Bird Survey Stations
-  Turtle Survey Station



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3.0 DESCRIPTION OF THE SITE AND THE NATURAL ENVIRONMENT

3.1 Landforms, Soils, and Geology

The surficial geology of the McEwan Creek catchment which encompasses Site 1 consists of 62% clay, 32% sand, 3% diamicton, 3% gravel, and 1% Paleozoic bedrock (RVCA, 2016). Site 1 is underlain by B2, M6, and X1 soil landscape units (Table 2; Figure 3; Marshall et al., 1979). Note that these soil landscape units represent the parent material of Site 1. The surface material has been worked over throughout several decades of ongoing agriculture (from prior to 1965 to early to late 2010s). Recent geotechnical investigations of Site 1 show that it is underlain by shallow topsoil (0 to 0.8 m) followed by very stiff to stiff brown silty clay (0.1 to 3.81 m) and glacial till (1.52 to 7.32 m; Paterson Group Inc., 2020). Depth to bedrock on Site 1 varied from 4.57 m to 7.32 m (Paterson Group Inc., 2020). The existing ground surface across Site 1 is generally level at approximate geodetic elevation 69 to 70 m, with the exception of a hill that borders the southwestern edge of Site 1 which slopes up to geodetic elevation 79 m (Paterson Group Inc., 2020; X1 in Figure 3).

Table 2 Description of the soil landscape units underlying Site 1 at 4120 Russell Road, Ottawa (adapted from Marshall et al., 1979)


Soil Landscape Unit	Description of Soil Landscape Unit	Main Surface Texture	Soil Association	Description of Soil Association
B2	Dominantly poorly drained Bearbrook series (Orthic Humic Gleysol) on level to very gently sloping topography with slopes between 0 and 2%.	Moderately fine: Clay loam, silty clay loam, sandy clay loam.	Bearbrook	Neutral, very fine textured marine materials that contain reddish brown layers of varying thickness with a depth of 2 m.
M6	Dominantly poorly drained Allendale series (Orthic Humic Gleysol) found on level to very gently sloping topography with slopes between 0 and 2%.	Coarse: Sand, loamy sand, loamy fine sand	Manotick	Strongly acidic, coarse textured marine and estuarine veneer (25 to 100 cm) overlying neutral, moderately fine to fine textured marine clay.
X1	Clay escarpments with moderately fine to fine surface textures found on strongly sloping topography with slopes between 9 and 15%.	Fine: Sandy clay, clay, silty clay.	Escarpment	Steeply sloping bedrock scarps and clay escarpments.







Figure 3 Soils map for Site 1 at 4120 Russell Road, Ottawa (adapted from Marshall et al., 1979)

Legend

 Site 1


 Property Lines

N



0 100 m

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3.2 Surface Water, Groundwater, and Fish Habitat

A Headwater Drainage Feature Assessment (HDFA) was performed for the Master-level EIS covering the entire site of the proposed National Capital Business Park (KAL, 2020). No headwater features were identified on Site 1. The only surface water feature identified on Site 1 is described as a “wet depression” and is explained in detail below.

3.2.1 “Wet depression”

Close to the northeastern edge of Site 1 is a wet depression just under 0.5 ha in size that contains wetland vegetation (Reed Canary Grass (*Phalaris arundinacea*), Purple Loosestrife (*Lythrum salicaria*), Willows (*Salix* spp.), cattails (*Typha* spp.), etc.; Figure 4). Although this small depression has wetland plant species cover >50% of total plant cover, it does not meet the size requirements (≥ 0.5 ha) of the Ontario Wetland Evaluation System (OWES) to be a “true” wetland (MNR, 2014). Further, this area does not have standing water or pools >20% ground coverage as wetlands defined in ELC (Lee et al., 1998; but see ELC classification below). In addition, this wet depression does not have wetland soils (i.e., no signs of mottling or gley) based on two soil cores that were sampled from the wet depression on August 29, 2019 by KAL Biologists. The water table in this feature was slightly above the surface in the early spring and then the soil surface was dry in the summer (water table rarely/briefly above the substrate surface). The depression is located along the toe of a slope and does not have a defined inlet; its primary source of water is likely run-off water during the spring freshet from the slope to the southwest. This feature drains east into a culvert under Hunt Club Road and out into a small channel that feeds into a headwater drainage feature of McEwan Creek.

Since the wet depression is not a wetland as defined above it was not evaluated as a headwater drainage feature or a wetland in the HDFA (KAL, 2020). However, federal lands are subject to the *Federal Policy on Wetland Conservation* with the goal of “no net loss of wetland functions” (Government of Canada, 1991). The federal wetland classification system uses the National Wetlands Working Group’s (1988) definition of a wetland: “*land that is saturated with water long enough to promote wetland or aquatic processes as indicated by poorly drained soils, hydrophytic vegetation, and various kinds of biological activity which are adapted to a wet environment*” (Hanson et al., 2008). This definition does not specify size criteria for wetlands as in OWES, and therefore the subject wet depression may be considered a wetland from a federal perspective simply due to the presence of hydrophytic vegetation. Therefore, for full due diligence, we used the wetland ecological functions assessment tool provided in the federal wetland classification guidelines (Hanson et al., 2008). This assessment tool is high-level, largely qualitative, does not use a numerical scoring system as in OWES, and is primarily based on approaches used in the state of Wisconsin.

Based on our field investigations and the federal wetland functions assessment tool, the wet depression has very limited biological functions, no social functions, limited hydrological functions, and no special or unique features. Based on field surveys conducted in 2019 and 2020 by KAL and NCC, there is no evidence that this wet depression provides habitat for amphibians, turtles, wetland birds, fish, rare flora or fauna, SAR, or other species of significance. It is instead a small depression that, in the absence of agricultural activities in recent years, has remained saturated enough in the spring to promote the establishment of hydrophytic vegetation, with most of the vegetation being non-native. The hydrological functions of this wet depression were limited to holding meltwater in the spring and conveying it to a tributary of McEwan’s Creek. Given that this feature provides minimal hydrological function in the spring, there would be no net loss of wetland functions if this



wet depression were removed so long as the conveyance of meltwater and stormwater on and off the site follows similar flow paths (i.e., water is conveyed off Site 1 into the same downstream features). If this wet depression were ≥ 0.5 ha and qualified as a wetland under OWES, its evaluation score would fall well below the minimum 600 points required to score as provincially significant due to its lack of biological, social, and hydrological functions and special features.

3.2.2 Groundwater

Groundwater levels were measured at two borehole locations on Site 1 on September 27, 2019 (Paterson Group Inc., 2020). Depth to groundwater was 1.35 m near the southeastern edge of Site 1 and no groundwater was detected near the northern edge of Site 1 (i.e., the borehole was dry).

3.3 Vegetation

3.3.1 Ecological Land Classification

Four distinct (i.e., mappable) ELC ecosites/vegetation types were delineated on Site 1 (Figure 5). Each ELC unit and the dominant vegetation therein is described in detail below. The ELC designations below were used in subsequent analyses in Section 3.4.1 to identify potential habitat that may be used by species of interest (e.g., SAR) potentially occurring on Site 1.









Figure 4 Photo showing the wet depression near the eastern edge of Site 1 at 4120 Russell Road, Ottawa on May 31, 2019

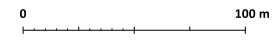




Figure 5 Map showing Ecological Land Classification units for Site 1 at 4120 Russell Road, Ottawa

Legend

-  Site 1
-  Property Lines
- ELC**
-  CUM1-1
-  CUW1
-  MAM2-1
-  FODM11



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

This vegetation type is the most dominant classification on Site 1 and consists of open fallow fields (Figure 6). These vegetation communities are on unconsolidated mineral substrates with tree and shrub cover less than 25%. These open communities originated from anthropogenic and culturally based disturbances (agriculture) and include a large proportion of introduced species. The dominant species here are Goldenrod (*Solidago* spp.), Reed Canary Grass, Kentucky Bluegrass (*Poa pratensis*), Quack Grass (*Elymus repens*), Common Dandelion (*Taraxacum officinale*), Smooth (Common) Brome Grass (*Bromus inermis*), Green Ash (*Fraxinus pennsylvanica*) saplings, and White Clover (*Trifolium repens*).



Figure 6 Photo showing the Dry-Moist Old Field Meadow Type (CUM1-1) on Site 1 of 4120 Russell Road, Ottawa on May 31, 2019

Naturalized Deciduous Hedgerow Ecosite (FODM11)

There is one hedgerow dominated by deciduous trees (greater than 25% tree cover) on Site 1 that is classified as Naturalized Deciduous Hedgerow Ecosite (FODM11; Figure 7). It is a linear hedgerow located along the northern border of the site. This hedgerow is approximately 250 m long and 25 m wide. Note that although the FODM11 ecosite is a subcategory of deciduous forest (FOD) systems under ELC, the FODM11 ecosite itself does not represent a forest.

The tree hedgerow on Site 1 is currently in the process of natural regeneration by woody species. It existed prior to 1976 and was left intact during historical and recent agricultural operations on Site 1. Its dominant species are Green Ash (almost all of them are dying or already dead), White Poplar (*Populus alba*), Manitoba



Maple (*Acer negundo*), American Elm (*Ulmus americana*), European Buckthorn (*Rhamnus cathartica*), and Poison Ivy (*Toxicodendron rydbergii*).



Figure 7 Photos showing the Naturalized Deciduous Hedgerow Ecosite (FODM11) on Site 1 at 4120 Russell Road, Ottawa on May 31, 2019

Reed Canary Grass Mineral Meadow Marsh Type (MAM2-1)

This vegetation type makes up the wet depression previously described in Section 3.2.1 (Figure 4). As outlined in preceding sections, the wet depression on Site 1 is not a “true” wetland by OWES or ELC definitions, but we included it under the Reed Canary Grass Mineral Meadow Marsh Type (MAM2-1) due to its dominant vegetation cover. This open community originated from agriculture and now has a large proportion of introduced species, including Reed Canary Grass and Purple Loosestrife, which are typical of disturbed meadow marsh communities. This area was used for agriculture prior to 1965 and up until sometime between 2008 and 2011. At this time, the area was left fallow and its location in a relatively lower-lying area has, over time, allowed it to accumulate water during the spring freshet such that the water table is briefly above the substrate surface in the spring, hence the current meadow marsh-type vegetation cover.

Mineral Cultural Woodland Ecosite (CUW1)

The Mineral Cultural Woodland Ecosite (CUW1) is a cluster of mainly Basswood (*Tilia americana*) trees in the southernmost portion of the road allowance (Figure 8). Most of this community has a legacy of agricultural use and the majority of trees are less than 60 years old (geoOttawa, 2020). Trees running parallel to Hunt Club Road existed prior to 1965 and are over 60 years old (geoOttawa, 2020). The other trees in this



community are not apparent in available aerial imagery until 1999 (geoOttawa, 2020). In addition to Basswood, this community contains American Elm, Green Ash (most are dead), Manitoba Maple, Sugar Maple (*Acer saccharum*), and Black Cherry (*Prunus serotina*). The understory is dominated by European Buckthorn.



Figure 8 Photo showing the Mineral Cultural Woodland Ecosite (CUW1) on Site 1 at 4120 Russell Road, Ottawa

3.3.2 Vegetation Inventory

In addition to the detailed ELC above, Appendix A includes a comprehensive species list of all vascular vegetation occurring over the entire area of the proposed National Capital Business Park, including Site 1. No federally significant plant species were found on Site 1.

A total of seven provincially rare (Brunton, 2005) plant species were observed on Site 1: Siberian Crab Apple (*Malus baccata*), Flowering Crab Apple (*Malus floribunda*), Siberian Elm (*Ulmus pumila*), Siberian-pea (*Caragana arborescens*), Goat's-rue (*Galega officinalis*), Velvet-leaf (*Abutilon theophrasti*), and Black Knapweed (*Centaurea nigra*). All of these species are non-native, and the former four species are frequently planted and not considered ecologically significant. Appendix A also denotes 24 species observed over the entire area of the proposed National Capital Business Park as 'uncommon' (Brunton, 2005). Those species are found only occasionally within suitable habitat, often in small numbers. The habitat of 'uncommon' species is often geographically limited as well (Brunton, 2005). Despite their 'uncommon' designation, these 24 species are frequently planted, are considered 'weeds' or are common in disturbed/fallow environments, and/or are invasive species.



3.3.3 Tree Inventory

The results of the tree inventory are presented as a TCR in Appendix B. In general, trees on Site 1 are limited to a hedgerow dominated by dead Green Ash along the northwestern border (FODM11), an ~0.6 ha cluster of mainly dead Green Ash along the eastern edge, and an ~0.4 ha cluster of trees dominated by Basswood in the southernmost portion of the proposed access road to Hunt Club Road (CUW1). Most trees on site are less than 60 years old, except for some trees in the FODM11 and CUW1 ecosites. Some of the trees in these ecosites existed prior to 1965 and therefore are over 60 years old (geoOttawa, 2020).

3.4 Wildlife

3.4.1 Species at Risk

The potential for SAR to occur on Site 1 and interact with the proposed development was assessed based on our review of existing information, ELC delineations (habitat assessment), and field surveys (Appendix C). Barn Swallow (*Hirundo rustica*) was assessed as having a moderate to high potential to interact with the proposed development, and Bobolink (*Dolichonyx oryzivorus*) and Eastern Meadowlark (*Sturnella magna*) were assessed as having a low to moderate potential. Further details regarding at-risk turtles, birds, and bats based on our field observations are included in the following sections.

3.4.2 Amphibians

No amphibians were visually or audibly observed on Site 1 or adjacent areas in 2019 or 2020. Given the lack of amphibians and amphibian habitat on Site 1, no portion of Site 1 is considered Significant Amphibian Breeding Habitat per the Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E (MNRF, 2015b) or habitat otherwise considered important for amphibian biodiversity.

3.4.3 Reptiles

No reptiles were observed on or adjacent to Site 1 during the field visits, including during turtle surveys conducted at the stormwater management pond southwest of the site. The stormwater management pond did not have any visible basking structures and only limited aquatic vegetation along the periphery of the pond, suggesting that it is not ideal turtle habitat, particularly for at-risk turtles (refer to habitat descriptions for Blanding's Turtle and Snapping Turtle in Appendix C).

3.4.4 Birds

A total of 31 species were observed during breeding bird surveys conducted in 2019 and 2020 for Site 1 (Table 3). The most abundant species on Site 1 was European Starling (*Sturnus vulgaris*), followed by Song Sparrow (*Melospiza melodia*), Red-winged Blackbird (*Agelaius phoeniceus*), and American Goldfinch (*Spinus tristis*). Two listed SAR were observed during breeding bird surveys: Barn Swallow and Eastern Meadowlark. Both of these species are listed as Threatened under ESA and SARA. Neither of these SAR were observed directly on Site 1, but they were observed in similar habitats as those on Site 1 on Site 2.



Table 3 Birds observed during breeding bird surveys conducted in 2019 and 2020 for Site 1 of the proposed National Capital Business Park at 4055 Russell Road, Ottawa

Common Name	Scientific Name	Station(s) Observed	Date(s) Observed
Alder Flycatcher	<i>Empidonax alnorum</i>	BBS-1	2020/06/10
American Crow	<i>Corvus brachyrhynchos</i>	BBS-1, BBS-3, BBS-4	2020/06/10, 2020/06/25, 2020/07/10
American Goldfinch	<i>Carduelis tristis</i>	BBS-1, BBS-3	2019/05/31, 2019/06/21, 2019/07/01, 2020/06/10, 2020/06/25, 2020/07/10
American Redstart	<i>Setophaga ruticilla</i>	BBS-1	2019/05/31
American Robin	<i>Turdus migratorius</i>	BBS-1, BBS-2, BBS-3, BBS-4	2019/07/01, 2020/06/10, 2020/06/25, 2020/07/10
Barn Swallow	<i>Hirundo rustica</i>	BBS-2, BBS-3, BBS-4	2020/06/10, 2020/07/10
Blue Jay	<i>Cyanocitta cristata</i>	BBS-1	2020/07/10
Clay-coloured Sparrow	<i>Spizella pallida</i>	BBS-1, BBS-2	2020/06/10, 2020/06/25
Cedar Waxwing	<i>Bombycilla cedrorum</i>	BBS-1	2019/07/01
Chipping Sparrow	<i>Spizella passerina</i>	BBS-1, BBS-2	2020/06/25, 2020/07/10
Common Grackle	<i>Quiscalus quiscula</i>	BBS-3	2020/06/25
Common Yellowthroat	<i>Geothlypis trichas</i>	BBS-1, BBS-2, BBS-3, BBS-4	2019/05/31, 2019/06/21, 2019/07/01, 2020/06/10, 2020/06/25, 2020/07/10
Double-crested Cormorant	<i>Phalacrocorax auritus</i>	BBS-4	2020/07/10
Eastern Kingbird	<i>Tyrannus tyrannus</i>	BBS-1	2019/06/21
Eastern Meadowlark	<i>Sturnella magna</i>	BBS-2	2020/06/10
Eastern Phoebe	<i>Sayornis phoebe</i>	BBS-1, BBS-2, BBS-3	2019/07/01, 2020/06/10
European Starling	<i>Sturnus vulgaris</i>	BBS-1, BBS-2, BBS-3, BBS-4	2019/06/21, 2019/07/01, 2020/06/10, 2020/06/25, 2020/07/10
Great Blue Heron	<i>Ardea herodias</i>	BBS-4	2020/06/10, 2020/07/10
Gray Catbird	<i>Dumetella carolinensis</i>	BBS-1, BBS-2, BBS-3, BBS-4	2019/07/01, 2020/06/10, 2020/07/10
Killdeer	<i>Charadrius vociferus</i>	BBS-4	2020/06/10, 2020/06/25, 2020/07/10
Mallard	<i>Anas platyrhynchos</i>	BBS-1, BBS-4	2019/05/31, 2020/06/25, 2020/07/10
Mourning Dove	<i>Zenaida macroura</i>	BBS-2, BBS-3	2020/06/10, 2020/06/25
Northern Cardinal	<i>Cardinalis cardinalis</i>	BBS-1, BBS-2, BBS-3, BBS-4	2019/06/21, 2019/07/01, 2020/06/25, 2020/07/10
Northern Flicker	<i>Colaptes auratus</i>	BBS-1	2019/06/21, 2019/07/01



Common Name	Scientific Name	Station(s) Observed	Date(s) Observed
Ring-billed Gull	<i>Larus delawarensis</i>	BBS-1, BBS-3, BBS-4	2019/06/21, 2019/07/01, 2020/06/10, 2020/06/25, 2020/07/10
Red-eyed Vireo	<i>Vireo olivaceus</i>	BBS-2, BBS-3	2020/06/10
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	BBS-1, BBS-2, BBS-3, BBS-4	2019/05/31, 2019/06/21, 2019/07/01, 2020/06/10, 2020/06/25, 2020/07/10
Song Sparrow	<i>Melospiza melodia</i>	BBS-1, BBS-2, BBS-3, BBS-4	2019/05/31, 2019/06/21, 2019/07/01, 2020/06/10, 2020/06/25, 2020/07/10
Swamp Sparrow	<i>Melospiza georgiana</i>	BBS-1	2019/05/31, 2019/06/21, 2019/07/01, 2020/06/10
Tree Swallow	<i>Tachycineta bicolor</i>	BBS-3, BBS-4	2020/07/10
Yellow Warbler	<i>Setophaga petechia</i>	BBS-1	2019/06/21

3.4.4.1 Barn Swallow

In both 2019 and 2020, Barn Swallows were observed foraging over open fallow fields of Site 2 and over the stormwater management pond southwest of Site 1. Barn Swallows were observed during two of the three bird surveys in 2019 (KAL, 2020) and during all three surveys performed in 2020. The number of individual Barn Swallows observed during these surveys ranged from one to 10. During most Barn Swallow observations, individuals were seen flying back and forth from Site 2 and industrial buildings north of Site 2 along Belgreen Drive (~400 m away).

Since only the area within 200 m of a Barn Swallow nest is protected under ESA as foraging habitat (MECP, 2019b), KAL conducted searches for Barn Swallow nests on structures within the vicinity of Site 1 to determine if the habitat that Barn Swallows were observed foraging in is legally protected habitat. No nests were located within 200 m of Site 1 in 2019, so KAL (2020) recommended additional searches to determine the location(s) of nests prior to the commencement of site works to conclude if additional mitigation or compensation measures are necessary. In 2020, KAL re-checked the exterior of all structures that were inspected in 2019 for Barn Swallow nests including: nearby bridges and culverts, abandoned farm buildings at 4055 Russell Road, buildings at the cemetery at 3970 Russell Road, and industrial buildings northwest of Site 1 along Stevenage Drive, Belgreen Drive, and Hawthorne Road. Several of the industrial buildings north of Site 2 (where Barn Swallows were observed flying towards) contain open garages, warehouses, and Seacan containers that provide suitable nesting habitat for Barn Swallow. These structures were not inspected in 2019 due to private property restrictions. KAL was granted permission by property owners in 2020 to inspect the interior of these structures; no Barn Swallow nests were found. Due to the absence of Barn Swallow nests on suitable nesting structures within ~400 m of Site 1, KAL concludes that Barn Swallows observed foraging over Site 2 are nesting beyond 200 m from Site 1. Therefore, Site 1 and adjacent areas where Barn Swallows were observed foraging are not legally protected Category 3 habitat under ESA.

3.4.4.2 Eastern Meadowlark

Eastern Meadowlark was only observed once during the field investigations. A single individual was seen perched on a tree in a hedgerow near the western edge of Site 2 (east of the proposed location of the access



road) during the first bird survey conducted on June 10, 2020. It flew west from Site 2 and no Eastern Meadowlarks were observed during subsequent surveys or other site visits. The observed Eastern Meadowlark did not exhibit any signs of breeding (e.g., no songs or breeding calls were heard, no courtship displays were seen, and it did not exhibit agitated behaviour) or nesting within the adjacent fallow field habitat. Due to these factors, KAL considers the individual's presence as transient as it was likely just passing through the area.

3.4.5 Mammals

Across several site visits, KAL and NCC Biologists saw the following mammals and/or signs of them (tracks, chews, scat, dens, etc.) on and/or adjacent to Site 1: Coyote (*Canis latrans*), Raccoon (*Procyon lotor*), White-tailed Deer (*Odocoileus virginianus*), Porcupine (*Erethizon dorsatum*), and White-tailed Jackrabbit (*Lepus townsendii*). The fallow field composition of Site 1 makes it unlikely to support a large and diverse mammal community. The linear nature of the single hedgerow and limited tree cover on Site 1 would provide only limited cover for wildlife and very minimal connectivity to other areas as most of the surrounding area is already developed.

3.4.5.1 Bats

Site 1 contains several dying/dead trees and snags with cavities and/or peeling bark that may be suitable for bat roosting (Appendix B). However, potentially suitable trees are in low density and are not in a naturalized forest or woodland form (i.e., not a large, dense stand of trees comprising typical wooded bat roosting habitat; treed communities on Site 1 originated from culturally based disturbances). Habitats with the Deciduous Forest (FOD) Ecological Land Classification (ELC) code (Lee et al., 1998) are considered candidate Significant Wildlife Habitat for bat maternity colonies (MNRF, 2011; 2015). The hedgerow on the northwestern edge of Site 1 is classified as a Naturalized Deciduous Hedgerow Ecosite (FODM11) and falls under the FOD class, but is not considered by KAL as a candidate Significant Wildlife Habitat because it is a hedgerow surrounded by open habitat. This hedgerow is less than 1 ha in area. The Significant Wildlife Habitat Criterion Schedules for Ecoregion 6E (MNRF, 2015) indicate that candidate maternity colonies are typically found in mature deciduous or mixed forest stands with greater than 10 trees with DBH > 25 cm per hectare. Site 1 contains 34 trees with DBHs > 25 cm that are potentially suitable for bat roosting (Appendix A). However, the small sizes of the treed communities on Site 1 (FODM11: ~0.6 ha, CUW1: ~0.4 ha) would render them as having a low potential to support maternity colonies. As such, there is very low potential for maternity roosting colonies to occur on or adjacent to Site 1.

4.0 PROJECT DESCRIPTION

The proposed National Capital Business Park is a business and industrial park intended to service the warehousing, data communications centres, distribution, and employment needs of the National Capital Region by providing over 100,000 m² of new build-to-suit office, warehouse, and industrial space on approximately 40 ha of urban land spanning 4120 and 4055 Russell Road. The National Capital Business Park will be composed of three distinct sites and developments planned and designed as a cohesive industrial park through urban design, landscape architecture, and architecture.



Site 1 at 4120 Russell Road (the subject site) has a proposed building area of 8,325 m² and will consist of a warehouse building with office space ("Building C") and parking (Figure 9). The proposed development also involves the construction of an access road ("Last Mile Drive") connecting Russell Road to Hunt Club Road along the northern edge of Site 1 and Site 2, and along the western edge of Site 2 south to Hunt Club Road. Site preparation (e.g., vegetation removal and grading) is proposed to occur in November 2020. Construction is proposed to start in April 2021 with a completion date of September 2021.





Figure 9 Map showing the proposed development of Site 1 of the National Capital Business Park at 4120 Russell Road, Ottawa

Legend

-  Site 1
-  Property Lines

N



0 100 m

Project: AVE 866.1
Created By: Nicholas Schulz
Checked By: Katie Black
Universal Transverse Mercator - Zone 18 (N)
Printed on: 2020-07-29



5.0 IMPACT ASSESSMENT

5.1 Surface Water Features

The wet depression towards the northeastern edge of Site 1 will be developed, but this feature provides very limited biological functions, no social functions, limited hydrological functions, and no special or unique features. There are no other surface water features on Site 1.

5.2 Vegetation and Trees

In general, the proposed development involves the removal of the following vegetation features: the hedgerow on the northwestern edge of Site 1 (FODM11), a cluster of mainly dead Green Ash near the southeastern border of Site 1, the open fallow fields comprising most of Site 1 (CUM1), and trees along the western edge of the site west of Site 1 extending south to Hunt Club Road within the right-of-way of Last Mile Drive (CUW1). A detailed description of the trees to be removed vs. retained under the proposed development is included in the TCR for Site 1 (Appendix B).

5.3 Species at Risk

5.3.1 Barn Swallow

Barn Swallows were observed during breeding bird surveys conducted in 2019 and 2020 but were not observed directly on Site 1. Their observed foraging was limited to Site 2 and the stormwater management pond southwest of Site 1. The habitat on Site 1 is similar to Site 2 and provides suitable foraging habitat despite no Barn Swallows being observed on Site 1. This suitable foraging habitat would be removed under the proposed development. However, the suitable foraging habitat on Site 1 does not fall within 200 m of a Barn Swallow nest and is therefore not protected under ESA. Removing the potential foraging habitat on Site 1 does not remove all suitable foraging habitat in the area; foraging habitat over the stormwater management pond to the southwest would remain.

5.3.2 Eastern Meadowlark and Bobolink

Areas potentially suitable as habitat for Eastern Meadowlark and/or Bobolink exist on Site 1 (CUM1-1), though they would be marginal at best. Neither species was observed on Site 1 during the field investigations in 2019 or 2020. While the transient presence of both species in adjacent areas indicates that these species may be present in the broader vicinity, the absence of individuals using the CUM-1 ecosite as habitat indicates that the neither Site 1 nor adjacent areas constitute habitat. Since this is not confirmed habitat for either Eastern Meadowlark or Bobolink, it is not protected under ESA (MECP, 2019c; 2019d). There is no federal recovery strategy for Eastern Meadowlark nor Bobolink describing SARA-protected habitat. SARA therefore only provides protection for individuals of the species and their places of residence (e.g., nests). SARA protections would therefore only apply if the species or their nests were observed on Site 1.

5.3.3 Bats

The proposed development requires the removal of trees on the edges of Site 1 and within the proposed location of Last Mile Drive (Appendix B). While some trees to be removed have the potential to provide



diurnal roosting habitat for bats, the small area of treed areas precludes their consideration as maternity roosting habitat. Given the low number and density of trees on Site 1 and the availability of more suitable habitat nearby, bats are unlikely to be significantly impacted by the proposed development.

6.0 MITIGATION MEASURES

6.1 Surface Water Features

The wet depression on Site 1 is not a wetland due to its small size and lack of wetland functions. The hydrological functions of this wet depression were limited to holding meltwater in the spring and conveying it to a small tributary off site. Given that this feature only provides minimal hydrological function in the spring and then quickly dries in the summer, there would be no net loss of hydrological function if this wet depression were removed so long as the conveyance of meltwater and stormwater off site follows similar flow paths (i.e., water is conveyed off site into the same downstream features). RVCA concurred with this conclusion in the technical comments they provided to the City of Ottawa on the Master-level EIS (KAL, 2020).

While no headwater drainage features occur on Site 1, construction works will require standard erosion and sediment control mitigation measures to protect waters in the broader vicinity, including:

- A multi-faceted approach to provide erosion and sediment control;
- Retention of existing vegetation and stabilization of exposed soils with vegetation where possible;
- Limiting the duration of soil exposure and phase construction;
- Limiting the size of disturbed areas by minimizing nonessential clearing and grading;
- Minimizing the total slope length and the gradient of disturbed areas;
- Refueling of machinery should occur >30 m from any watercourse;
- Maintaining overland sheet flow and avoid concentrated flows; and
- Storing/stockpiling all soil away (e.g., greater than 30 m) from watercourses, drainage features, and tops of steep slopes.

6.2 Trees

The following mitigation measures must be applied during site preparation and construction:

- Tree removal on Site 1 should be limited to that which is necessary to accommodate construction.
- Tree and vegetation clearing should not take place during sensitive times of the year for wildlife (breeding season; early spring throughout summer) unless mitigation measures are implemented and/or the habitat has been inspected by a qualified Biologist.
- The *Migratory Birds Convention Act*, 1994 protects the nests and young of migratory breeding birds in Canada. The NCC recognizes April 1 to August 31 as the breeding bird period for the Ottawa area (personal communication, Tiera Zukerman, February 5, 2020). As such, clearing of trees or vegetation should not take place between April 1 and August 31, unless a qualified Biologist has determined that no nesting is occurring within 5 days prior to the clearing (City of Ottawa, 2015).
- To minimize impacts to remaining trees during development:



- Erect a fence beyond the CRZ of retained trees. The fence should be highly visible (orange construction fence) and paired with erosion and sediment control fencing. Pruning of branches is recommended in areas of potential conflict with construction equipment;
- Do not place any material or equipment within the CRZ of trees unless otherwise approved by the General Manager;
- Do not attach any signs, notices, or posters to any trees unless otherwise approved by the General Manager;
- Do not raise or lower the existing grade within the CRZ of trees unless otherwise approved by the General Manager;
- Do not extend any hard surface or significantly change landscaping within the CRZ of trees unless otherwise approved by the General Manager;
- Do not damage the root system, trunk, or branches of any remaining trees unless otherwise approved by the General Manager;
- Use tunneling or boring when digging within the CRZ of a tree; and
- Ensure that exhaust fumes from equipment are not directed towards any tree's canopy.

Native tree and shrub species are recommended for planting for Site 1 to help offset vegetation loss. Tree planting must follow the guidelines provided in *Tree Planting in Sensitive Marine Clay Soils* (City of Ottawa, 2017) by using trees with low water demand and planting trees at a distance equivalent to the full mature height of a tree from a building or foundation structure.

Additional trees and shrubs should be planted along the hill slope that borders the southwestern edge of Site 1 to stabilize the slope.

6.3 Wildlife

6.4 Species at Risk

6.4.1 Barn Swallow

KAL has confirmed that ESA-protected Barn Swallow habitat does not exist on Site 1. There is no federal recovery strategy for Barn Swallow describing SARA-protected habitat. SARA therefore only provides protection for individuals of the species and their places of residence (e.g., nests; Government of Canada, 2007b). SARA protections would therefore only apply if the species or their nests were observed on Site 1. No further mitigation measures are required assuming the project follows the proposed schedule.

6.4.2 Eastern Meadowlark and Bobolink

To ensure no impacts to these species, no site alteration should occur within the fallow fields on Site 1 between April 1 and August 31 (personal communication, Tiera Zukerman, February 5, 2020) without first



ensuring the absence of grassland bird nests during that period. If any at-risk bird species are nesting in these areas, site alteration must be delayed until all nestlings are fledged.

6.4.3 Bats

The potential presence of at-risk bats or maternity colonies in trees on Site 1 cannot be dismissed completely without detailed bat monitoring data. No clearing of trees should take place between May to September inclusive without first confirming the absence of bats (MNR, 2015b). Trees should not be cleared within the month of June at all. SARA and the federal recovery strategy for Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*), and Tri-Coloured Bat (*Perimyotis subflavus*) do not provide specific mitigation measures for diurnal bat roosting habitat (Government of Canada 2007a; 2007b).

6.5 General Wildlife Mitigation Measures

During several field visits to Site 1 common wildlife species were observed, all of which are represented throughout the developed adjacent landscape. The following mitigation measures shall be implemented on site during construction of the project to generally protect wildlife:

- Areas shall not be cleared during sensitive times of the year for wildlife (breeding season; early spring throughout summer) unless mitigation measures are implemented and/or the habitat has been inspected by a qualified Biologist.
- Do not harm, feed, or unnecessarily harass wildlife.
- Manage waste to prevent attracting wildlife to the site. Effective mitigation measures include litter prevention and keeping all trash secured in wildlife-proof containers and promptly removing it from the site, especially during warm weather.
- Drive slowly and avoid hitting wildlife.
- Manage stockpiles and equipment on site to prevent wildlife from being attracted to artificial habitat. Cover and contain any piles of soil, fill, brush, rocks and other loose materials and cap ends of pipes where necessary to keep wildlife out. Ensure that trailers, bins, boxes, and vacant buildings are secured at the end of each work day to prevent access by wildlife.
- Check the entire work site for wildlife prior to beginning work each day.
- Inspect protective fencing and/or other installed wildlife exclusion measures daily and after each rain event to ensure their integrity and continued function.
- Monitor construction activities to ensure compliance with the project-specific protocol (where applicable) or any other requirements.
- If SAR are encountered on site, immediately stop all work in the vicinity of the observation and comply with the project-specific SAR protocol (where applicable, e.g., contact project Biologist to determine next steps).
- Follow the best practices for the construction and maintenance of bird-safe buildings, such as applying visual markers on windows to prevent birds from colliding with glass and reducing the



intensity and direction of night lighting (turn off lights at night if possible). See <https://flap.org/workplaces-safe-for-birds/> for more resources and tips on designing and maintaining bird-friendly buildings.

6.6 Lighting

Light pollution from urbanization is a long-standing issue, with broad potential for ecological impacts unless properly mitigated. For birds and bats, concerns have been raised regarding possible behavioural changes due to increasing illumination in urban areas, though the primary concerns surrounding artificial lighting are mostly related to the introduction of new light sources to previously unlit areas (Gaston et al., 2012).

There are two general possible impacts to local fauna that relate to lighting. The first are impacts to birds and bats that may nest/roost within or adjacent to areas subject to illumination. The current site already has some level of constant exposure to lighting from the north related to industrial buildings along Belgreen Drive and from the south from street lighting on Hunt Club Road. The development of Site 1 is occurring in an area where local fauna is likely tolerant of light exposure.

The second type of impact from lighting is to birds and bats not living within the direct vicinity but that may have migratory routes or flight paths that pass over illuminated areas. Many studies discuss the impacts of artificial lighting during migration. Birds use environmental and celestial light for orientation and flight trajectory (Muheim, Schmaljohann, and Alerstam, 2018). Horizontal light, stars, and lunar illumination provide visual cues for migrating birds when weather conditions permit. The magnetic orientation system of many bird species relies on sensory input related to incident light as well as magnetite receptors, which functionally allow these birds to navigate based on their location relative to the magnetic poles (Ritz et al., 2000; Wiltschko et al., 2011a; Wiltschko and Wiltschko, 2013). The light-reliant portion of this system receives input from blue-sensitive pigment in the bird's retina (Wiltschko et al., 2011b), making migratory birds particularly susceptible to disorientation from white, red, or yellow light (Verheijen, 1960; Evans Ogden, 1996; Wiltschko and Wiltschko, 1999; Wiltschko and Wiltschko, 2002; Gauthreaux and Belser, 2006). Artificial lighting may impact migratory birds due to its ability to reroute them, increasing the chances for collision, exhaustion, and delayed arrival to breeding or overwintering areas (Rich and Longcore, 2013). Red light, more than the light of any other wavelength, has the ability to attract birds from a distance, inducing hovering and circling behaviour that increases risk of collision and exhaustion (Gauthreaux and Belser, 2006). It has been documented that after an hour of exposure to light of longer wavelengths, birds can regain orientation as their magnetite sensing system takes over (Wiltschko et al., 2011a). Migratory birds show normal orientation behaviour in blue (443 nm) and green (565 nm) wavelengths of light (Wiltschko and Wiltschko, 1999). Many investigations have recognized green light as being the least impactful (Wiltschko and Wiltschko, 1995; Wiltschko et al., 2000, 2001; Wiltschko and Wiltschko, 2001; Poot et al., 2008). Bird responses to all light conditions will be strongest on overcast evenings when visual cues are naturally obscured (Poot et al., 2008).

In considering the potential significance of these types of effects on migrating birds, it must be noted that Site 1 is already subject to light exposure from surrounding lighting. Additional lighting would be unlikely to draw birds any closer to existing hazard structures, nor would additional lighting draw birds dangerously away from safe landing areas more than any other existing lighting in the area. The area does not need to be protected as a shadowed refuge for sensitive species. Accordingly, KAL does not consider the addition of



lights to Site 1 as being likely to impose further impacts to migrating birds beyond effects already caused by lighting in adjacent areas if best practices are followed to limit light intensity.

Gaston et al. (2012) provide useful considerations when addressing mitigation options for lighting. These considerations apply to birds and bats. Mitigation recommendations addressing these considerations would be in agreement with mitigation strategies independently proposed by Rich and Longcore (2006), as well as the Toronto-based Fatal Light Awareness Program (FLAP; Evans Ogden, 1996). For this project, mitigation measures must consider:

- **Naturally unlit areas** - Areas that have been shaded from sky glow in highly developed centres provide refuge as well as corridors for movement in nocturnal species. Areas secluded from artificial lighting should be preserved and expanded as much as possible to allow the continued use of these areas by sensitive species. Areas already illuminated by neighbouring light sources do not typically serve as refuge.
- **Duration of artificial light** - Bat activity peaks an hour after sunset (Day et al., 2015); it is therefore recommended that outdoor lighting be limited around this time when feasible. FLAP recommends keeping lights off between the hours of 11PM and 7AM (Evans Ogden, 1996). Other nocturnal species also benefit from nighttime shut-off or reduction of lighting, with a window of midnight to dawn being recommended as generally protective/light-free (Rich and Longcore, 2013). The use of lighting should be timed accordingly as much as possible.
- **Light leakage** – Light leakage refers to light leaving the area of intended illumination (Rich and Longcore, 2013). The best practice to prevent light leakage and minimize adding to skyglow effects is to direct lights toward the ground that do not cast light far beyond the edges of infrastructure and buildings (Rich and Longcore, 2013). Controlling for reflection and glare will also help in limiting light leakage.
- **Intensity of light** - Flashing or strobing lights do not attract or disorient birds as readily as constant lighting (Avery et al., 1976). White strobe lights may induce non-linear flight patterns in nearby birds but do not cause hovering or circling behaviour (Gauthreaux and Belser, 2006). If the use of flashing lights instead of constant lighting is not an option, dimming of lights can act to reduce unintended light spill into areas that do not require illumination and will reduce the area of potential ecological impact. With respect to dimming, illuminance level is not an impacting factor in nighttime bat activity for both photophobic and light-tolerant species when light emitting diodes (LEDs) are used (Lewanzik and Voigt, 2017). LED lighting is preferable to other forms (mercury vapour), as it restores a more natural level of competition between photophobic and light tolerant bat species due to their reduced attractiveness to insects (Lewanzik and Voigt, 2017).
- **Spectrum of light** – In general, green light is recommended as the least disorienting to migratory bird species, while all light of lower wavelengths (blue to green) is preferable to light of higher wavelengths (yellow to red). White light includes the higher wavelength portion of the spectrum and therefore also introduces the possibility of disorientation in nearby birds (Verheijen, 1960; Evans Ogden, 1996; Poot *et al.*, 2008).




7.0 CLOSURE

It is our professional opinion that no negative impacts are anticipated to significant natural heritage features, SAR, or habitat suitable for SAR under the proposed development of Site 1 if the recommended mitigation measures are followed.

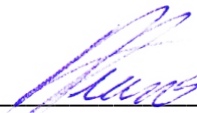
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Respectfully submitted,

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**Appendix A: Vascular Plant List for the Proposed National Capital Business Park at 4055
and 4120 Russell Road, Ottawa (Master-level)**



Scientific Name	Common Name	Brunton (2005)
EQUISETACEAE (Horsetail Family)		
<i>Equisetum arvense</i> L.	Field Horsetail	Common
OSMUNDACEAE (Flowering-fern Family)		
<i>Osmunda cinnamomea</i> L.	Cinnamon Fern	Common
THELYPTERIDACEAE (Marsh Fern Family)		
<i>Phegopteris connectilis</i> (Michx.) Watt	Northern Beech Fern	Common
<i>Thelypteris palustris</i> Schott	Marsh Fern	Common
DRYOPTERIDACEAE (Woodfern Family)		
<i>Dryopteris carthusiana</i> (Vill.) H.P.Fuchs	Spinulose Woodfern	Common
<i>Matteuccia struthiopteris</i> (L.) Tod.	Ostrich Fern	Common
<i>Onoclea sensibilis</i> L.	Sensitive Fern	Common
PINACEAE (Pine Family)		
<i>Larix laricina</i> (Du Roi) K.Koch	Tamarack	Common
<i>Picea glauca</i> (Moench) Voss	White Spruce	Common
<i>Picea pungens</i> Engelm.	Blue Spruce	-
<i>Pinus strobus</i> L.	White Pine	Common
<i>Pinus sylvestris</i> L.	Scots Pine	Rare (frequently planted)
CUPRESSACEAE (Cypress Family)		
<i>Juniperus communis</i> L.	Common Juniper	Common
<i>Juniperus virginiana</i> L.	Red Cedar	Uncommon
<i>Thuja occidentalis</i> L.	White Cedar	Common
ALISMATACEAE (Water-plantain Family)		
<i>Alisma triviale</i> Pursh	Northern Water-plantain	Common
TYPHACEAE (Cat-tail Family)		
<i>Typha angustifolia</i> L.	Narrow-leaved Cat-tail	Common
<i>Typha latifolia</i> L.	Common Cat-tail	Common
POACEAE (Grass Family)		
<i>Alopecurus pratensis</i> L.	Meadow Foxtail Grass	Uncommon
<i>Bromus inermis</i> Leyss.	Common Brome Grass	Common
<i>Dactylis glomerata</i> L.	Orchard Grass	Common
<i>Elymus repens</i> (L.) Gould	Quack Grass	Common
<i>Festuca brevipila</i> R.Tracey	Sheep Fescue	Uncommon
<i>Festuca rubra</i> L.	Red Fescue	Uncommon
<i>Hordeum jubatum</i> L.	Foxtail Barley	Common
<i>Lolium arundinaceum</i> (Schreb.) Darbysh.	Tall Fescue	Uncommon
<i>Lolium pratense</i> (Huds.) Darbysh.	Meadow Fescue	Common
<i>Phalaris arundinacea</i> L.	Reed Canary Grass	Common
<i>Phleum pratense</i> L.	Timothy	Common
<i>Phragmites australis</i> (Cav.) Trin. ex Steud. subsp. <i>australis</i>	European Reed Grass	Uncommon (locally abundant adventive)
<i>Poa annua</i> L.	Annual Bluegrass	Common
<i>Poa compressa</i> L.	Canada Bluegrass	Common
<i>Poa pratensis</i> L.	Kentucky Bluegrass	Common
<i>Sporobolus neglectus</i> Nash	Overlooked Dropseed	Common
CYPERACEAE (Sedge Family)		

Scientific Name	Common Name	Brunton (2005)
<i>Carex crinita</i> Lam.	Fringed Sedge	Common
<i>Carex scoparia</i> Schkuhr exWilld.	Broom Sedge	Regionally significant
<i>Carex vesicaria</i> L.	Inflated Sedge	Uncommon
<i>Carex vulpinoidea</i> Michx.	Fox Sedge	Common
<i>Schoenoplectus acutus</i> (Muhl. ex Bigel.) Love & Love	Hard-stemmed Bulrush	Regionally significant
LEMNACEAE (Duckweed Family)		
<i>Lemna minor</i> L.	Small Duckweed	Common
LILIACEAE (Lily Family)		
<i>Asparagus officinalis</i> L.	Asparagus	Common
<i>Convallaria majalis</i> L.	Lily-of-the-valley	Uncommon (locally abundant invasive)
<i>Erythronium americanum</i> Ker Gawl.	Trout-lily	Common
<i>Hemerocallis fulva</i> (L.) L.	Day Lily	Common
<i>Maianthemum canadense</i> Desf. var. <i>canadense</i>	Canada Mayflower	Common
SALICACEAE (Willow Family)		
<i>Populus alba</i> L.	White Poplar	Common
<i>Populus balsamifera</i> L.	Balsam Poplar	Common
<i>Populus deltoides</i> W.Bartram ex Marsh.	Eastern Cottonwood	Common
<i>Populus nigra</i> L.	Lombardy Poplar	Rare (commonly cultivated)
<i>Populus tremuloides</i> Michx.	Trembling Aspen	Common
<i>Salix alba</i> L.	White Willow	Uncommon
<i>Salix amygdaloides</i> Andersson	Peach-leaved Willow	Uncommon
<i>Salix bebbiana</i> Sargent	Bebb's Willow	Common
<i>Salix discolor</i> Muhl.	Pussy Willow	Common
<i>Salix exigua</i> Nutt. subsp. <i>interior</i> (Rowlee) Cronq.	Sandbar Willow	Common
BETULACEAE (Birch Family)		
<i>Alnus incana</i> (L.) Moench subsp. <i>rugosa</i> (Du Roi) R.T.Clausen	Speckled Alder	Common
<i>Betula alleghaniensis</i> Britton	Yellow Birch	Common
<i>Betula nigra</i> L.	River Birch	-
<i>Betula papyrifera</i> Marsh.	White Birch	Common
<i>Betula populifolia</i> Marsh.	Gray Birch	Common
<i>Corylus cornuta</i> Marsh.	Beaked Hazel	Common
<i>Ostrya virginiana</i> (Mill.) K.Koch	Ironwood	Common
FAGACEAE (Oak Family)		
<i>Fagus grandifolia</i> Ehrh.	American Beech	Common
<i>Quercus macrocarpa</i> Michx.	Bur Oak	Common
ULMACEAE (Elm Family)		
<i>Ulmus americana</i> L.	American Elm	Common
<i>Ulmus pumila</i> L.	Siberian Elm	Rare
URTICACEAE (Nettle Family)		
<i>Urtica dioica</i> L. subsp. <i>gracilis</i> (Aiton) Selander	Slender Stinging Nettle	Common
POLYGONACEAE (Knotweed Family)		
<i>Fallopia cilinodis</i> (Michx.) Holub	Fringed Black Bindweed	Common
<i>Persicaria hydropiper</i> (L.) Delarbre	Water-pepper	Common
<i>Rumex crispus</i> L.	Curled Dock	Common

Scientific Name	Common Name	Brunton (2005)
CHENOPODIACEAE (Goosefoot Family)		
<i>Chenopodium album</i> L.	Lamb's-quarters	Common
AMARANTHACEAE (Amaranth Family)		
<i>Amaranthus retroflexus</i> L.	Redroot Pigweed	Common
CARYOPHYLLACEAE (Pink Family)		
<i>Cerastium fontanum</i> Baumg.	Mouse-ear Chickweed	Common
<i>Silene latifolia</i> Poir.	White Cockle	Uncommon
<i>Stellaria graminea</i> L.	Lesser Stitchwort	Common
RANUNCULACEAE (Crowfoot Family)		
<i>Actaea rubra</i> (Aiton) Willd.	Red Baneberry	Common
<i>Ranunculus acris</i> L.	Tall Buttercup	Common
BRASSICACEAE (Mustard Family)		
<i>Alliaria petiolata</i> (M. Bieb.) Cavara & Grande	Garlic-mustard	Common
<i>Barbarea vulgaris</i> W.T.Aiton	Yellow-rocket	Common
<i>Berteroa incana</i> (L.) DC.	Hoary-alyssum	Common
<i>Capsella bursa-pastoris</i> (L.) Medik.	Shepherd's-purse	Common
<i>Erysimum cheiranthoides</i> L.	Wormseed Mustard	Common
<i>Hesperis matronalis</i> L.	Dame's Rocket	Uncommon (spreading invasive)
<i>Lepidium campestre</i> (L.) W.T.Aiton	Cow Cress	Uncommon
<i>Rorippa palustris</i> (L.) Besser subsp. <i>fernaldiana</i> (Butters & Abbe) Jonsell	Yellow Cress	Common
<i>Thlaspi arvense</i> L.	Field Penny-cress	Common
CRASSULACEAE (Stonecrop Family)		
<i>Sedum telephium</i> L.	Live-forever	Uncommon
GROSSULARIACEAE (Currant Family)		
<i>Ribes cynosbati</i> L.	Wild Gooseberry	Common
<i>Ribes lacustre</i> (Pers.) Poir.	Swamp Currant	Uncommon
ROSACEAE (Rose Family)		
<i>Amelanchier arborea</i> (F.Michx.) Fernald subsp. <i>laevis</i> (Wiegand) S.M.McKay ex P.Landry	Smooth Serviceberry	Common
<i>Crataegus</i> spp.	Hawthorn	-
<i>Fragaria virginiana</i> Mill.	Common Strawberry	Common
<i>Geum aleppicum</i> Jacq.	Yellow Avens	Common
<i>Malus baccata</i> (L.) Borkh.	Siberian Crab Apple	Rare
<i>Malus floribunda</i> Siebold ex Van Houtte	Flowering Crab Apple	Rare
<i>Malus sylvestris</i> (L.) Mill.	Domestic Apple	Common
<i>Potentilla argentea</i> L.	Silvery Cinquefoil	Common
<i>Potentilla norvegica</i> L.	Rough Cinquefoil	Common
<i>Potentilla recta</i> L.	Rough-fruited Cinquefoil	Common
<i>Prunus nigra</i> Aiton	Canada Plum	Common
<i>Prunus pensylvanica</i> L.f.	Fire Cherry	Common
<i>Prunus serotina</i> Ehrh.	Black Cherry	Common
<i>Prunus virginiana</i> L.	Choke Cherry	Common
<i>Rosa</i> sp.	Rose	-
<i>Rubus allegheniensis</i> Porter	Blackberry	Common
<i>Rubus strigosus</i> Michx.	Common Raspberry	Common

Scientific Name	Common Name	Brunton (2005)
<i>Sorbus aucuparia</i> L.	European Mountain-ash	Common
<i>Spiraea alba</i> Du Roi	Meadowsweet	Common
FABACEAE (Bean Family)		
<i>Caragana arborescens</i> Lam.	Siberian-pea	Rare
<i>Galega officinalis</i> L.	Goat's-rue	Rare
<i>Lotus corniculatus</i> L.	Bird's-foot Trefoil	Common
<i>Melilotus officinalis</i> (L.) Pall.	Yellow Sweet-clover	Common
<i>Trifolium hybridum</i> L.	Alsike Clover	Common
<i>Trifolium pratense</i> L.	Red Clover	Common
<i>Trifolium repens</i> L.	White Clover	Common
<i>Vicia cracca</i> L.	Cow Vetch	Common
OXALIDACEAE (Wood-sorrel Family)		
<i>Oxalis stricta</i> L.	Yellow Wood-sorrel	Common
SAPINDALES		
ANACARDIACEAE (Cashew Family)		
<i>Rhus hirta</i> (L.) Sudworth	Staghorn Sumac	Common
<i>Toxicodendron rydbergii</i> (Rydb.) Greene	Poison-ivy	Common
ACERACEAE (Maple Family)		
<i>Acer ginnala</i> Maxim.	Amur Maple	Uncommon (spreading invasive)
<i>Acer negundo</i> L.	Manitoba Maple	Common
<i>Acer rubrum</i> L.	Red Maple	Common
<i>Acer saccharinum</i> L.	Silver Maple	Common
BALSAMINACEAE (Touch-me-not Family)		
<i>Impatiens capensis</i> Meerb.	Spotted Touch-me-not	Common
RHAMNACEAE (Buckthorn Family)		
<i>Rhamnus cathartica</i> L.	Black Buckthorn	Common
<i>Rhamnus frangula</i> L.	Glossy Buckthorn	Common
Current name: <i>Frangula alnus</i> Mill.		
VITACEAE (Grape Family)		
<i>Parthenocissus vitacea</i> (Knerr) Hitchc.	Virginia Creeper	Common
<i>Vitis riparia</i> Michx.	River Grape	Common
TILIACEAE (Linden Family)		
<i>Tilia americana</i> L.	Basswood	Common
MALVACEAE (Mallow Family)		
<i>Abutilon theophrasti</i> Medik.	Velvet-leaf	Rare
LYTHRACEAE (Loosestrife Family)		
<i>Lythrum salicaria</i> L.	Purple Loosestrife	Common
ONAGRACEAE (Evening-primrose Family)		
<i>Circaea lutetiana</i> L. subsp. <i>canadensis</i> (L.) Asch. & Magnus	Enchanter's-nightshade	Common
<i>Oenothera biennis</i> L.	Evening-primrose	Common? [taxonomic problem]
APIACEAE (Carrot Family)		
<i>Aegopodium podagraria</i> L.	Goutweed	Common
<i>Daucus carota</i> L.	Wild Carrot	Common

Scientific Name	Common Name	Brunton (2005)
<i>Pastinaca sativa</i> L.	Wild Parsnip	Common
CORNACEAE (Dogwood Family)		
<i>Cornus alternifolia</i> L.f.	Alternate-leaved Dogwood	Common
<i>Cornus sericea</i> L.	Red-osier Dogwood	Common
PYROLACEAE (Wintergreen Family)		
<i>Pyrola elliptica</i> Nutt.	Shinleaf	Common
OLEACEAE (Olive Family)		
<i>Fraxinus pennsylvanica</i> Marsh.	Green Ash	Common
<i>Syringa vulgaris</i> L.	Lilac	Common
ASCLEPIADACEAE (Milkweed Family)		
<i>Asclepias syriaca</i> L.	Common Milkweed	Common
<i>Cynanchum rossicum</i> Kleopow	Dog-strangling Vine	Uncommon (locally abundant invasive)
BORAGINACEAE (Borage Family)		
<i>Cynoglossum officinale</i> L.	Sheep-bur	Common
<i>Lithospermum officinale</i> L.	Gromwell	Common
LAMIACEAE (Mint Family)		
<i>Glechoma hederacea</i> L.	Ground-ivy	Common
<i>Leonurus cardiaca</i> L.	Motherwort	Common
<i>Nepeta cataria</i> L.	Catnip	Common
SOLANACEAE (Nightshade Family)		
<i>Solanum dulcamara</i> L.	Deadly Nightshade	Common
SCROPHULARIACEAE (Figwort Family)		
<i>Linaria vulgaris</i> Mill.	Toadflax	Common
<i>Verbascum thapsus</i> L.	Mullein	Common
<i>Veronica peregrina</i> L. subsp. <i>peregrina</i>	Purslane Speedwell	Uncommon [adventive?]
<i>Veronica serpyllifolia</i> L.	Thyme-leaved Speedwell	Common
PLANTAGINACEAE (Plantain Family)		
<i>Plantago major</i> L.	Common Plantain	Common
RUBIACEAE (Bedstraw Family)		
<i>Galium mollugo</i> L.	White Bedstraw	Common
<i>Galium palustre</i> L.	Marsh Bedstraw	Common
CAPRIFOLIACEAE (Honeysuckle Family)		
<i>Lonicera tatarica</i> L.	Tartarian Honeysuckle	Common
<i>Sambucus racemosa</i> L. subsp. <i>pubens</i> (Michx.) Hultén	Red Elderberry	Common
<i>Viburnum acerifolium</i> L.	Maple-leaf Viburnum	Common
<i>Viburnum lentago</i> L.	Southern Wild-raisin	Common
<i>Viburnum rafinesquianum</i> Schult.	Northern Arrow-wood	Common
<i>Viburnum trilobum</i> Marsh.	Highbush-cranberry	Uncommon
CUCURBITACEAE (Gourd Family)		
<i>Echinocystis lobata</i> (Michx.) Torr. & A.Gray	Wild Cucumber	Common
ASTERACEAE (Aster Family)		
<i>Anthemis cotula</i> L.	Mayweed	Common
<i>Arctium lappa</i> L.	Great Burdock	Uncommon
<i>Arctium minus</i> (Hill) Bernh.	Common Burdock	Common

Scientific Name	Common Name	Brunton (2005)
<i>Artemisia vulgaris</i> L.	Mugwort	Common
<i>Bidens cernuus</i> L.	Nodding Beggarticks	Common
<i>Bidens frondosa</i> L.	Large-leaved Beggarticks	Common
<i>Centaurea nigra</i> L.	Black Knapweed	Rare
<i>Cichorium intybus</i> L.	Chickory	Common
<i>Cirsium arvense</i> (L.) Scop.	Canada Thistle	Common
<i>Cirsium vulgare</i> (Savi) Ten.	Bull Thistle	Common
<i>Crepis tectorum</i> L.	Hawk's-beard	Uncommon
<i>Erigeron annuus</i> (L.) Pers.	Daisy Fleabane	Common
<i>Gnaphalium uliginosum</i> L.	Mud Cudweed	Uncommon
<i>Hieracium aurantiacum</i> L.	Orange Hawkweed	Common
<i>Lactuca scariola</i> L.	Prickly-lettuce	Common
<i>Leucanthemum vulgare</i> Lam.	Ox-eye Daisy	Common
<i>Senecio vulgaris</i> L.	Common Groundsel	Uncommon
<i>Solidago canadensis</i> L.	Canada Goldenrod	Common
<i>Solidago rugosa</i> Mill.	Rough Goldenrod	Common
<i>Tanacetum vulgare</i> L.	Tansy	Uncommon
<i>Taraxacum officinale</i> F.H.Wiggers	Common Dandelion	Common
<i>Tragopogon pratensis</i> L.	Goat's-beard	Common

**Appendix B: Tree Conservation Report for the Proposed Development of Site 1 of the
National Capital Business Park at 4120 Russell Road, Ottawa**



Tree Conservation Report for the Proposed Development of Site 1 of the National Capital Business Park at 4120 Russell Road, Ottawa, Ontario

Draft Report

July 31, 2020

Submitted to:
R. Michel Pilon
AVENUE31
236 Metcalfe Street, Unit 206
Ottawa, ON
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KILGOUR & ASSOCIATES LTD.
www.kilgourassociates.com
Project Number: AVE 866.1



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List of Acronyms and Abbreviations

CRZ – Critical root zone
KAL – Kilgour & Associates Ltd.
NCC – National Capital Commission
RVCA – Rideau Valley Conservation Authority
TCR – Tree Conservation Report



1.0 INTRODUCTION

Kilgour & Associates Ltd. (KAL) was retained by AVENUE31 to provide a Tree Conservation Report (TCR) for the proposed development of Site 1 of the National Capital Business Park at 4120 Russell Road in Ottawa, Ontario. The purpose of a TCR is to demonstrate how tree cover will be retained on sites subject to development using a “design with nature approach” to planning and engineering. A design with nature approach incorporates natural features of a site into the design and engineering of a proposed development. This TCR has been prepared following the City of Ottawa’s guidelines (2018a). This report identifies and describes tree cover on Site 1 prior to its proposed development.

A TCR is required for all Plans of Subdivision, Site Plan Control Applications, Common Elements Condominium Applications, and Vacant Land Condominium Applications where there is a tree of 10 cm in diameter at breast height (DBH) or greater on the site and/or if there is a tree on an adjacent site that has a critical root zone (CRZ) extending onto the development site. A “tree” is defined as any species of woody perennial plant, including its root system, which has reached or can reach a minimum height of at least 450 cm at physiological maturity. The CRZ is calculated as DBH x 10 cm.

The removal of trees on Site 1 cannot occur until written approval of the TCR has been granted through a tree permit as per the City of Ottawa’s Tree Protection By-law. The approval of the TCR will come in the form of a letter (the tree permit) from the General Manager¹ with conditions specific to the site, tree retention, and associated tree protection and tree removal. The approved TCR is a requirement for the approval of the development applications listed above. A copy of the report must be available on-site during tree removal, grading, construction, or any other site alteration activities, and for the duration of construction on the site.

2.0 PROPERTY INFORMATION

Site 1 is composed of three parcels:

- The northeastern portion of 4120 Russell Road;
- The northeastern portion of the parcel directly southeast of 4120 Russell Road; and
- 4224 Russell Road.

In addition to the parcels above, Site 1 also includes the proposed location of an access road connecting Russell Road to Hunt Club Road along the northern and western boundaries of 4120 Russell Road and the right-of-way south of the western border of 4120 Russell Road to Hunt Club Road. Note that the southernmost portion of the road allowance falls on City of Ottawa lands; the rest of the site falls on NCC lands. For the purposes of this report, all three of the above parcels and the proposed location of the road will be referred to as “Site 1”.

Site 1 is approximately 6 ha (including the road allowance) and is split into two zoning designations: IH – Heavy Industrial Zone and AG – Agricultural Zone. The Heavy Industrial Zone is intended for industrial

¹ General Manager of the Public Works & Environmental Services Department or the General Manager of the Planning, Infrastructure and Economic Development Department of the City of Ottawa, or their designate.



development with a wide range of uses, and the Agricultural Zone is intended for agricultural, forestry, and related accessory uses. Site 1 is bordered by:

- Heavy industrial lands and Russell Road to the north;
- Hunt Club Road and agricultural and wooded lands to the east;
- A City-owned stormwater management pond to the south; and
- NCC-owned lands to the west (Site 2 of the proposed National Capital Business Park) dominated by fallow field.



At the time of writing this report, Site 1 predominantly consisted of fallow fields which were used for crops until approximately 2012 (based on aerial imagery; geoOttawa, 2020; Google Earth Pro). Trees on Site 1 are limited to hedgerows/clusters along the periphery of the site. Most trees on Site are less than 60 years old, except for a few trees in a hedgerow on the northwestern edge of the site. Some of the trees in this hedgerow existed prior to 1965 and thus the oldest trees here are over 60 years old (geoOttawa, 2020).





Figure 1 Map showing existing conditions of Site 1 at 4120 Russell Road, Ottawa

Legend

-  Site 1
-  Property Lines



0 100 m

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Checked By: Katie Black
Universal Transverse Mercator - Zone 18 (N)
Printed on: 2020-07-29



2.1 Property Owner and Applicant Contact Information

Table 1 Organization, role, contact person, phone number, and email address for property owner and applicant

Organization	Role	Contact Person	Phone Number	Email Address
National Capital Commission	Property owner	Bill Leonard	(613) 239-5678 x5728	Bill.Leonard@ncc-ccn.ca
National Capital Commission	Property owner	Jennifer Halsall	(613) 239-5678 x5589	Jennifer.Halsall@ncc-ccn.ca
AVENUE31 and National Capital Business Park Inc.	Developer and project entity, respectively (Applicant)	Michel Pilon	(613) 850-3132	mpilon@ave31.com

Table Notes: AVENUE31 has leased the land from the National Capital Commission.

2.2 Arborist Contact Information and Qualifications

Table 2 Organization, role, contact person, phone number, and email address for arborists

Organization	Role	Contact Person	Phone Number	Email Address
KAL	Biologist	Katherine Black	(613) 260-5555	kblack@kilgourassociates.com
KAL	Biologist	Anthony Francis	(613) 260-5555	afrancis@kilgourassociates.com
KAL	Biologist and Certified Arborist with the International Society of Arboriculture	Ed Malindzak	(613) 260-5555	emalindzak@kilgourassociates.com



Katherine Black has over six years of comprehensive field experience in biology and has worked in a variety of field settings, including undisturbed natural environments, construction sites, and greenhouses. Ms. Black's background is predominantly in vegetation ecology; she has performed vegetation surveys in a variety of natural and disturbed environments, including wetland, tundra, field, and forest environments. Since joining KAL in 2019, Ms. Black has contributed to numerous Environmental Impact Statements and TCRs. Ms. Black is also a certified Butternut Health Assessor (BHA #731).

Anthony Francis, Ph.D. is a Senior Ecologist with 20 years' consulting experience to both government agencies and private industry. He has worked on a diversity of projects relating to species at risk, invasive species, terrestrial and aquatic habitat, environmental effects monitoring and mitigation, and fate/effects of contaminants. Within each of these subject areas, Dr. Francis has completed projects addressing specific site concerns and broader policy initiatives. Dr. Francis's academic background is in spatial ecology with a focus on tree species diversity. As a Senior Ecologist at KAL, he regularly completes Tree Conservation Reports, Environmental Impact Statements, Integrated Environmental Reviews for land development projects throughout Ottawa and Eastern Ontario. He is also a certified Butternut Health Assessor (BHA #104).

Ed Malindzak, MSC is a Senior Biologist and International Society of Arboriculture Certified Arborist. Ed has extensive experience in conducting environmental surveys, tree inventories, habitat assessments, and inventories for Environmental Assessments (EA), Environmental Impact Statements (EIS), and environmental baseline studies within the City of Ottawa.

2.3 Additional Applications

The Master-level Site Plan Control Application for the proposed development of the National Capital Business Park (the entire proposed development spanning three sites at 4120 Russell Road and 4055 Russell Road) was submitted to the City of Ottawa in March 2020. The City of Ottawa and Rideau Valley Conservation Authority (RVCA) provided technical comments addressing the site plan and concerns regarding landscaping, engineering, natural heritage, transportation, and stormwater management on June 25, 2020. Based on their review, the City of Ottawa deemed the submission incomplete and RVCA recommended the application be placed on hold until all technical comments are addressed.

3.0 EXISTING CONDITIONS

3.1 Tree Inventory

A detailed inventory of the trees on Site 1 was performed on June 25 and July 10, 2020 following the City of Ottawa's TCR guidelines (2018a). At the request of NCC, all trees with a diameter at breast height (DBH) ≥ 10 cm having potential to be removed under the proposed development were identified, enumerated, mapped, their DBH measured, and their general health and condition documented (Appendix A, Figure 2). Trees on site are dominated by Green Ash (*Fraxinus pennsylvanica*), followed by American Elm (*Ulmus americana*) and Manitoba Maple (*Acer negundo*; Table 3).






Figure 2 Map showing existing vegetation on Site 1 of the proposed National Capital Business Park at 4120 Russell Road, Ottawa

Legend

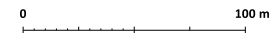
-  Site 1
-  Property Lines

ELC

-  CUM1-1
-  CUW1
-  MAM2-1
-  FODM11

Tree Numbers

-  NCC Tree
-  City Tree



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Table 3 Tree species count and percent composition for Site 1 based on the detailed tree inventory

Species	Count	Percent Composition
American Elm (<i>Ulmus americana</i>)	38	15.5
Balsam Poplar (<i>Populus balsamifera</i>)	0	0.0
Basswood (<i>Tilia americana</i>)	0	0.0
Black Ash (<i>Fraxinus nigra</i>)	9	3.7
Black Cherry (<i>Prunus serotina</i>)	2	0.8
Blue Spruce (<i>Picea pungens</i>)	0	0.0
Bur Oak (<i>Quercus macrocarpa</i>)	6	2.4
Common Apple (<i>Malus</i> sp.)	1	0.4
Crack Willow (<i>Salix fragilis</i>)	1	0.4
Eastern White Cedar (<i>Thuja occidentalis</i>)	2	0.8
European Buckthorn (<i>Rhamnus cathartica</i>)	4	1.6
Green Ash (<i>Fraxinus pennsylvanica</i>)	104	42.4
Ironwood (<i>Ostrya virginiana</i>)	0	0.0
Largetooth Aspen (<i>Populus grandidentata</i>)	1	0.4
Manitoba Maple (<i>Acer negundo</i>)	34	13.9
Red Maple (<i>Acer rubrum</i>)	0	0.0
Red Pine (<i>Pinus resinosa</i>)	0	0.0
River Birch (<i>Betula nigra</i>)	0	0.0
Siberian Elm (<i>Ulmus pumila</i>)	9	3.7
Silver Maple (<i>Acer saccharinum</i>)	0	0.0
Sugar Maple (<i>Acer saccharum</i>)	0	0.0
Snag	17	6.9
Tamarack (<i>Larix laricina</i>)	0	0.0
Trembling Aspen (<i>Populus tremuloides</i>)	1	0.4
White Poplar (<i>Populus alba</i>)	15	6.1
White Willow (<i>Salix alba</i>)	1	0.4
SUM	245	100.0

3.1.1 Ecological Significance of Trees on Site

The trees on Site 1 are not considered to be of ecological significance. Trees in the northwestern hedgerow (FODM11) and in the treed cluster near Hunt Club Road (CUW1) likely buffer the site from some noise and light pollution from industrial facilities and surrounding roads. However, most of the periphery of the site is not treed and is exposed to disturbance associated with the surrounding developed landscape. These trees provide some shading as well as habitat structure. However, the trees on Site 1 are likely to only provide



habitat for common bird and small mammal species in the Ottawa area and not species of significance (i.e., species that are at risk, rare, or provincially or federally significant).

Site 1 contains several dying/dead trees and snags with cavities and/or peeling bark that may be suitable for bat roosting (Appendix A). However, potentially suitable trees are in low density and are not in a naturalized forest or woodland form (i.e., not a large, dense stand of trees comprising typical wooded bat roosting habitat; treed communities on Site 1 originated from culturally based disturbances). Habitats with the Deciduous Forest (FOD) Ecological Land Classification (ELC) code (Lee et al., 1998) are considered candidate Significant Wildlife Habitat for bat maternity colonies (MNRF, 2011; 2015). The hedgerow on the northwestern edge of Site 1 is classified as a Naturalized Deciduous Hedgerow Ecosite (FODM11) and falls under the FOD class, but is not considered by KAL as a candidate Significant Wildlife Habitat because it is a hedgerow surrounded by open habitat. This hedgerow is less than 1 ha in area. The Significant Wildlife Habitat Criterion Schedules for Ecoregion 6E (MNRF, 2015) indicate that candidate maternity colonies are typically found in mature deciduous or mixed forest stands with greater than 10 trees with DBH > 25 cm per hectare. Site 1 contains 34 trees with DBHs > 25 cm that are potentially suitable for bat roosting (Appendix A). However, the small sizes of the treed communities on Site 1 (FODM11: ~0.6 ha, CUW1: ~0.4 ha) would render them as having a low potential to support maternity colonies. As such, there is very low potential for maternity roosting colonies to occur on or adjacent to Site 1.

3.2 Other Natural Environment Elements

3.2.1 Surface Water Features

Site 1 does not contain any headwater features. The only surface water feature identified on Site 1 is a small (0.28 ha) wet depression towards the northeastern edge of the site (MAM2-1 on Figure 2). The wet depression is not a true wetland as defined in the Ontario Wetland Evaluation System (MNRF, 2014) or ELC (Lee et al., 1998). This feature has no trees.

3.2.2 Steep Slopes

The existing ground surface across Site 1 is generally level at approximate geodetic elevation 69 to 70 m, except for a hill that borders the southwestern edge of Site 1 which slopes up to geodetic elevation 79 m (Paterson Group Inc., 2020).

3.2.3 Valued Woodlots

Site 1 does not contain any woodlots designated as Urban Natural Features or Natural Environment Areas, areas evaluated in the Urban Natural Areas Environmental Evaluation Study (UNAEES), or other areas that meet the criteria used in the UNAEES.

3.2.4 Significant Woodlands

Site 1 does not contain any significant woodlands per the City of Ottawa's significant woodland guidelines (2018b).



3.2.5 Distinctive Trees

Site 1 does not contain any distinctive trees (i.e., trees with a DBH \geq 50 cm located on private property; Appendix A).

3.2.6 Hazardous Trees

Site 1 contains 134 dead trees and/or snags that are recommended for removal (Appendix A).

3.2.7 Unique Ecological Features

Site 1 does not contain any riparian woodlots, rare communities, or other unique ecological features.

3.2.8 Species at Risk

The potential for SAR to occur on Site 1 and interact with the proposed development was assessed based on our review of existing information, ELC delineations (habitat assessment), and field surveys conducted in 2019 and 2020. Barn Swallow (*Hirundo rustica*) was assessed as having a moderate to high potential to interact with the proposed development, and Bobolink (*Dolichonyx oryzivorus*) and Eastern Meadowlark (*Sturnella magna*) were assessed as having a low to moderate potential. No species at risk were directly observed on Site 1, nor do any of their legally protected habitats occur on Site 1.

4.0 PROPOSED DEVELOPMENT

The proposed National Capital Business Park is a business and industrial park intended to service the warehousing, data communications centres, distribution, and employment needs of the National Capital Region by providing over 100,000 m² of new build-to-suit office, warehouse, and industrial space on approximately 40 ha of urban land spanning 4120 and 4055 Russell Road. The National Capital Business Park will be composed of three distinct sites and developments planned and designed as a cohesive industrial park through urban design, landscape architecture, and architecture.

Site 1 at 4120 Russell Road (the subject site) has a proposed building area of 8,325 m² and will consist of a warehouse building with office space ("Building C") and parking (Figure 3). The proposed development also involves the construction of an access road ("Last Mile Drive") connecting Russell Road to Hunt Club Road along the northern edge of Site 1 and the adjacent site to the west, and along the western edge of the adjacent site.

4.1 Proposed Schedule

Site preparation (e.g., vegetation removal and grading) is proposed to occur in November 2020. Construction is proposed to start in April 2021 with a completion date of September 2021.

The proposed development is expected to require the removal of 205 trees; 122 of these trees are dead and/or are snags (Appendix A).







Figure 3 Map of the proposed development of Site 1 of the National Capital Business Park at 4120 Russell Road, Ottawa

Retained/Removed Trees


Retained

Removed

 Site 1

 Property Lines

N



0 100 m

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Universal Transverse Mercator - Zone 18 (N)
Printed on: 2020-07-29



5.0 MITIGATION MEASURES

5.1 Site Preparation and Construction

The following mitigation measures must be applied during site preparation and construction:

- Tree removal on Site 1 should be limited to that which is necessary to accommodate construction.
- Tree and vegetation clearing should not take place during sensitive times of the year for wildlife (breeding season; early spring throughout summer) unless mitigation measures are implemented and/or the habitat has been inspected by a qualified Biologist.
- The *Migratory Birds Convention Act*, 1994 protects the nests and young of migratory breeding birds in Canada. The NCC recognizes April 1 to August 31 as the breeding bird period for the Ottawa area (personal communication, Tiera Zukerman, February 5, 2020). As such, clearing of trees or vegetation should not take place between April 1 and August 31, unless a qualified Biologist has determined that no nesting is occurring within 5 days prior to the clearing (City of Ottawa, 2015).
- To minimize impacts to remaining trees during development:
 - Erect a fence beyond the CRZ of retained trees. The fence should be highly visible (orange construction fence) and paired with erosion and sediment control fencing. Pruning of branches is recommended in areas of potential conflict with construction equipment;
 - Do not place any material or equipment within the CRZ of trees unless otherwise approved by the General Manager;
 - Do not attach any signs, notices, or posters to any trees unless otherwise approved by the General Manager;
 - Do not raise or lower the existing grade within the CRZ of trees unless otherwise approved by the General Manager;
 - Do not extend any hard surface or significantly change landscaping within the CRZ of trees unless otherwise approved by the General Manager;
 - Do not damage the root system, trunk, or branches of any remaining trees unless otherwise approved by the General Manager;
 - Use tunneling or boring when digging within the CRZ of a tree; and
 - Ensure that exhaust fumes from equipment are not directed towards any tree's canopy.

5.2 Tree Planting Recommendations

The following tree and shrub species are recommended for planting for Site 1 to help offset vegetation loss. These tree and shrub species must be used to direct the development of the Landscape Plan for Site



1. The following species are appropriate given site conditions and are native and non-invasive: Alternate-leaf Dogwood (*Cornus alternifolia*), American Beech (*Fagus grandifolia*), Balsam Poplar, Basswood, Bitternut Hickory (*Carya cordiformis*), Black Cherry, Black Walnut (*Juglans nigra*), Bur Oak, Chokecherry (*Prunus virginiana*), Eastern White Cedar, Eastern White Pine (*Pinus strobus*), Flowering Dogwood (*Cornus florida*), Hawthorns (*Crataegus* sp.), Ironwood, Largetooth Aspen, Peachleaf Willow (*Salix amygdaloides*), Red Maple, Red Oak (*Quercus rubra*), Serviceberries (*Amelanchier* spp.), Silver Maple, Sugar Maple, Tamarack, Trembling Aspen, White Birch (*Betula papyrifera*), and White Oak (*Quercus alba*).

Tree planting must follow the guidelines provided in *Tree Planting in Sensitive Marine Clay Soils* (City of Ottawa, 2017) by using trees with low water demand and planting trees at a distance equivalent to the full mature height of a tree from a building or foundation structure.

Additional trees and shrubs should be planted along the hill slope that borders the southwestern edge of Site 1 to stabilize the slope.

6.0 CLOSURE

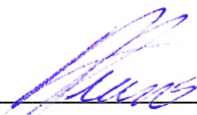
This report was prepared for exclusive use by AVENUE31 and may be distributed only by AVENUE31. Questions relating to the data and interpretation can be addressed to the undersigned.

Respectfully submitted,


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**Appendix A Summarized results of the detailed tree inventory performed for Site 1 of the
National Capital Business Park at 4120 Russell Road, Ottawa**



Tree No.	Species	No. Stems	DBH (cm)	General Health	To be Removed or Retained?
1	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	38	Dead upper crown; lower epicormic branching; covered in wild grape	Removed
2	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	16	Dead upper crown; lower epicormic branching; covered in wild grape; sloughing bark	Removed
3	Green Ash (<i>Fraxinus pennsylvanica</i>)	2	10.2	Dead upper crown; sloughing bark	Retained
8	White Poplar (<i>Populus alba</i>)	1	19	Healthy	Removed
9	White Poplar (<i>Populus alba</i>)	1	13.5	Healthy	Removed
10	White Poplar (<i>Populus alba</i>)	3	22.4	Healthy	Removed
11	White Poplar (<i>Populus alba</i>)	1	10	Healthy	Removed
12	White Poplar (<i>Populus alba</i>)	1	17.5	Healthy	Removed
13	White Poplar (<i>Populus alba</i>)	1	13.5	Healthy	Removed
14	White Poplar (<i>Populus alba</i>)	1	18.5	Healthy	Removed
15	White Poplar (<i>Populus alba</i>)	1	22	Healthy	Removed
16	White Poplar (<i>Populus alba</i>)	1	11.8	Healthy	Removed
17	White Poplar (<i>Populus alba</i>)	1	22.6	Healthy	Removed
18	White Poplar (<i>Populus alba</i>)	1	17	Healthy	Removed
19	White Poplar (<i>Populus alba</i>)	3	16.7	Healthy	Removed
20	White Poplar (<i>Populus alba</i>)	1	11.7	Healthy	Removed
21	White Poplar (<i>Populus alba</i>)	1	9.8	Healthy	Removed
24	White Poplar (<i>Populus alba</i>)	1	72.8	Crown dieback	Removed
60	Black Ash (<i>Fraxinus nigra</i>)	2	27	Dead crown; lower epicormic branching	Removed
61	Black Ash (<i>Fraxinus nigra</i>)	1	14.4	Dead crown; lower epicormic branching	Removed
62	Green Ash (<i>Fraxinus pennsylvanica</i>)	2	18	Dead upper crown; lower epicormic branching	Removed
63	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	25.1	Healthy	Removed
64	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	11.6	Healthy	Removed
65	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	17	Healthy	Removed
66	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	11.8	Healthy	Removed



Tree No.	Species	No. Stems	DBH (cm)	General Health	To be Removed or Retained?
67	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	26.2	Healthy	Removed
69	Green Ash (<i>Fraxinus pennsylvanica</i>)	2	13	Dead; still has bark	Removed
70	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	22	Dead; still has bark	Removed
71	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	23	Dead; peeling bark	Removed
72	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	11	Dead; sloughing bark	Removed
79	Black Ash (<i>Fraxinus nigra</i>)	1	13.6	Dead; main trunk is snapped; sloughing bark	Removed
80	Black Ash (<i>Fraxinus nigra</i>)	1	13.8	Healthy	Removed
81	Black Ash (<i>Fraxinus nigra</i>)	2	21.5	Dead; still has bark	Removed
82	Black Ash (<i>Fraxinus nigra</i>)	1	21.2	Dead; snapped trunk; still has bark	Removed
83	Black Ash (<i>Fraxinus nigra</i>)	1	10.4	Dead crown; still has bark; cavities on lower half of trunk	Removed
84	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	15.6	Dead; still has bark	Removed
85	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	18.4	Dead; still has bark	Removed
86	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	22	Dead; still has bark	Removed
87	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	15.6	Dead; still has bark	Removed
88	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	18.7	Dead; still has bark	Removed
89	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	16	Dead; still has bark	Removed
90	Snag	1	19.2	Still has bark	Removed
95	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	11	Dead; still has bark	Removed
96	Eastern White Cedar (<i>Thuja occidentalis</i>)	1	27	Peeling bark; signs of insect predation	Removed
97	Eastern White Cedar (<i>Thuja occidentalis</i>)	1	39.4	Dead crown; signs of insect predation	Removed
98	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	11.3	Dead crown	Removed
99	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	10.9	Dead crown	Removed
100	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	14.1	Healthy	Removed
101	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	12.9	Dead crown	Removed
102	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	10.1	Dead crown; lower epicormic branching	Removed
107	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	10.5	Dead crown	Removed



Tree No.	Species	No. Stems	DBH (cm)	General Health	To be Removed or Retained?
111	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	21.4	Dead crown	Removed
112	Crack Willow (<i>Salix fragilis</i>)	1	25.8	Healthy	Removed
114	Black Ash (<i>Fraxinus nigra</i>)	1	14.8	Dead crown; lower epicormic branching	Removed
119	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	24.4	Dead crown	Removed
120	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	22.3	Dead crown; lower epicormic branching	Removed
128	Manitoba Maple (<i>Acer negundo</i>)	1	13.2	Lower branch dieback	Removed
139	Snag	6	14.5	Peeling bark; covered in wild grape	Removed
141	American Elm (<i>Ulmus americana</i>)	1	27	Dead; no bark	Removed
142	American Elm (<i>Ulmus americana</i>)	1	30.4	Lower branch dieback	Removed
143	Green Ash (<i>Fraxinus pennsylvanica</i>)	5	13.9	Dead crown; lower epicormic branching	Removed
144	Green Ash (<i>Fraxinus pennsylvanica</i>)	2	11.2	Dead crown; lower epicormic branching	Removed
145	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	14.1	Dead crown; lower epicormic branching	Removed
146	Green Ash (<i>Fraxinus pennsylvanica</i>)	2	15	Dead crown; lower epicormic branching	Removed
147	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	11.3	Dead crown; lower epicormic branching	Removed
148	Green Ash (<i>Fraxinus pennsylvanica</i>)	3	15.5	Dead crown; lower epicormic branching	Removed
149	Green Ash (<i>Fraxinus pennsylvanica</i>)	3	12.5	Healthy	Removed
150	Green Ash (<i>Fraxinus pennsylvanica</i>)	2	12.9	Healthy	Removed
151	Green Ash (<i>Fraxinus pennsylvanica</i>)	5	19	Healthy	Removed
152	Green Ash (<i>Fraxinus pennsylvanica</i>)	5	13.6	Dead crown; lower epicormic branching	Removed
153	Green Ash (<i>Fraxinus pennsylvanica</i>)	3	13.3	Healthy	Removed
154	Black Ash (<i>Fraxinus nigra</i>)	5	19.1	Peeling bark; covered in wild grape	Removed
155	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	12.1	No crown	Removed
156	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	12	Dead crown	Removed
157	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	15.9	Dead crown	Removed
158	American Elm (<i>Ulmus americana</i>)	1	14.8	Healthy	Removed
159	Manitoba Maple (<i>Acer negundo</i>)	1	15.1	Peeling bark	Removed



Tree No.	Species	No. Stems	DBH (cm)	General Health	To be Removed or Retained?
160	Manitoba Maple (<i>Acer negundo</i>)	2	16.3	Crown dieback	Removed
161	Green Ash (<i>Fraxinus pennsylvanica</i>)	5	14.3	Dead crown; lower epicormic branching	Removed
162	Green Ash (<i>Fraxinus pennsylvanica</i>)	5	16.3	Dead crown; lower epicormic branching	Removed
163	Manitoba Maple (<i>Acer negundo</i>)	4	16.6	Healthy	Removed
164	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	13.5	Dead crown	Removed
165	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	14.1	Dead crown	Removed
166	Green Ash (<i>Fraxinus pennsylvanica</i>)	4	14.6	Healthy	Removed
167	Green Ash (<i>Fraxinus pennsylvanica</i>)	3	11	Dead crown	Removed
168	Green Ash (<i>Fraxinus pennsylvanica</i>)	3	21	Dead crown; sloughing bark	Removed
169	American Elm (<i>Ulmus americana</i>)	8	14.3	Dead; no bark	Removed
174	Green Ash (<i>Fraxinus pennsylvanica</i>)	3	17.7	Dead crown; lower epicormic branching	Removed
175	Bur Oak (<i>Quercus macrocarpa</i>)	1	26.2	Healthy	Removed
176	Green Ash (<i>Fraxinus pennsylvanica</i>)	4	23.4	Dead crown; lower epicormic branching	Removed
177	Manitoba Maple (<i>Acer negundo</i>)	4	15.6	One stem is dead	Removed
178	American Elm (<i>Ulmus americana</i>)	1	17.6	Healthy	Removed
179	Snag	2	19	Peeling bark	Removed
180	American Elm (<i>Ulmus americana</i>)	2	23	Healthy	Removed
181	Green Ash (<i>Fraxinus pennsylvanica</i>)	2	13.5	Dead crown; lower epicormic branching	Removed
182	Snag	1	12	Healthy	Removed
183	Manitoba Maple (<i>Acer negundo</i>)	1	13	Healthy	Removed
184	Manitoba Maple (<i>Acer negundo</i>)	3	30	Healthy	Removed
185	Manitoba Maple (<i>Acer negundo</i>)	2	44	Healthy	Removed
186	Manitoba Maple (<i>Acer negundo</i>)	2	37	Healthy	Removed
187	Snag	1	45	No bark	Removed
188	American Elm (<i>Ulmus americana</i>)	1	18.9	Healthy	Removed
189	Manitoba Maple (<i>Acer negundo</i>)	17	22.3	Healthy	Removed
190	Snag	1	15	No bark	Removed



Tree No.	Species	No. Stems	DBH (cm)	General Health	To be Removed or Retained?
191	Manitoba Maple (<i>Acer negundo</i>)	5	18.4	Healthy	Removed
192	Manitoba Maple (<i>Acer negundo</i>)	3	22.5	Healthy	Removed
193	Snag	1	23.8	No bark	Removed
258	American Elm (<i>Ulmus americana</i>)	1	15.9	Healthy	Removed
259	American Elm (<i>Ulmus americana</i>)	1	13.4	Healthy	Removed
260	Bur Oak (<i>Quercus macrocarpa</i>)	1	19.6	Healthy	Removed
261	Bur Oak (<i>Quercus macrocarpa</i>)	1	23.2	Healthy	Removed
262	Manitoba Maple (<i>Acer negundo</i>)	3	25.5	Significant crown dieback and damage	Retained
263	Manitoba Maple (<i>Acer negundo</i>)	3	38.4	Dead crown; peeling bark	Removed
264	Snag	1	10.6	No bark	Removed
265	American Elm (<i>Ulmus americana</i>)	1	21	Dead; no bark	Removed
266	American Elm (<i>Ulmus americana</i>)	1	25.5	Dead; no bark	Removed
267	Snag	3	12.9	No bark	Retained
268	American Elm (<i>Ulmus americana</i>)	1	20.3	Healthy	Retained
269	Bur Oak (<i>Quercus macrocarpa</i>)	1	14.6	Dead; no bark	Retained
270	Bur Oak (<i>Quercus macrocarpa</i>)	1	18.9	Healthy	Retained
271	Snag	1	13.1	No bark	Retained
272	Manitoba Maple (<i>Acer negundo</i>)	4	29	Dead; no bark	Removed
273	Snag	1	28.1	No bark	Removed
274	Snag	1	32	No bark	Removed
275	Snag	1	38	Peeling bark	Removed
276	Snag	1	17	No bark	Removed
277	Manitoba Maple (<i>Acer negundo</i>)	2	27	Healthy	Removed
278	Manitoba Maple (<i>Acer negundo</i>)	1	15	Healthy	Removed
279	Bur Oak (<i>Quercus macrocarpa</i>)	1	31.2	Healthy	Removed
282	Manitoba Maple (<i>Acer negundo</i>)	1	14.3	Healthy	Removed
283	Manitoba Maple (<i>Acer negundo</i>)	1	17	Forked	Removed
317	Manitoba Maple (<i>Acer negundo</i>)	3	12.4	Healthy	Retained
318	American Elm (<i>Ulmus americana</i>)	1	11	Healthy	Retained



Tree No.	Species	No. Stems	DBH (cm)	General Health	To be Removed or Retained?
319	Manitoba Maple (<i>Acer negundo</i>)	1	12.8	Healthy	Retained
320	Manitoba Maple (<i>Acer negundo</i>)	2	13.4	Healthy	Retained
321	Manitoba Maple (<i>Acer negundo</i>)	2	15.6	Healthy	Retained
322	Siberian Elm (<i>Ulmus pumila</i>)	2	14	Healthy	Retained
323	American Elm (<i>Ulmus americana</i>)	1	19.3	Forked	Retained
324	American Elm (<i>Ulmus americana</i>)	1	11.5	Healthy	Retained
325	American Elm (<i>Ulmus americana</i>)	1	17	Healthy	Retained
326	White Willow (<i>Salix alba</i>)	1	33	Healthy	Retained
328	Largetooth Aspen (<i>Populus grandidentata</i>)	1	25.3	Healthy	Removed
329	Siberian Elm (<i>Ulmus pumila</i>)	1	16.7	Forked	Removed
330	Siberian Elm (<i>Ulmus pumila</i>)	1	12.5	Healthy	Removed
331	Manitoba Maple (<i>Acer negundo</i>)	1	11.8	Healthy	Removed
332	Manitoba Maple (<i>Acer negundo</i>)	1	19.3	Forked	Removed
333	Manitoba Maple (<i>Acer negundo</i>)	2	15.4	Healthy	Removed
334	Siberian Elm (<i>Ulmus pumila</i>)	1	13.1	Branch dieback; forked	Removed
335	Siberian Elm (<i>Ulmus pumila</i>)	2	45	Some branch dieback	Removed
336	Siberian Elm (<i>Ulmus pumila</i>)	1	27.3	Healthy	Removed
340	American Elm (<i>Ulmus americana</i>)	1	15.5	Healthy	Removed
341	Siberian Elm (<i>Ulmus pumila</i>)	1	23.5	Healthy	Removed
342	Manitoba Maple (<i>Acer negundo</i>)	1	10.7	Healthy	Removed
343	Siberian Elm (<i>Ulmus pumila</i>)	1	10.5	Healthy	Removed
344	Siberian Elm (<i>Ulmus pumila</i>)	1	11.6	Healthy	Removed
345	Manitoba Maple (<i>Acer negundo</i>)	1	14	Healthy	Removed
346	Manitoba Maple (<i>Acer negundo</i>)	1	12.5	Healthy	Retained
347	American Elm (<i>Ulmus americana</i>)	1	11	Healthy	Retained



Tree No.	Species	No. Stems	DBH (cm)	General Health	To be Removed or Retained?
354	Manitoba Maple (<i>Acer negundo</i>)	1	25.4	Healthy	Removed
355	Manitoba Maple (<i>Acer negundo</i>)	2	13.6	Healthy	Retained
363	Snag	1	22	Sloughing bark	Retained
364	Snag	1	25	Sloughing bark	Retained
365	Manitoba Maple (<i>Acer negundo</i>)	1	27.6	Healthy	Retained
366	American Elm (<i>Ulmus americana</i>)	1	18.5	Healthy	Retained
367	American Elm (<i>Ulmus americana</i>)	1	14	Dead; peeling bark; no leaves	Retained
368	American Elm (<i>Ulmus americana</i>)	1	18.2	Healthy	Retained
369	American Elm (<i>Ulmus americana</i>)	1	14.2	Healthy	Retained
370	American Elm (<i>Ulmus americana</i>)	1	15	Lower branch dieback; forked	Retained
371	American Elm (<i>Ulmus americana</i>)	1	10.6	Healthy	Retained
372	American Elm (<i>Ulmus americana</i>)	1	19.3	Lower branch dieback	Retained
373	American Elm (<i>Ulmus americana</i>)	1	16.8	Healthy	Retained
374	Common Apple	4	24	Healthy	Retained
375	American Elm (<i>Ulmus americana</i>)	1	11	Healthy	Retained
376	American Elm (<i>Ulmus americana</i>)	1	15.7	Healthy	Retained
467	Trembling Aspen	1	13	Healthy; forked	Retained
468	Green Ash (<i>Fraxinus pennsylvanica</i>)	2	34	Dead; peeling bark	Removed
469	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	40	Dead; peeling bark	Removed
470	Manitoba Maple (<i>Acer negundo</i>)	1	78.5	Covered in wild grape; forked	Removed
471	Green Ash (<i>Fraxinus pennsylvanica</i>)	2	24.5	Dead; peeling bark	Removed
472	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	42	Dead; peeling bark	Removed
473	Manitoba Maple (<i>Acer negundo</i>)	1	10.5	Healthy	Removed
474	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	20.5	Dead crown; lower epicormic branching	Removed
475	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	19.5	Dead crown; lower epicormic branching	Removed
476	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	18.2	No crown	Removed
477	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	15.4	Dead crown; lower epicormic branching	Removed



Tree No.	Species	No. Stems	DBH (cm)	General Health	To be Removed or Retained?
478	European Buckthorn (<i>Rhamnus cathartica</i>)	2	14	Healthy	Removed
479	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	18.2	Dead crown; sloughing bark	Removed
480	European Buckthorn (<i>Rhamnus cathartica</i>) European Buckthorn (<i>Rhamnus cathartica</i>) (<i>Rhamnus cathartica</i>)	1	11	Healthy	Removed
481	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	33	Dead crown; lower epicormic branching	Removed
482	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	30.5	Dead crown; lower epicormic branching	Removed
483	European Buckthorn (<i>Rhamnus cathartica</i>)	1	10	Healthy	Removed
484	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	20	Dead crown; lower epicormic branching	Removed
485	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	13	Dead crown; lower epicormic branching	Removed
486	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	13	Dead crown; lower epicormic branching	Removed
487	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	10	Dead crown; lower epicormic branching	Removed
488	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	10	Dead crown; lower epicormic branching	Removed
489	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	16	Dead crown; lower epicormic branching	Removed
490	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	11	Dead crown; lower epicormic branching	Removed
491	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	12	Dead crown; lower epicormic branching	Removed
492	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	19	Dead crown; lower epicormic branching	Removed
493	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	17	Dead crown; lower epicormic branching	Removed
494	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	24.4	Dead crown; lower epicormic branching	Removed
495	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	10	Dead crown; lower epicormic branching	Removed
496	Green Ash (<i>Fraxinus pennsylvanica</i>)	2	10	Dead crown; lower epicormic branching	Removed
497	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	16.4	Dead crown; lower epicormic branching	Removed
498	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	15.5	Dead crown; lower epicormic branching	Removed
499	Green Ash (<i>Fraxinus pennsylvanica</i>)	2	36	Dead crown; lower epicormic branching	Removed
500	Green Ash (<i>Fraxinus pennsylvanica</i>)	2	28	Dead crown; lower epicormic branching	Removed
501	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	25.8	Dead crown; lower epicormic branching	Removed



Tree No.	Species	No. Stems	DBH (cm)	General Health	To be Removed or Retained?
502	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	24	Dead crown; lower epicormic branching	Removed
503	European Buckthorn (<i>Rhamnus cathartica</i>)	1	12.3	Healthy	Removed
504	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	23.8	Dead crown; lower epicormic branching	Removed
505	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	13	Dead crown; lower epicormic branching	Removed
506	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	15	Dead crown; lower epicormic branching	Removed
507	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	27	Dead crown; lower epicormic branching	Removed
508	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	26	Dead crown; lower epicormic branching	Removed
509	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	32	Dead crown; lower epicormic branching	Removed
510	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	38.5	Dead crown; lower epicormic branching	Removed
511	American Elm (<i>Ulmus americana</i>)	1	17	Dead; peeling bark	Removed
512	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	10	Dead; peeling bark	Removed
521	American Elm (<i>Ulmus americana</i>)	1	11.2	Healthy	Removed
522	American Elm (<i>Ulmus americana</i>)	1	14.9	Healthy	Removed
523	American Elm (<i>Ulmus americana</i>)	1	14.5	Dead; peeling bark	Retained
524	American Elm (<i>Ulmus americana</i>)	1	12	Healthy	Removed
525	American Elm (<i>Ulmus americana</i>)	1	13	Healthy	Removed
526	American Elm (<i>Ulmus americana</i>)	1	16.8	Healthy	Removed
527	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	23.9	Dying; still has leaves; sloughing bark	Removed
528	American Elm (<i>Ulmus americana</i>)	1	10.2	Healthy	Removed
529	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	24.6	Dead; peeling bark	Removed
532	American Elm (<i>Ulmus americana</i>)	1	23.7	Dead; still has bark	Removed
533	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	22.6	Dead; peeling bark	Removed
534	Black Cherry (<i>Prunus serotina</i>)	1	34	Healthy	Removed
535	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	32.5	Dead; peeling bark	Retained
536	American Elm (<i>Ulmus americana</i>)	1	43.8	Healthy	Removed
590	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	30.7	Dead; still has bark	Retained



Tree No.	Species	No. Stems	DBH (cm)	General Health	To be Removed or Retained?
591	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	28.6	Dead; still has bark	Retained
596	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	22	Dead; still has bark	Removed
597	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	37	Dead; still has bark	Removed
598	Snag	1	34	Still has bark	Removed
599	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	26.1	Dead; still has bark	Removed
600	Green Ash (<i>Fraxinus pennsylvanica</i>)	2	17.5	Dead; still has bark	Removed
602	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	22.2	Dead; no crown; peeling bark; cavities	Removed
603	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	33.7	Dead; still has bark	Removed
604	Black Cherry (<i>Prunus serotina</i>)	1	16.1	Lower branch dieback	Retained
605	Green Ash (<i>Fraxinus pennsylvanica</i>)	1	39	Dead; still has bark	Removed



**Appendix C: Species at risk potential for Site 1 of the proposed National Capital
Business Park at 4120 Russell Road, Ottawa**



Species Name	Provincial (ESA) Status	Federal (SARA) Status	Habitat Requirement	Habitat on Site 1	Potential to Interact with the Proposed Development of Site 1
Birds					
Bank Swallow (<i>Riparia riparia</i>)	Threatened	Threatened	Nest in banks or earthen walls cut by meandering streams and rivers, but artificial banks may also be used. Foraging occurs over fields, streams, wetlands, farmlands, and still water.	The open fallow field (CUM1-1) on Site 1 and the adjacent site may provide suitable foraging habitat. No available nesting habitat on Site 1. The banks of nearby McEwan Creek are do not provide suitable nesting habitat (heavily vegetated and contain rip-rap). There are no occurrence records within 1 km of Site 1.	Negligible potential.
Barn Swallow (<i>Hirundo rustica</i>)	Threatened	Threatened	Terrestrial open and anthropogenic structures for nesting; near open areas for feeding.	The open fallow field (CUM1-1) on Site 1 may provide suitable foraging habitat. Barn Swallows were observed foraging over the site to the west of Site 1 and the stormwater management pond southwest of Site 1 during breeding bird surveys conducted in 2019 and 2020. There are several buildings and bridges within the vicinity of Site 1 that may provide nesting habitat.	Moderate to high potential.
Bobolink (<i>Dolichonyx oryzivorus</i>)	Threatened	Threatened	Periodically mown, dry meadow for nesting. Habitat (meadow) should be >10 ha, and preferably >30 ha before Bobolink are attracted to the area. Not near tall trees.	The open fallow fields (CUM1-1) on Site 1 and the adjacent site are potentially suitable as nesting and foraging habitat, though the habitat would be marginal at best (the combined area of fallow fields on Site 1 and Site 2 is ~9 ha; these fields are separated by a hill slope and a cluster of tall trees). NCC Biologists observed	Low to moderate potential.



				Bobolinks < 500 m north of Site 1 in 2019 early in the breeding season. No Bobolinks were observed on or near Site 1 during KAL's breeding bird surveys subsequently in 2019 or 2020. The 2019 NCC observations are thus considered to be of transient individuals.	
Canada Warbler (<i>Wilsonia Canadensis</i>)	Special Concern	Threatened	Prefers to nest in a range of wet forest types with a well-developed understory.	No suitable habitat on Site 1 or adjacent areas. No occurrence records within 2 km of Site 1.	Negligible potential.
Chimney Swift (<i>Chaetura pelagica</i>)	Threatened	Threatened	Nests in open chimneys and, very rarely, in tree hollows (trees > 60 cm DBH). Tend to forage close to water as this is where the flying insects they eat congregate.	No suitable habitat on Site 1 or adjacent areas. No occurrence records within 2 km of Site 1.	Negligible potential.
Common Nighthawk (<i>Chordeiles minor</i>)	Special Concern	Threatened	Nests in wide variety of open sites, including beaches, fields, and gravel rooftops.	No suitable habitat on Site 1 or adjacent areas. No occurrence records within 2 km of Site 1.	Negligible potential.
Eastern Meadowlark (<i>Sturnella magna</i>)	Threatened	Threatened	Periodically mown, dry meadow for nesting. Habitat (meadow) should be >10 ha, and preferably >30 ha before Eastern Meadowlark are attracted to the area. Not near tall trees.	The open fallow fields (CUM1-1) on Site 1 and the adjacent site are potentially suitable as nesting and foraging habitat, though the habitat would be marginal at best (the combined area of fallow fields on Site 1 and the site to west is ~9 ha; these fields are separated by a hill slope and a cluster of tall trees). KAL observed a single Eastern Meadowlark along the western edge of Site 2 on June 10, 2020.	Low to moderate potential.



Eastern Wood-Pewee (<i>Contopus virens</i>)	Special Concern	Special Concern	Woodland species, often found near clearings and edges.	No suitable habitat on Site 1 or adjacent areas. No occurrence records within 2 km of Site 1.	Negligible potential.
Evening Grosbeak (<i>Coccothraustes vespertinus</i>)	Special Concern	Special Concern	Nests in trees or large shrubs; prefers mature mixed-wood forests dominated by fir species, White Spruce, and/or Trembling Aspen but will also use deciduous forests, parklands, and orchards.	No suitable habitat on Site 1 or adjacent areas. No occurrence records within 2 km of Site 1.	Negligible potential.
Grasshopper Sparrow (<i>Ammodramus savannarum</i>)	Special Concern	Special Concern	Prefers open grasslands with well-drained, sandy soil but will also nest in hayfields, pastures, alvars, prairies, and occasionally grain crops (e.g., barley).	The open fallow field (CUM1-1) on Site 1 may provide nesting and foraging habitat. However, this species was not observed during the two years of breeding bird surveys performed by KAL and there are no occurrence records within 2 km of Site 1.	Negligible potential.
Least Bittern (<i>Ixobrychus exilis</i>)	Threatened	Threatened	Found in large (> 5-10 ha) marshes with tall emergent vegetation (usually cattails), relatively stable water levels (usually 10-50 cm), and about 50% open water interspersed in small pockets throughout vegetated areas.	No suitable habitat on Site 1 or adjacent areas. No occurrence records within 2 km of Site 1.	Negligible potential.
Olive-sided Flycatcher (<i>Contopus cooperi</i>)	Special Concern	Threatened	Found along edges of coniferous and mixed forests often adjacent to rivers or wetlands.	No suitable habitat on Site 1 or adjacent areas. No occurrence records within 2 km of Site 1.	Negligible potential.
Rusty Blackbird (<i>Euphagus carolinus</i>)	Special Concern	Special Concern	Breeds in habitats that are dominated by coniferous forest with wetlands nearby. Often	The open fallow field (CUM1-1) on Site 1 may provide suitable foraging habitat, but this is unlikely given that suitable breeding and nesting	Negligible potential.



			forages in agricultural lands.	habitat does not exist within the vicinity. No occurrence records within 2 km of Site 1.	
Wood Thrush (<i>Hylocichla mustelina</i>)	Special Concern	Threatened	Deciduous or mixed woodlands.	No suitable habitat on Site 1 or adjacent areas. No occurrence records within 2 km of Site 1.	Negligible potential.
Mammals					
Little Brown Bat (<i>Myotis lucifugus</i>)	Endangered	Endangered	Widespread, roosting in trees and buildings. Hibernate in caves or abandoned mines.	Site 1 contains several dying/dead trees and snags (Appendix B) that may be suitable for roosting. However, suitable trees are in low density and not in suitable forest forms (i.e., they are in hedgerows/small clusters). Much more suitable habitat exists in wooded areas south of Hunt Club Road.	Low potential.
Tri-Coloured Bat (<i>Perimyotis subflavus</i>)	Endangered	Endangered	Widespread, roosting in trees and buildings. Hibernate in caves or abandoned mines.	Site 1 contains several dying/dead trees and snags (Appendix B) that may be suitable for roosting. However, suitable trees are in low density and not in suitable forest forms (i.e., they are in hedgerows/small clusters). Much more suitable habitat exists in wooded areas south of Hunt Club Road.	Low potential.
Northern Long-Eared Bat (<i>Myotis septentrionalis</i>)	Endangered	Endangered	Associated with boreal forests, choosing to roost under loose bark and in the cavities of trees. Hibernate in caves or abandoned mines.	No suitable habitat on Site 1 or adjacent areas.	Negligible potential.
Eastern Small-Footed Bat (<i>Myotis leibii</i>)	Endangered	Not at Risk	Coniferous forest in hilly country. Hibernate in smaller caves. Subject to air movement.	No suitable habitat on Site 1 or adjacent areas.	Negligible potential.



Reptiles					
Blanding's Turtle (<i>Emydoidea blandingii</i>)	Threatened	Threatened	Shallow water usually in large wetlands or shallow lakes. Can be found far from water bodies if searching for mates or nesting sites, which usually contain gravel, cobble, and/or sand.	There are occurrence records of Blanding's Turtle within the 10 x 10 km Herp Atlas square that contains Site 1 sometime after 1999 (Ontario Nature, 2019). However, there is no suitable turtle habitat on Site 1, and these occurrences are likely limited to suitable habitat in nearby McEwan Creek and Ramsay Creek. No turtles were observed on Site 1 in 2019 or 2020.	Negligible potential.
Milksnake (<i>Lampropeltis triangulum</i>)	Not at Risk	Special Concern	Found in a variety of habitats but tends to use open habitats such as rocky outcrops, fields, and forest edges. In rural areas this snake may be common, especially around barns where they thrive on abundant mice.	The open fallow field (CUM1-1) on Site 1 may provide habitat. No snakes were observed on Site 1 in 2019 or 2020. There are also no records of Milksnake occurrences within the 10 x 10 km Herp Atlas Square that contains Site 1 (Ontario Nature, 2019).	Negligible potential.
Snapping Turtle (<i>Chelydra serpentina</i>)	Special Concern	Special Concern	Prefers shallow water usually in large wetlands or shallow lakes. Can be found far from water bodies if searching for mates or nesting sites, which usually contain gravel, cobble, and/or sand.	There are records of Snapping Turtle occurrences within the 10 x 10 km Herp Atlas square that contains Site 1 sometime after 1999 (Ontario Nature, 2019b). However, there is no suitable turtle habitat on Site 1, and these occurrences are likely limited to suitable habitat in nearby McEwan Creek and Ramsay Creek. No turtles were observed on Site 1 in 2019 or 2020.	Negligible potential.
Amphibians					
Western Chorus Frog (<i>Pseudacris triseriata</i>)	Not at Risk	Threatened	Forest openings around woodland ponds, damp meadows, bottomland	There is no suitable habitat on Site 1. This species was not observed during Western	Negligible potential.



			swamps, temporary ponds and ditches. Overwinters underground or under surface cover such as fallen logs.	Chorus Frog surveys performed by NCC or amphibian surveys conducted by KAL in 2019 for the broader (Master-level) site of the proposed National Capital Business Park. There are also no occurrence records within the 10 x 10 km Herp Atlas Square that contains Site 1 (Ontario Nature, 2019).	
Vascular Plants					
Butternut (<i>Juglans cinerea</i>)	Endangered	Endangered	Variable but typically on well-drained soils.	No individuals were observed on Site 1 or within 50 m.	Negligible potential.
Arthropods					
Monarch (<i>Danaus plexippus</i>)	Special Concern	Special Concern	Larvae (caterpillars) feed on Milkweed plants (<i>Asclepias</i> spp.) in meadows and open areas where Milkweed grows. Adult butterflies are found in farmlands, meadows, open wetlands, prairies, roadsides, city gardens, and parks where wildflowers provide nectar.	The open fallow field (CUM1-1) on Site 1 may provide suitable feeding habitat for larvae and adults. Milkweed was observed on Site 1, albeit in low abundance. No larvae or adults were observed on Site 1 or Site 2.	Low potential.





Appendix D Qualifications of Report Authors



Katherine Black, MSc

Ms. Black is a Biologist with over six years of comprehensive field, laboratory, and report-writing experience. She has worked in a variety of research settings, including technical laboratories, greenhouses, construction sites, and remote fly-in field sites. Katie's background is predominantly in terrestrial ecology; she has performed vegetation and wildlife surveys in a variety of natural and disturbed environments, including wetland, tundra, field, and forest environments. She has also worked on projects in aquatic ecology, ecohydrology, and biostatistics. Katie joined Kilgour & Associates Ltd. in January of 2019 and has since contributed to numerous Environmental Impact Statements (EIS), Tree Conservation Reports (TCR), Headwater Drainage Feature Assessments (HDFA), Integrated Environmental Reviews (IER), Constraints Analyses, Existing Conditions Reports, delineation of natural heritage features, species at risk (SAR) monitoring, erosion and sediment control inspections, water quality monitoring, fish dissections, and sorting and identification of aquatic macroinvertebrates. Ms. Black is certified in the Ontario Wetland Evaluation System protocol, Ontario Reptile and Amphibian Survey methods, and Butternut Health Assessment (BHA #731).

Anthony Francis, PhD

Dr. Francis is a Senior Ecologist with 20 years' consulting experience to both government agencies and private industry. He has worked on a diversity of projects relating to species at risk, invasive species, terrestrial and aquatic habitat, environmental effects monitoring and mitigation, and fate/effects of contaminants. Within each of these subject areas, Dr. Francis has completed projects addressing specific site concerns and broader policy initiatives.

In the Ottawa area Dr. Francis helps clients work their way through the land development process by producing key supporting studies such as Environmental Impact Statements, Integrated Environmental Reviews, and by obtaining various permits and approvals from local regulatory agencies including the conservation authorities and Ministries of Environment and Natural Resources. Dr. Francis is our local in-house geomatics specialist, capable of carrying out detailed and complex analyses of geospatial data of plant and animal distribution. He often utilizes his skills to carry out constraint studies prior to a client purchasing or planning a development for a property.

Ed Malindzak, MSc

Mr. Malindzak is a Biologist with a background in fisheries science and species at risk and is an International Society of Arboriculture Certified Arborist. Ed has experience in conducting environmental surveys, habitat assessments, and inventories for Environmental Assessments (EA), Environmental Impact Statements (EIS), ecological risk assessments, and environmental baseline studies in many industry sectors, including energy, mining, and transportation. Ed has diverse technical experience that includes several areas of the natural sciences (e.g., aquatic environments, terrestrial wildlife, trees/vegetation). He has extensive experience completing fauna/flora inventories and habitat assessments on urban, rural, and remote environments in coastal, in-land, and mountain regions of North America and the Caribbean. He is experienced in the use and interpretation of descriptive, inferential, and non-parametric statistical analysis of biotic and abiotic data. He is very knowledgeable in federal, provincial, and regional regulations and associated permitting requirements for the *Fisheries Act*, *Species at Risk Act*, *Endangered Species Act*, *Fish and Wildlife Conservation Act*, *Migratory Birds Convention Act*, *Navigation Protection Act*, *Conservation Authorities Act*, and the *National Parks Act*.

