Stittsville South W4 Future Neighbourhood Area – Eder Block: Environmental Impact Study for the Draft Plan of Subdivision

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Final Report

Submitted To:

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List of Acronyms and Abbreviations

BAA – Black Ash Assessment
BHA – Butternut Health Assessment
BHE – Butternut Health Expert Report
cm – centimeters
CRZ – critical root zone
DFO – Department of Fisheries and Oceans (Fisheries and Oceans Canada)
ECCC – Environment and Climate Change Canada
e.g. – *exempli gratia*
EIS – Environmental Impact Study
ELC – Ecological Land Classification
ESC – erosion and sediment control
ESA – *Endangered Species Act*
EWPW – Eastern Whip-poor-will
FWCA – *Fish and Wildlife Conservation Act*
ha – hectare
HDFA – Headwater Drainage Features Assessment
HDF – Headwater Drainage Feature
i.e. – *id est*
KAL – Kilgour & Associates Ltd.
km – kilometer
m – meter
MBCA – *Migratory Birds Convention Act*
MECP – Ministry of Environment, Conservation and Parks
MNRF – Ministry of Natural Resources and Forestry
NHIC – Natural Heritage Information Centre
PPS – Provincial Policy Statement
SAR – species at risk
SARA – *Species at Risk Act*
SWH – Significant Wildlife Habitat

1.0 INTRODUCTION

This report is an Environmental Impact Study (EIS) prepared by Kilgour & Associates Ltd. (KAL; Appendix A) on behalf of Caivan (Stittsville South) Inc. and Caivan (Stittsville West) Ltd. ("the Client") in support of a Draft Plan of Subdivision application for a proposed residential development on the north side of Flewellyn Road west of Shea Road in Stittsville, Ontario. Analysis and review within this EIS consider the entire group of parcels associated with the proposed new community (i.e. with major parcels including 5993 and 6115 Flewellyn Road, and 6070 Fernbank Road), which together constitute "the Site" (Figure 1). This EIS, however, is intended to support the Draft Plan of Subdivision application specifically associated with the portion of the Site referred to as the 'Eder Lands' (Figure 1).

This report builds upon the previously approved Existing Conditions Report, dated January 19, 2024, and the previously approved Updated EIS, dated April 23, 2025, that supported the Zoning By-law Amendment and Official Plan Amendment applications.

This report identifies natural heritage conditions on and adjacent to the Site, outlines the policy context associated with development plans, assesses the potential impacts of the proposed development on existing features, and recommends mitigation measures to minimize or eliminate identified impacts. The content of this EIS was completed per both the *5993 And 6115 Flewellyn Road and 6070 Fernbank Road Environmental Impact Study Terms of Reference* (KAL, 2022), which were developed in consultation with the City staff in 2021/2022 and approved in January 2024, and the *Environmental Impact Study Guidelines* (City of Ottawa, 2023a).

2.0 ENVIRONMENTAL POLICY CONTEXT

2.1 The Provincial Planning Statement, 2024

The Provincial *Policy* Statement (PPS) under which the proposed project was initiated was issued under Section 3 of the Planning Act (Government of Ontario, 1990b) and came into effect May 1, 2020 (Government of Ontario, 2020). Natural features are afforded protection under the PPS including the maintenance, restoration, and improved function of diversity, connectivity, ecological function, and biodiversity of natural heritage systems. These protections restrict development and site alteration in significant natural areas (e.g., woodlands, wetlands, wildlife habitat) unless it can be demonstrated that there will be no negative effects on the features and ecological functions of those natural areas. The PPS also calls for the restriction of development and site alteration on sensitive surface water features. Technical guidance for implementing the natural heritage policies of the PPS is found within the second edition of the Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005 (NHRM; Ministry of Natural Resources (MNR, 2010)).

Figure 1. Site Context

Subsequently, the Province approved the updated Provincial Planning Statement 2024 (MMAH, 2024; herein also "PPS"), which came into effect on October 20, 2024. As such, the 2024 edition will be the relevant planning document when the proposed application is submitted for approval. While the revised PPS is intended to simplify and integrate existing policies to achieve housing objectives while providing tools for municipalities to deliver on housing objectives, the portions of the document related to Natural Heritage considerations have only been renumbered; they have not otherwise been meaningfully changed. Therefore, the revision of the PPS does not impose any relevant changes with respect to Natural Heritage considerations from a policy perspective; for the purposes of this EIS, both PPS documents are effectively equivalent.

2.2 The City of Ottawa Official Plan (2021)

The City of Ottawa Official Plan (OP; City of Ottawa, 2021) was updated and approved by the Ministry of Municipal Affairs and Housing as part of a comprehensive review. Pursuant to subsections 17(36.5) and (38.1) of the Planning Act, the decision of the Minister of Municipal Affairs and Housing regarding an official plan adopted in accordance with section 26 of the Planning Act is final and not subject to appeal. Accordingly, the new City of Ottawa Official Plan, as approved with modifications by the Minister, came into effect on November 4, 2022. The OP provides a vision for the future growth of the city and a policy framework to guide the city's physical development. With respect to natural heritage considerations addressed under an EIS, the OP provides a framework through which species at risk and other wildlife (and their habitats), forested areas, wetlands and surface water features must be reviewed. Key portions of the OP to be considered include:

The Environmental Impact Study Guidelines (City of Ottawa, 2023a) - which outlines study requirements of the EIS;

OP Schedule C11 – which identifies Natural Heritage Features and Natural Heritage System Core Areas and Linkages as an overlay;

OP Section 4.8.1 - under which the City recognizes the following natural heritage features, as defined in Ottawa's Environmental Impact Study Guidelines:

a) Significant wetlands;
b) Habitat for endangered and threatened species;
c) Significant woodlands;
d) Significant valleylands;
e) Significant wildlife habitat;
f) Areas of Natural and Scientific Interest;
g) Urban Natural Features;
h) Natural Environment Areas;
i) Natural linkage features and corridors;
j) Groundwater features;
k) Surface water features, including fish habitat; and
l) Landform features.

Significant Woodlands: Guidelines for Identification, Evaluation, and Impact Assessment (City of Ottawa, 2022b) - which identifies wooded areas within the urban boundary that are > 0.8 hectares (ha) and have been continuously forested for > 60 years as "Significant Woodland'';

OP Section 4.9.3 – which provides policies for development and site alteration near surface water features through the provision of minimum setbacks and directives to retain wetland areas and the requirement to complete headwater drainage feature assessments (HDFA) to provide management recommendations for headwater features; and

The Protocol for Wildlife Protection during Construction (City of Ottawa, 2022a) – which identifies best management practices to be employed through construction to reduce the direct impacts of development on wildlife.

The Upper Poole Creek Rehabilitation Project (Mississippi Valley Conservation Authority, 2019) addresses the nearby Poole Creek Corridor but does not include the Site. The Jock River Reach 2 Subwatershed Study is currently listed as incomplete (City of Ottawa, 2023b) but extends to include the Site. The Jock River Reach 2 Subwatershed Study Existing Conditions Report (Marshall Macklin Monaghan Limited, 2009) identifies measures (e.g. watercourse setbacks) that are either consistent with or directly reiterate measures as provided within the City's Official Plan in place at that time. This EIS thus seeks accordance with the OP.

2.3 Conservation Authorities Act, 1990

Conservation Authorities were created to address erosion, flooding, and drought concerns regionally by managing at the watershed level. Conservation Authorities were given the ability to regulate under Section 28 of the Conservation Authorities Act (CA Act; Government of Ontario, 1990a). The Act obliges Conservation Authorities to implement Ontario Regulation (O.Reg.) 41/24, *Prohibited Activities, Exemptions and Permits* (formerly O.Reg. 174/06, *Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses*) under Section 28.1 of the Conservation Authorities Act for relevant works. This project falls under the jurisdiction of the Rideau Valley Conservation Authority (RVCA).

Bill 23, which was passed on November 28th, 2022, and received Royal Assent the same day, introduced a series of legislative and proposed regulatory changes affecting conservation authorities. It is now in effect. Among the changes under Bill 23, the definition of "watercourse" was updated from an identifiable depression to a defined channel having a bed, and banks or sides.

2.4 Species at Risk Act, 2002

The federal Species at Risk Act (SARA; Government of Canada, 2002) is administered by Environment and Climate Change Canada (ECCC) and provides direction to protect and ensure the survival of wildlife species in Canada. The purpose of the SARA is to prevent populations of wildlife from becoming Extirpated, Endangered, or Threatened, provide recovery plans for Endangered or Threatened species, and to manage other species to prevent them from becoming Endangered or Threatened.

All species listed on Schedule 1 of SARA are afforded protection on federal lands. Aquatic species and species of migratory birds protected by the Migratory Birds Convention Act (MBCA; Government of Canada, 1994) and listed as Endangered, Threatened, or Extirpated under Schedule 1 of SARA are protected wherever they

occur in Canada, regardless of land ownership. SARA protections for other species do not normally extend to privately owned land. However, the Federal Minister of ECCC can and has imposed SARA protections on private projects where habitat is deemed "…*necessary for the survival or recovery of the species*…" in the area of concern.

2.5 Endangered Species Act, 2007

The provincial Endangered Species Act (ESA; Government of Ontario, 2007) is administered by the Ministry of Environment, Conservation, and Parks (MECP) and provides protection for species at risk (SAR) and their habitat. Species listed as Endangered, Threatened, or Extirpated and their habitats (e.g., areas essential for breeding, rearing, feeding, hibernation, and migration) are automatically afforded legal protection under the ESA.

2.6 Fisheries Act, 1985

The federal Fisheries Act (Government of Canada, 1985) is administered by Fisheries and Oceans Canada (DFO) and provides protections to fish, fish habitat, and fisheries. Specifically, the Fisheries Act in its current version provides protection for all fish and fish habitat, and prohibits the harmful alteration, disruption, or destruction of fish habitat.

Projects with a scope that does not fall within DFO's defined standards and codes of practice require submission of a request for review to DFO.

2.7 Migratory Birds Convention Act, 1994

Nesting migratory birds are protected under the MBCA (Government of Canada, 1994). No work is permitted that would result in the destruction of active nests (nests with eggs or young birds) or the wounding or killing of bird species protected under the MBCA and/or associated regulations (e.g., SARA).

2.8 Fish and Wildlife Conservation Act, 1997

The provincial Fish and Wildlife Conservation Act (FWCA; Government of Ontario, 1997) governs the hunting and trapping of a variety of wildlife including mammals, birds, reptiles, amphibians, and fish in Ontario, thereby facilitating the protection of wildlife and their habitat. The FWCA outlines the prohibition of hunting or trapping specially protected species and the requirement for provincially issued licenses for the hunting or trapping of "furbearing" or "game" animals. Examples of specifically protected animals include, for example, Southern Flying Squirrel (*Glaucomys volans*), Northern Harrier (*Circus cyaneus*), American Kestrel (*Falco sparverius*), Blue Jay (*Cyanocitta cristata*), Midland Painted Turtle (*Chrysemys picta marginata*), Northern Watersnake (*Nerodia sipedon*), and Gray Treefrog (*Hyla versicolor*). In particular, raptors that are not protected under the MBCA (including Peregrine Falcon) are protected under the FWCA.

3.0 PROPERTY IDENTIFICATION

The Site (Figure 1) currently includes four major parcels (5993 and 6115 Flewellyn Road, and 6070 Fernbank Road, plus a 14.2 ha field on the northwest corner of Shea and Flewellyn Roads, 1820 Shea Road, and is hereby referred to as the "Eder Parcel"). Several other associated parcels are also included in the Site. There is the Faulkner Stormwater Management (SWM) pond (addressed as 59 Aridus Cres.), and a hydro corridor that diagonally crosses the southern end of 6070 Fernbank Road. The hydro corridor is currently cultural thicket, however, is subject to occasional mowing (every ~3-5 years). The SWM area includes a sanitary pump station at its north end but is otherwise comprised almost entirely of the open pond, though the banks are sparsely vegetated. A recreational pathway extends around the east side of the SWM pond and through a portion of the hydro corridor.

Seven additional 0.8 ha properties (residential parcels at 5971, 6015, 6025, 6035, 6141, and 6159 Flewellyn Road, and 1770 Shea Road, which is farmed as part of the larger, adjacent agricultural field/Eder Parcel), are associated with the Site. These parcels are still held by private landowners not currently associated with proposed site development, but nevertheless are considered within the context of this study as areas likely to be eventually included. The Eder Parcel is not included within the W-4 urban expansion lands, but is considered in this EIS as part of the Site.

Combined, these parcels cover an area of approximately 75 ha south of Stittsville in the west end of Ottawa. Much of the Site was historically farmed though some currently forested areas on the western half area associated with broad forested bands that have existed on the Site for more than 60 years based on historical aerial photography[1]. Much of 5993 Flewellyn Road and the Eder Parcel was cleared of vegetation in ~2016 (per geoOttawa imagery) in association with the construction of the Faulkner SWM Pond. The remaining forested area in the southeast corner of the Site was cleared of tree cover throughout 2018. Other than the hydro corridor, which is zoned O1P – Open Lands, the Site is currently zoned RU – Rural, with a zoning by-law application submitted concurrently with the draft plan submission for this property.

The Site is bordered by:

- A community of R1 to R3 density residential (single homes; still partially under construction) to the north, together with parks, ponds, etc.;
- Country estate lots to the west;
- Shea Road and agricultural lands to the east; and
- Flewellyn Road and agricultural lands (with some forest blocks) to the south.

[1] National Air Photo Library Roll A18057, Photo 0049, Dated 1963-05-24

4.0 METHODOLOGY

4.1 Desktop and Background Data Review

4.1.1 General Records Review

Background information was obtained from online databases and geographic information system mapping applications to review relevant information. Aerial imagery from Google Earth, the RVCA Geoportal and the City's geoOttawa systems was used to identify existing features and confirm information found in the background review.

4.1.2 Species at Risk Screening

The review of existing information included a preliminary SAR screening for species listed under the federal SARA and provincial ESA having some record of occurrence within the broader vicinity of the Site. The screening was completed following the *Draft Client's Guide to Preliminary Screening for Species at Risk* (MECP, 2019). The results of the screening process informed the list of species that were considered in the assessment of the potential for development impact(s) to SAR or SAR habitat. Previously, the results of the preliminary SAR screening were forwarded to MECP for comment and review. The results of the screening were sent to MECP on October 4, 2022, to confirm the information collected (Appendix B). As of 2023, however, the MECP no longer provides this service, and no response will be provided. Regardless, it is considered unlikely that MECP would indicate potential for SAR beyond those already considered in this EIS.

Where it is determined through the EIS process that there is an anticipated impact of the development on SAR, an Information Gathering Form (IGF) is typically submitted to MECP for further review. The IGF process, however, is not generally necessary where the SAR management process may be handled through a Notice of Activity process associated with the Ontario Conservation Fund under O.Reg. 829/21. The preliminary screening considered data sources including:

- Species at Risk in Ontario (SARO; Ministry of Environment, Conservation, and Parks (MECP, 2024b);
- Species at Risk Public Registry (Government of Canada, 2024);
- Natural Heritage Information Centre (NHIC; Ministry of Natural Resources, and Forestry (MNRF, 2025);
- Land Information Ontario (MNRF, 2024b);
- Aquatic Species at Risk Map (Fisheries and Oceans Canada (DFO), 2024);
- Ontario Reptile and Amphibian Atlas (Ontario Nature, 2019);
- Ontario Breeding Birds Atlas (Birds Canada, Canadian Wildlife Service (Environment and Climate Change Canada), et al., 2009);
- Ontario Butterfly Atlas (Toronto Entomologists' Association, 2024);

- eBird (The Cornell Lab of Ornithology, 2024);
- iNaturalist (California Academy of Sciences and National Geographic Society, 2025);
- Bumble Bee Watch (Wildlife Preservation Canada et al., 2024);
- Recovery Strategy for the Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*), and Tri-colored Bat (*Perimyotis subflavus*) in Ontario (Humphrey & Fotherby, 2019);
- Recovery Strategy for the Eastern Small-footed Myotis (*Myotis leibii*) in Ontario (Humphrey, 2017); and
- Fish ON-Line (MNRF, 2024a).

4.1.3 Agency Consultation

The Site is located within the jurisdictions of the City of Ottawa and the Rideau Valley Conservation Authority (RVCA).

Ongoing consultation with City of Ottawa staff has been undertaken throughout the various phases of the project. The W4 Natural Systems Working Group has met on a regular basis throughout 2023, 2024, and 2025, and includes members of City staff, Caivan, and KAL.

4.2 Field Surveys

4.2.1 Site Work Summary

KAL undertook a field program to document existing ecological conditions on the Site and to confirm the results of the background review.

KAL Biologists completed an initial field review of the site in the late summer of 2022, then completed an extensive suite of field studies through the spring and summer of 2023. Black Ash surveys were completed in summer 2024. Table 1 provides a summary of all field visits. Specific details of each program are further described under each study type (e.g., breeding bird surveys) in the relevant sub-sections following through the remainder of Section 4.2. Specific survey stations are shown in Figure 2.

Table 1: Field Study Dates

Date	Purpose	Conditions	Personnel
November 23, 2021	• Identify general site conditions • Map Butternuts along drill rig routes	• 3°C • Cloudy, no precipitation • Light breeze	• Anthony Francis
September 8, 2022	• Review general site conditions • Conduct initial ELC	• 24°C • Sunny with some clouds • 12km/h wind SW	• Anthony Francis • Kesia Miyashita
September 28, 2022	• Confirm ELC designations	• 14°C • Overcast • No precipitation	• Sarantia Katsaras
April 4, 2023	• Site recon	• 8°C • Sunny • 13km/h winds N	• Nick Moore • Rob Hallett
April 17, 2023	• HDFA #1	• 8°C • Light rain • Cloudy	• Nick Moore • Rob Hallett
April 20, 2023	• Frogs #1	• 8°C • 30% cloud cover • Very light wind	• Rob Hallett • Kurtis Westbury
May 19, 2023	• HDFA #2	• 21°C • Sunny with some clouds • Strong breeze	• Kurtis Westbury • Nicholas Schulz
May 23. 2023	• Frogs #2	• 18°C • 0% cloud cover • No wind	• Nick Moore • Kurtis Westbury
May 29, 2023	• EWPW #1	• 18°C • No cloud cover • 75% of moon visible	• Kurtis Westbury • Maren Nielsen
June 1, 2023	• EWPW #2	• 29°C • 50% cloud cover • 90% of moon visible	• Kurtis Westbury • Jenni Velichka
June 2, 2023	• Breeding Bird Survey #1 • Acoustic Bat Monitor Deployment • ELC	• 29°C • Sunny with clouds	• Rob Hallett • Maren Nielsen
June 5, 2023	• Butternut Health Assessment	• 22°C • Cloudy • Slight breeze	• Maren Nielsen • Rob Hallett
June 13, 2023	• Breeding Bird Survey #2 • Acoustic Bat Monitor Deployment (2nd location)	• 22°C • Slightly cloudy • Slight breeze	• Rob Hallett
June 30, 2023	• Frogs #3 • EWPW #3	• 22°C • Clear and smoky sky • 100% of moon visible	• Jenni Velichka • Maren Nielsen
July 5, 2023	• Breeding Bird Survey #2 • HDFA #3	• 24°C • Slight breeze • 0% cloud cover	• Nicholas Schulz
June 27, 2024	• Black Ash Assessment	• 19°C • Sunny with some clouds • Strong winds	• Maren Nielsen • Kesia Miyashita
June 28, 2024	• Black Ash Assessment	• 24°C • Sun and cloud • Slight breeze	• Maren Nielsen • Kesia Miyashita

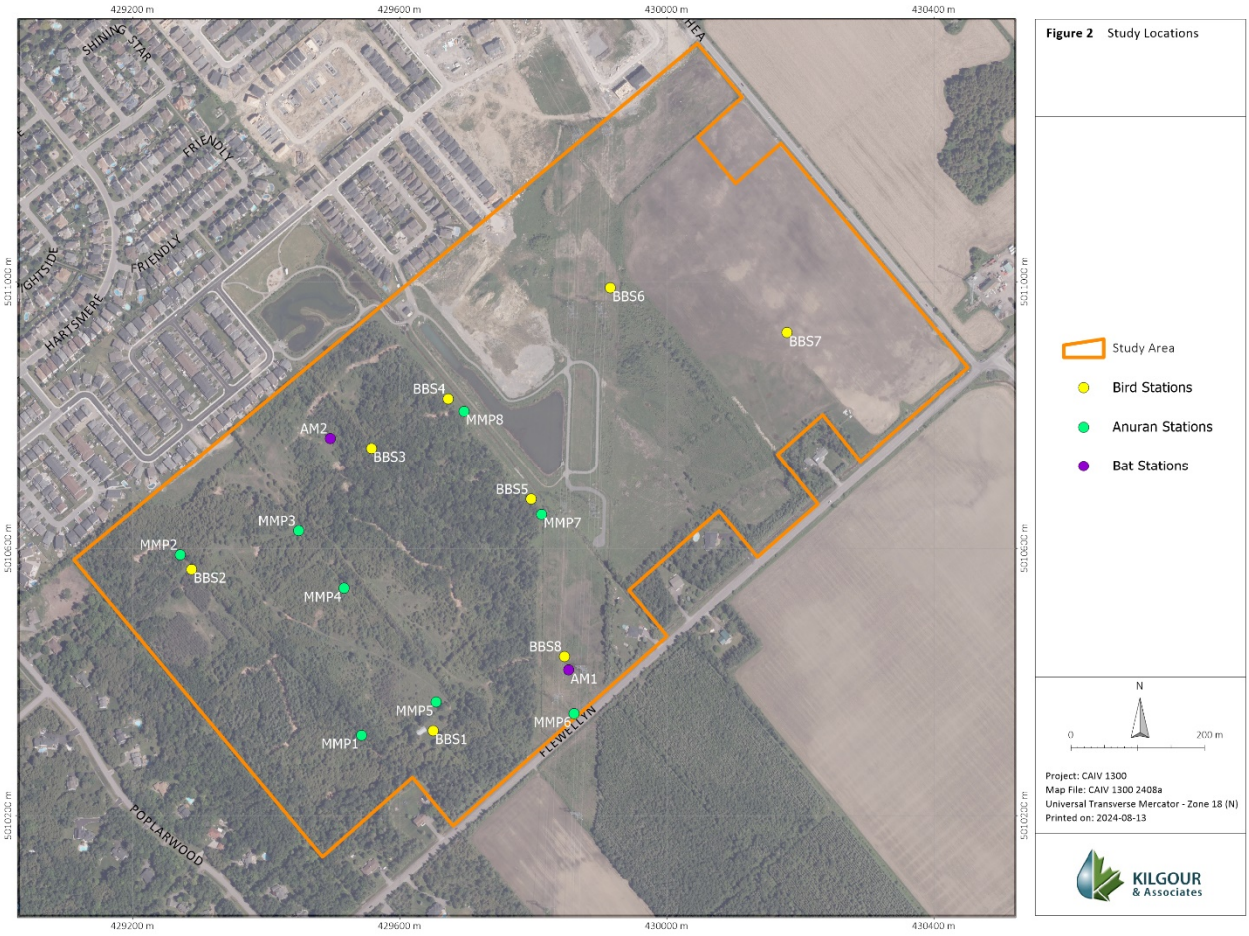

Figure 2 Study Locations

4.2.2 Surface Water Characterization

Aerial imagery and public databases were reviewed to determine wetland areas and watercourses (MNRF, 2025; Rideau Valley Conservation Authority, 2023a). Wetlands on the Site were delineated and characterized in the field as part of the Ecological Land Classification (ELC) exercise (see Section 4.2.3 below). A Headwater Drainage Feature Assessment (HDFA) was conducted for the Site following the methods per the *Evaluation, Classification and Management of Headwater Drainage Features Guidelines* (Toronto and Region Conservation Authority & Credit Valley Conservation, 2013). The Faulkner Drain was not assessed using the HDFA protocol but was described based on existing data for the feature.

The HDFA protocol requires up to three surveys of HDFs on a site. The first is conducted near the spring freshet to identify channel and wetted dimensions at peak water levels. Fish communities and habitats are assessed later in the spring for those HDFs hydrologically capable of supporting fish. Water levels of features not found to be dry during the second visit are checked once more in mid to late summer to assess their status as permanent watercourses.

4.3 Ecological Land Classification

Vegetation communities on the Site were identified and mapped in the field on September 8 and September 28, 2022, and updated on June 2, 2023, using standard Ecological Land Classification (ELC) methods for Ontario (Lee et al., 1998). This method provides a consistent approach to identify, describe, and map vegetation communities or physiographic features on the landscape based on dominant plant species and soil composition. This method results in a standardized description of each vegetation community to capture the natural diversity and variability of communities within a site and to provide insight into available habitat and the type of species that may be present. More specifically, the classifications from ELC provide a basis for determining whether potential habitat for a given SAR or other ecological value may be present.

A desktop review of available aerial imagery and preliminary field visits informed how the Site generally divides into vegetation communities based on variation in land cover, topography, and vegetation structure. The dominant plant species were recorded within each proposed ecosite in the field to further divide ecosites into vegetation types (the finest resolution in ELC), where possible. Soil samples were taken using a 120 centimeter (cm) long soil auger to characterize community substrates. Representative photos of each ELC unit on the Site were taken and are included with the community descriptions in this report.

4.3.1 Butternut Health Assessment

Butternut *(Juglans cinerea*) trees on site were initially mapped on November 23, 2021, along proposed routes for drilling rigs that would be used in subsequent geotechnical surveys. The intention of that work was to adjust routes as required to avoid impacts to Butternuts. A subsequent, more detailed site review on September 8, 2022, noted that many of the previously observed Butternuts had blown down, presumably during the derecho event on May 21, 2022. A formal Butternut survey was conducted by KAL Biologists Rob Hallett and Maren Nielsen on June 5, 2023, to map and assess the remaining Butternuts on the Site (Appendix C). The Butternut Health Assessment (BHA) was completed following the provincial Butternut Assessment Guidelines: Assessment of Butternut Tree Health for the purposes of the *Endangered Species Act, 2007* (MECP, 2021).

4.3.2 Black Ash Assessment

A formal Black Ash (*Fraxinus nigra*) Assessment (BAA) was conducted by KAL Biologists Maren Nielsen and Kesia Miyashita on June 27 and 28, 2024, to map and assess the Black Ash on the Site (Appendix D). The BAA was completed following the provincial Black Ash Assessment Guidelines: Assessment of Black Ash (*Fraxinus nigra*) for the purposes of the *Endangered Species Act, 2007* (MECP, 2024a). The BAA inventoried every Black Ash stem over 8 cm at 1.37 m and recorded the number of Black Ash with a stem less than 1.37 m in height or a DBH less than 8 cm. Based on field observations, an ultimate health determination was assigned for each stem. ESA clause 9 (1) (a), prohibits the killing, harm, harassment, possession, transportation, trade and/or removal of a living, healthy Black Ash tree.

4.3.3 Breeding Birds

Morning breeding bird surveys were performed using point counts following the Ontario Breeding Bird Atlas Guide for Participants (Ontario Breeding Bird Atlas, 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. As per the Ontario Breeding Bird Atlas, two rounds of surveys must take place between sunrise and five hours after sunrise between May 24 and July 10. Surveys took place during the mornings of June 2 and July 5, 2023.

A total of eight breeding bird survey stations were established in representative habitats on the Site (Figure 2). All incidental observations were recorded while moving between survey points as well as during other visits to the Site. Birds were identified by song and/or direct visual observation.

Bird species were classed as regionally rare based on an analysis of data from the Atlas of Breeding Birds of Ontario (2009) based on Hill's Site Regions, now Ecoregions. The federal and provincial significance of bird species were classed based on species' listings under Schedule 1 of SARA and the ESA, and species tracked by NHIC (MNRF, 2023c; for non-SAR species considered provincially significant).

4.3.4 Nightjars

Night-time bird surveys to confirm the presence/absence of at-risk nightjars, specifically Eastern Whip-poor-will (*Antrostomus vociferus*), and their potential breeding territories were conducted following the Survey Protocol for Eastern Whip-poor-will in Ontario (MNRF, 2014; Ontario Breeding Bird Atlas, 2021). This protocol calls for three separate night-time surveys between May 18 and June 30 that are timed based on moon conditions. Eastern Whip-poor-wills usually forage in the semi-darkness of early morning and dusk, but on nights when the moon is more than half full, they are likely to forage all night long under the brighter conditions. Their broods are timed such that the young hatch approximately 10 days before the full moon when the parents have more time (and moonlight) to catch food for them (Kaufman, 2019; The Cornell Lab of Ornithology, 2023). As such, this species is more detectable during a full moon period.

As per the draft protocol, surveys were completed within a week of the full moon while the moon was visible above the horizon (greater than 50% illuminated) and started at least 30 minutes after sunset and ended while the moon was still visible. Surveys were conducted under field conditions with no precipitation, little or no wind, clear skies, temperature of 10°C or above, and good visibility (low cloud cover). The timing of Eastern Whip-poor-will surveys is also optimal for observing Common Nighthawk (*Chordeiles minor*), as that

species is generally best heard calling in the late evening. MNRF (2014) recommends a minimum of three surveys to be completed during the breeding season, with two ideally occurring in late May or the first week of June during a week preceding or just after a full moon, and a third survey in the next available full moon period (middle/end of June). Nightjar surveys took place on the evenings of May 29th, June 1st, and June 30th, 2023.

Survey points are to be established at 500 m intervals along the survey route (the aim is to have one survey point for every 30 ha of typical habitat). Two survey stations were used for nightjar surveys (EWPW1 and EWPW2; Figure 2), and these stations covered habitats that were considered most likely to uncover nightjars (i.e., they were close to edge habitats along wooded areas that would provide feeding opportunity near potential nesting areas). As per MNRF (2014), each point count station had a fixed radius of 300 m so that the absolute number of birds could be counted within a reasonable hearing range (note that calling Eastern Whip-poor-will can be heard up to 1 km away under ideal conditions). Surveyors were careful not to walk directly through suitable nightjar habitat in between survey stations to avoid stepping on any potential Eastern Whip-poor-will eggs, which are cryptically coloured and laid on the forest floor.

4.3.5 Anurans

Anuran (frog and toad) surveys were performed following the Marsh Monitoring Program (Birds Canada, Environmental Canada, et al., 2009). This protocol calls for multiple survey stations across a site to capture spatial and habitat variability. The Marsh Monitoring Program advises that each station be visited three times at night, no less than 15 days apart, during the spring and early summer. Following this protocol, the timing of the three anuran surveys is based on nighttime air temperature:

- Early breeders (Wood Frog, Western Chorus Frog, Spring Peeper): above 5°C;
- Mid-season breeders (Mink Frog, American Toad, Gray Treefrog): above 10°C; and
- Late breeders (Green Frog, Bullfrog): above 17°C.

Anuran surveys are to begin one half hour after sunset and end before midnight on evenings with appropriate temperatures and light winds (≤3 on the Beaufort Scale[1]). Anuran surveys took place on the evenings of April 20th, May 23rd, and June 30th, 2023. Additional observations of amphibians were made throughout the spring and summer during other field visits.

4.3.6 Bats and Other Mammals

Bat monitoring was completed following acoustic surveys under the MNRF's Survey Protocol for Species at Risk Bats within Treed Habitats (2017). This is currently the recommended protocol for confirming the presence/absence of Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*), and Tri-coloured Bat (*Perimyotis subflavus*), where it is determined that potentially suitable habitat for the establishment of maternity roosts is present. Wooded areas on the Site were deemed potentially suitable habitat for the establishment of maternity roosts during KAL's preliminary desktop review and initial field visits. Trees with characteristics suitable for bat roosting were observed in the area.

All species of bats in a given area are detectable under this protocol if ultrasonic acoustic monitors are used and the signal-to-noise ratio can be analyzed from sonogram displays to identify bat calls to species level. Under the protocol, acoustic monitors are to be installed for a minimum of 10 nights between June 1 and

June 30, with recordings commencing after dusk and continuing for five hours. KAL installed two acoustic monitors on the Site (Figure 2): one at the edge of the forested area on the north edge of the Site, and one at the edge of the forested area near the southeast corner of the Site. The acoustic monitors were placed in these locations to capture the best potential bat habitat on the Site (potential roosting habitat in wooded areas and potential foraging habitat over adjacent open areas) and to increase the likelihood of detecting bats based on their echolocating behaviour. Bats use echolocation more frequently in cluttered environments (Falk et al., 2014), so installing monitors along the edges of wooded areas rather than in the middle of open foraging areas likely increases bat detectability. The monitors were placed just outside of the cluttered environment (forested area) as the distinguishability of calls among species diminishes within such locations (National Park Service, 2020). Both monitors were installed on June 2, 2023, moved to a second location on June 13, 2023, and removed on July 4, 2023.

Incidental observations of other mammals present in the Study Area were collected during all field visits. Mammal observations were limited to sightings of scat, tracks, and in some cases, direct observations.

5.0 RESULTS

5.1 General Natural Heritage Context

The nearest lands zoned EP-Environmental Protection surrounding the Site are approximately 850 m northwest of the northwest corner of the site. These EP lands are associated with the Fernbank Wetland (not a Provincially Significant Wetland [PSW]) located to the west of Stittsville Main Street. The closest PSW is the Goulbourn Wetland complex located 1.8 km to the northwest of the Site. Wetland estimates from within the geoOttawa system (City of Ottawa, 2025) purport the potential presence of wetland along the east edge of the site. Those mappings, however, are estimates from 2011 and this area has been subject to active agricultural usage since 2018. The currently existing extent of wetland cover is assessed in Sections 5.3 and 5.4 below.

There are no Areas of Natural and Scientific Interest in this portion of Stittsville (Muncaster, 2019). No environmental constraints were indicated on the site in Schedule K of the City's previous Official Plan (Muncaster, 2019). Most of the forested portions of the Site are indicated as potential Natural Heritage Features within Schedule C11 of the City's current OP.

5.2 Landforms, Soils, and Geology

The topography of the broader area is generally flat with loamy, fine sand soils over clay or fluvial materials (Schut & Wilson, 1987). The eastern edge of the site is indicated in regional soil maps as part Osgoode Association, with fine loamy sand with poor drainage. The remainder of the Site is indicated as part of the Reevecraig Association, also with (alkaline) loamy fine sand but typically over clay causing poor drainage. Soil cores taken across the Site during the ELC investigation confirmed the upper soil layers as consisting of ~80 cm of fine loamy sand, but generally hit fluvial-type material with sufficient gravel texture to preclude deeper coring. Across most of the Site, soil was moist/fresh but with no noticeable mottles or gley above ~60 cm depth. Accumulated organic material on the surface was never more than 5 cm in depth except in the small swamp pocket at the north end of the site where the organic layer was 10 to 15 cm in depth.

5.3 Ecological Land Classification

A total of ten distinct landcovers or ELC units were delineated on the Site (Figure 3). The majority of the western portion of the Site is a mixed Eastern White Cedar forest, a Poplar dominant deciduous forest, and meadow areas, with smaller areas of Scots Pine plantation and an Eastern White Cedar Swamp. The eastern portion of the Site is dominated by a thicket community and open agricultural lands. KAL Biologists were not permitted direct access to the small, residential parcels along Flewellyn Road as they are privately-owned. Road-side and aerial image reviews, however, indicate land cover on the small parcels (other than of the manicured spaces directly associated with houses and lawns) to correspond with the adjacent landcover of the Site. For each ELC unit identified, the dominant species observed, and any SAR plant species (highlighted in the descriptions below with an asterisk) are discussed in the following sections. An exhaustive list of all plant species observed in each ELC unit as well as tree sizes (DBH), where applicable is included in Appendix E.

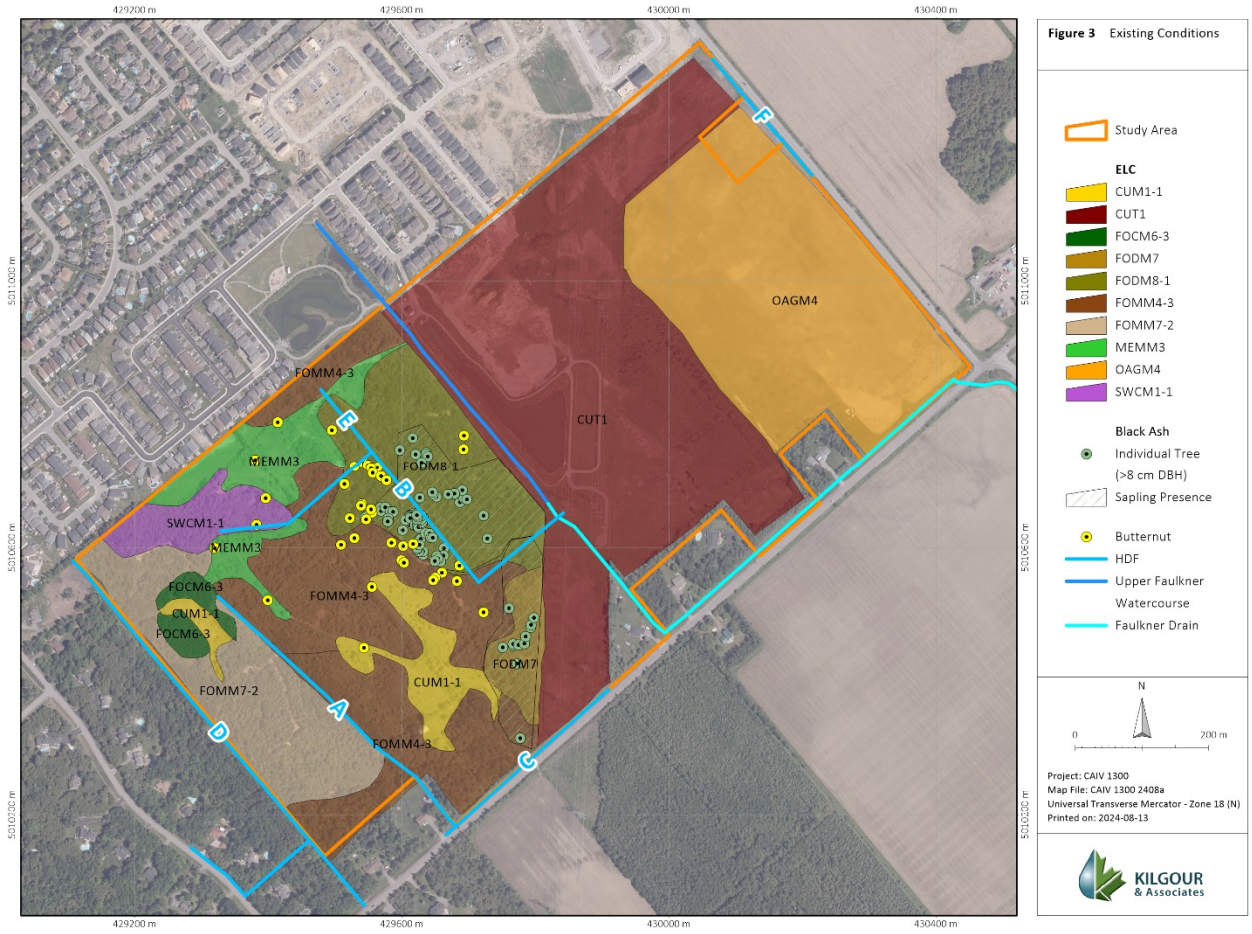

Figure 3. Existing Conditions

5.3.1 Dry - Fresh White Cedar – Hardwood Mixed Forest Type (FOMM4-3)

A broad swath of the western portion of the Site is characterized as a Dry - Fresh White Cedar – Hardwood Mixed Forest Type (FOMM4-3) community (Figure 4). It is dominated by Eastern White Cedar (*Thuja occidentalis*; 10-20 cm DBH), Trembling Aspen *(Populus tremuloides*; 10-20 cm DBH), Green Ash (*Fraxinus pennsylvanica*; 10-15 cm DBH), Large tooth Aspen (*Populus grandidentata*; ~15 cm DBH), White Spruce (*Picea glauca*; 30 cm DBH), White Pine (*Pinus strobus*; 25 cm DBH), Larch/Tamarack (*Larix laricina*; 15-20 cm DBH), American Beech (*Fagus grandifolia*; 10-15 cm DBH), and American Elm (*Ulmus americana*). Butternut* (*Juglans cinerea*; 20-50 cm DBH) were observed scattered throughout this community.

Figure 4. Dry - Fresh White Cedar – Hardwood Mixed Forest Type (FOMM4-3)

5.3.2 Fresh - Moist White Cedar - Hardwood Mixed Forest Type (FOMM7-2)

The western-most extent of the Site is characterized as a Fresh - Moist White Cedar - Hardwood Mixed Forest Type (FOMM7-2) community (Figure 5). It is dominated by Eastern White Cedar (*Thuja occidentalis*; 5-15 cm DBH), White Birch (*Betula papyrifera*; 10-20 cm DBH), Trembling Aspen *(Populus tremuloides*; 10-35 cm DBH), White Ash (*Fraxinus americana*; 5-8 cm DBH), White Spruce (*Picea glauca*; ~10 cm DBH), and Balsam Fir (*Abies Balsamea*) tree species.

Figure 5. Fresh - Moist White Cedar - Hardwood Mixed Forest Type (FOMM7-2)

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

A Dry – Moist Old Field Meadow Type (CUM1-1; Figure 6) is located centrally on the Site. This area is characteristic of previous disturbance with scattered tree species including Large tooth Aspen (*Populus grandidentata*; ~5 cm DBH), Trembling Aspen (*Populus tremuloides*; 10-25 cm DBH), Eastern White Cedar (*Thuja occidentalis*; ~10 cm DBH), Scots Pine (*Pinus sylvestris*; 5-10 cm DBH), American Beech (*Fagus grandifolia*; ~10 cm DBH), Apple Spp. (*Malus*; 8-10 cm DBH), White Spruce (*Picea glauca*; 20-25 cm DBH), Larch/Tamarack (*Larix laricina*; ~5-10 cm DBH), Green Ash (*Fraxinus pennsylvanica*; <5 cm DBH). Dominant shrub and groundcover species included Common Juniper (*Juniperus communis*), Trembling Aspen (*Populus tremuloides*) saplings, Orchard Grass (*Dactylis glomerata*), Wild Strawberry (*Fragaria vesca*), Canada Goldenrod (*Solidago canadensis*), Poison Ivy (*Toxicodendron radicans*), Red Raspberry (*Rubus idaeus*), Alder Buckthorn (*Rhamnus frangula*), and Common Blackberry (*Rubus allegheniensis*).

Figure 6. Dry – Moist Old Field Meadow Type (CUM1-1)

5.3.4 Dry – Fresh Mixed Meadow Ecosite (MEMM3)

A Dry – Fresh Mixed Meadow Ecosite (MEMM3) is located in the northwest corner of the Site (Figure 7). This area is mainly characterized by Eastern White Cedar (*Thuja occidentalis*), Scots Pine (*Pinus sylvestris;* ~10-20 DBH), Larch/Tamarack (*Larix laricina*; ~10 DBH), and scattered Butternut* (*Juglans cinerea*; ~10-20 DBH) trees. Dominant shrub and groundcover species included Common Juniper (*Juniperus communis*), Orchard grass (*Dactylis glomerata*), Wild strawberry (*Fragaria vesca*), Canada Goldenrod (*Solidago canadensis*), Alder Buckthorn (*Rhamnus frangula*), and Common Blackberry (*Rubus allegheniensis*).

Figure 7. Dry – Fresh Mixed Meadow Ecosite (MEMM3)

5.3.5 Dry – Fresh Scots Pine Naturalized Coniferous Plantation Type (FOCM6-3)

A Fresh Scots Pine Naturalized Coniferous Plantation Type (FOCM6-3) is located in the northwest corner of the Site (Figure 8). It is mainly dominated by Scots Pine (*Pinus sylvestris*; ~10-20 cm DBH), Jack Pine (*Pinus banksiana*; ~15 cm DBH), Eastern White Cedar (*Thuja occidentalis*), White Pine (*Pinus strobus*; ~20 cm DBH), White Birch (*Betula papyrifera*; 10-20 cm DBH), Butternut* (*Juglans cinerea*), American Beech (*Fagus grandifolia*), and Green Ash (*Fraxinus pennsylvanica*; 10-15 cm DBH).

Figure 8. Dry – Fresh Scots Pine Naturalized Coniferous Plantation Type (FOCM6-3)

5.3.6 White Cedar Mineral Coniferous Swamp (SWCM1-1)

A White Cedar Mineral Coniferous Swamp (SWCM1-1) is located on Site (Figure 9). It is dominated by Eastern White Cedar (*Thuja occidentalis*) and has ground cover consisting of Bulblet Bladder Fern (*Cystopteris bulbifera*), Alder Buckthorn (*Rhamnus frangula*), Interrupted Fern (*Osmunda claytoniana*), Sensitive Fern (*Onoclea sensibilis),* and Poison Ivy (*Toxicodendron radicans*).

Figure 9. White Cedar Mineral Coniferous Swamp (SWCM1-1)

5.3.7 Fresh – Moist Lowland Deciduous Forest Ecosite (FODM7)

A Fresh-Moist Lowland Deciduous Forest Ecosite (FODM7) is located in the center of the Site (Figure 10). It is dominated by Trembling Aspen (*Populus tremuloides*) Eastern White Cedar (*Thuja occidentalis*), Butternut* (*Juglans cinerea*), Black Ash* (*Fraxinus nigra*), and Balsam Poplar (*Populus balsamifera*). Its ground cover consists of Common Buckthorn (*Rhamnus cathartica*), Poison Ivy (*Toxicodendron radicans*), White Panicle Aster (*Symphyotrichum lanceolatum*), Riverbank Grape (*Vitis riparia*), Common Ragweed (*Ambrosia artemisiifolia*), and Yellow Sweet Clover (*Melilotus officinalis*).

Figure 10. Fresh – Moist Lowland Deciduous Forest Ecosite (FODM7)

5.3.8 Fresh – Moist Poplar Deciduous Forest Type (FODM8-1)

A Fresh – Moist Poplar Deciduous Forest Type (FODM8-1; Figure 11) is located on Site and is dominated by Trembling Aspen (*Populus tremuloides*; 10-20 cm DBH), White Birch (*Betula papyrifera;* 10-20 cm DBH), Balsam Poplar (*Populus balsamifera*; 10-25 cm DBH), Butternut* (*Juglans cinerea*; 10-20 cm DBH), Eastern White Cedar (*Thuja occidentalis*; 10-20 cm DBH), Basswood (*Tilia americana*; ~30 cm DBH), Red Maple (*Acer rubrum*; ~27 cm DBH), American Elm (*Ulmus americana*; 10-20 cm DBH), and Black Ash* (*Fraxinus nigra*). Its dominant ground cover consists of Common Juniper (*Juniperus communis*), Trembling Aspen saplings (*Populus tremuloides*), Sensitive Fern (*Onoclea sensibilis*), Ostrich Fern (*Matteuccia struthiopteris),* Interrupted Fern (*Osmunda claytoniana*), Canada Goldenrod (*Solidago canadensis*), Poison Ivy (*Toxicodendron radicans*), Alder Buckthorn (*Rhamnus frangula*), Bloodroot (*Sanguinaria*), and Meadow Horsetail (*Equisetum pratense*).

Figure 11. Fresh – Moist Poplar Deciduous Forest Type (FODM8-1)

5.3.9 Medium Mineral Open Pasture Type (OAGM4)

A Medium Mineral Open Pasture Type (OAGM4) on Site (Figure 12) is dominated by planted crop cultivar and scattered shrub community species such as Canada Goldenrod (*Solidago canadensis*), Meadow Horsetail (*Equisetum pratense*), Purple Aster (*Symphyotrichum patens*), Common Mullein (*Verbascum thapsus*), Meadow Buttercup (*Ranunculus acris*), Wild Strawberry (*Fragaria vesca*), and Common Dandelion (*Taraxacum officinale*).

Figure 12. Medium Mineral Open Pasture Type (OAGM4)

5.3.10 Cultural Thicket Ecosite (CUT1)

A Cultural Thicket Ecosite (CUT1; Figure 13) on Site is dominated by Bebb's Willow (*Salix bebbiana*), Alder Buckthorn (*Rhamnus frangula*), Trembling Aspen Saplings (*Populus tremuloides*), White Willow (*Salix alba*), White Meadowsweet (*Spiraea alba*), and Common Milkweed (*Asclepias syriaca*).

Figure 13. Cultural Thicket Ecosite (CUT1)

5.4 Surface Water, Groundwater and Fish Habitat

The Site is located within the Rideau River watershed and the Jock River subwatershed (Ministry of Natural Resources and Forestry – Government of Ontario, 2023; Rideau Valley Conservation Authority, 2023b). The Site contains a portion of the Faulkner Municipal Drain. A channelized watercourse originating near Hickstead Way flows south, becoming the legal Faulkner Municipal Drain where it crosses the hydro corridor onsite to south, turning east and becoming a roadside ditch along Flewellyn Road, towards Shea Road. The drain continues south down Shea Road, eventually joining the Flowing Creek Phase 1 Drain, just south of Brownlee Road (Figure 1). The channelized watercourse north of the legal Faulkner Municipal Drain is hereby referred to as the "Upper Faulkner Watercourse".

The HDFA identified six (6) HDFs/Tributaries located on and adjacent to the Site. One group of channels is primarily associated with the Faulkner Municipal Drain, and the second group primarily conveys water from within the forested areas on the Site towards the Faulkner Drain (Figure 3). During the ELC survey, one wetland pocket was identified on the Site, the White Cedar Mineral Coniferous Swamp (SWCM1-1) vegetation community.

5.4.1 Faulkner Drain

The Site contains a portion of the Faulkner Drain, which, per geoOttawa mapping, appears to be primarily a tributary of Flowing Creek. The Faulkner Drain and the Site are mapped within both the Flowing Creek catchment and the Monahan Drain catchment within RVCA catchment reports, suggesting that the Faulkner Drain is not a significant hydrological contributor to the overall subwatershed and catchment area. The Faulkner Drain is addressed, minimally, within the *Jock River Reach 2 & Mud Creek Subwatershed Study Existing Conditions Report* (Marshall Macklin Monaghan Limited, 2009). Descriptions in that subwatershed study are generally limited to noting that: the drain is a tributary to the Monahan Drain; it includes very few tributaries of its own; and is in generally poor condition. The subwatershed study does not set any specific setback requirements for watercourses other than to indicate that are to be set in accordance with the City's Official Plan. An existing 18 m easement is registered in favour of the City over the length of the Caivan lands; the 18 m corridor extends northward into the adjacent community directly abutting existing development.

Under the current Official Plan, setbacks to water courses are determined in accordance with Section 4.9.3:

> *2) Where a Council-approved watershed, subwatershed or environmental management plan does not exist, or provides incomplete recommendations, the minimum setback from surface water features shall be the greater of the following:*
>
> *a) Development limits as established by the conservation authority's hazard limit, which includes the regulatory flood line, geotechnical hazard limit and meander belt;*
>
> *b) Development limits as established by the geotechnical hazard limit in keeping with Council approved Slope Stability Guidelines for Development Applications;*
>
> *c) 30 metres from the top of bank, or the maximum point to which water can rise within the channel before spilling across the adjacent land; and*
>
> *d) 15 metres from the existing stable top of slope, where there is a defined valley slope or ravine.*

However, per Policy 10):

> *10) In addition to the provisions for setbacks described in this section, development proposals next to municipal drains or other works under the Drainage Act shall also maintain clear access to the legal working space adjacent to the drain. This working space is defined in the engineer's report adopted through a By-law approved by Council under the Drainage Act for the construction and future maintenance of drainage works.*

In the consideration of setback requirements for the drain different from the standard values provided in OP Section 4.9.3 2), the ecological services that are, or would be provided by the setbacks must be considered. The Faulker Drain Tributary currently receives input from a stormwater management pond treating the runoff from the recent urban residential development immediately to the north of the Site, with 3:1 side slopes the channel cross-section is over 12 m wide from top-of-slope to top-of-slope. The typical trapezoid shape of the constructed channel, straight alignment, grass swale and minimal canopy cover greatly impact the aquatic habitat attributes of the channel. Existing residential land uses adjacent to

the Upper Faulkner Watercourse just north of the Site provide minimal setback with the adjacent rear yard fencing < 10 m from the channel bank. On the portion of the Upper Faulkner Watercourse north of the hydro corridor on the Site, a 30 m setback from the top of bank per OP Section 4.9.3 2c (City of Ottawa, 2021) would retain the forested space within the existing adjacent significant woodland area and other forested lands on the west side of the drain and is thus warranted. Watercourse setbacks are shown in Figure 14.

Where the Faulkner Drain originates in and crosses the hydro corridor, a setback is not directly specified here or considered relevant as the adjacent space there will continue to function, and be maintained, as hydro corridor regardless. For the remainder of the Faulkner Drain south of the hydro corridor area to its confluence with Flowing Creek (a distance of ~5 km), the feature currently exists solely as a roadside ditch located directly adjacent to the roadway with no natural setback or buffer; no natural riparian land exists for the entire length of the feature. The potential for functionality as habitat (beyond the existing forest) or as a wildlife corridor generally, is considered to be negligible.

The retained buffer south of the retained forested space would be limited to providing filtration of overland runoff to the drain, shading, and allochthonous inputs. Where the Faulkner Drain, however, approaches and abuts Flewellyn Road, the setback may be reduced to 15 m from the existing stable top of slope in locations where the feature continues to exist as roadside ditch so long as:

- Site grading is designed to ensure all adjacent overland flow is directed to a SWM system for quality and quantity control before release (i.e., to otherwise prevent direct, unfiltered/unmitigated surface flow) to the drain; and

- The buffer space includes vegetation suitable for the provision of soil stability, allochthonous input to drain, and (to the extent feasible from the north side bank) shading over water to improve existing drain condition and fish habitat.

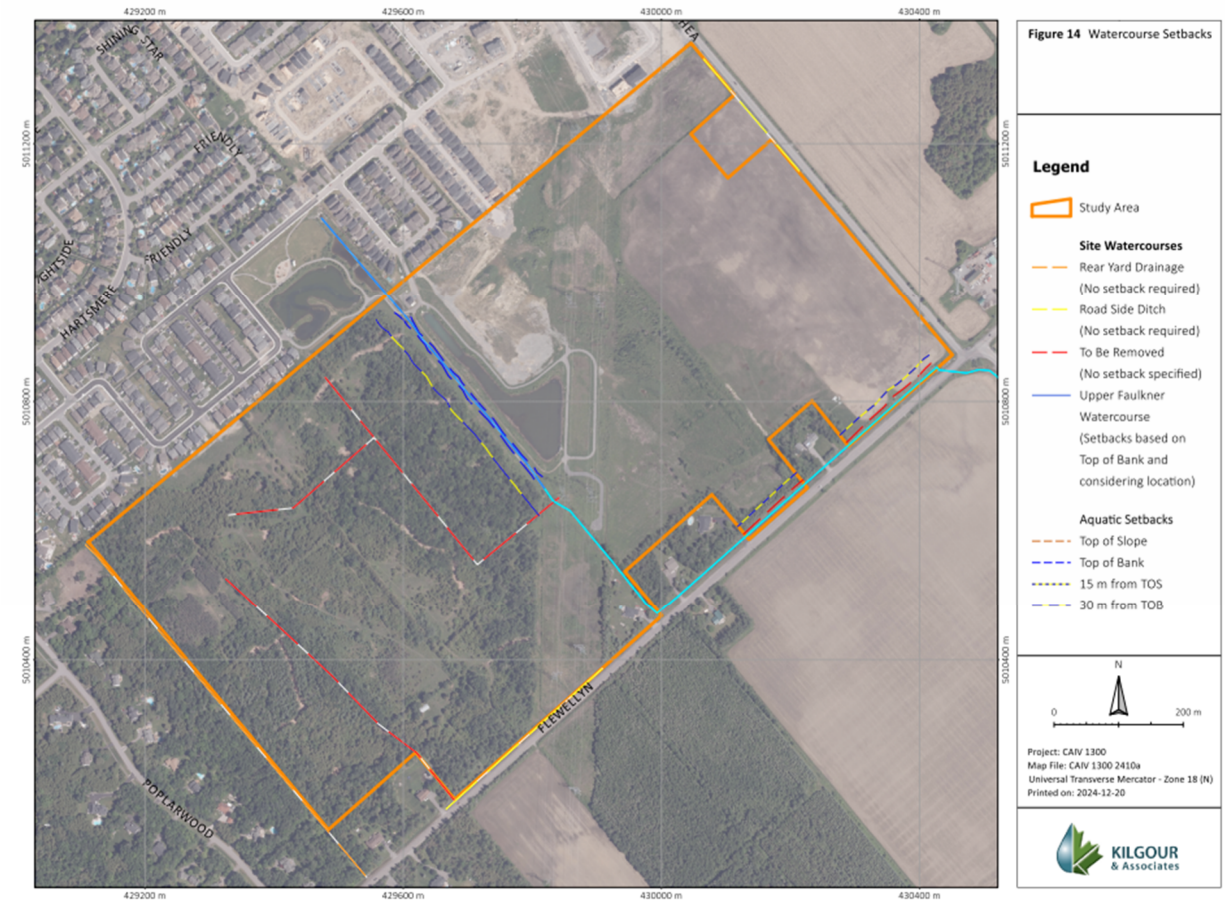

Figure 14 Watercourse Setbacks

5.4.2 HDFA

The HDFA identified six (6) HDFs located on and adjacent to the Site. Three HDFs (Tributaries A, B and D) are associated with the forested areas and White Cedar swamp on the Site, while three (tributaries C, E and F) are associated with the Faulkner Drain.

Tributary A originates directly south of the White Cedar Swamp (SWCM1-1) community and flows southward as a man-made ditch and braided channel towards Flewellyn Road. It primarily functions as a drainage feature supporting spring run-off and after heavy rainfall. The chain of classification descriptors, as listed in the HDFA report (Appendix F) leads to a standard management directive of "Mitigation" for this reach. Further discussion and review of the standard HDFA mitigations for this and the other HDFs occurring directly on the Site are included below.

Tributary B originates within the SWCM1-1 community and flows southeast, eventually joining with Tributary E. It has a man-made standing water pool present with interstitial flow towards the Faulkner Drain. While areas of standing water can potentially function as amphibian breeding habitat, no amphibians were observed within this reach. The chain of classification descriptors leads to a management directive of Protection for this reach.

Tributary C is a roadside ditch feature that originates at the southwestern corner of the Site, at the terminus of Tributary D. It flows eastward, joining the Faulkner Drain. Tributary C is a permanent feature that has water present year-round. This feature was confirmed to function as amphibian breeding habitat and fish habitat. The chain of classification descriptors leads to a management directive of Protection for this reach. It is recommended that this feature be retained to maintain overland flow conditions on the Site and along Flewellyn Road.

Tributary D is a man-made, engineered lot swale drain feature that originates in the northwestern corner of the Site, within the FOMM7-2 vegetation community. It follows the western property boundary and is present within portions of the rear yard allowances of the western adjacent residences. It primarily functions as a drainage feature supporting spring run-off and after heavy rainfall. The chain of classification descriptors leads to a management directive of Mitigation for this reach. As this feature is located off of the Site, it will be retained and will continue to provide an overland flow route during the spring freshet.

Tributary E is a constructed, linear channel feature that originates within the FOMM4-3 and MEMM3 vegetation communities and flows south eventually turning eastward joining the Faulkner Drain. It has intermittent standing water pools present with intermittent flow towards Faulkner Drain. Standing water contributes to groundwater recharge and can function as amphibian breeding habitat. Breeding amphibians were observed within this reach. The chain of classification descriptors leads to a management directive of Protection for this reach.

Tributary F is a roadside ditch feature located along Shea Road at the eastern Site boundary. It is located adjacent to an idle agricultural field and connects downstream to the Faulkner Drain at the intersection with Flewellyn Road. It primarily functions as a drainage feature supporting spring run-off and after heavy rainfall. Breeding amphibians were not observed within this reach. Significant groundworks have and continue to occur in the southern portion of this tributary, and a large portion of this tributary has been altered and/or removed. This chain of classification descriptors leads to a management directive of Protection for this reach.

Standard HDFA management directives of "Mitigation" indicate that the feature may be maintained, replicated, or enhanced using natural channel design techniques to maintain or enhance the overall productivity of the reach. There is no requirement to retain the feature per se, but on-site flow, outlet flows, and overall water balance for the area must be maintained by providing mitigation measures to infiltrate clean stormwater. Standard HDFA management directives of "Protection" indicate that the feature may be maintained and/or enhanced, but typically should not be relocated. The general directive is for the feature to be protected and its riparian zone enhanced where feasible. Notably for Tributaries B and E, however, these tributaries are sourced from the SWCM1-1 community wetland. As the wetland would be unlikely to remain with development occurring on the western half of the Site, (i.e., even with standard setbacks) the hydrology of those Tributaries is unlikely to remain regardless of protections otherwise applied.

5.4.3 Wetlands

One isolated wetland was identified on the Site during the ELC survey, the White Cedar Mineral Coniferous Swamp (SWCM1-1) vegetation community. Species within this community are limited to Eastern White Cedar (*Thuja occidentalis*), Bulblet Bladder Fern (*Cystopteris bulbifera*), Alder Buckthorn (*Rhamnus frangula*), Interrupted Fern (*Osmunda claytoniana*), Sensitive Fern (*Onoclea sensibilis),* and Poison Ivy (*Toxicodendron radicans*). This community has developed in a low-lying area, with organic loamy soils. Mottling and gley were encountered at a depth of ~30 cm.

Tributary B originates in the SWCM1-1 community, and Tributaries A and D originate adjacent to the SWCM1-1 community. As described above, Tributary A and Tributary D have management directives of "Mitigation", and Tributary B has a management directive of "Protection".

The hydrology of the White Cedar Mineral Coniferous Swamp (SWCM1-1) wetland community, however, is maintained by overland flow and precipitation catchment into the low-lying area (Paterson Group, 2023). Tributary D is located within the FOMM7-2 vegetation community and is sufficiently removed from the SWCM1-1 community. The direction of hydraulic gradient indicates that surface water and groundwater flow travels eastward across the Site and, therefore, the White Cedar Mineral Coniferous Swamp (SWCM1-1) wetland community located northeast of Tributary D is not contributing significantly to the hydrology of Tributary D (Paterson Group, 2023). Tributary B originating in the SWCM1-1 community that eventually joins Tributary E and the Faulkner Drain are both constructed channels traversing the forested areas on the Site, but are ultimately fed by surficial flows and very shallow water transport through the adjacent soils rather than true groundwater upwellings or bedrock aquifer (Paterson Group, 2023). Development occurring on the western portions of the property would be likely to alter shallow overburden and subsurface flows, removing overburden groundwater supply to the swamp wetland feature and Tributaries B and E.

5.4.4 Fish Habitat

The HDFA follows Ontario Stream Assessment Protocol (OSAP) methodologies for descriptions of flow conditions, riparian vegetation and site features that are important components of habitat (headwater sampling protocol OSAP S4.M10) and includes an electrofishing survey to describe fish and fish habitat (OSAP S4.M10). During the electrofishing survey conducted on May 18, 2023, six fish were caught belonging to 4 species. Two Northern Redbelly Dace were caught only in the standing water pool associated with Tributary B, and one Eastern Blacknose Dace, one Northern Redbelly Dace, one Creek Chub and one Brook Stickleback were caught in Tributary C.

The Faulkner Drain was subject to an extensive clean-out program by the City in 2022 between the Faulkner SWM pond and its confluence with Flowing Creek ~5 km to the south. As is typical of municipal drain clean outs, the entire length of the feature was dredged with excavators to restore the trapezoidal form with no remaining organic substrate, woody structure or in-water vegetation. KAL conducted a fish relocation program along the entire length of the drain to support this work between August 8 and September 28, 2022. Fish species captured are indicated in Table 2 below.

Table 2. Fish species in the upper and lower reaches of the Faulkner Drain

Common Name	Species
* Blacknose Dace	*Rhinichthys atratulus*
Bluegill	*Lepomis macrochirus*
* Bluntnose minnow	*Pimephales notatus*
* Brook Stickleback	*Culaea inconstans*
* Central Mudminnow	*Umbra limi*
Central Stoneroller	*Campostoma anomalum*
* Common Shiner	*Luxilus cornutus*
* Creek Chub	*Semotilus atromaculatus*
* Fathead Minnow	*Pimephales promelas*
* Finescale Dace	*Chrosomus neogaeus*
Golden Shiner	*Notemigonus crysoleucas*
* Johnny Darter	*Etheostoma nigrum*
Long Nose Dace	*Rhinichthys cataractae*
Northern Pike	*Esox lucius*
* Northern Redbelly Dace	*Chrosomus eos*
Pumpkinseed	*Lepomis gibbosus*
* Rock Bass	*Ambloplites rupestris*
* White Sucker	*Catostomus commersonii*

* Species caught in upper reaches of the Drain in proximity to the Site. Other fish species were only present in the lower reaches.

5.5 Wildlife Surveys

5.5.1 Breeding Birds

Morning breeding bird surveys were conducted on the dates outlined in Table 3.

Table 3 Summary of dates and weather conditions of morning breeding bird surveys, 2023

Date	Cloud Cover (%)	Air Temperature (°C)	Wind (Beaufort)
June 2, 2023	30	18	2
July 13, 2023	100	15	2
July 5, 2023	0	24	1

A total of 44 bird species were observed on the Site via morning breeding bird surveys and incidental observations. A list of all bird species observed and their respective observation dates and stations, and highest breeding evidence is included in Appendix G. The most commonly observed species during breeding bird surveys were American Crow, American Goldfinch, American Robin, Common Yellowthroat, and Song Sparrow. The Brown-headed Cowbird (*Molothrus ater*) was observed incidentally on the Site.

Three listed at-risk bird species were observed during the morning breeding bird surveys. These SAR observations are summarized in Table 4 below.

Table 4 Summary of species at risk observations during breeding bird surveys, 2023

Species (Taxonomic name)	SARA Status	ESA Status	Dates and Locations Observed
Chimney Swift (*Chaetura pelagica*)	Threatened	Threatened	June 13, 2023: BBS#1
Eastern Wood-Pewee (*Contopus virens*)	Special Concern	Special Concern	June 2 and June 13, 2023: BBS#2 and BBS#3
Wood Thrush (*Hylocichla mustelina)*	Special Concern	Threatened	June 4, 2023: BBS#1

5.5.2 Nightjars

KAL surveyors completed nightjar surveys on May 29th and June 1st and 29 2023 (Table 5), two during the first moon cycle and one in the next moon cycle, per MNRF (2014) protocols.

Table 5 Summary of dates and weather conditions of nightjar surveys, 2021

Date	Cloud Cover (%)	Air Temperature (°C)	Wind (Beaufort)	Moon Illumination (%)	Moon Visibility (%)
2023-05-29	0-25	18	0	75	100
2023-06-01	50-75	29	1	90	90
2023-06-29	0	22	0	70	100

No Eastern Whip-poor-will were heard calling at either station during any of the three surveys. No Common Nighthawks were observed on the Site.

5.5.3 Anurans

Anuran surveys were performed on April 20th, May 23rd, and June 30th, 2023, at eight stations distributed across the Site to capture spatial and habitat variability. A total of five frog species were observed on the Site via evening Frog surveys and incidental observations. A summary of the weather conditions during the anuran survey is provided in Table 6. Frog species and their respective stations and calling codes are summarized in Table 7. Station locations are shown in Figure 3.

Table 6 Dates and weather conditions of anuran surveys

Date/Time	Wind (Beaufort Scale)	Air Temperature (°C)	Cloud Cover (%)	Precipitation
2023-04-20	1	8	30	None
2023-05-23	0	20	0	None
2023-06-30	0	22	0	None

Table 7 Summary of anurans detected during anuran surveys

Common Name	Scientific Name	Station(s) Observed	Survey Date(s) Observed	Highest Calling Code[1]
American toad	*Anaxyrus americanus*	MMP1, MMP3, MMP4, MMP5, MMP6, MMP7	2023-05-23, 2023-06-29	1
Green frog	*Rana clamitans*	MMP6, MMP7	2023-06-29	2
Spring peeper	*Pseudacris crucifer*	MMP4, MMP5, MMP6, MMP8	2023-04-20, 2023-05-23	3
Western chorus frog	*Pseudacris triseriata*	MMP5	2023-04-20,	3
Wood frog	*Lithobates sylvaticus*	MMP1, MMP5, MMP6	2023-04-20,	3

Table Notes: [1]Calling codes are defined as follows (Birds Canada et al., 2008): **1** – Calls not simultaneous, individuals can be accurately counted; **2** – Some calling simultaneous, individuals reliably estimated; **3** – Full chorus, continuous and overlapping, individuals not reliably estimated.

5.5.4 Bats and Other Mammals

Two acoustic bat monitors were installed for 14 nights and placed facing an open meadow community, where the greatest likelihood for bat activity would occur on the Site. Conditions were ideal with mainly clear or cloudy nights and warm temperatures (≥15°C). The most commonly observed bat species include the Big Brown Bat (*Eptesicus fuscus*), Hoary bat (*Lasiurus cinereus*), and Silver-haired Bat (*Lasionycteris noctivagans*). The southern bat monitor was placed on June 2nd, 2023, within a hydro corridor. The North Bat monitor was installed on June 2nd, 2023, in a forested community and moved to a second location on June 13, 2023, to cover a wider area of the northern forest. Bat monitor locations are shown in Figure 2.

Table 8. Summary of bat recordings from acoustic monitoring

Survey Station	Survey Dates	Habitat Description	Big Brown Bat	Eastern Red Bat	Hoary Bat	Little Brown Bat	Silver-haired Bat	Tri-Colored Bat	Mean Number of Calls per Night
AM-1 (North)	2023-05-25 to 2023-06-02	Mixed forest opening to a small meadow	85	0	2	0	37	1	9
AM-2 (South)	2023-05-25 to 2023-06-02	Open hydro corridor with sparse shrubs and trees	2108	12	1761	1	4229	5	585

5.6 Species at Risk

An assessment of species listed under SARA and ESA was completed to identify species having some potential to occur on or near the Site, including Extirpated, Endangered, Threatened, and Special Concern species. Species listed as Extirpated, Endangered, and Threatened are afforded species and habitat protection under the ESA. Federal protections under SARA are always in force for listed species of fish and migratory birds. For species of other groups, SARA normally only applies on federal lands or on projects having some level of participation with or oversight by the federal government. However, SARA-based protections can be imposed by ministerial order on a case-by-case basis in situations where provincial-level protections are deemed inadequate to otherwise protect a species. Such protections are not expected to apply to the Site.

The SAR assessment evaluated whether the Site may provide suitable habitat for SAR (i.e., considering species known to occur in the Ottawa area; Appendix H) and whether they have potential to interact with future development of the Site. An assessment of the potential for SAR and their potential habitat was completed based on the results of the field surveys, ELC (i.e., habitat availability), and a desktop review that considered known species ranges, historic observation records, and preferred habitat requirements of these species (Appendix H). A total of 12 species subject to protections as SAR under the ESA and/or SARA were initially considered to have a moderate to high potential to occur on the Site and/or interact with the project (Table 9). Of those 12 species, four were observed to occur on the Site, and only two are considered likely to be negatively impacted by the project. Those species are discussed below.

SAR presented in Table 9 do not include listed species that are not directly protected as SAR on the Site under the ESA or SARA (e.g., listed only as Special Concern, or are protected only federally and are not birds or fish). However, individuals of these species are protected under other regulations addressing wildlife conservation generally, such as the FWCA, the MBCA, and the PPS. In addition, species listed as Special Concern under the ESA may receive habitat protection if they are observed in habitats that meet the criteria for designation as SWH for Special Concern Species (MNRF, 2015a). Species of Species Concern will be discussed with SWH in Section 5.8.

Table 9 Species at risk with moderate or high potential to interact with the project

Common Name	Taxonomic Name	Status under Endangered Species Act	Status under Species at Risk Act (Schedule 1)	Potential to Interact with Development of the Site
Birds				
Barn Swallow	*Hirundo rustica*	Special Concern	Threatened	Not detected on the Site
Bobolink	*Dolichonyx oryzivorus*	Threatened	Threatened	Not detected on the Site
Canada Warbler	*Cardellina canadensis*	Special Concern	Threatened	Not detected on the Site
Chimney Swift	*Chaetura pelagica*	Threatened	Threatened	Limited/Transient presence only. A single fly-over was detected on the south side of the property. The species is considered unlikely to be resident on the Site. Low probability of interaction with the project
Common Nighthawk	*Chordeiles minor*	Special Concern	Special Concern	Not detected on the Site
Eastern Meadowlark	*Sturnella magna*	Threatened	Threatened	Not detected on the Site
Eastern Wood-Pewee	*Contopus virens*	Special Concern	Special Concern	Detected on the Site during breeding bird surveys
Eastern Whip-poor-will	*Antrostomus vociferus*	Threatened (Special Concern January 2025)	Threatened	Not detected on the Site
Olive-sided Flycatcher	*Contopus cooperi*	Special Concern	Special Concern	Not detected on the Site
Wood Thrush	*Hylocichla mustelina*	Special Concern	Threatened	Detected on the Site during breeding bird surveys
Mammals				
Eastern Red Bat	*Lasiurus borealis*	Endangered (January 2025)	Not Listed	Detected on the Site – migratory species, low probability of negative interactions if tree clearing occurs outside of the active season
Eastern Small-footed Myotis	*Myotis leibii*	Endangered	Not Listed	Not detected on the Site
Hoary Bat	*Lasiurus cinereus*	Endangered (January 2025)	Not Listed	Detected on the Site – migratory species, low probability of negative interactions if tree clearing occurs outside of the active season
Little Brown Myotis	*Myotis lucifugus*	Endangered	Endangered	Limited/Transient presence only - low probability of negative interactions if tree clearing occurs outside of the active season
Northern Myotis	*Myotis septentrionalis*	Endangered	Endangered	Not detected on the Site
Silver-haired Bat	*Lasionycteris noctivagans*	Endangered (January 2025)	Not Listed	Limited/Transient presence only - low probability of negative interactions if tree clearing occurs outside of the active season
Tri-colored Bat	*Perimyotis subflavus*	Endangered	Endangered	Limited/Transient presence only - low probability of negative interactions if tree clearing occurs outside of the active season
Vascular Plants				
Butternut	*Juglans cinerea*	Endangered	Endangered	High – present on site in areas likely to be developed
Black Ash	*Fraxinus nigra*	Endangered	No Status	High – present on site in areas likely to be developed

5.6.1 Chimney Swift

A single chimney swift was observed one time flying over the south end of the Site. There are no structures present on Site (i.e., chimneys or comparable human-built constructs) that would offer suitable nesting locations. While the species can nest in cavities in large, old trees, this is not their preferred nesting habitat. Moreover, the trees within the southwestern portion of the Site over which the bird was observed tend almost entirely < 35 cm DBH. Given the low nesting potential of the Site, the single observation, and the tendency for the species to feed over large distances away from its nest (MNRF, 2018), the observation is considered to be a fly-over; the species is not considered to be resident on the Site. The potential for development impacts to the species generally is thus considered to be very low, and is therefore not considered further in this EIS. It is anticipated that general wildlife mitigation (Section 9.4) will provide adequate protection for this species.

5.6.2 SAR Bats

The Committee on the Status of Species at Risk in Ontario (COSSARO) has updated the provincial status for the Hoary Bat, Silver-haired Bat, and Eastern Red Bat to Endangered. These species will receive general habitat protection on or prior to January 31, 2025. Although these species are not officially listed at the time of this EIS, it is anticipated that protections will apply throughout the development application timeline, and during future community build-out. As such, these species are considered and assessed as Endangered species in this EIS.

The Hoary Bat and Silver-haired Bat were detected in high numbers at the monitoring stations on the Site, indicating potential roosting habitat. The Eastern Red Bat, Little Brown Myotis and Tri-colored Bat were detected at the monitoring stations on the Site and therefore likely forage and/or roost in proximity to the Site. The numbers of detections, however, were very low, suggesting only a limited transient presence over most of the Site, with little evidence of maternal roosting activity or habitat. As Endangered species, Hoary Bat, Silver-haired Bat, Eastern Red Bat, Little Brown Myotis and Tri-colored Bat receive “general habitat protection” under the ESA. However, vegetation removal on the Site would not result in a loss of maternal roosting habitat for the Hoary Bat, Little Brown Myotis and Tri-colored Bat.

Regardless, individuals of listed bat species may periodically roost diurnally in trees or buildings on the site during the active season (April 1 to September 30 inclusive; MNRF, 2017), i.e., bats could briefly use any site tree or structure as a rest stop, but only opportunistically (not as a required habitat element). Potential impacts to individual at-risk bats directly would be mitigated by clearing trees, removing structures (or commencing construction works on them) outside of the roosting season. Following this tree-clearing window would also avoid potential interactions with birds and bird nests protected under the Migratory Birds Convention Act (MBCA; Government of Canada, 1994). As such, the Hoary Bat, Silver-haired Bat, Eastern Red Bat, Little Brown Myotis and Tri-colored Bat are generally considered unlikely to be impacted by future site development.

5.6.3 Butternut

Butternut, endangered under the ESA and SARA, are often found along stream banks as they prefer to grow in moist, well-drained loams; however, the species can tolerate a broad range of soil types. Butternut are intolerant of shade and competition, as they require ample sunlight to grow (Poisson & Ursic, 2013).

A total of 45 Butternuts were observed on the Site (Figure 3). These were the individuals that remained following the 2022 derecho event; a number of toppled and dead Butternuts were evident during the BHA assessment, but these were not considered. All 45 remaining trees were determined to be Category 2 or 3 and are thus protected as SAR under the ESA (Appendix C). These trees were located predominantly within the central FODM8-1 forest ecosite, which is the most mature forested area on the property.

Development within any portion of this would lead to the removal of Butternuts. The BHA (Appendix C) may be used to support a project registration through the Ontario Conservation Fund in accordance with O. Reg. 829/21. Completion of the registration through this process would permit the removal of trees as required to proceed with site development while ensuring an overall net benefit for the species.

5.6.4 Black Ash

Black Ash (*Fraxinus nigra*), endangered under the ESA and with no status under the SARA, are a medium-sized shade-intolerant hardwood tree primarily found in wetland environments like swamps, floodplains and fens. Black Ash can also occur in moist upland forests (COSEWIC, 2018). Black Ash received protection under the ESA on January 24, 2024. O.Reg 6/24 and O.Reg 7/24 set out individual and habitat protection. Black Ash habitat is defined as a radial distance of 30 m from the stem of every Black Ash that are over 8 cm at 1.37 m.

A total of 102 Black Ash >8 DBH were observed on the Site (Figure 3). Black Ash were located predominantly within the FODM7 and FODM8-1 forest ecosites. Of the 102 Black Ash observed, 73 were determined to be healthy, while 29 were determined to be unhealthy. Healthy trees have a canopy condition rating of 1, 2 or 3, and mortality is unlikely within five years based on severity of stressors. Unhealthy trees have a canopy condition rating on 3, 4 or 5, and mortality is expected within five years based on the severity of stressors. Approximately, over 2,000 Black Ash that do not meet the size requirements for protection under the ESA were observed on the Site.

Development within any portion of these ecosites would lead to the removal of healthy Black Ash protected under the ESA. The Black Ash Assessment Report, to be submitted to the MECP and form part of the *Information Gathering Form* (IGF) to support a Net Benefit Permit under the ESA is included in Appendix D. An IGF will be submitted to facilitate the completion of the Net Benefit Permit would permit the removal of trees as required to proceed with site development.

5.7 Significant Woodlands and Canopy Cover

The City of Ottawa's (2022b) Significant Woodland Policy, defines Significant Woodlands within the urban boundary as any area 0.8 hectares in size or larger, supporting woodland 60 years of age and older at the time of evaluation. Significant Woodland on the Site was thus demarcated by delineating the boundaries of wooded areas on and adjacent to the property based on aerial imagery from 1963[2] (Appendix I). Portions of the demarcated areas that were noted as subsequently deforested in historical aerial imagery between 1976 and 2023 within the geoOttawa system were removed. Remaining areas greater than 0.8 ha in size were deemed to constitute Significant Woodland. A total of 10.0 ha of the wooded areas on the Site thus constitute

[2] National Air Photo Library Roll A18057, Photo 0049, Dated 1963-05-24

Significant Woodland (Figure 15). Significant Woodland features on the Site are characterized according to screening criteria per the City's Significant Woodlands policy (2022; Table 10).

Table 10. Characterization of Significant Woodland Areas

Social Values	
Unusual recreational, educational or cultural opportunities	None. The Site consists of private property with no public use supported.
Qualifying Cultural, Heritage, or Historical Features	None. There are no existing designations within the OP.
Indigenous values established through consultation	No values are identified in the Jock River Subwatershed Study or in the nearby Stittsville Mainstreet or Fernbank CDPs. These studies did not however include indigenous consultation.
Hazard lands	
Constrained areas	None. Subject area has no hazards (e.g., floodplain, meander belts, steep or unstable slopes, restrictive soils or karst).
Habitat and Landscape Connectivity	
Adjacency and connectivity	None. Not part of Natural Heritage System Core Area or identified greenspace. Forested areas on the Site extend to abutting areas of dense residential development to the north and west. As such, they cannot serve as connection corridors between other natural areas.
Specialized habitat	Limited. There are no uncommon community types or rare species within the wooded areas. Many of the largest trees on the Site (primarily poplar species) were blown down in the 2022 derecho event (including the largest historically present Butternuts). The current forest mix consists of trees neither especially large nor uncharacteristically old for the broader area. The Significant Woodlands do contain remaining Butternuts (i.e., those not blown down) and some small clusters of Black Ash, which are both listed as SAR.

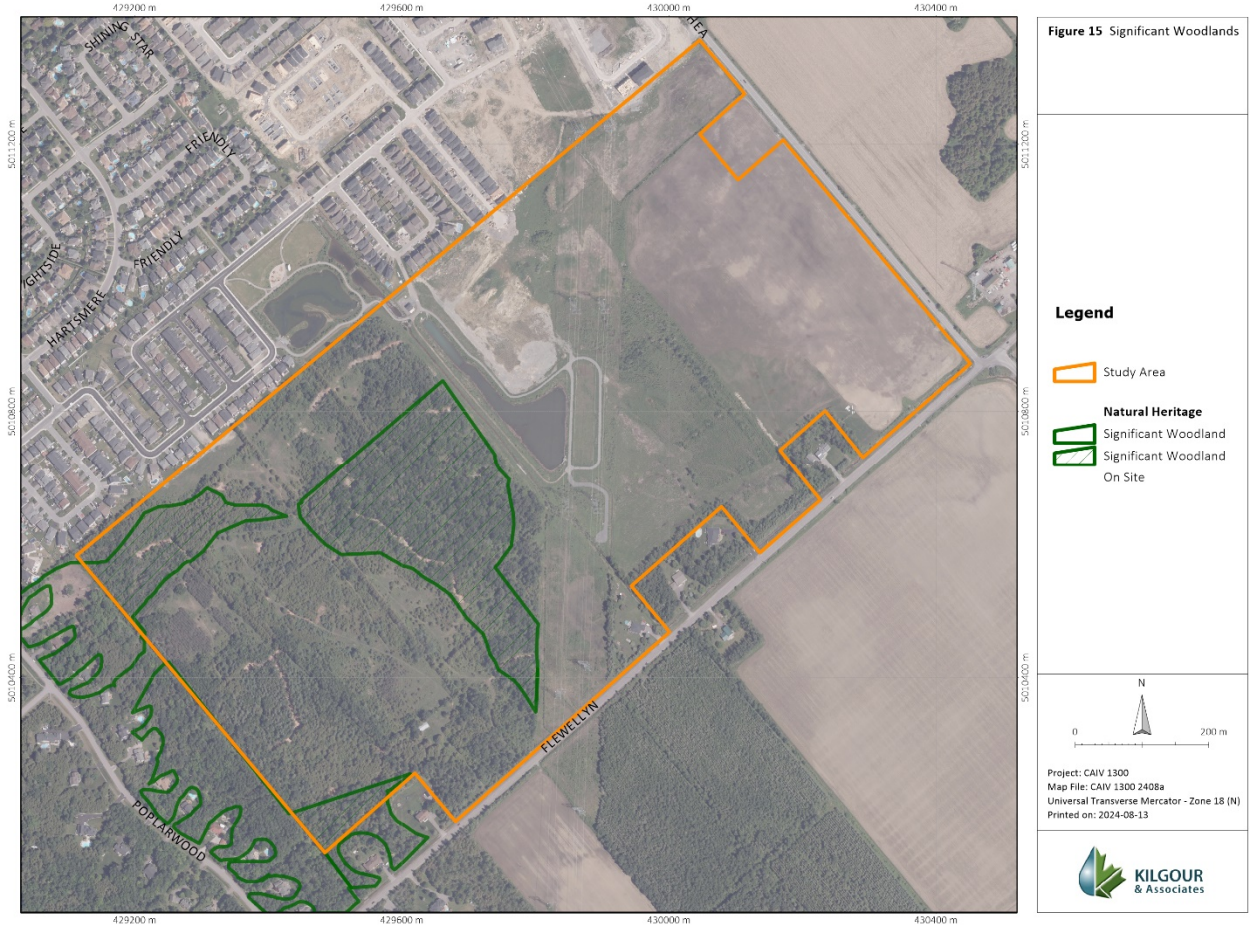

Figure 15. Significant Woodlands

An iTree Canopy assessment of the Site compares the canopy services across the Site generally and within the areas constituting significant woodlands (City of Ottawa, 2022b). Assessments were each based on distributions of 100 random sample points across the entire Site and Significant Woodlands, respectively.

Table 11 Assessment of canopy benefits of the trees across the Site generally and within the areas of Significant Woodland

Land Cover Distribution				
Land Cover Type	General Site		Significant Woodlands Only	
	Area (ha)	Area (%)	Area (ha)	Area (%)
Grass/Herbaceous	42.04 ± 4.12	51.00 ± 5.00	0.10 ± 1.00	1.00 ± 1.00
Impervious Buildings	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Impervious Other	1.65 ± 1.17	2.00 ± 1.41	0.00 ± 0.00	0.00 ± 0.00
Impervious Road	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Soil/Bare Ground	4.95 ± 2.02	6.00 ± 2.45	0.00 ± 0.00	0.00 ± 0.00
Tree/Shrub	32.97 ± 4.04	40.00 ± 4.90	9.88 ± 0.10	99.00 ± 0.99
Water	0.82 ± 0.82	1.00 ± 1.00	0.00 ± 0.00	0.00 ± 0.00
Total	82.43	100	9.98	100.00

Tree Benefit Estimates: Carbon						
	General Site			**Significant Woodlands Only**		
	Carbon (t) ± SE	**CO_2 Equiv. (t) ± SE**	**Value (CAD) ± SE**	**Carbon (t) ± SE**	**CO_2 Equiv. (t) ± SE**	**Value (CAD) ± SE**
Sequestered annually in trees	100.90 ± 12.36	369.96 ± 45.31	$25,895 ± $3,172	30.25 ± 0.30	110.90 ± 1.11	7,763 ± 78
Total stored in trees	2,533.94 ± 310.34	9,291.12 ± 1,137.93	$650,330 ± $79,649	759.61 ± 7.63	2785.24 ± 27.99	194,970 ± 1,960

Tree Benefit Estimates: Air Pollution				
Pollutant Removed Annually	**General Site**		**Significant Woodlands Only**	
	Amount (kg) ± SE	**Value (CAD) ± SE**	**Amount (kg) ± SE**	**Value (CAD) ± SE**
CO - Carbon Monoxide	33.33 ± 4.08	$4 ±$1	9.99 ± 0.10	$1 ± $0
NO_2 - Nitrogen Dioxide	166.98 ± 22.26	$7 ± $1	54.47 ± 0.55	$2 ± $0
O_3 - Ozone	1,775.64 ± 221.65	$383 ± $47	542.53 ± 5.45	$115 ± $1
SO_2 – Sulfur Dioxide	166.77 ± 14.02	$1 ± $0	34.33 ± 0.35	$0 ± $0
PM2.5 - Particulate Matter <2.5 µm	87.74 ± 10.77	$791 ± $97	26.36 ± 0.26	$237 ± $2
PM10 - Particulate Matter 2.5 – 10 µm	606.21 ± 74.25	$278 ±34	181.73 ± 1.83	$83 ± $1

Tree Benefit Estimates: Hydrological				
Benefit	**General Site**		**Significant Woodlands Only**	
	Amount (l) ±SE	**Value (CAD)**	**Amount (l) ±SE**	**Value (CAD)**
Avoided Runoff	267.93 ± 19.53	$1	47.71 ± 0.48	$0
Evaporation	13,168.09 ± 1,612.76	N/A	3,947.45 ± 39.67	N/A
Interception	13,241.78 ± 1,621.78	N/A	3,969.55 ± 39.90	N/A
Transpiration	17,818.46 ± 2,182.31	N/A	5,341.51 ± 53.68	N/A
Potential Evaporation	99,780.41 ± 12,220.55	N/A	29,911.59 ± 300.62	N/A
Potential Evapotranspiration	81,412.47 ± 9,970.95	N/A	24,405.36 ± 245.28	N/A

Trees within Significant Woodlands (and other forested portions of the Site) generally furnish areas with near-100% canopy cover. Large portions of the Site, however, (e.g. the eastern half of the Site with its agricultural fields) provide near-0% canopy. This uneven distribution results in the iTree calculation of 40% existing canopy cover for the Site as a whole. The iTree tree review then provides a metric of the services currently provided by the site trees (located directly within Significant Woodland features or across the site generally).

Future site development will almost certainly result in the replacement of existing forested areas (currently >95% canopy) with other land uses having lower canopy coverage (e.g., streetscapes). Losses in canopy, however, should be equivalently offset with targeted tree planting where development will occur in currently open/agricultural areas (i.e., Eder Parcel). Residential areas should target a minimum of 20% canopy cover at maturity and streetscapes should target at least 30% canopy cover at maturity. Open lands associated with SWM facilities should target at least 15% canopy cover at maturity and park spaces that are not otherwise specifically programmed as sports fields should target at least 50% canopy cover at maturity to generate (semi-) wooded features that would be distributed across the future community.

5.8 Significant Wildlife Habitat

The Significant Wildlife Habitat (SWH) Criteria Schedule for Ecoregion 6E (MNRF, 2015) identifies four main types of significant wildlife habitat: seasonal concentration areas, rare vegetation communities, specialized habitat for wildlife and habitats of Species of Conservation Concern.

5.8.1 Seasonal Concentration Areas

The background information reviewed for the Site did not identify any seasonal concentration areas for animals. No obvious signs or evidence of use as a seasonal concentration area were observed and none are likely to occur on the Site.

5.8.2 Rare Vegetation Communities or Specialized Habitat for Wildlife

Rare Vegetation Communities

Rare vegetation communities typically include those that have developed on cliff and talus slopes, sand barrens, shallow soils over limestone bedrock (alvar), old growth forests, savannahs, and tallgrass prairies. No rare vegetation communities were observed on the Site.

Specialized Wildlife Habitat

Specialized Wildlife Habitat includes waterfowl nesting areas, Bald Eagle and Osprey nesting, foraging and perching habitat, woodland raptor nesting habitat, turtle nesting areas, seeps and springs, woodland amphibian breeding habitat, wetland breeding habitat, and woodland area-sensitive bird breeding habitat.

One pool of standing water was observed in Tributary B during the HDFA. The SWH Criteria requires the presence of 2 or more springs to be considered SWH. Per Section 5.4.3, however, water within site Tributaries is due only to short-distance, horizontal migration through shallow soils rather than groundwater springs.

Woodland amphibian breeding habitat is present on the Site. KAL's amphibian surveys recorded the presence of Spring Peeper (*Pseudacris crucifer*), Western Chorus Frog (*Pseudacris triseriata*), and Wood Frog

(*Lithobates sylvaticus*) within the MMP5 and MMP6 stations, all of which are listed as qualifying significant wildlife species in the SWH criteria. As two or more of these species with a Call Level Code of 3 were recorded, the habitat of the breeding area plus a 230 m radius of woodland area qualifies as SWH. Only the areas near MMP5 and MMP6 stations therefore qualify as SWH.

No other Specialized Wildlife Habitats were identified or observed on the Site.

Habitats of Species of Conservation Concern

Habitats of Species of Conservation Concern include marsh bird breeding habitat, open country bird habitat, shrub/early successional bird breeding habitat, terrestrial crayfish and special concern and rare wildlife species. Habitats of Species of Conservation Concern do not include habitats of Endangered or Threatened species as identified by the ESA. Our background review did not identify the presence of any of the Habitats of Species of Conservation Concern for marsh bird breeding habitat, open country bird habitat, shrub/early successional bird breeding habitat, or terrestrial crayfish. The Site qualifies as SWH for special concern and rare wildlife species, as the Eastern Wood-Pewee and Wood Thrush (special concern) were observed on the Site during breeding bird surveys.

5.9 Other Natural Heritage Features

No Provincially Significant Wetlands (PSW) and/or Areas of Natural and Scientific Interest (ANSI) are located on or adjacent to the Site. The Site does not contain significant valleylands or greenspace linkages. No other significant natural heritage features are located within 120 m of the Site.

6.0 DDESCRIPTION OF THE PROPOSED PROJECT

The proposed Draft Plan for the Site as a whole (Figure 16) includes a mix of single detached, standard townhouse, and stacked condominium residential areas. A total of two parks are proposed, located west of the Upper Faulkner Watercourse, and in the southeast portion of the Site adjacent to Shea Road. The existing utility corridor will be maintained as an open space area. No development is proposed within the utility corridor other than the street 12/13 and street 21 crossings and proposed enhancements to the Upper Faulkner Watercourse. Street widening areas are proposed to accommodate the future widening of Shea Road (Block 102) and Flewellyn Road (Block 104).

The Draft Plan for the Eder Lands portion of the Site specifically, includes single and townhome blocks, but no medium-density condominium blocks (i.e. stacked condominium residential areas). The more easterly of the two community park blocks (0.95 ha in size) is located near the southeast corner of the Eder Lands. The Site's second SMW pond area (2.11 ha; as detailed below) is also located in this corner, and forms part of the open space for both the Eder Lands parcels and the broader community. Other than the Faulkner drain along the southern edge of the parcel (discussed and detailed bellowed), no preexisting natural features are located directly within the Eder Lands. As such, there are no specific grading restrictions or limitations (outside of the Faulkner drain corridor) required to protect such features.

For stormwater considerations, two SWM ponds are proposed to be located in the southeast corners of the east and west halves of the Site respectively, based on the existing site topography as well as technical and cost constraints per the Master Servicing Study (MSS) dated July 2024, prepared by DSEL. The SWM ponds are (and must be) located at relatively lower elevations than the remainder of the Site to effectively receive site runoff, but cannot be at lower elevations than the downstream receivers to which they drain. The required elevations for the pond relative to both the Site and the surrounding areas require that most of the Site be regraded (DSEL, 2024). The pond blocks have been sized and located such that outflow systems will be limited to pipe connections to the immediately adjacent Faulkner Drain. As such, the area within the SWM blocks is dedicated almost fully to SWM functionality, though the outer perimeter of the circumferential access road/berm can still include some limited tree planting.

The Upper Faulkner Watercourse is proposed to be enhanced to improve fish habitat and create additional wildlife habitat to support herpetofauna using principles of natural channel design, in-stream and riparian native vegetation planting, and wetland pocket creation. A general design concept is included in Figure 16. Final design details will be provided to the City when available. An existing naturalized corridor including at least 30 m from the top of its channel bank of natural riparian vegetation and Significant Woodland along the west side will be retained as natural heritage lands, thus providing a 30 m setback. A 5.5 m wide public pathway is proposed adjacent to the western edge of the 30 m forested setback, abutting rear yards. No grading will occur within the 30 m forested setback. The limit of grading is the eastern boundary of the 5.5 m pathway, which will match existing grade, and is shown on the Conceptual Grading Plan (DSEL, 2025a), included in Appendix J. Rear yards abutting the 5.5 m pathway will drain predominantly via a storm trunk tributary (DSEL, 2025b) and via overland flow directed southeast (based on existing topography) to the Upper Faulkner Watercourse. Sufficient grade exists within the 30 m forested setback lands to adequately dissipate flows. Thus, ponding at surface for an extended period of time is not anticipated given the slope to the drain and soil type(s) as identified by Paterson Group (DSEL, personal communication, April 17, 2025; Paterson Group, 2023).

The Faulkner Drain, where it is not directly adjacent to the utility corridor or other properties not part of the proposed development, would be retained as natural heritage lands within the Eder Lands parcel and include a 15 m setback from the northern top of slope on the Site. The setback is proposed to be planted with medium-sized trees to provide some shading and allochthonous inputs to the channel. A SWM pond is located immediately north of the 15 m setback. The south bank of the Faulkner Drain would remain adjacent to Flewellyn Road to maintain its current functionality as a roadside ditch.

Existing forest cover on the western half of the Site will be fully removed to accommodate development, except for the 30 m forested setback from the Upper Faulkner Watercourse, and east of HDF D abutting rear yards along the western site boundary. HDFs associated with forest cover on the western half of the Site (HDF A, B and E) will be fully removed to accommodate development. Surface water features are discussed further in Section 7.2 below. The eastern half of the Site currently has an extremely limited number of trees. Thus, development will lead to increased urban canopy cover with streetscape tree planting, parks, and SWM ponds within the eastern half of the Site. Overall canopy cover on the Site would likely be reduced from 40% to 32% (NAK Design Strategies, 2025), not considering park blocks. Existing trees within forested areas on the western half of the site will be retained to the highest extent possible. Development would result in a significantly more even distribution of canopy cover across both east and west portions of the Site. While tree cover is not generally feasible within the hydro corridor, the site landscape plan is recommended to

naturalize that area as further public greenspace for the community. Employing low-height canopy enhancements through the planting of thickets can be expected to further increase the Site canopy cover. Canopy coverage is based on average expected mature diameter of ~12.5m, area of 138m² (combination of medium and large sized trees). Calculation accounts for canopy overlap between trees and excludes canopy overlap to non-residential lands (NAK Design Strategies, 2025).

Figure 16. Proposed Draft Plan of Subdivision

7.0 IMPACT ASSESSMENT

The potential area of impact associated with the proposed development includes the lands associated with the Upper Faulkner Drain, Faulkner Drain, and all forested and naturalized lands and their associated natural heritage features west of the Faulkner Drain. The development of the previously cleared eastern portion of the Site is not anticipated to have significant impacts to the ecological function of the Site. Impact assessment consideration for this portion of the Site is limited to Tributary F, the Faulkner Drain, and associated setbacks along Flewellyn Road. The assessment of impacts is based on the proposed development compared to existing Site conditions observed in 2023 and 2024.

7.1 Impacts to Vegetation, Significant Woodland and Canopy Cover

The Significant Woodland Policy (City of Ottawa, 2022b) provides that the forest attributes of woodland features qualified as "significant" can be replaced, substituted, or otherwise (adequately) mitigated. The policy acknowledges that negative impacts on the functions and services of significant woodlands within the urban area may be necessary in order to achieve the policies and objectives of the Official Plan and PPS. In evaluating potential tradeoffs associated with how the proposed development can be expected to impact Significant Woodland on the Site, this EIS considers changes in:

- Total canopy cover and tree "benefits" as measured using iTree Canopy; and
- Social value, Accessibility and Equity considering the percentage of the community with easy access to greenspace (i.e. considering the portion of the community within 250 m of wooded features).

In its existing condition, the distribution of forest coverage on the Site is highly irregular, with treed areas (Significant Woodland or otherwise) within the western portion of the Site and very few trees within the eastern portion of the Site. The Draft Plan of Subdivision reduces forest cover on the western portion of the Site, it is anticipated to significantly increase canopy cover on the eastern portion of the Site.

The initial estimate of likely overall mature canopy coverage for the future Site is 32% (NAK Design Strategies, 2025). The assessment of existing conditions (Section 5.7) considered tree functions both within Significant Woodland areas and across the site generally. Given the redistribution of canopy cover across the entire Site, the iTree Canopy assessment of the Site post-development (Table 13) employs the same 100 sample points used for the initial "whole-site" assessment. Future tree presence for each point was weighted based on a projected estimate of 32% (NAK Design Strategies, 2025).

Table 12 Post-Development Assessment of Canopy Benefits

Land Cover Distribution		
Land Cover Type	**General Site (post-development)**	
	Area (ha)	**Area (%)**
Treed (i.e. with canopy)	26.38 ± 3.85	32.00 ± 4.66
Not Treed	56.05± 3.85	68.00 ± 4.66
Total	82.43	100%

Tree Benefit Estimates: Carbon			
	General Site (post-development)		
	Carbon (t) ± SE	**CO2 Equiv. (t) ± SE**	**Value (CAD) ± SE**
Sequestered annually in trees	80.72 ± 11.77	295.97 ± 43.14	$20,516 ± 2,991
Total stored in trees	2,027.15 ± 295.51	7,432.90 ± 1,085.52.02	$515,231 ± 75,107

Tree Benefit Estimates: Air Pollution		
Pollutant Removed Annually	**General Site (post-development)**	
	Amount (kg) ± SE	**Value (CAD) ± SE**
CO - Carbon Monoxide	26.70 ± 3.89	$16 ± 2
NO_2 - Nitrogen Dioxide	133.58 ± 19.47	$5 ± 1
O_3 - Ozone	1,420.28 ± 207.04	$245 ± 36
SO_2 – Sulfur Dioxide	133.42 ± 19.45	$1 ± 0
PM2.5 - Particulate Matter <2.5 µm	70.19 ± 10.23	$514 ± 75
PM10 - Particulate Matter 2.5 – 10 µm	504.69 ± 73.57	$1,474± 215

Tree Benefit Estimates: Hydrological		
Benefit	**General Site (post-development)**	
	Amount (l) ±SE	**Value (CAD) ± SE**
Avoided Runoff	221.54 ± 32.30	$707 ± 103
Evaporation	18,279.43 ± 2,664.66	N/A
Interception	18,370.65 ± 2,667.96	N/A
Transpiration	28,325.47 ± 4,129.11	N/A
Potential Evaporation	138,985.28 ± 20.260.41	N/A
Potential Evapotranspiration	138,985.28 ± 20,260.41	N/A

The overall impact to vegetation, Significant Woodland and canopy cover from the proposed development would be the removal of all forested areas and vegetation on the Site to accommodate site development (Figure 16), except in the 30 m retained forest buffer west of the Upper Faulkner Watercourse. Future development would, therefore, result in a loss of 26.76 ha of forested lands, 9.66 ha of which constitute Significant Woodlands. The retained 30 m forest buffer totals 1.22 ha in size and maintains >95% canopy cover. This includes the easternmost portions of the FOMM4-3, MEMM3 and FODM5-1 vegetation communities, and 0.34 ha of Significant Woodlands. Open and regenerating areas associated with

Geotechnical cut lines and the MEMM3 vegetation community as well as the lands east of the FOMM4-3 and FODM5-1 vegetation communities will be planted extensively from the western top of bank of the Upper Faulkner Watercourse into the existing forest. This will enhance the existing forest edge and open areas west of the Faulkner Drain, provide increased canopy cover, watercourse shading, riparian habitat, and improved allochthonous inputs. Trees along the southern portion of the Faulkner Drain along Flewellyn Road will be retained within holdout parcels, and the 15 m setback from the northern existing stable top of slope will be planted to achieve a minimum of 80% canopy cover at maturity.

Tree planting will be undertaken across the Site associated with the Upper Faulkner Watercourse enhancement, 30 m wide forested corridor, SWM ponds, park blocks, and streetscaping. Tree planting to be completed across the entire Site (i.e., the current proposed development, and the broader Site including the future development of the Eder Parcel) is anticipated to provide 32% canopy cover at maturity (NAK Design Strategies, 2025).

The Preliminary Streetscape Plan (NAK Design Strategies, 2025; Appendix K) provides single and multiple tree soil volumes (m^3) and demonstrates sufficient soil volume to support medium and large sized trees in street cross sections, and right of ways. Tree planting will be undertaken to the extent possible to meet the estimate of 32% overall mature canopy coverage in consideration of significant woodland loss.

Development across the western half of the Site is anticipated to reduce sub-soil surface water movements generally (Paterson Group, 2023). Thus, development west of (substantially more than 30 m) the area of current Black Ash concentration will likely render most of the Ash habitat too dry to support the species. Only areas still directly associated with the riparian edge of the drain would remain suitable as habitat. No mature Black Ash individuals (or Butternut) currently occur within the 30 m wide retained forested corridor, though hundreds of Black Ash saplings (<8 DBH at 1.37 m) do occur there and will be preserved.

A 5.5 m strip of land located between the 30 m forested setback limit and the adjacent residential area along the western side of the Upper Faulkner Watercourse will include a new pathway to provide recreational access to the residents of the new community and those of the adjacent community to the mature forest there. This will provide a degree of separation between rear yards and mature forest. While Site landscaping plans will require new trees generally within SWM blocks, planting along the sides of each SWM block will augment urban forest with a focus on establishing areas of denser tree coverage, maximized in width to the highest extent possible while allowing operational space. Pathways associated with these concentrated areas of tree planting are intended to provide recreational walkways under a nearly full canopy at maturity near the pond features within the blocks. Similarly, areas of tree planting with a higher density in park blocks would establish further expressions of urban forest canopy. Tree planting within SWM blocks and park blocks can result in up to a total of 82% of the new community being located within 250 m of the recreational walkways with the retained forest and/or new areas enhanced new canopy cover. The existing, non-publicly accessible hydro corridor will also result in 9.4 ha of publicly accessible open space with enhanced opportunities for recreational pathways and increased social value. Including the consideration of other open space areas, 88% of the community is located within 250 m of public greenspace; the opportunities for additional canopy coverage will be confirmed as the planning process progresses for the Site. An 11.0 ha area of the adjacent community to the north will also be located within 250 m of retained forest cover on the Site and its recreational pathway. Those residents currently have no legal access to Site forests. Overall changes in forest function and canopy cover are indicated in Table 13.

Table 13 Summary of Changes in Canopy and Forest Function

Ecosystem Service	Change		
Social Value	Existing - Private land, no public access Proposed - New community with 32% urban canopy cover		
Public Greenspace (Natural Areas, Parks, Open Space)	Existing - Private land, no public access Proposed -1.8 ha of retained mature forest with recreational access and 1.5 ha of new urban forest features with recreational access, 23.4 acres of open space, with proposed recreational pathways in hydro corridor		
Percent of the community within 250 m of public greenspace	Existing - Private land, no public access Proposed – 43%, plus 11.0 ha of the neighbouring community newly within 250 m of naturally forested space. – a further 46% of the community is situated within 250 m of other public greenspace such as parks, open SWM areas or (re-greened) hydro corridor		
	Existing Site Total	Existing Significant Woodland	Proposed Site Total
Canopy Cover (Total for site)	40%	13.4%	32% (higher if low-height tree coverage is maintained within the hydro corridor)
	Change Relative to Significant Woodland	Change Relative to Total Site	
Carbon Storage (t/yr)	+50.47 (+167%)	-20.18 (-20%)	
CO removal (kg/yr)	+16.71 (+167%)	-6.63 (-20%)	
NO2 removal (kg/yr)	+79.11 (+145%)	-33.4 (-20%)	
Ozone removal (kg/yr)	+877.75 (+162%)	-355.06 (-20%)	
SO2 removal (kg/yr)	+99.09 (+289%)	-33.35 (-20%)	
PM 2.5 removal (kg/yr)	+43.83 (+166%)	-17.55 (-20%)	
Avoided Runoff (l/yr)	+173.83 (+364%)	-46.39 (-17%)	

7.2 Impacts to Surface Water Features

Tributaries on the Site were found to be primarily fed by overland flow and precipitation catchment into the SWCM1-1 wetland and by very shallow water transport through the adjacent soils rather than true groundwater upwellings (Paterson Group, 2023). Direct fish habitat occurs on the Site in the Faulkner Drain, Tributary C within the roadside ditch, and in Tributary B, but associated only with the small standing water pool there. Fish were otherwise absent from within the Tributary B and all other headwater channels. Table 15 shows the channelized water feature impacts and compensation.

Development occurring generally on the western half Site would alter shallow overburden and subsurface flows, removing groundwater supply to the swamp wetland feature (Paterson Group, 2023). With SWM systems required to be located at the elevationally-low end of the Site (i.e. the southeast corner) there is no opportunity to maintain hydration to Tributaries B and E, even with the full retention of all otherwise-required setbacks. Development on the western half of the Site thus precludes options to retain those features; they would be removed in any future site plan. Thus, tributaries A, B, and E will be removed and impacted; tributaries C, D, and F will be maintained. Tributaries to be removed will require permission under Section 28.1 of the CA Act (Government of Ontario, 1990a) and O.Reg 41/24 (an “RVCA Permit”) and the

removal of tributary B would need to be supported by both an RVCA Permit and a *Request for Review* (RFR) to Fisheries and Oceans Canada (DFO). Habitat enhancements along the Upper Faulkner Watercourse (Figure 16) and the Faulkner Drain through extensive planting efforts providing shading, allochthonous inputs, fish habitat elements, and improved filtration can be implemented to replicate the function of the removed Tributaries, SWCM1-1 wetland, and loss of fish habitat on the Site. Ecological enhancements will continue to be designed such that operational requirements are not impacted. Habitat compensation plans will be prepared subsequently to this EIS to City staff satisfaction that the proposed features can be accommodated without constraining maintenance activities, sediment storage requirements, or tree planting.

No development would be permitted to occur within 30 m from the top of bank of the Upper Falkner Watercourse, except where road crossings are required. Along the northern reach of the feature, 30 m to the west of the top of bank will be retained and planted (within riparian areas) to create a 1.22 ha forested corridor. The existing SWM pond to the east would remain. Road crossings of the Faulkner channel(s) would require the use of a box culvert sufficiently wide to accommodate the maximum wetted width of the channel. Regardless, any such crossings would need to be supported by an RFR to DFO and an RVCA Permit. Compliance with the requirements issued accordingly from those agencies for the final design and construction approach for the crossings would ensure that potential impacts of the crossing to adjacent aquatic habitat would be suitably mitigated.

The Faulkner Drain along the south side of the Site currently serves primarily as a roadside ditch to Flewellyn Road along its south bank and has active farmland immediately adjacent to its north bank. The treed 15 m setback from the top of slope on the Site would provide shading and allochthonous inputs to the channel and is considered to be sufficient to both protect and enhance the functionality of the drain corridor.

The 15 m setback is contemplated from the top of slope in its existing position, as the City has no current plans to alter the road location (i.e. nor the banks of the Faulkner Drain). If a future widening of Flewellyn Road were to be required, high-density residential development directly adjacent to the current road corridor along the western half of the Site (i.e. west of the Faulkner Drain) would likely force the road corridor to expand southward (i.e. leaving the Faulkner Drain alignment unchanged).

Table 14 Channelized Water Feature Impacts & Compensation

Channel	Flow Condition	Fish Habitat Considerations	Length (m)
Channels Removed			
A	Spring freshet drainage only	Not Fish Habitat	465
B	Perennial, but limited flows after spring.	Fish Habitat (Lower half only)	678
E	Perennial, but highly limited at all times	Not Fish Habitat	120
Total length of channels removed			**1263**
Total length of channels providing fish habitat removed			**339**
Channels Added or Improved			
Upper Faulkner Watercourse	Permanent The feature will be enhanced with principles of natural channel design, in-stream and riparian native vegetation planting, and wetland pocket creation.	This feature will continue to support local fish species along its entire length post-development.	Existing reach to be enhanced 432 m Enhanced reach 471 m New riparian wetland space 565 m^2
Faulker Drain	Permanent Channel morphology will remain in its existing condition. A 15 m setback from the northern top of slope will be implemented and planted with native trees and shrubs to provide shading and allochthonous inputs.	This feature will continue to support local fish species along its entire length post-development.	Existing on site 800 m
Total length of enhanced channels providing fish habitat			**432 m enhanced 39 m new**
Channels Retained			
D	Ephemeral	Off-Site, unlikely to support Fish Habitat	675
C (excluding Faulkner Drain)	Perennial, but limited flows after spring.	Fish Habitat	326
F	Perennial, but highly limited at all times	Not Fish Habitat	640
Total Length of Channels Post-Development			**3182**

7.3 Impacts to Species at Risk

A total of 12 species subject to protections as SAR under the ESA and/or SARA were initially considered to have a moderate to high potential to occur on the Site and/or interact with the project (Table 9). Of those 12 species, four were observed to occur on the Site, and only two are considered likely to be negatively impacted by the project. Butternut and Black Ash are detailed below.

The general wildlife mitigations provided in Section 9.4 are anticipated to protect the SAR that may potentially occur on the Site.

7.3.1 Butternut

Butternut and their associated root-harm prevention zone are regulated under the ESA (Government of Ontario, 2007). The proposed development requires the removal of all 45 Butternuts identified on the Site. A BHA was completed on June 5, 2023, and the Butternut Health Expert Report is included in Appendix C. The BHE may be used to support a project registration through the Ontario Conservation Fund in accordance with O. Reg. 829/21. Completion of the registration through this process would permit the removal of trees as required to proceed with site development while ensuring an overall net benefit for the species.

7.3.2 Black Ash

Black Ash over 8 cm at 1.37 m and their habitat are regulated under the ESA (Government of Ontario, 2007). The proposed development requires the removal of all 102 Black Ash identified on the Site. A BAA was completed on June 27 and 28, 2024. The *Black Ash Health Assessment Report Worksheet* for submission to the MECP alongside the *Information Gathering Form* (IGF) is included in Appendix D. Completion of the Net Benefit Permit would permit the removal of trees as required to proceed with site development.

Approximately, over 2,000 Black Ash that do not meet the size requirements for protection under the ESA were observed on the Site. Approximately 300-500 of these Black Ash are located within the area of the retained 30 m wide forested corridor west of the Faulkner Drain, allowing for continued growth of these stems post-construction.

7.4 Impacts to Wildlife

A total of five frog species were observed on the Site via evening Frog surveys and incidental observations, predominantly associated with the existing SWM pond on the Site. This SWM pond is being retained, and therefore no impact to species utilizing this feature is anticipated. Wood Frogs, Chorus Frog, and Spring Peeper were observed in association with Tributaries A, C and E. Tributary C is being retained, and therefore no impact to species utilizing this feature is anticipated. Under future site development, Tributaries A and E would experience altered subsurface flows and thus cannot be retained (Paterson Group, 2023). The limited anuran presence along the features, however, could be replicated in small wetland features associated with the enhancement of the Upper Faulkner Watercourse.

Migratory birds have potential to occur and nest on the Site, and large amounts of forest and nesting opportunity on the Site will be removed. The implementation of suitable mitigation measures (per Section 9.4) would minimize the risk resulting in reduced impacts to migratory birds.

Urban wildlife species common to the Ottawa area were incidentally observed on the Site during the field surveys (White Tailed Deer, Coyote, Fox, etc.). These species may continue to use or cross the Site within the Faulkner Drain and stormwater corridor, which will remain in place during and after Site development. The implementation of mitigation measures per Section 9.4 will minimize the risk resulting in reduced impacts to wildlife.

7.5 Impacts to Significant Wildlife Habitat

The proposed development will result in the loss of confirmed woodland amphibian breeding habitat for Spring Peeper (*Pseudacris crucifer*), Western Chorus Frog (*Pseudacris triseriata*), and Wood Frog (*Lithobates sylvaticus*) that currently occur within the MMP5 and MMP6 stations. The habitat of the breeding area plus a 230 m radius of woodland area qualifies as SWH, and the areas near MMP5 and MMP6 stations therefore qualify as SWH. Additionally, the Site qualifies as SWH for special concern and rare wildlife species, as the Eastern Wood-Pewee and Wood Thrush (Special Concern) were observed on the Site during breeding bird surveys.

No demonstrated, direct threats to Eastern Wood-Pewee population sizes are known, and loss of habitat is not documented as a significant impact to this species (COSSARO, 2013a). The Eastern Wood-Pewee is a small flycatcher that feeds on small insects from a perch in the subcanopy of the forest. The retention of the 30 m wide forested corridor adjacent to the Faulkner Drain and SWM pond is anticipated to continue to support this species, and no significant impact is anticipated.

Direct threats to Wood Thrush are not well understood, and may include a variety of factors including habitat degradation and fragmentation, over browsing by White-tailed Deer, Brown-headed Cowbird brood parasitism and nest predation (COSSARO, 2013b). Although Wood Thrush were observed on the Site, only one occurrence was recorded at one station (BBS1). Forests on the Site in their pre-development condition are already in a fragmented state due to historical agricultural operations and clearing, ongoing site usage and maintenance, and groundworks associated with the Faulker Drain. Brown-headed Cowbird was observed incidentally on the Site, indicating potential brood parasitism and nest predation.

Mitigation measures to eliminate or minimize impact to confirmed SWH are included in Section 9.5 below (OMNRF, 2014).

8.0 MITIGATION APPROACHES

The following sections provides recommended mitigative measures that would be imposed to limit potential impacts to natural heritage features on the Site under future residential development.

8.1 Mitigation for Vegetation

The following mitigation measures are recommended to minimize impacts on the 30 m forested setback and individual trees being retained on the Site:

- Erect a fence beyond the critical root zone (CRZ; i.e., 10 x the trunk diameter) of retained trees. The fence is recommended to be highly visible (e.g., orange construction fence) and paired with erosion control fencing. Pruning of branches is recommended in areas of potential conflict with construction equipment;
- Signage attached to the CRZ fence every 6.0 m indicating:
    a) the fencing is to protect the tree's CRZ; and
    b) that the fence must not be moved.
- Do not place any material or equipment within the CRZ of the tree;
- Do not attach any signs, notices, or posters to any tree;
- Do not raise or lower the existing grade within the CRZ without approval;
- Tunnel or bore when digging within the CRZ of a tree;
- Do not damage the root system, trunk or branches of any tree; and
- Ensure that exhaust fumes from all equipment are NOT directed toward any tree's canopy.

Tree planting plans will be created as part of the landscape plan for the development. The tree planting plan for the retained forest areas, riparian areas, and residential areas of the Site are to include directives that will contribute to the City's 40% canopy cover target at maturity. Trees and other plants identified in landscape plans are recommended to be non-invasive and locally appropriate native species.

The following general protection measures are recommended during Site preparation and construction to limit impacts to vegetation:

- Limit tree removal onsite to the highest extent possible and only remove trees necessary to accommodate construction and development; and
- Ensure equipment is clean prior to vegetation removal to avoid introducing invasive species to the Site, and clean equipment prior to leaving Site to avoid spreading the aforementioned invasive species elsewhere.

After community buildout, it is recommended that residents/landowners are provided with an environmental awareness package detailing common invasive plant species to avoid planting in yards to reduce risk of invasive species spread into the retained woodland, as well as avoiding dumping yard waste.

8.2 Mitigation for Surface Water Features

The following mitigation measures are recommended to be implemented to minimize or eliminate impacts to surface water features:

- The landscape plan for the Upper Faulkner Watercourse is recommended to generally include a variety of native tree, shrub, grass, and forb species to provide allochthonous inputs, maximize shading, limit solar heating, provide erosion and sediment control, and contaminant filtration; and,

- The landscape plan for the setback space directly along Flewellyn Road must include tree planting on the northern side of the drain. City maintenance access to the channel will be from the southern side along Flewellyn Road. Medium sized trees are recommended to be planted near the top of the north side bank to maximize effectiveness for shading, soil stability, and allochthonous inputs. The 15 m buffer width will provide sufficient soil volume to accommodate a variety of tree planting along with grass and forb ground cover.

To eliminate harmful alteration, disruption, or destruction (HADD) of fish and fish habitat under the Fisheries Act (Government of Canada, 1985), the following mitigation measures are recommended to be implemented:

- Time work to avoid the restricted activity timing windows to reduce the risk of harm to fish and fish habitat. Restricted timing windows in Ontario are March 15 - July 15, and October 1 – May 31;

- Utilize methods to prevent soil compaction near fish habitat, such as swamp mats or pads;

- Install a temporary cofferdam or other isolation method to isolate the construction zone for any in-water works prior to beginning work;

- Perform a fish removal of the isolated area, conducted by a qualified professional biologist;

- Minimize duration of in-water work;

- Wherever possible, operate machinery on land above the high water mark in a manner that minimizes disturbance to the banks and bed of retained waterbodies;

- Do not place fill or (re)grade any channels or watercourses without required authorization and/or permits from RVCA, DFO, and MNRF, and consult a qualified professional biologist on additional measures that may be required to protect fish habitat;

- Maintain fish passage by avoiding obstructing or interfering with the movement and migration of fish by changing flows or water levels of watercourses and/or channels; and

- Prevent entry of deleterious substances to watercourses and channels.

It is recommended that the project follow applicable DFO standards and codes of practice including:

- Interim standard: In-water Site Isolation;
- Interim code of practice: End-of-pipe fish protection screens for small water intakes in freshwater; and
- Interim code of practice: Municipal and agricultural drain maintenance.

The potential for construction-related impacts to surface water features can be managed with the implementation of appropriate mitigation measures, such as:

- Implementation of natural channel design principles in the design process;
- Import only clean fill for the construction of enhancements within the Upper Faulkner Watercourse corridor to avoid introduction of non-native and/or invasive species;
- Ensure equipment is clean prior to construction works to avoid introducing invasive species to the Site, and clean equipment prior to leaving Site to avoid spreading the aforementioned invasive species elsewhere;
- Design and implement erosion and sediment controls to contain/isolate the construction zone, manage site drainage/runoff and prevent erosion of exposed soils and migration of sediment;
- An Erosion and Sediment Control Plan outlining mitigation measures to limit the potential for sediment and erosion to enter these watercourses. The ESC Plan must be developed to the satisfaction of RVCA. The ESC Plan should include:
    - A multi-faceted approach to provide ESC;
    - Regularly inspecting and maintaining the ESC measures during all phases of the project;
    - Retention of existing vegetation and stabilization of exposed soils with native vegetation where possible;
    - Keeping the ESC measures in place until all disturbed ground has been permanently stabilized;
    - Using biodegradable ESC materials where possible and removing all exposed non-biodegradable ESC materials once the Site is stabilized;
    - Limiting the duration of soil exposure and phasing project works;
    - 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 surface water features and all machinery will remain on the project-side of silt and construction fence;
- Maintaining overland sheet flow and avoiding concentrated flows;
- Storing/stockpiling materials >30 m away from the Faulkner Drain, SWM pond, and other surface water features;
- Fencing or tarping all stockpiled material (<150-millimeter gravel) during the turtle nesting period (late May to early July) (MECP, 2021b) to prevent turtles from nesting in stockpiles. If the stockpile is within a properly fenced area (i.e., the project footprint) additional fencing is not necessary for turtle management, but is recommended for ESC if piles will be left unused for extended periods;
- Regularly inspecting the Site for signs of sedimentation during all phases of work and taking corrective action if required;
- Developing a response plan to be implemented immediately in the event of a spill of a deleterious substance;
- Keeping an emergency spill kit on the Site;
- Stopping work and containing deleterious substances to prevent dispersal; and
- Reporting any spills of sewage, oil, fuel, or other deleterious material whether near or directly into a surface water feature.

As a general surface water protection measure post-development, residents should be made aware of the importance of minimizing or avoiding the use of fertilizers, herbicides, and pesticides and should consider using surface materials that allow for rainwater infiltration, Upper Faulkner Watercourse erosion risks and reduction, as well as interpretive signage for enhanced habitats and biodiversity protection.

8.3 Mitigation for Species at Risk

Impacts to Butternut and Black Ash are mitigated through project registration through the Ontario Conservation Fund in accordance with O. Reg. 829/21 for Butternut, and the completion of a Net Benefit Permit for Black Ash. These processes would permit the removal of SAR trees while ensuring an overall net benefit for these species, thus permitting the future development of the site to proceed in compliance with federal and provincial SAR regulations.

Impacts to other SAR can be managed with the implementation of appropriate mitigation measures, such as:

- All on-site staff are recommended undergo environmental awareness training to be able to identify the potential SAR that may be encountered;
- Removal of vegetation suitable as nesting habitat should occur outside of the breeding bird season, and outside of the bat roosting season (April 1 to September 30 inclusive; MNRF, 2017). This will

ensure no impact to SAR birds and bats (including bats being listed in January 2025) utilizing the Site; and

- Perform daily pre-work searches of the construction area to ensure no wildlife has entered the work area overnight.

8.4 Mitigation for Wildlife

The following mitigation measures are recommended to be implemented during future construction to generally protect wildlife:

- Areas are not recommended to be altered or cleared during sensitive times of year for wildlife unless mitigation measures are implemented and/or the habitat has been inspected by a qualified Biologist;
    - Clearing of trees and/or vegetation should not take place April 1 to September 30 inclusive unless a qualified Biologist has determined that no birds are nesting or suitable bat roosting trees are present. The bird nest sweep would be valid for five days:
        - The MBCA protects the nests and young of migratory breeding birds in Canada. The timing of nesting for birds in the area spans April 1 to August 31 (Government of Canada, 1994);
- Ensure that a qualified biologist develops a wildlife management plan for the construction process and delivers environmental compliance and biodiversity training to all site workers to implement the plan. The plan is recommended include (but not be limited to) requirements to:
    - Utilize silt fence paired with sturdy construction fence along the project perimeter and around soil stockpiles to serve as a wildlife exclusion measure to prevent smaller animals from accessing/utilizing temporary habitats on the Site;
    - Check the entire work site for wildlife prior to beginning work each day;
    - It is recommended that construction and vegetation removal occurs in phases, limiting vegetation removal to the highest extent possible to facilitate wildlife movement towards safety;
    - Do not harm, feed, or unnecessarily harass wildlife;
    - Manage waste to prevent attracting wildlife to the work site. Effective mitigation measures include litter prevention and keeping all trash secured in wildlife-proof containers and promptly removing it from the work site, especially during warm weather;
    - A recommended a speed limit of 20 km/h during the active season (April 1 to September 30) to reduce wildlife mortality; and
    - Manage stockpiles and equipment at the work 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 workday to prevent access by wildlife.

Once construction is complete and the residences are occupied, KAL recommends that new residents are encouraged through signage and public education to keep pets on leash during the bird breeding season (April 1 to August 31). It is recommended that landowners be provided with educational resources about keeping cats on a leash or indoors, as cats are one of the largest threats to bird populations (Blancher, 2013).

8.5 Mitigation for Significant Wildlife Habitat

Impacts to qualifying woodland amphibian breeding habitat SWH and special concern and rare wildlife species SWH for Eastern Wood-Pewee and Wood Thrush can be mitigated by implementing the following mitigation measures:

- Enhancing remaining forest and significant woodland with plantings, protecting the structure and moisture regime of the forest;
- Improving shading along the Upper Faulkner Watercourse, Faulkner Drain and existing and new SWM ponds, resulting in higher quality habitat and increased amphibian activity in these areas;
- Establishing new amphibian habitat features along the Upper Faulkner Watercourse (Figure 16);
- Implementing overland flow catchment and stormwater management controls, reducing the release of contaminants (i.e., sediments, high nutrient concentrations, deleterious substances, salt, etc.) into retained and enhanced amphibian habitat, reducing exposure to aquatic toxicants; and,
- Fencing areas between retained forested lands and residential lots to reduce long-term disturbance and predation by pets due to the adjacent residential community.

9.0 REVIEW AND CONCLUSIONS

The intent of this report is to consider potential impacts to natural heritage system features associated with the Draft Plan of Subdivision for the Site, allowing such development to planned and pursued. This report identifies likely mitigation measures that would be employed under future development and/or imposed on future development.

Reviewing natural heritage system elements addressed within the PPS and the City's OP (and in consideration of relevant federal and/or provincial legislation per Section 2.0 above):

a) Significant Wetlands

- No significant wetlands are present on the Site.

b) Habitat for SAR (and SAR directly)

- For all SAR identified on the Site, the ESA provides mechanisms that permit the removal of those SAR species and/or their habitat from the Site – with the implantation of offsetting measures to ensure a net benefit for those species – such that future site development can be permitted in full compliance with that legislation.

c) Significant Woodlands

- The total area of Significant woodland would be reduced from 9.66 ha to 1.22 ha, but total canopy cover across the site would only be reduced by ~8%. The redistribution of treed spaces within new residential community would provide open green space within 250 m to 89% of the new community residents.

d) Significant Valleylands

- There are no significant valleylands associated with the Site.

e) Significant Wildlife Habitat

- Significant Wildlife Habitat on the Site is limited to supporting Eastern Wood-Pewee, Wood Thrush, and several species of frogs. Both bird species were present in limited numbers and would likely remain associated with the Site in limited numbers. Frog habitat can be maintained and/or re-established along the Upper Faulkner Watercourse corridor.

f) Areas of Natural and Scientific Interest

- There are no ANSIs associated with the Site.

g) Urban Natural Features

- There are no UNFs associated with the Site.

h) Natural Environment Areas

- There are no significant Natural Environment Areas associated with the Site.

i) Natural linkage features and corridors

- The Site abuts developed areas and as such, does not provide Natural linkage features and corridors.

j) Groundwater features

- There are no significant groundwater features associate with the Site.

k) Surface water features, including fish habitat

- One small wetland feature and three headwater channels would be removed from the central portion of the Site, but these features could not be feasibly retained with even limited development on the western half the Site. The functionality of these features, however, can be replicated through the outlet design of the SWM features on the future Site.

l) Landform features

- There are no significant landform features associate with the Site.

It is the opinion of the undersigned that residential development could be sufficiently mitigated to limit net negative impacts to significant natural features or ecological functions of the existing Site.

10.0 CLOSURE

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

Respectfully submitted,

KILGOUR & ASSOCIATES LTD.

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Appendix A Qualifications of Report Authors

Maren Nielsen, BES, EMA

Maren is a Biologist and Project Manager with over eight years of comprehensive field, laboratory, and consulting experience. She has worked extensively in the environmental sector, assisting clients through complex land development, ecological restoration, species at risk, and fisheries permitting and approvals processes, ensuring compliance with key environmental regulations while achieving project goals. She carries out field programs for the collection, analysis, and monitoring of water, fish, benthos, sediment, and soils as well as a variety of vegetation, wetland, wildlife surveys, and construction monitoring. Maren plays a key role in delivering high-quality assessments, including the delivery of Environmental Impact Studies (EIS), Environmental Assessments (EA), Species at Risk (SAR) assessments, Headwater Drainage Feature Assessments (HDFA), Existing Conditions Reports, and Environmental Constraints Analyses. Since joining Kilgour & Associates Ltd. in 2023, Maren has contributed her expertise to a diverse portfolio of land development and environmental monitoring projects for government agencies and private industry. Maren is a certified wetland evaluator under the Ontario Wetland Evaluation System (OWES).

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 (SAR), 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' academic background is in spatial ecology with a focus on tree species diversity. As a Senior Ecologist at KAL, he regularly completes TCRs, Environmental Impact Statements, and Integrated Environmental Reviews for land development projects throughout Ottawa and eastern Ontario. He is also a certified Butternut Health Assessor (BHA #104).

Appendix B MECP Species at Risk Correspondence

October 4, 2022 **Our File: CAIV 1300**

Management Biologist
Permissions and Compliance Section
Ontario Ministry of Environment, Conservation and Parks
10-1 Campus Drive
Kemptville, ON
K0G 1J0

Reference: Species at risk information request for 5993 and 6115 Flewellyn Road and 6070 Fernbank Road in Stittsville

1.0 INTRODUCTION

This letter is a request for information relating to the potential presence of species at risk (SAR) for the proposed development at 5993 and 6115 Flewellyn Road and 6070 Fernbank Road, Stittsville, Ontario. This letter includes a desktop review of SAR occurrence records using the resources and guidelines outlined in the draft document, *Client's Guide to Preliminary Screening for Species at Risk* (Ministry of the Environment, Conservation and Parks (MECP), 2019). We (Kilgour & Associates Ltd.; KAL) are seeking confirmation from MECP regarding the list of SAR that may occur on or near the project site. Potential impacts to SAR will be assessed via an Environmental Impact Study (EIS) that we will be preparing for our client. If impacts to SAR are anticipated, we will recommend that our client notifies MECP and engages in consultation to further consider potential impacts, avoidance and/or mitigation measures, and whether the project may require authorization under the *Endangered Species Act* (ESA).

1.1 Site Overview

The site is 67.24 ha in size and is located at 5993 and 6115 Flewellyn Road and 6070 Fernbank Road (Figure 1). The zoning of the property is Rural Countryside (RU), and it is currently a naturalized lot with a hydro corridor some agricultural activities. The site is dominated by mixed forest and cultural meadow, with agricultural activities in the northeast corner.

The centroid coordinates of the subject project area are:

Latitude: 45.245871°, Longitude: -75.895627°

The site is bordered by:

- Residential to the north;
- Agricultural lands to the east;
- Agricultural lands and forest to the south; and
- Residential, forest, and wetland to the west.

Figure 1 Location and existing conditions of the site

2.0 SPECIES AT RISK RESOURCES REVIEW AND RESULTS

We reviewed the following online resources to determine SAR occurrences on and/or nearby the site.

- Aquatic Species at Risk Map (DFO, 2022)
- Ontario Ministry of Natural Resources and Forestry (MNRF)
    - Natural Heritage Information Centre (MNRF, 2022a)

- Land Information Ontario Provincially Tracked Species Grid Detail (MNRF, 2022b)
- Recovery Strategy for the Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*), and Tri-colored Bat (*Perimyotis subflavus*) in Ontario (Humphrey and Fotherby, 2019)
- Recovery Strategy for the Eastern Small-footed Myotis (*Myotis leibii*) in Ontario (Humphrey, 2017)

- Species at Risk in Ontario (MECP, 2022)
- Species at Risk Public Registry (Government of Canada, 2022)
- Atlas of the Breeding Birds of Ontario 2001-2005 (Birds Canada et al., 2009)
- Ontario Reptile and Amphibian Atlas (Ontario Nature, 2019)
- iNaturalist (California Academy of Sciences and National Geographic Society, 2022)
- eBird (Cornell Lab of Ornithology, 2022)
- Bumble Bee Watch (Wildlife Preservation Canada et al., 2022)
- Ontario Butterfly Atlas (Toronto Entomologists' Association, 2022)

The results of the SAR desktop review are indicated in Table 1. Note that occurrence data in Table 1 from the Natural Heritage Information Centre (MNRF, 2022a), Land Information Ontario (MNRF, 2022b), eBird (Cornell Lab of Ornithology, 2022), and iNaturalist (California Academy of Sciences and National Geographic Society, 2022) are occurrences within ~5 km of the site. SAR occurrence data from the Ontario Breeding Birds Atlas (Birds Canada et al., 2009) and the Ontario Reptile and Amphibian Atlas (Ontario Nature, 2019) are based on the 10 x 10 km Atlas square that the site falls in. As this Site was located at the corner of four squares (18VR21, 18VR31, 18VR20, 18VR30) data was gather from all.

Table 1 List of species at risk with potential to occur on or near the project site based on our desktop review

Species Name (*Scientific name*)	Information Source
Birds	
Bald Eagle (*Haliaeetus leucocephalus*)	Cornell Lab of Ornithology (2022); California Academy of Sciences and National Geographic Society (2022)
Bank Swallow (*Riparia riparia*)	Birds Canada et al. (2009); Cornell Lab of Ornithology (2022)

Species Name (*Scientific name*)	**Information Source**
Barn Swallow (*Hirundo rustica*)	Birds Canada et al. (2009); MNRF (2022a); MNRF (2022b); Cornell Lab of Ornithology (2022)
Bobolink (*Dolichonyx oryzivorus*)	Birds Canada et al. (2009); MNRF (2022a); MNRF (2022b); Cornell Lab of Ornithology (2022)
Canada Warbler (*Cardellina canadensis*)	MNRF (2022a)
Chimney Swift (*Chaetura pelagica*)	Cornell Lab of Ornithology (2022)
Common Nighthawk (*Chordeiles minor*)	Birds Canada et al. (2009); Cornell Lab of Ornithology (2022)
Eastern Meadowlark (*Sturnella magna*)	Birds Canada et al. (2009); MNRF (2022a); MNRF (2022b); Cornell Lab of Ornithology (2022)
Eastern Whip-poor-will (*Antrostomus vociferus*)	Birds Canada et al. (2009); MNRF (2022a)
Eastern Wood-Pewee (*Contopus virens*)	Birds Canada et al. (2009); Cornell Lab of Ornithology (2022)
Evening Grosbeak (*Coccothraustes vespertinus*)	Birds Canada et al. (2009); Cornell Lab of Ornithology (2022)
Grasshopper Sparrow (*Ammodramus savannarum*)	Birds Canada et al. (2009)
Hudsonian Godwit (*Limosa haemastica*)	Cornell Lab of Ornithology (2022)
Least Bittern (*Ixobrychus exilis*)	MNRF (2022a)
Lesser Yellowlegs (*Tringa flavipes*) *	Cornell Lab of Ornithology (2022)
Olive-sided Flycatcher (*Contopus cooperi*)	Cornell Lab of Ornithology (2022)
Peregrine Falcon (*Falco peregrinus*)	Cornell Lab of Ornithology (2022); California Academy of Sciences and National Geographic Society (2022)
Rusty Blackbird (*Euphagus carolinus*)	Cornell Lab of Ornithology (2022)
Wood Thrush (*Hylocichla mustelina*)	Birds Canada et al. (2009); MNRF (2022a); Cornell Lab of Ornithology (2022)
Mammals	
Eastern Small-footed Myotis (*Myotis leibii*)	Humphrey (2017)
Little Brown Myotis (*Myotis lucifugus*)	Humphrey and Fotherby (2019)
Northern Myotis (*Myotis septentrionalis)*	Humphrey and Fotherby (2019)
Tri-colored Bat (*Perimyotis subflavus*)	Humphrey and Fotherby (2019)
Amphibians	
Western Chorus Frog (*Pseudacris triseriata*)	Ontario Nature (2019); MNRF (2022a)
Reptiles	
Blanding's Turtle (*Emydoidea blandingii*)	Ontario Nature (2019); MNRF (2022a); MNRF (2022b); California Academy of Sciences and National Geographic Society (2022)

Species Name (*Scientific name*)	Information Source
Eastern Milksnake (*Lampropeltis triangulum*)	Ontario Nature (2019); MNRF (2022a); MNRF (2022b); California Academy of Sciences and National Geographic Society (2022)
Midland Painted Turtle (*Chrysemys picta marginata*)	Ontario Nature (2019); MNRF (2022a); California Academy of Sciences and National Geographic Society (2022)
Northern Map Turtle (*Graptemys geographica*)	MNRF (2022a); California Academy of Sciences and National Geographic Society (2022)
Snapping Turtle (*Chelydra serpentina*)	Ontario Nature (2019); MNRF (2022a); MNRF (2022b); California Academy of Sciences and National Geographic Society (2022)
Arthropods	
Monarch (*Danaus plexippus*)	California Academy of Sciences and National Geographic Society (2022); Toronto Entomologists' Association (2022)
Yellow-banded Bumble Bee (*Bombus terricola*)	MNRF (2022a)
Fish	
American Eel (*Anguilla rostrata*)	MNRF (2022a)
Vascular Plants	
Black Ash (*Fraxinus nigra*)	MNRF (2022a); California Academy of Sciences and National Geographic Society (2022)
Butternut (*Juglans cinerea*)	MNRF (2022a)
Lichens	
Flooded Jellyskin (*Leptogium rivulare*)	MNRF (2022a); MNRF (2022b)

* Lesser Yellowlegs is not currently listed under the ESA or SARA (currently it is listed as Threatened under COSEWIC). However, it will be added to SARO as Threatened on Jan 25, 2023. As the project likely will not commence until after Jan 25, 2023, it has been included here.

The local conservation authority (Rideau Valley Conservation Authority) does not have a SAR geodatabase and no additional SAR information was found in their relevant watershed/subwatershed reports.

We note that observation records on eBird (Cornell Lab of Ornithology, 2022) and iNaturalist (California Academy of Sciences and National Geographic Society, 2022) are crowd-sourced and rely heavily on data submitted by volunteer citizen scientists that are not necessarily vetted by experts. As such, observation records from these sources are considered non-confirmed by KAL, but are included in this preliminary SAR screening based on guidelines set forth by MECP (2019).

3.0 CLOSURE

Thank you for considering this SAR information request for 5993 and 6115 Flewellyn Road and 6070 Fernbank Road. We look forward to any comments you may have. Questions relating to the contents of this letter can be addressed to the undersigned.

Respectfully submitted,

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cc: Kesia Miyashita (KAL)

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Wildlife Preservation Canada et al. 2022. Bumble Bee Watch: Bumble Sightings Map. Available online at: https://www.bumblebeewatch.org/app/#/bees/map?filters=%7B%22sightingstatus_id%22:%5B%5D,%22species_id%22:%5B%2237%22%5D,%22province_id%22:%5B%5D%7D

Appendix C Butternut Health Assessment

Ministry of the Environment,
Conservation and Parks

Butternut Health Expert's Report Template – Version 2022

Instructions to Butternut Health Experts (BHEs):

Please enter the 6-character BHE Report number: HAL546

BHE Report numbering format:
BHE Report numbers are to be assigned by the BHE using the first 3 letters of BHE's last name, followed by BHE's own 3-digit report numbering system. If the BHE's last name has fewer than 3 letters, use the full last name and numbers for the remaining characters.

  Disponible en français

BHE Report Number: HAL546

Cover letter to client:
Insert your cover letter to your client here and include the below list of enclosures.

Enclosures:

1. Information from the Ministry of the Environment, Conservation and Parks about Butternut and the *Endangered Species Act, 2007*
2. Butternut Health Expert's Report, including the completed Butternut Data Collection Form

Ministry of the Environment, Conservation and Parks

Species at Risk Branch
40 St. Clair Avenue West
14th Floor
Toronto ON M4V 1M2

Ministère de l'Environnement, de la Protection de la nature et des Parcs

Direction des espèces en péril
40, avenue St. Clair Ouest
14e étage
Toronto ON M4V 1M2

Information for the Property Owner (or person(s) who requested the enclosed Butternut Health Expert's Report):

The enclosed Butternut Health Expert's Report (BHE Report) documents the results of the Butternut health assessment that was conducted by the Butternut Health Expert (BHE) identified in the top section of the report. If there are other Butternut trees (of any size or age) at the site that may be impacted by a proposed activity that are not identified in the enclosed BHE Report, they too must be assessed by a BHE before commencing any actions that may impact those Butternut trees or their habitat.

Butternut (*Juglans cinerea*) is listed as an endangered species in Schedule 2 of Ontario Regulation (O. Reg.) 230/08 "the Species at Risk in Ontario List". As an endangered species, the *Endangered Species Act, 2007* (ESA) prohibits adversely impacting Butternut and its habitat. A permit or agreement under the ESA is required before engaging in an activity that is otherwise prohibited under the ESA. The activity may be eligible for the Butternut conditional exemption in Part V of O. Reg. 830/21, provided the requirements of the regulation are met.

If the proposed activity is eligible for the conditional exemption in Part V of O. Reg. 830/21, the next step is to submit the BHE Report and the Butternut Data Collection Form enclosed in this package to the Ministry of the Environment, Conservation and Parks (MECP).

If the enclosed BHE Report does not identify which Butternut tree(s) are proposed to be killed, harmed or taken and the reasons for doing so (e.g., if "unknown" is indicated in Table 1) or if the information in the last two columns of Table 1 has changed since the date this BHE Report was produced, **do not edit the BHE Report to update this information**. Instead, the report must be submitted together with a cover letter that identifies which Butternut tree(s) are proposed to be killed, harmed or taken (by referencing the tree identification numbers) when you submit the BHE Report to MECP.

The BHE Report must be submitted to MECP at least 30 days before registering an activity in respect of the Butternut conditional exemption. MECP may need to examine the Butternut trees subject to the report during this 30-day period. **Adversely impacting Butternut trees during this 30-day period or before registration is completed is prohibited by the ESA.** Further, the conditional exemption for Butternut does not apply unless the requirements of Part V of O. Reg. 830/21 are being followed.

If the proposed activity is eligible for the Butternut conditional exemption, you may register the proposed activity using the "**Notice of Butternut Impact**" form after the 30-day period has elapsed.

If the proposed activity is not eligible for a regulatory exemption, please contact MECP to determine whether the proposed activity would require a permit or agreement under the ESA in order to proceed.

Please retain this information and a copy of the BHE Report for your records, along with any other documentation you may receive from MECP should an examination of the trees occur.

This information should not be relied upon to determine legal obligations. To determine your legal obligations, consult the *Endangered Species Act, 2007* and the relevant regulations made thereunder. These may be found at www.ontario.ca/laws. If legal advice is required, consult a legal professional. In the event of an error on this template or a conflict between this template and any applicable law, the law prevails.

If you have any questions, please contact MECP at SAROntario@ontario.ca.

Butternut Health Expert's Report (BHE Report)

BHE Report Number: HAL546

Butternut Health Expert Contact Information

Name of Butternut Health Expert

Last Name	First Name
HALLETT	ROBERT

Mailing Address

Unit Number	Street Number	Street Name	PO Box
16	2285	St. Laurent Blvd	

City/Town	Province	Postal Code
Ottawa	Ontario	K1G 4Z6

Telephone Number	Email Address
613-367-5549	rhallett@kilgourassociates.com

Summary of qualifications as a Butternut Health Expert

a) expertise in relation to butternut

Completed numerous Butternut Health Assessments, certified BHE

b) expertise, education, training and experience necessary to assess the health of butternut trees

Completed the MNRF Butternut Health Assessor Course. Robert is a certified BHE

Property Owner Contact Information

Name of Property Owner (or representative)

Last Name	First Name
Caivan Communities	

Mailing Address

Unit Number	Street Number	Street Name	PO Box
	3713	Borrisokane Road	

Lot Number	Concession	Township	Rural Route

City/Town	Province	Postal Code
Ottawa	Ontario	K2J 4J4

Telephone Number	Email Address
613-518-1864	AP@caivan.com

Site Location

Unit Number	Street Number	Street Name	PO Box
	6115	Flewellyn Road	

Lot Number	Concession	Township	Rural Route

City/Town	Province	Postal Code
Stittsville	Ontario	K2A 1B6

Additional Site Location Information

Date(s) of Butternut health assessment

Start Date (yyyy/mm/dd) 2023/06/05

End Date (yyyy/mm/dd) 2023/06/05

Date BHE Report prepared (yyyy/mm/dd) 2023/08/15

Map datum used: ☑ NAD83 ☐ WGS84

Total number of trees assessed in this BHE Report 45

The assessed trees were numbered on site using White flagging tape

The numbers at the site correspond to the tree identification numbers referenced in this report.

This BHE Report includes the following tables:

- Table 1: Butternut trees assessed by the BHE
- Table 2: Trees determined by the BHE to be Butternut hybrids
- Table 3: Summary of Butternut health assessment results

Table 1: Butternut trees assessed by the BHE

Tree ID #	UTM coordinates	Accuracy (+/-)	Category[1] (1, 2 or 3)	Tree stem diameter[2] (cm)	Is tree stem shorter than 1.37 m? (Yes/No)	Cultivated? (Yes/No)	Proposed to be: (killed, harmed, taken, or unknown[3])	If tree is proposed to be killed, harmed or taken, indicate reason tree is to be killed, harmed or taken, if known
001	18N 429543 5010450	5m	2	25	No	No	killed	Site development
002	18N 429399 5010521	5m	2	51	No	No	killed	" "
003	18N 429320 5010599	5m	3	11	No	No	killed	" "
004	18N 429382 5010634	5m	3	29	No	No	killed	" "
005	18N 429396 5010674	5m	3	23	No	No	killed	" "
006	18N 429380 5010732	5m	2	19	No	No	killed	" "
007	18N 429414 5010789	5m	3	30	No	No	killed	" "
008	18N 429495 5010777	5m	2	19	No	No	killed	" "
009	18N 429514 5010695	5m	2	43	No	No	killed	" "
010	18N 429529 5010722	5m	3	35	No	No	killed	" "

Tree ID #	UTM coordinates	Accuracy (+/-)	Category[1] (1, 2 or 3)	Tree stem diameter[2] (cm)	Is tree stem shorter than 1.37 m? (Yes/No)	Cultivated? (Yes/No)	Proposed to be: (killed, harmed, taken, or unknown[3])	If tree is proposed to be killed, harmed or taken, indicate reason tree is to be killed, harmed or taken, if known
011	18N 429543 5010727	5m	2	24	No	No	killed	Site development
012	18N 429549 5010724	5m	2	22	No	No	killed	" "
013	18N 429563 5010721	5m	3	30	No	No	killed	" "
014	18N 429554 5010720	5m	3	29	No	No	killed	" "
015	18N 429556 5010712	5m	2	41	No	No	killed	" "
016	18N 429569 5010707	5m	3	0	No	No	unknown	dead tree
017	18N 429577 5010701	5m	3	0	No	No	unknown	dead tree
018	18N 429555 5010652	5m	3	0	No	No	unknown	dead tree
019	18N 429554 5010657	5m	3	0	No	No	unknown	dead tree
020	18N 429540 5010665	5m	3	46	No	No	killed	Site development
021	18N 429539 5010663	5m	3	55	No	No	killed	" "
022	18N 429546 5010642	5m	3	23	No	No	killed	" "
023	18N 429522 5010644	5m	3	35	No	No	killed	" "
024	18N 429529 5010614	5m	3	33	No	No	killed	" "
025	18N 429509 5010604	5m	3	4	No	No	killed	" "
026	18N 429509 5010604	5m	3	4	No	No	killed	" "
027	18N 429509 5010604	5m	3	4	No	No	killed	" "
028	18N 429509 5010604	5m	3	4	No	No	killed	" "

Tree ID #	UTM coordinates	Accuracy (+/-)	Category[1] (1, 2 or 3)	Tree stem diameter[2] (cm)	Is tree stem shorter than 1.37 m? (Yes/No)	Cultivated? (Yes/No)	Proposed to be: (killed, harmed, taken, or unknown[3])	If tree is proposed to be killed, harmed or taken, indicate reason tree is to be killed, harmed or taken, if known
029	18N 429509 5010604	5m	3	4	No	No	killed	Site development
030	18N 429509 5010604	5m	3	4	No	No	killed	" "
031	18N 429555 5010541	5m	3	12	No	No	killed	" "
032	18N 429600 5010579	5m	3	36	No	No	killed	" "
033	18N 429599 5010581	5m	3	0	No	No	unknown	Dead tree
034	18N 229603 5010577	5m	3	0	No	No	unknown	Dead tree
035	18N 429602 5010602	5m	2	21	No	No	killed	" "
036	18N 429584 5010607	5m	3	40	No	No	killed	" "
037	18N 429617 5010605	5m	3	36	No	No	killed	" "
038	18N 429660 5010562	5m	3	33	No	No	killed	" "
039	18N 429650 5010555	5m	3	28	No	No	killed	" "
040	18N 429647 5010551	5m	3	35	No	No	killed	" "
041	18N 429686 5010573	5m	3	46	No	No	killed	" "
042	18N 429682 5010550	5m	2	48	No	No	killed	" "
043	18N 429722 5010503	5m	2	29	No	No	killed	" "
044	18N 429693 5010769	5m	2	36	No	No	killed	" "
045	18N 429692 5010748	5m	3	48	No	No	killed	" "

[1] Details regarding the extent to which the tree is affected by Butternut Canker is presented in the Butternut Data Collection Form that accompanies this BHE Report.

[2] Diameter of the tree stem rounded to nearest cm, measured in accordance with the Butternut Assessment Guidelines: Assessment of Butternut Tree Health for the Purposes of the *Endangered Species Act, 2007*

[3] In this column, "unknown" indicates that at the time of assessment and reporting, there are no proposals to kill, harm or take this tree that are known to the BHE.

Table 2: Trees determined by the BHE to be Butternut hybrids

Tree ID #	UTM coordinates	Method used (genetic testing or field identification)	Additional Comments on Method Used

Table 3: Summary of Butternut health assessment results

Result	Total number of trees in this category	Information for persons planning activities that may impact Butternut
Category 1	0	• Category 1 Butternut tree — the Butternut tree is affected by Butternut Canker to such an advanced degree that retaining the tree would not support the protection or recovery of Butternut trees in the area in which the tree is located.
		• If the proposed activity will kill, harm or take one or more Butternut trees of any category (including Category 1), the BHE Report must be submitted to MECP at SARontario@ontario.ca.
Category 2	12	• Category 2 Butternut tree — the Butternut tree is not affected by Butternut Canker or the Butternut tree is affected by Butternut Canker but the degree to which it is affected is not as advanced as a Category 1 Butternut tree and retaining the tree could support the protection or recovery of Butternut trees in the area in which the tree is located.
		• Activities that may kill, harm or take up to a **maximum of fifteen (15)** Category 2 trees may be eligible for the conditional exemption in Part V of Ontario Regulation 830/21. Refer to the regulation for eligibility conditions and requirements that must be fulfilled.
		• If the proposed activity will kill, harm or take more than fifteen (15) Category 2 trees, **contact MECP** for information on how to seek an ESA authorization (e.g., a permit).

Result	Total number of trees in this category	Information for persons planning activities that may impact Butternut
Category 3	33	• Category 3 Butternut tree — the Butternut tree may be useful in determining sources of resistance to Butternut Canker.
		• Activities that may kill, harm or take up to a **maximum of five (5)** Category 3 trees may be eligible for the conditional exemption in Part V of Ontario Regulation 830/21. Refer to the regulation for eligibility conditions and requirements that must be fulfilled.
		• If the proposed activity will kill, harm or take more than five (5) Category 3 trees, contact MECP for information on how to seek an ESA authorization (e.g., a permit).
Cultivated	0	• An activity that will kill, harm or take a cultivated Butternut tree that was required to be planted to fulfil a condition of an ESA permit or agreement, or a conditional exemption, is **not** eligible for the exemption for cultivated trees that is provided by subsection 25 (5) of O. Reg. 830/21. Refer to the regulation for eligibility conditions.
Hybrid	0	• Hybrid Butternut trees are not protected under the ESA but impacts to these trees may be subject to local municipal by-laws and other legislation.

Additional Information on Cultivated Tree Determination

Please note:

- A BHE Report that is submitted to MECP must include the completed Butternut Data Collection Form. As appropriate, please also ensure additional relevant documentation to support the assessment (e.g., completed Data Sheets for Field Identification of Butternut Hybrids, evidence that the Butternut was cultivated) and all relevant maps and photographs are provided.
- During the 30-day period that follows the submission of this BHE Report to MECP, no Butternut trees (of any category) may be killed, harmed or taken. MECP may need to examine the Butternut trees subject to the report during this 30-day period.

Butternut Health Expert's Comments

Note to BHEs: use this space to provide general comments.

Appendix D Black Ash Assessment

Appendix D - Black Ash Assessment Data

TREE ID	Location	Accuracy (ft)	Date/Time	Number of Stems	DBH (cm)	Canopy Health	EAB Infestation	Other Health Stressors	Severity of Other Stressors	Photos Taken	Preliminary Field-based Health Determination
BA 1	45.24281890°, -75.89476520° 250.63 ft	12.8	2024-06-27 10:01 AM (7d)	1	13	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	Competition	Low	Yes	1. Healthy: Canopy condition rating of 1 or 2
BA 2	45.24382650°, -75.89483820° 253.95 ft	12.8	2024-06-27 10:22 AM (7d)	1	8.5	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	2. Medium Severity (several exit holes, especially on lower stem, several larval galleries, bark splitting/cracking; direct ID of some EAB adults or larvae	Anthropogenic injuries/site degradation	Medium	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 3	45.24404130°, -75.89512040° 251.2 ft	12.8	2024-06-27 10:40 AM (7d)	1	8	3: Canopy has </+ 50% dieback	2. Medium Severity (several exit holes, especially on lower stem, several larval galleries, bark splitting/cracking; direct ID of some EAB adults or larvae	Wind exposure	Medium	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 4	45.24406550°, -75.89491300° 241.13 ft	12.8	2024-06-27 10:47 AM (7d)	1	9.5	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	None	Low	Yes	1. Healthy: Canopy condition rating of 1 or 2
BA 5	45.24408510°, -75.89492150° 242.32 ft	12.8	2024-06-27 10:53 AM (7d)	1	14.5	1: Canopy is full and healthy	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	None	Low	Yes	1. Healthy: Canopy condition rating of 1 or 2
BA 6	45.24407710°, -75.89481640° 238.81 ft	12.8	2024-06-27 10:58 AM (7d)	1	8.3	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	2. Medium Severity (several exit holes, especially on lower stem, several larval galleries, bark splitting/cracking; direct ID of some EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 7	45.24409680°, -75.89470810° 221.8 ft	14.67	2024-06-27 11:26 AM (7d)	1	10	5: Canopy has no leaves. Epicormic or basal shoots may be present on trunk	3. High Severity (numerous exit holes, including higher on stem/on major branches; extensive larval galleries and bark damage; abundant EAB adults or larvae	Wind exposure Anthropogenic injuries/site degradation	High	Yes	4. Unhealthy: Canopy condition rating of 4 or 5 (unless there is evidence to suggest the tree may survive longer than 5 years)
BA 8	45.24418990°, -75.89468710° 249.49 ft	12.8	2024-06-27 11:34 AM (7d)	1	8.3	4: Canopy has > 50% dieback	3. High Severity (numerous exit holes, including higher on stem/on major branches; extensive larval galleries and bark damage; abundant EAB adults or larvae	Wind exposure	High	Yes	4. Unhealthy: Canopy condition rating of 4 or 5 (unless there is evidence to suggest the tree may survive longer than 5 years)
BA 9	45.24431450°, -75.89458890° 259.08 ft	15.8	2024-06-27 11:39 AM (7d)	1	10.5	4: Canopy has > 50% dieback	3. High Severity (numerous exit holes, including higher on stem/on major branches; extensive larval galleries and bark damage; abundant EAB adults or larvae	Wind exposure	High	Yes	4. Unhealthy: Canopy condition rating of 4 or 5 (unless there is evidence to suggest the tree may survive longer than 5 years)
BA 10	45.24434580°, -75.89458470° 244.61 ft	17	2024-06-27 11:41 AM (7d)	1	12	3: Canopy has </+ 50% dieback	3. High Severity (numerous exit holes, including higher on stem/on major branches; extensive larval galleries and bark damage; abundant EAB adults or larvae	Competition Wind exposure	Medium	Yes	4. Unhealthy: Canopy condition rating of 4 or 5 (unless there is evidence to suggest the tree may survive longer than 5 years)
BA 11	45.24444200°, -75.89452780° 253.14 ft	12.99	2024-06-27 11:46 AM (7d)	1	154	3: Canopy has </+ 50% dieback	2. Medium Severity (several exit holes, especially on lower stem, several larval galleries, bark splitting/cracking; direct ID of some EAB adults or larvae	Wind exposure Competition	Medium	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 12	45.24457130°, -75.89500870° 242.02 ft	15.2	2024-06-27 11:55 AM (7d)	1	11.2	4: Canopy has > 50% dieback	2. Medium Severity (several exit holes, especially on lower stem, several larval galleries, bark splitting/cracking; direct ID of some EAB adults or larvae	Wind exposure	Medium	Yes	3. Unhealthy: Canopy condition rating of 3 AND mortality is expected within 5 years (based on severity of stressors)
BA 13	45.24550210°, -75.89543550° 245.3 ft	14.45	2024-06-27 12:19 PM (7d)	1	15.4	3: Canopy has </+ 50% dieback	2. Medium Severity (several exit holes, especially on lower stem, several larval galleries, bark splitting/cracking; direct ID of some EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 14	45.24581470°, -75.89551430° 242.94 ft	12.8	2024-06-27 12:32 PM (7d)	1	16	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)

TREE ID	Location	Accuracy (ft)	Date/Time	Number of Stems	DBH (cm)	Canopy Health	EAB Infestation	Other Health Stressors	Severity of Other Stressors	Photos Taken	Preliminary Field-based Health Determination
BA 15	45.24602190°, -75.89591740° 237.13 ft	12.8	2024-06-27 12:36 PM (7d)	1	12	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 16	45.24598670°, -75.89597370° 245.48 ft	12.8	2024-06-27 12:39 PM (7d)	1	21.5	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 17	45.24604760°, -75.89589570° 255.54 ft	9.84	2024-06-27 12:40 PM (7d)	1	14	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	Competition	Medium	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 18	45.24602980°, -75.89583470° 243.6 ft	9.84	2024-06-27 12:42 PM (7d)	1	8.2	4: Canopy has > 50% dieback	2. Medium Severity (several exit holes, especially on lower stem, several larval galleries, bark splitting/cracking; direct ID of some EAB adults or larvae	Competition	Medium	Yes	3. Unhealthy: Canopy condition rating of 3 AND mortality is expected within 5 years (based on severity of stressors)
BA 19	45.24615260°, -75.89592170° 236.4 ft	12.8	2024-06-27 12:45 PM (7d)	1	10.5	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	None	Low	Yes	1. Healthy: Canopy condition rating of 1 or 2
BA 20	45.24609320°, -75.89606460° 244.32 ft	11.69	2024-06-27 12:51 PM (7d)	1	18	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	3. High Severity (numerous exit holes, including higher on stem/on major branches; extensive larval galleries and bark damage; abundant EAB adults or larvae	Wind exposure	Medium	Yes	3. Unhealthy: Canopy condition rating of 3 AND mortality is expected within 5 years (based on severity of stressors)
BA 21	45.24610590°, -75.89607560° 254.09 ft	10.69	2024-06-27 12:54 PM (7d)	1	21	4: Canopy has > 50% dieback	3. High Severity (numerous exit holes, including higher on stem/on major branches; extensive larval galleries and bark damage; abundant EAB adults or larvae	None	Low	Yes	3. Unhealthy: Canopy condition rating of 3 AND mortality is expected within 5 years (based on severity of stressors)
BA 22	45.24609320°, -75.89619500° 245.27 ft	12.73	2024-06-27 12:57 PM (7d)	1	15.1	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	2. Medium Severity (several exit holes, especially on lower stem, several larval galleries, bark splitting/cracking; direct ID of some EAB adults or larvae	None Competition	Medium	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 23	45.24605710°, -75.89641710° 243.05 ft	12.8	2024-06-27 1:02 PM (7d)	1	21.5	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 24	45.24609250°, -75.89648300° 231.73 ft	12.8	2024-06-27 1:05 PM (7d)	1	9.5	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 25	45.24611890°, -75.89649910° 257.14 ft	12.8	2024-06-27 1:07 PM (7d)	1	21	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 26	45.24604300°, -75.89673350° 245.87 ft	12.8	2024-06-27 1:11 PM (7d)	1	21	3: Canopy has </+ 50% dieback	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	Competition	Medium	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 27	45.24583090°, -75.89678510° 260.71 ft	12.8	2024-06-27 1:16 PM (7d)	1	18	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	None	Low	Yes	1. Healthy: Canopy condition rating of 1 or 2
BA 28	45.24582540°, -75.89688000° 256.93 ft	12.8	2024-06-27 1:21 PM (7d)	1	11	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	None	Low	Yes	1. Healthy: Canopy condition rating of 1 or 2
BA 29	45.24580970°, -75.89690890° 267.1 ft	10.29	2024-06-27 1:24 PM (7d)	1	11.4	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	2. Medium Severity (several exit holes, especially on lower stem, several larval galleries, bark splitting/cracking; direct ID of some EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)

TREE ID	Location	Accuracy (ft)	Date/Time	Number of Stems	DBH (cm)	Canopy Health	EAB Infestation	Other Health Stressors	Severity of Other Stressors	Photos Taken	Preliminary Field-based Health Determination
BA 30	45.24580710°, -75.89690860° 267.24 ft	13.86	2024-06-27 1:24 PM (7d)	1	11.4	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	2. Medium Severity (several exit holes, especially on lower stem, several larval galleries, bark splitting/cracking; direct ID of some EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 31	45.24580510°, -75.89690100° 264.46 ft	13.47	2024-06-27 1:25 PM (7d)	1	11.3	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	2. Medium Severity (several exit holes, especially on lower stem, several larval galleries, bark splitting/cracking; direct ID of some EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 32	45.24579310°, -75.89693380° 258.71 ft	9.84	2024-06-27 1:27 PM (7d)	1	10.5	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 33	45.24578070°, -75.89693900° 259.17 ft	17.46	2024-06-27 1:28 PM (7d)	1	8.2	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	2. Medium Severity (several exit holes, especially on lower stem, several larval galleries, bark splitting/cracking; direct ID of some EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 34	45.24576620°, -75.89686620° 274.5 ft	15.69	2024-06-27 1:32 PM (7d)	1	9.5	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 35	45.24578300°, -75.89686220° 258.98 ft	12.8	2024-06-27 1:34 PM (7d)	1	9	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	2. Medium Severity (several exit holes, especially on lower stem, several larval galleries, bark splitting/cracking; direct ID of some EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 36	45.24577670°, -75.89685810° 264.74 ft	15.61	2024-06-27 1:37 PM (7d)	1	9	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	2. Medium Severity (several exit holes, especially on lower stem, several larval galleries, bark splitting/cracking; direct ID of some EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 37	45.24578060°, -75.89685650° 261.19 ft	12.8	2024-06-27 1:39 PM (7d)	1	13.2	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	2. Medium Severity (several exit holes, especially on lower stem, several larval galleries, bark splitting/cracking; direct ID of some EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 38	45.24576860°, -75.89684380° 267.05 ft	18.42	2024-06-27 1:40 PM (7d)	1	8.7	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	2. Medium Severity (several exit holes, especially on lower stem, several larval galleries, bark splitting/cracking; direct ID of some EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 39	45.24574760°, -75.89684510° 256.53 ft	12.8	2024-06-27 1:41 PM (7d)	1	12.8	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	2. Medium Severity (several exit holes, especially on lower stem, several larval galleries, bark splitting/cracking; direct ID of some EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 40	45.24574020°, -75.89685320° 256.89 ft	12.8	2024-06-27 1:42 PM (7d)	1	11.3	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	2. Medium Severity (several exit holes, especially on lower stem, several larval galleries, bark splitting/cracking; direct ID of some EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 41	45.24572350°, -75.89689330° 261.41 ft	12.8	2024-06-27 1:44 PM (7d)	1	13.2	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 42	45.24568520°, -75.89683800° 247.27 ft	12.8	2024-06-27 1:46 PM (7d)	1	17.1	1: Canopy is full and healthy	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	None	Low	Yes	1. Healthy: Canopy condition rating of 1 or 2
BA 43	45.24567270°, -75.89684200° 261.4 ft	12.8	2024-06-27 1:48 PM (7d)	1	12.2	3: Canopy has </+ 50% dieback	2. Medium Severity (several exit holes, especially on lower stem, several larval galleries, bark splitting/cracking; direct ID of some EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 44	45.24666160°, -75.89662840° 280.57 ft	18.82	2024-06-28 10:00 AM (6d)	1	11.2	5: Canopy has no leaves. Epicormic or basal shoots may be present on trunk	3. High Severity (numerous exit holes, including higher on stem/on major branches; extensive larval galleries and bark damage; abundant EAB adults or larvae	Wind exposure	Medium	Yes	4. Unhealthy: Canopy condition rating of 4 or 5 (unless there is evidence to suggest the tree may survive longer than 5 years)

TREE ID	Location	Accuracy (ft)	Date/Time	Number of Stems	DBH (cm)	Canopy Health	EAB Infestation	Other Health Stressors	Severity of Other Stressors	Photos Taken	Preliminary Field-based Health Determination
BA 45	45.24664090°, -75.89662470° 234.85 ft	15.8	2024-06-28 10:03 AM (6d)	1	17.8	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	2. Medium Severity (several exit holes, especially on lower stem, several larval galleries, bark splitting/cracking; direct ID of some EAB adults or larvae	Wind exposure	Medium	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 46	45.24661440°, -75.89659570° 223.55 ft	12.77	2024-06-28 10:05 AM (6d)	1	13	5: Canopy has no leaves. Epicormic or basal shoots may be present on trunk	3. High Severity (numerous exit holes, including higher on stem/on major branches; extensive larval galleries and bark damage; abundant EAB adults or larvae	Wind exposure	Medium	Yes	4. Unhealthy: Canopy condition rating of 4 or 5 (unless there is evidence to suggest the tree may survive longer than 5 years)
BA 47	45.24652740°, -75.89671460° 231.7 ft	17.52	2024-06-28 10:08 AM (6d)	1	18	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	Wind exposure	Medium	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 48	45.24664070°, -75.89682640° 215.27 ft	14.93	2024-06-28 10:11 AM (6d)	1	11.3	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	Wind exposure	Medium	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 49	45.24685610°, -75.89688350° 239.35 ft	12.72	2024-06-28 10:14 AM (6d)	1	11.2	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	2. Medium Severity (several exit holes, especially on lower stem, several larval galleries, bark splitting/cracking; direct ID of some EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 50	45.24669190°, -75.89712490° 238.7 ft	12.8	2024-06-28 10:18 AM (6d)	1	11	5: Canopy has no leaves. Epicormic or basal shoots may be present on trunk	3. High Severity (numerous exit holes, including higher on stem/on major branches; extensive larval galleries and bark damage; abundant EAB adults or larvae	Wind exposure	Medium	Yes	4. Unhealthy: Canopy condition rating of 4 or 5 (unless there is evidence to suggest the tree may survive longer than 5 years)
BA 51	45.24577950°, -75.89777730° 248.58 ft	12.8	2024-06-28 10:35 AM (6d)	1	19.1	3: Canopy has </+ 50% dieback	2. Medium Severity (several exit holes, especially on lower stem, several larval galleries, bark splitting/cracking; direct ID of some EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 52	45.24578590°, -75.89774830° 239.55 ft	12.8	2024-06-28 10:37 AM (6d)	1	12.5	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 53	45.24590650°, -75.89748070° 249.77 ft	12.8	2024-06-28 10:43 AM (6d)	1	10.5	1: Canopy is full and healthy	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 54	45.24585800°, -75.89746800° 246.12 ft	12.8	2024-06-28 10:46 AM (6d)	1	16.1	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	Competition	Low	Yes	1. Healthy: Canopy condition rating of 1 or 2
BA 55	45.24591110°, -75.89739620° 251.36 ft	19.41	2024-06-28 10:48 AM (6d)	1	11	1: Canopy is full and healthy	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	None	Low	Yes	1. Healthy: Canopy condition rating of 1 or 2
BA 56	45.24584990°, -75.89729920° 241.8 ft	12.8	2024-06-28 10:49 AM (6d)	1	14.4	5: Canopy has no leaves. Epicormic or basal shoots may be present on trunk	3. High Severity (numerous exit holes, including higher on stem/on major branches; extensive larval galleries and bark damage; abundant EAB adults or larvae	None	Low	Yes	4. Unhealthy: Canopy condition rating of 4 or 5 (unless there is evidence to suggest the tree may survive longer than 5 years)
BA 57	45.24584900°, -75.89724060° 253.17 ft	12.8	2024-06-28 10:51 AM (6d)	1	15.2	5: Canopy has no leaves. Epicormic or basal shoots may be present on trunk	2. Medium Severity (several exit holes, especially on lower stem, several larval galleries, bark splitting/cracking; direct ID of some EAB adults or larvae	None	Low	Yes	4. Unhealthy: Canopy condition rating of 4 or 5 (unless there is evidence to suggest the tree may survive longer than 5 years)
BA 58	45.24575810°, -75.89733470° 238.98 ft	12.8	2024-06-28 10:56 AM (6d)	1	8.2	5: Canopy has no leaves. Epicormic or basal shoots may be present on trunk	2. Medium Severity (several exit holes, especially on lower stem, several larval galleries, bark splitting/cracking; direct ID of some EAB adults or larvae	None	Low	Yes	4. Unhealthy: Canopy condition rating of 4 or 5 (unless there is evidence to suggest the tree may survive longer than 5 years)
BA 59	45.24572150°, -75.89734200° 246.38 ft	13	2024-06-28 10:58 AM (6d)	1	11	4: Canopy has > 50% dieback	3. High Severity (numerous exit holes, including higher on stem/on major branches; extensive larval galleries and bark damage; abundant EAB adults or larvae	None	Low	Yes	3. Unhealthy: Canopy condition rating of 3 AND mortality is expected within 5 years (based on severity of stressors)

TREE ID	Location	Accuracy (ft)	Date/Time	Number of Stems	DBH (cm)	Canopy Health	EAB Infestation	Other Health Stressors	Severity of Other Stressors	Photos Taken	Preliminary Field-based Health Determination
BA 60	45.24572070°, -75.89734090° 247.94 ft	12.8	2024-06-28 10:59 AM (6d)	1	11.3	4: Canopy has > 50% dieback	2. Medium Severity (several exit holes, especially on lower stem, several larval galleries, bark splitting/cracking; direct ID of some EAB adults or larvae	Anthropogenic injuries/site degradation	Low	Yes	3. Unhealthy: Canopy condition rating of 3 AND mortality is expected within 5 years (based on severity of stressors)
BA 61	45.24560310°, -75.89705280° 252.92 ft	12.8	2024-06-28 11:05 AM (6d)	1	12.6	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 62	45.24574120°, -75.89700380° 242.87 ft	12.8	2024-06-28 11:08 AM (6d)	1	23	3: Canopy has </+ 50% dieback	2. Medium Severity (several exit holes, especially on lower stem, several larval galleries, bark splitting/cracking; direct ID of some EAB adults or larvae	Competition	Medium	Yes	3. Unhealthy: Canopy condition rating of 3 AND mortality is expected within 5 years (based on severity of stressors)
BA 63	45.24576630°, -75.89691690° 234.18 ft	12.8	2024-06-28 11:10 AM (6d)	1	15	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	Competition	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 64	45.24567100°, -75.89682380° 247.95 ft	12.8	2024-06-28 11:14 AM (6d)	1	16	3: Canopy has </+ 50% dieback	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 65	45.24566570°, -75.89677730° 287.12 ft	13.57	2024-06-28 11:17 AM (6d)	1	9.4	4: Canopy has > 50% dieback	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	None	Low	Yes	3. Unhealthy: Canopy condition rating of 3 AND mortality is expected within 5 years (based on severity of stressors)
BA 66	45.24565520°, -75.89677850° 268.16 ft	12.8	2024-06-28 11:17 AM (6d)	1	10.7	3: Canopy has </+ 50% dieback	2. Medium Severity (several exit holes, especially on lower stem, several larval galleries, bark splitting/cracking; direct ID of some EAB adults or larvae	None	Low	Yes	3. Unhealthy: Canopy condition rating of 3 AND mortality is expected within 5 years (based on severity of stressors)
BA 67	45.24562850°, -75.89675490° 246.33 ft	19.68	2024-06-28 11:21 AM (6d)	1	15.2	3: Canopy has </+ 50% dieback	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 68	45.24564850°, -75.89674920° 233.8 ft	12.8	2024-06-28 11:22 AM (6d)	1	16	4: Canopy has > 50% dieback	3. High Severity (numerous exit holes, including higher on stem/on major branches; extensive larval galleries and bark damage; abundant EAB adults or larvae	None	Low	Yes	4. Unhealthy: Canopy condition rating of 4 or 5 (unless there is evidence to suggest the tree may survive longer than 5 years)
BA 69	45.24547920°, -75.89673200° 240.76 ft	12.8	2024-06-28 11:26 AM (6d)	1	18.2	5: Canopy has no leaves. Epicormic or basal shoots may be present on trunk	2. Medium Severity (several exit holes, especially on lower stem, several larval galleries, bark splitting/cracking; direct ID of some EAB adults or larvae	None	Low	Yes	4. Unhealthy: Canopy condition rating of 4 or 5 (unless there is evidence to suggest the tree may survive longer than 5 years)
BA 70	45.24549120°, -75.89671190° 241.67 ft	12.8	2024-06-28 11:27 AM (6d)	1	16	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	2. Medium Severity (several exit holes, especially on lower stem, several larval galleries, bark splitting/cracking; direct ID of some EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 71	45.24569430°, -75.89668470° 244.73 ft	12.8	2024-06-28 11:31 AM (6d)	1	8	3: Canopy has </+ 50% dieback	2. Medium Severity (several exit holes, especially on lower stem, several larval galleries, bark splitting/cracking; direct ID of some EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 72	45.24573010°, -75.89668910° 251.35 ft	12.8	2024-06-28 11:36 AM (6d)	1	8.2	1: Canopy is full and healthy	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	None	Low	Yes	1. Healthy: Canopy condition rating of 1 or 2
BA 73	45.24571620°, -75.89669370° 246.36 ft	12.8	2024-06-28 11:36 AM (6d)	1	11.1	1: Canopy is full and healthy	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	None	Low	Yes	1. Healthy: Canopy condition rating of 1 or 2
BA 74	45.24571140°, -75.89668940° 255.43 ft	13.47	2024-06-28 11:38 AM (6d)	1	10	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)

TREE ID	Location	Accuracy (ft)	Date/Time	Number of Stems	DBH (cm)	Canopy Health	EAB Infestation	Other Health Stressors	Severity of Other Stressors	Photos Taken	Preliminary Field-based Health Determination
BA 75	45.24574110°, -75.89673390° 247.13 ft	12.8	2024-06-28 11:41 AM (6d)	1	9.2	3: Canopy has </+ 50% dieback	2. Medium Severity (several exit holes, especially on lower stem, several larval galleries, bark splitting/cracking; direct ID of some EAB adults or larvae	Competition	Low	Yes	3. Unhealthy: Canopy condition rating of 3 AND mortality is expected within 5 years (based on severity of stressors)
BA 76	45.24575770°, -75.89671580° 245.02 ft	12.8	2024-06-28 11:42 AM (6d)	1	14.4	1: Canopy is full and healthy	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	Competition	Low	Yes	1. Healthy: Canopy condition rating of 1 or 2
BA 77	45.24577470°, -75.89666650° 244.74 ft	12.8	2024-06-28 11:43 AM (6d)	1	9.3	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 78	45.24574960°, -75.89670290° 233.54 ft	12.8	2024-06-28 11:44 AM (6d)	1	9.4	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	2. Medium Severity (several exit holes, especially on lower stem, several larval galleries, bark splitting/cracking; direct ID of some EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 79	45.24580350°, -75.89670280° 231.54 ft	12.8	2024-06-28 11:45 AM (6d)	1	12.4	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 80	45.24575470°, -75.89677410° 245.82 ft	12.8	2024-06-28 11:47 AM (6d)	1	12	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 81	45.24578690°, -75.89676770° 237.03 ft	12.8	2024-06-28 11:48 AM (6d)	1	11.2	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 82	45.24580680°, -75.89678930° 249.07 ft	12.8	2024-06-28 11:49 AM (6d)	1	10	1: Canopy is full and healthy	2. Medium Severity (several exit holes, especially on lower stem, several larval galleries, bark splitting/cracking; direct ID of some EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 83	45.24556650°, -75.89661220° 238.06 ft	12.8	2024-06-28 11:54 AM (6d)	1	8.6	4: Canopy has > 50% dieback	2. Medium Severity (several exit holes, especially on lower stem, several larval galleries, bark splitting/cracking; direct ID of some EAB adults or larvae	None	Low	Yes	3. Unhealthy: Canopy condition rating of 3 AND mortality is expected within 5 years (based on severity of stressors)
BA 84	45.24556480°, -75.89654170° 237.02 ft	12.8	2024-06-28 11:55 AM (6d)	1	8.4	5: Canopy has no leaves. Epicormic or basal shoots may be present on trunk	3. High Severity (numerous exit holes, including higher on stem/on major branches; extensive larval galleries and bark damage; abundant EAB adults or larvae	None	Low	Yes	4. Unhealthy: Canopy condition rating of 4 or 5 (unless there is evidence to suggest the tree may survive longer than 5 years)
BA 85	45.24550550°, -75.89651070° 245.23 ft	12.8	2024-06-28 11:57 AM (6d)	1	15.3	5: Canopy has no leaves. Epicormic or basal shoots may be present on trunk	3. High Severity (numerous exit holes, including higher on stem/on major branches; extensive larval galleries and bark damage; abundant EAB adults or larvae	None	Low	Yes	4. Unhealthy: Canopy condition rating of 4 or 5 (unless there is evidence to suggest the tree may survive longer than 5 years)
BA 86	45.24551040°, -75.89648030° 243.95 ft	14.03	2024-06-28 11:59 AM (6d)	1	13.5	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 87	45.24536840°, -75.89626310° 261.62 ft	12.8	2024-06-28 12:05 PM (6d)	1	10.2	4: Canopy has > 50% dieback	2. Medium Severity (several exit holes, especially on lower stem, several larval galleries, bark splitting/cracking; direct ID of some EAB adults or larvae	Wind exposure	Low	Yes	3. Unhealthy: Canopy condition rating of 3 AND mortality is expected within 5 years (based on severity of stressors)
BA 88	45.24526780°, -75.89627670° 250.56 ft	12.8	2024-06-28 12:07 PM (6d)	1	18.2	4: Canopy has > 50% dieback	2. Medium Severity (several exit holes, especially on lower stem, several larval galleries, bark splitting/cracking; direct ID of some EAB adults or larvae	Competition	Medium	Yes	3. Unhealthy: Canopy condition rating of 3 AND mortality is expected within 5 years (based on severity of stressors)
BA 89	45.24525190°, -75.89635680° 247.48 ft	12.8	2024-06-28 12:09 PM (6d)	1	11.3	1: Canopy is full and healthy	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)

TREE ID	Location	Accuracy (ft)	Date/Time	Number of Stems	DBH (cm)	Canopy Health	EAB Infestation	Other Health Stressors	Severity of Other Stressors	Photos Taken	Preliminary Field-based Health Determination
BA 90	45.24526580°, -75.89626620° 239.45 ft	12.8	2024-06-28 12:10 PM (6d)	1	10.3	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 91	45.24518990°, -75.89632080° 243.99 ft	12.8	2024-06-28 12:11 PM (6d)	1	14.1	3: Canopy has </+ 50% dieback	2. Medium Severity (several exit holes, especially on lower stem, several larval galleries, bark splitting/cracking; direct ID of some EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 92	45.24525960°, -75.89639470° 246.18 ft	12.8	2024-06-28 12:13 PM (6d)	1	17.6	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	None	Low	Yes	1. Healthy: Canopy condition rating of 1 or 2
BA 93	45.24522520°, -75.89637550° 246.01 ft	16.76	2024-06-28 12:15 PM (6d)	1	15.4	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	None	Low	Yes	1. Healthy: Canopy condition rating of 1 or 2
BA 94	45.24519260°, -75.89643310° 247.96 ft	12.8	2024-06-28 12:16 PM (6d)	1	9.5	5: Canopy has no leaves. Epicormic or basal shoots may be present on trunk	3. High Severity (numerous exit holes, including higher on stem/on major branches; extensive larval galleries and bark damage; abundant EAB adults or larvae	Competition	Medium	Yes	4. Unhealthy: Canopy condition rating of 4 or 5 (unless there is evidence to suggest the tree may survive longer than 5 years)
BA 95	45.24527680°, -75.89666000° 236.88 ft	12.8	2024-06-28 12:17 PM (6d)	1	13.6	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 96	45.24532150°, -75.89666210° 242.26 ft	12.8	2024-06-28 12:19 PM (6d)	1	18.8	3: Canopy has </+ 50% dieback	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 97	45.24531920°, -75.89673940° 244.6 ft	12.8	2024-06-28 12:20 PM (6d)	1	12.2	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	Competition	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 98	45.24535000°, -75.89677740° 253.23 ft	12.8	2024-06-28 12:21 PM (6d)	1	10.7	3: Canopy has </+ 50% dieback	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)
BA 99	45.24536450°, -75.89677320° 246.51 ft	12.8	2024-06-28 12:22 PM (6d)	1	10.5	3: Canopy has </+ 50% dieback	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	None	Low	Yes	3. Unhealthy: Canopy condition rating of 3 AND mortality is expected within 5 years (based on severity of stressors)
BA 100	45.24536840°, -75.89675900° 241.63 ft	12.8	2024-06-28 12:23 PM (6d)	1	8.2	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	None	Low	Yes	1. Healthy: Canopy condition rating of 1 or 2
BA 101	45.24536220°, -75.89677290° 239.15 ft	29.29	2024-06-28 12:23 PM (6d)	1	19.9	2: Canopy has started to lose leaves (thinning) but no dieback (dead canopy twigs)	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	None	Low	Yes	1. Healthy: Canopy condition rating of 1 or 2
BA 102	45.24541070°, -75.89673660° 246.65 ft	12.8	2024-06-28 12:25 PM (6d)	1	13.5	3: Canopy has </+ 50% dieback	1. Low Severity (minimal/no EAB exit holes; minimal/no larval galleries; minimal/no observations of EAB adults or larvae	None	Low	Yes	2. Healthy: Canopy condition rating of 3 AND mortality is unlikely within 5 years (based on severity of stressors)

Appendix E Vascular Plant List

Appendix D - Vascular Plant List

Trees

Species Common Name	Scientific Name	ELC Codes	DBH Ranges
American Beech	*Fagus grandifolia*	FOMM4-3, FOCM6-3,CUM1-1	10-15 cm
American Elm	*Ulmus americana*	FOMM4-3, FODM8-1	10-20 cm
Apple Spp.	*Malus spp.*	CUM1-1	8-10 cm
Balsam Fir	*Abies Balsamea*	FOMM7-2	
Balsam Poplar	*Populus balsamifera*	FODM7, FODM8-1	10-25 cm
Basswood	*Tilia americana*	FODM8-1	~30 cm
Black Ash*	*Fraxinus nigra*	FODM7, FODM8-1	
Butternut*	*Juglans cinerea*	FOMM4-3, MEMM3, FOCM6-3, FODM7, FODM8-1	~10-20 cm, 20-50 cm
Eastern White Cedar	*Thuja occidentalis*	FOCM6-3, FODM8-1, CUM1-1, FOMM4-3, FOMM7-2, MEMM3, FOM7	5-15 cm, 10-20 cm
Green Ash	*Fraxinus pennsylvanica*	FOMM4-3, FOMM7-2, CUM1-1, FOCM6-3	<5 cm , 10-15 cm
Jack Pine	*Pinus banksiana*	FOCM6-3	~15 cm
Larch/Tamarack	*Larix laricina*	FOMM4-3, CUM1-1,MEMM3	~5-10 cm, 15-20 cm
Large tooth Aspen	*Populus grandidentata*	FOMM4-3, CUM1-1	~15 cm, ~5 cm
Red Maple	*Acer rubrum*	FODM8-1	~27 cm
Scots Pine	*Pinus sylvestris*	CUM1-1, MEMM3, FOCM6-3	5-10 cm, ~10-20 cm
Trembling Aspen	*Populus tremuloides*	FOMM4-3, FOMM7-2,CUM1-1,FODM7, FODM8-1	10-35 cm
White Ash	*Fraxinus americana*	FOMM7-2	5-8 cm
White Birch	*Betula papyrifera*	FOMM7-2, FOCM6-3, FODM8-1	10-20 cm
White Pine	*Pinus strobus*	FOMM4-3,FOCM6-3	20-25 cm
White Spruce	*Picea glauca*	FOMM4-3, FOMM7-2, CUM1-1	20-25cm, 30 cm, ~10 cm

Understory & Groundcover

Species Common Name	Scientific Name	ELC Codes
Alder Buckthorn	*Rhamnus frangula*	FOMM7-2, CUM1-1, MEMM3, FOCM6-3, SWMC1-1, FODM8-1, CUT1
American Elm Saplings	*Ulmus americana*	MEMM3
American Vetch	*Vicia americana*	MEMM3
Apple Spp.	*Malus spp.*	MEMM3, FOCM6-3

Species Common Name	Scientific Name	ELC Codes
Basswood Saplings	*Tillia americana*	FOMM4-3
Bebb's Willow	*Salix bebbiana*	CUM1-1, MEMM3, FOCM6-3, CUT1
Birds-foot Trefoil	*Lotus corniculatus*	MEMM3, CUM1-1
Bladder Campion	*Silene vulgaris species*	CUM1-1
Bloodroot	*Sanguinaria*	FODM8-1
Box Elder Saplings	*Acer negundo*	MEMM3,CUM1-1
Broad-leaved helleborine	*Epipactis helleborine*	FODM8-1
Brown Eyed Susan	*Rudbeckia triloba*	CUM1-1
Bulblet Bladder Fern	*Cystopteris bulbifera*	SWMC1-1
Canada Goldenrod	*Solidago canadensis*	FOMM4-3, CUM1-1, MEMM3, FODM8-1, OAGM4
Canada Mayflower	*Maianthemum canadense*	FOMM7-2
Clematis virginiana	*Clematis virginiana*	FODM8-1
Common Blackberry	*Rubus allegheniensis*	CUM1-1, MEMM3, FOCM6-3
Common Buckthorn	*Rhamnus cathartica*	FOMM4-3
Common Buckthorn	*Rhamnus cathartica*	FODM7
Common Dandelion	*Taraxacum officinale*	CUM1-1, MEMM3, FOCM6-3, OAGM4
Common Juniper	*Juniperus communis*	FOMM4-3, CUM1-1, MEMM3, FOCM6-3, FODM8-1
Common Lady Fern	*Athyrium filix-femina*	FOMM7-2
Common Milkweed	*Asclepias syriaca*	MEMM3, FODM8-1, CUT1
Common Mullein	*Verbascum thapsus*	CUM1-1, OAGM4
Common Ragweed	*Ambrosia artemisiifolia*	CUM1-1, FODM7
Cow Vetch	*Vicia cracca*	CUM1-1, MEMM3, FOCM6-3
Deptford Pink	*Dianthus armeria*	FOCM6-3
Eastern Hemlock	*Tsuga canadensis*	FOMM7-2
Eastern Prickly Gooseberry	*Ribes cynosbati*	FODM8-1
False Solomon's Seal	*Maianthemum racemosum*	FOMM4-3, FODM8-1
Fragrant bedstraw	*Galium trifler*	FOCM6-3
Garlic Mustard	*Alliaria petiolata*	FOMM4-3, FOMM7-2
Glossy Buckthorn	*Rhamnus frangula*	MEMM3
Grass-leaved Goldenrod	*Euthamia graminifolia*	MEMM3
Gray's Sedge	*Carex grayi*	FODM8-1

Species Common Name	Scientific Name	ELC Codes
Interrupted Fern	*Osmunda claytoniana*	SWMC1-1, FODM8-1
Jack-in-the-pulpit	*Arisaema triphyllum*	FOMM7-2
Joe Pye Weed	*Eutrochium purpureum*	MEMM3
Kentucky Bluegrass	*Poa pratensis*	CUM1-1
Meadow Buttercup	*Ranunculus acris*	CUM1-1, FOCM6-3, OAGM4
Meadow Horsetail	*Equisetum pratense*	MEMM3, FODM8-1,OAGM4
New England Aster	*Symphyotrichum novae-angliae*	FOMM4-3, CUM1-1, MEMM3, FODM8-1
Orchard Grass	*Dactylis glomerata*	CUM1-1, MEMM3, FOCM6-3, FODM8-1
Ostrich Fern	*Matteuccia struthiopteris*	FOMM7-2, FODM8-1
Pin Cherry	*Prunus pensylvanica*	FOMM4-3, CUM1-1, MEMM3, FODM8-1
Poison Ivy	*Toxicodendrion radicans*	FOMM4-3, CUM1-1, SWMC1-1, FODM7, FODM8-1
Prairie Fleabane	*Erigeron strigosus*	CUM1-1
Purple Aster	*Symphyotrichum patens*	OAGM4
Purple Flowering raspberry	*Rubus odoratus*	FOMM4-3, CUM1-1, MEMM3
Purple Loosestrife	*Lythrum salicaria*	MEMM3
Queen Annes Lace	*Daucus carota*	CUM1-1
Red Osier Dogwood	*Cornus sericea*	MEMM3
Red Raspberry	*Rubus ideaus*	FOMM4-3, CUM1-1, FOCM6-3
Reed Canary Grass	*Phalaris arundinacea*	CUM1-1, FOCM6-3
Riverbank Grape	*Vitis riparia*	FOMM4-3, FODM7
Rough Cinquefoil	*Potentilla norvegica*	CUM1-1
Rough goldenrod	*Solidago rugosa*	FOMM4-3
Sensitive Fern	*Onoclea sensibillis*	FOMM4-3, FOMM7-2, MEMM3, SWMC1-1, FODM8-1
Silver Cinquefoil	*Potentilla argentea*	CUM1-1
Smooth Bromegrass	*Bromus inermis*	CUM1-1
Spiked Speedwell	*Veronica spicata*	FOMM4-3
Spinulose Wood Fern	*Dryopteris carthusiana*	FOMM4-3, FOMM7-2
Sugar Maple Saplings	*Acer saccharum*	FODM8-1
Tall Thimbleweed	*Anemone virginiana*	FOMM4-3,FOCM6-3
Trembling Aspen saplings	*Populus tremuloides*	CUM1-1, FOMM4-3, FODM8-1, CUT1
Vipers Bugloss	*Echium vulgare*	CUM1-1

Species Common Name	Scientific Name	ELC Codes
Virginia Creeper	*Parthenocissus quinquefolia*	FOMM7-2, FODM8-1
White Meadowsweet	*Spiraea alba*	MEMM3, FODM8-1, CUT1
White Panicle Aster	*Symphyotrichum lanceolatum*	MEMM3, FODM7
White Snakeroot	*Ageratina altissima*	FODM8-1
White Turtlehead	*Chelone glabra*	FODM8-1
White Willow	*Salix alba*	FODM8-1,FOMM7-2, CUT1
Wild Strawberry	*Fragaria vesca*	CUM1-1, MEMM3, FOCM6-3, OAGM4
Yarrow	*Achillea millefolium*	CUM1-1
Yellow Sweet Clover	*Melilotus officinalis*	FODM7
Yellow Toadflax	*Linaria vulgaris*	MEMM3

Appendix F Headwater Drainage Features Assessment

Headwater Drainage Feature Assessment for Caivan Development Corporation, Flewellyn Road Properties

2023-09-08

Draft Report

KILGOUR & ASSOCIATES LTD.
www.kilgourassociates.com

Project Number: CAIV 1300

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List of Acronyms and Abbreviations

EEM – Environmental Effects Monitoring
EIS – Environmental Impact Statement
KAL – Kilgour & Associates Ltd.
HDFA – Headwater Drainage Feature Assessment
HDFs – Headwater Drainage Features

1.0 INTRODUCTION

This report is a Headwater Drainage Feature Assessment (HDFA) prepared by Kilgour & Associates Ltd. (KAL) on behalf of Caivan Development Corporation in support of future residential development located at 5993 and 6115 Flewellyn Road, and 6070 Fernbank Road in Stittsville, Ontario (hereafter referred to as "the Site").

This report provides a detailed description of the Headwater Drainage Features (HDFs) on and adjacent to the property following field methodologies identified in the *Evaluation, Classification and Management of Headwater Drainage Features Guidelines* (Toronto and Region Conservation Authority & Credit Valley Conservation, 2013)), herein referred to as the HDF Guidelines.

2.0 HEADWATER DRAINAGE FEATURES

2.1 Overview

This study identifies and describes six (6) HDFs located on and adjacent to the Site (Figure 1). There are two main groups of channels that flow across and adjacent to the Site. The Site consists of forested areas, wetland areas, meadow, a hydro line, a stormwater pond, and an idle agricultural field. Surrounding land uses are predominantly residential and agricultural.

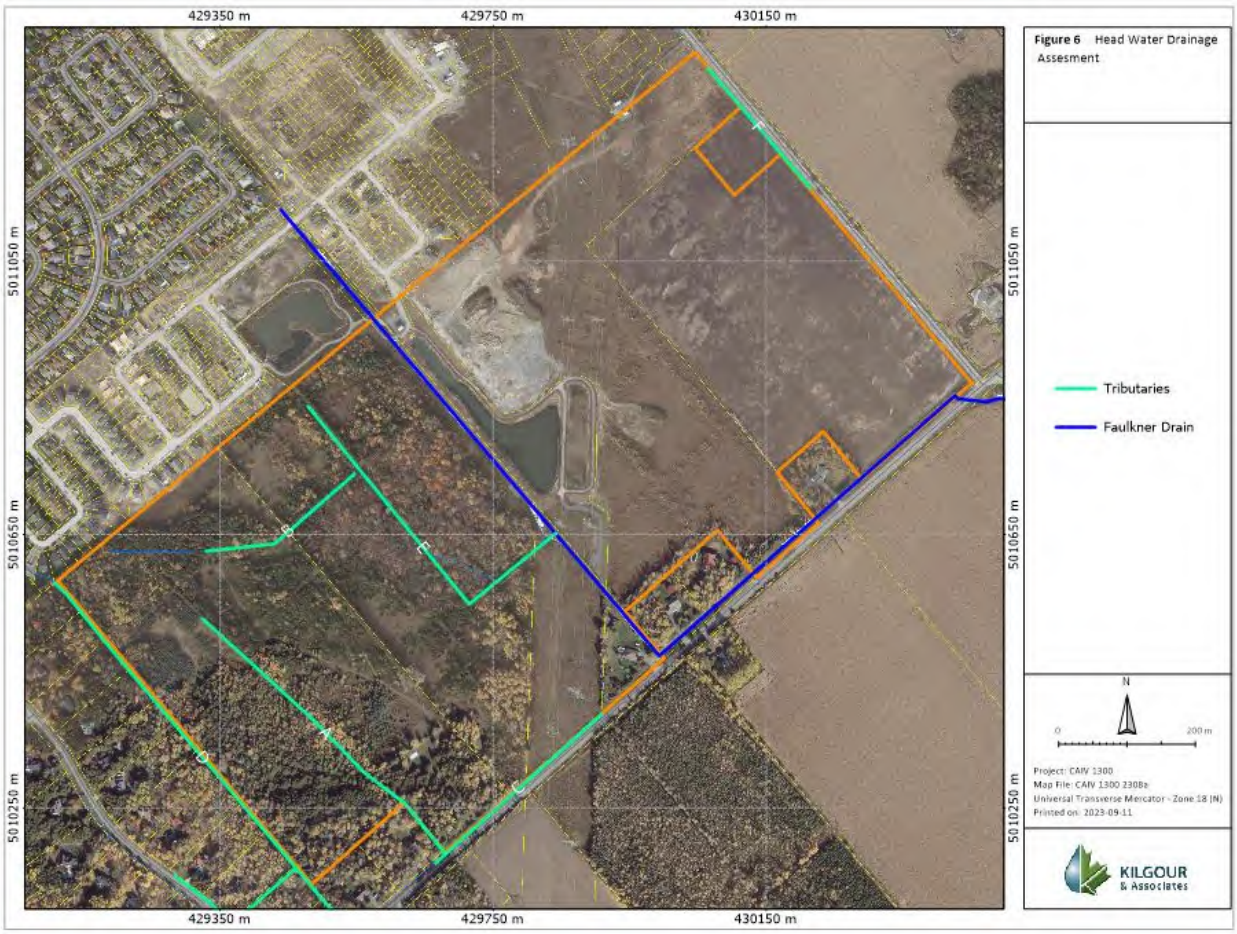
One group of channels is primarily associated with the Faulkner Municipal Drain, and the second group primarily conveys water from within the forested areas on the Site towards the Faulkner drain.

2.2 Assessment Methodology

The Standard level of assessment follows Ontario Stream Assessment Protocol (OSAP) methodologies for descriptions of flow conditions, riparian vegetation and site features that are important components of habitat (headwater sampling protocol OSAP S4.M10) and includes an electrofishing survey to describe fish and fish habitat (OSAP S4.M10). Additionally, the Ecological Land Classification for Southern Ontario (ELC) was applied to the Site (Lee et al., 1998), with specific focus on the riparian zone of each segment, and determined habitat community types present on the Site. An assessment of amphibian breeding was conducted following the Marsh Monitoring Protocol (MMP) (Birds Canada et al., 2009).

OSAP investigations of HDFs were conducted on April 17, 2023 during spring freshet, and electrofishing surveys on May 18, 2023. Two amphibian surveys following the MMP were conducted on April 20, 2023 and May 23, 2023. The ELC survey was conducted on June 02, 2023.

Figure 1 Headwater Drainage Features on, or within close proximity of the Site.



2.3 General Reach Descriptions

Images of Reaches A through F are provided in Appendix A.

2.3.1 Tributary A

Tributary A is a 465 m roadside ditch that flows southward and turns into a braided channel as it approaches Flewellyn Road. It originates within a cedar swamp wetland located centrally on the Site and flows through a mixed forest primarily composed of Eastern White Cedar and upland deciduous tree species. Tributary A was observed to have minimal flow during spring freshet, lacks in-stream vegetation and contains organic substrate. The mean bankfull width of the feature is approximately 0.73 m.

2.3.2 Tributary B

Tributary B is a ditch feature located in the northern portion of the Site, traversing the Site from west to east. The upstream reach flows southeast and while the downstream reach flows east. It flows primarily through deciduous forest and meadow communities. Tributary B was observed to have minimal flow during spring freshet, does not contain aquatic vegetation, and contains primarily organic substrate with sand and cobble. The mean bankfull width of Tributary B is approximately 0.93 m.

2.3.3 Tributary C

Tributary C is a permanent roadside ditch feature that flows eastward along Flewellyn Road from the western Site boundary to Shea Road, and connects to the Faulkner Drain just east of the hydro cut area. Riparian vegetation is primarily lawn and it contains primarily gravel and cobble substrate. It contains submerged vegetation and has a mean wetted width of approximately 1.85 m.

2.3.4 Tributary D

Tributary D is a tile feature that flows southward along the western Site boundary, traversing the Site from the northern Site boundary through the cedar swamp and mixed forest communities and joins Tributary C at the southern Site boundary. The majority of the feature does not contain vegetation; however, the downstream reach contains robust emergent vegetation and submergent vegetation. The mean bankfull width of Tributary D is approximately 1.59 m and contains organic substrate.

2.3.5 Tributary E

Tributary E is an channelized or constrained feature that flows from the terminus of Tributary B southeast through the mixed deciduous forest community and redirects and flows east into the Faulkner Drain that flows southeast at the boundary of the forested area and stormwater pond area. Tributary E lacks in-stream vegetation and has a mean bankfull width of approximately 2.06 m and contains organic substrate with sand and silt.

2.3.6 Tributary F

Tributary F is a roadside ditch that flows southeast along the eastern Site boundary and Shea Road. The meadow riparian vegetation is present on the left bank, and limited vegetation is present on the right

bank. In-stream vegetation consists of grasses. The mean bankfull width of Tributary F is approximately 1.30 m and contains a mixed substrate of organic, silt, and gravel.

2.4 Component Classifications

Tables 1-4 below summarize the functions provided by the six (6) Drainage Features.

Table 1 Hydrology Classification of the headwater drainage features on the Flewellyn Road Properties, 2023

Drainage Feature	Hydrology Classification					
	Assessment Period	Flow Conditions		Flow Classification	Modifiers	Hydrological Function
		Description	(OSAP Code)			
A	April 17, 2023 May 18, 2023	Minimal Surface flow No surface water	4 1	Intermittent/Ephemeral	No source other than spring run-off and after heavy rain	**Contributing Functions**
B	April 17, 2023 May 18, 2023	Minimal Surface flow Interstitial flow	4 4	Perennial	Pool present with interstitial flow from upstream ATV trail	**Important Functions**
C	April 17, 2023 May 18, 2023	Surface flow substantial Surface flow substantial	5 5	Perennial	Roadside ditch wet along all of Flewellyn Road along Site boundary	**Important Functions**
D	April 17, 2023 May 18, 2023	Minimal Surface flow No surface water /Standing water	4 2	Ephemeral	No source other than spring run-off and after heavy rain	**Contributing Functions**
E	April 17, 2023 May 18, 2023	Minimal Surface flow Minimal Surface flow	4 4	Perennial	Water is present throughout the year. Upstream minimal flow then no flow with intermitted small pools downstream	**Important Functions**
F	April 17, 2023 May 18, 2023	Minimal Surface flow Minimal Surface flow	4 4	Perennial	Water is present throughout the year. Downstream under construction. Outlets into Faulkner Drain	**Important Functions**

Table 2 Riparian Classification for headwater drainage features on the Flewellyn Road Properties, 2023

Drainage Feature	Riparian Classification			
	OSAP Descriptions	**OSAP Riparian Codes**	**ELC Codes**	**Riparian Conditions**
A	RUB - Forest LUB - Forest	RUB - 7 LUB - 7	FOM4, CUM1-1 SWCM1-1	**Valued/Contributing Functions**
B	RUB - Forest LUB - Forest	RUB - 7 LUB - 7	CUM1-1, FODM3-1	**Important Functions**
C	RUB - Lawn LUB - Lawn	RUB - 2 LUB - 2	FOM4, CUT1, OAGM4	**Important Functions**
D	RUB - Forest LUB - Forest	RUB - 7 LUB - 7	SWCM1-1, FOM4	**Valued/Contributing Functions**
E	RUB - Forest LUB - Forest	RUB - 7 LUB - 7	FODM3-1	**Important Functions**
F	RUB - None LUB - Meadow	RUB - 1 LUB - 4	OAGM4	**Important Functions**

Table Notes: RUB – right upstream bank, LUB – left upstream bank

Table 3 Fish and Fish Habitat Classification for the headwater drainage features on the Flewellyn Road Properties, 2023

Drainage Feature	Riparian Classification		
	Fish Observation **Fishing effort**	**Fish & Fish Habitat Designation***	**Modifiers/Notes**
A	Dry	Limited Functions	
B	Fish present, no SAR present; 166.8 S	Important Functions	Two fish caught belonging to one species. Species is very common and highly tolerant
C	Fish present; no SAR present; 468.6 S	Important Functions	Four fish caught belonging to four species. Species all very common and highly tolerant
D	Dry	Limited Functions	
E	No fish present; 90 S	Contributing Functions	
F	No fish present; 60 S	Limited Functions	

Table 4 Terrestrial Classifications on the Flewellyn Road Properties, 2023

Drainage Feature	Description	Amphibians	Terrestrial Classification
A	This reach provides habitat to the adjacent White Cedar Swamp and mixed forest vegetation communities	Wood Frogs were observed in the feature	Valued Functions
B	There is no wetland habitat present. This feature connects deciduous and mixed forest types on the Site	No frogs were observed within the vicinity of this feature	Limited Functions
C	This reach is a permanent roadside ditch that is wet year-round	Frogs were observed adjacent to this feature (Chorus Frog, Spring Peeper, Wood Frog)	Important Functions
D	This reach provides habitat to the adjacent White Cedar Swamp vegetation community	No frogs were observed within the vicinity of this feature	Limited Functions
E	There is no wetland habitat present. This feature connects a forest with the Flewellyn Drain and adjacent SWP	Frogs were observed within the vicinity of this feature (Wood Frog, Spring Peeper)	Valued Functions
F	This reach is a permanent roadside ditch that is wet year-round and very heavily vegetated	No frogs were observed within the vicinity of this feature	Contributing Functions

2.5 Reach Summary

Dimensions of the Headwater Drainage Features are summarized in Table 5 below.

Drainage Feature	Length (m)	Mean Bankfull Width (m)	Mean Wetted Width (m)	Mean Depth (m)
A	465 m	0.73	0.72	0.07
B	378 m	0.93	0.91	0.21
C	1, 185 m	-	1.85	0.17
D	675 m	1.59	1.56	0.36
E	478 m	2.06	2.02	0.15
F	640 m	1.30	2.14	0.25

3.0 MANAGEMENT RECOMMENDATIONS

The classification categories identified in Section 2 provide the basis of the management recommendations provided here. The following flow chart (Figure 2) combines and translates the classification results to management recommendations.

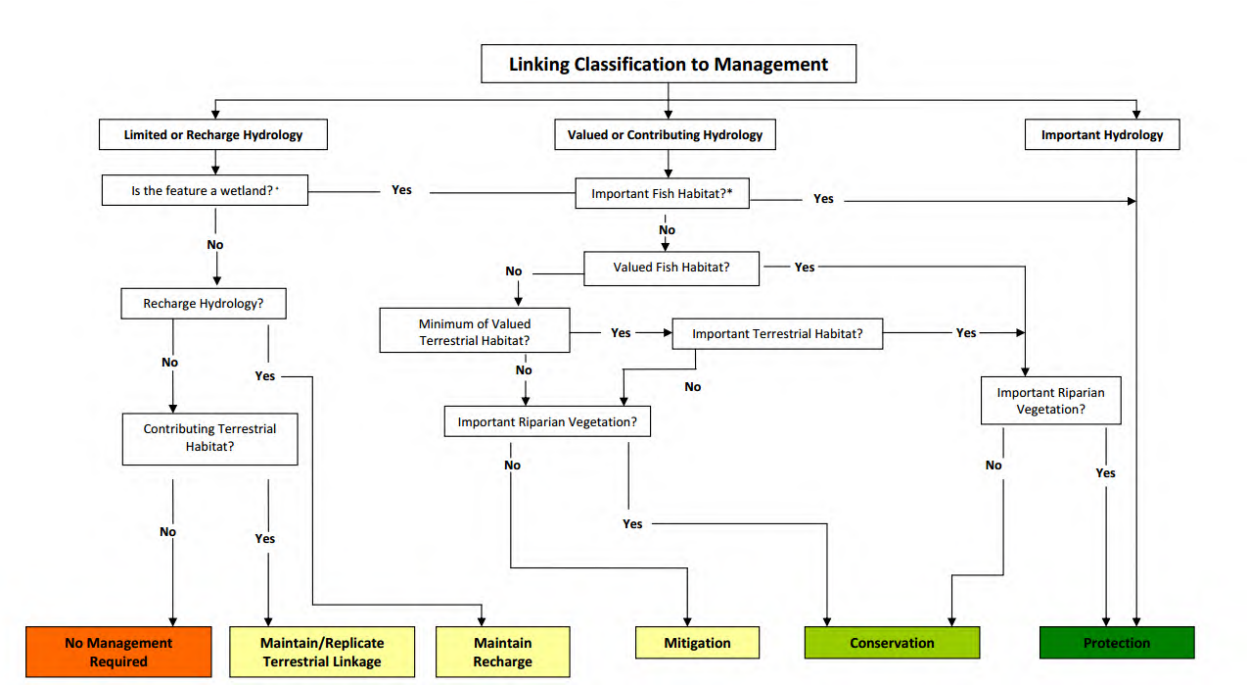


Figure 2 Headwater Drainage Feature Assessment (HDFA) flow chart providing direction on management options

3.1 Periphery Reaches

3.1.1 Tributary A

This feature is a drainage ditch that becomes braided downstream and is a direct connection between the edge of a white cedar swamp and mixed forest to the Flewellyn roadside ditch and Flewellyn Drain. It primarily functions as a drainage feature supporting spring run-off and after heavy rainfall. Following the HDFA Guide flow chart linking component classification to management directives, this reach:

1. Provides Valued/Contributing Hydrology;
2. Provides Valued/Contributing Riparian Vegetation;
3. Provides Limited Fish Habitat; and,
4. Provides Valued Terrestrial Habitat.

This chain of classification descriptors leads to a management directive of **Mitigation** for this reach. This feature may be maintained, replicated, or enhanced using natural channel design techniques to maintain or enhance overall productivity of the reach. This feature provides ephemeral flow and water storage functions during and (for a short time) after spring freshet and following large rain events only. Additionally, amphibians were heard calling during MMP surveys. There is no requirement to retain the feature per se, but on-site flow, outlet flows, and overall water balance for the area must be maintained by providing mitigation measures to infiltrate clean stormwater.

3.1.2 Tributary B

This feature is a ditch feature located within mixed and deciduous forest communities and connects downstream to Tributary E. It has a standing water pool present with interstitial flow towards the Flewellyn Drain. Standing water contributes to groundwater recharge and can function as amphibian breeding habitat. No amphibians were observed within this reach. Following the HDFA Guide flow chart linking component classification to management directives, this reach:

1. Provides Important Hydrology;
2. Provides Important Fish Habitat;
3. Provides Important Riparian Vegetation; and,
4. Provides Limited Terrestrial Habitat.

This chain of classification descriptors leads to a management directive of **Protection** for this reach. This feature may be maintained and/or enhanced, but cannot be relocated. The feature should be protected and its riparian zone enhanced where feasible. The hydroperiod must be maintained. Use natural channel design techniques or wetland design to restore and enhance existing habitat features if and where needed. Stormwater management systems must be designed to avoid impacts (i.e. sediment, temperature) to this tributary.

3.1.3 Tributary C

This feature is a roadside drainage ditch that conveys flow along Flewellyn Road, eventually meeting the Faulkner Drain (Tributary F) at Shea Road. Tributary C is a permanent feature that has water present year-round. This feature was confirmed to function as amphibian breeding habitat and fish habitat. Following the HDFA Guide flow chart linking component classification to management directives, this reach:

1. Provides Important Hydrology;
2. Provides Important Fish Habitat;
3. Provides Important Riparian Vegetation; and,
4. Provides Important Terrestrial Habitat.

This chain of classification descriptors leads to a management directive of **Protection** for this reach. This feature may be maintained and/or enhanced, but cannot be relocated. The feature should be protected and its riparian zone enhanced where feasible. The hydroperiod must be maintained. Use natural channel design techniques or wetland design to restore and enhance existing habitat features if and where needed. Stormwater management systems must be designed to avoid impacts (i.e. sediment, temperature) to this tributary.

3.1.4 Tributary D

This feature is a tile feature that flows from the northwest portion of the Site and from the adjacent residential area southward towards Tributary C. It is a direct connection between the edge of a white cedar swamp and mixed forest to the Flewellyn roadside ditch and Flewellyn Drain. It primarily functions as a drainage feature supporting spring run-off and after heavy rainfall. Following the HDFA Guide flow chart linking component classification to management directives, this reach:

1. Provides Valued/Contributing Hydrology;
2. Provides Limited Fish Habitat;
3. Provides Valued/Contributing Riparian Vegetation; and
4. Provides Limited Terrestrial Habitat.

This chain of classification descriptors leads to a management directive of **Mitigation** for this reach. This feature may be maintained, replicated, or enhanced using natural channel design techniques to maintain or enhance overall productivity of the reach. This feature provides ephemeral flow and water storage functions during and (for a short time) after spring freshet and following large rain events only. There is no requirement to retain the feature per se, but on-site flow, outlet flows, and overall water balance for the area must be maintained by providing mitigation measures to infiltrate clean stormwater.

3.1.5 Tributary E

This feature is a channelized or constrained feature located within mixed and deciduous forest communities and connects downstream to the Faulkner Drain. It has intermittent standing water pools present with intermittent flow towards Faulkner Drain. Standing water contributes to groundwater recharge and can function as amphibian breeding habitat. Breeding amphibians were observed within this reach. Following the HDFA Guide flow chart linking component classification to management directives, this reach:

1. Provides Important Hydrology;
2. Provides Contributing Fish Habitat;
3. Provides Important Riparian Vegetation; and,
4. Provides Valued Terrestrial Habitat.

This chain of classification descriptors leads to a management directive of **Protection** for this reach. This feature may be maintained and/or enhanced, but cannot be relocated. The feature should be protected and its riparian zone enhanced where feasible. The hydroperiod must be maintained. Use natural channel design techniques or wetland design to restore and enhance existing habitat features if and where needed. Stormwater management systems must be designed to avoid impacts (i.e. sediment, temperature) to this tributary.

3.1.6 Tributary F

This feature is a roadside ditch feature located along Shea Road adjacent to an idle agricultural field and connects downstream to the Faulkner Drain at the intersection with Flewellyn Road. It primarily functions as a drainage feature supporting spring run-off and after heavy rainfall. Breeding amphibians were not observed within this reach. Following the HDFA Guide flow chart linking component classification to management directives, this reach:

1. Provides Important Hydrology;
2. Provides Limited Fish Habitat;
3. Provides Important Riparian Vegetation; and,
4. Provides Contributing Terrestrial Habitat.

This chain of classification descriptors leads to a management directive of **Protection** for this reach. This feature may be maintained and/or enhanced, but cannot be relocated. The feature should be protected and its riparian zone enhanced where feasible. The hydroperiod must be maintained. Use natural channel design techniques or wetland design to restore and enhance existing habitat features if and where needed. Stormwater management systems must be designed to avoid impacts (i.e. sediment, temperature) to this tributary.

4.0 CLOSURE

This report provides detailed descriptions of the Headwater Drainage Features on and adjacent to 5993 and 6115 Flewellyn Road, and 6070 Fernbank Road, and provides management recommendations to direct future development near those features. Questions may be addressed to the undersigned.

Respectfully submitted,

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Appendix A Site Photos

Figure 3 Tributary A

Figure 4 Tributary B

Figure 5 Tributary B

Figure 6 Pool

Figure 7 Tributary C

Figure 8 Tributary D

Figure 9 Tributary E

Figure 10 Tributary E

Figure 11 Tributary F

Figure 12 Tributary F

Appendix G Breeding Bird Survey Data

Appendix F - Breeding Bird Survey Data

Common Name	Scientific Name	Date(s) Observed	Highest Breeding Evidence	Station(s) Observed
Alder Flycatcher	*Empidonax alnorum*	2023-06-02, 2023-06-13, 2023-07-04	PO	7,8
American Crow	*Corvus brachyrhynchos*	2023-06-02, 2023-06-13, 2023-07-04	PO	1,2,4,5,6,7,8
American Goldfinch	*Spinus tristis*	2023-06-02, 2023-06-13, 2023-07-04	PO	1,2,3,4,5,8
American Kestrel	*Falco sparverius*	2023-06-13	PO	8
American Redstart	*Setophaga ruticilla*	2023-06-02, 2023-06-13	PO	2,4,5
American Robin	*Turdus migratorius*	2023-06-02, 2023-06-13, 2023-07-04	PO	1,2,4,5,6,7
American Tree Sparrow	*Spizelloides arborea*	2023-06-02	PO	4,5,6
Black-capped Chickadee	*Poecile atricapillus*	2023-06-02, 2023-06-13, 2023-07-04	PO	1,8
Blue Jay	*Cyanocitta cristata*	2023-06-02, 2023-06-13, 2023-07-04	PO	1,2,4,8
Brown Thrasher	*Toxostoma rufum*	2023-06-02, 2023-06-13	PO	2,4
Canada Goose	*Branta canadensis*	2023-06-14	PO	5
Chimney Swift	*Chaetura pelagica*	2023-06-13	PO	1
Common Grackle	*Quiscalus quiscula*	2023-06-02	PO	5
Common Yellowthroat	*Geothlypis trichas*	2023-06-02, 2023-06-13, 2023-07-04	PO	1,4,5,6,7,8
Eastern Wood-Pewee	*Contopus virens*	2023-06-02, 2023-06-13	PO	2,3
European Starling	*Sturnus vulgaris*	2023-06-02	PO	2,5,6
Field Sparrow	*Spizella pusilla*	2023-06-02, 2023-06-13	PO	1,6,7,8
Great Crested Flycatcher	*Myiarchus crinitus*	2023-06-02, 2023-06-13, 2023-07-04	PO	2
Green Heron	*Butorides virescens*	2023-06-02	PO	5
Hermit Thrush	*Catharus guttatus*	2023-06-02	PO	3,4
House Wren	*Troglodytes aedon*	2023-06-02, 2023-06-13	PO	1,2,3
Killdeer	*Charadrius vociferus*	2023-06-02, 2023-07-04	PO	1,7
Mallard	*Anas platyrhynchos*	2023-06-02, 2023-06-13	PO	5,6,8
Mourning Dove	*Zenaida macroura*	2023-06-02, 2023-06-13	PO	2,6
Northern Cardinal	*Cardinalis cardinalis*	2023-06-02, 2023-06-13	PO	1,2,3,4,6
Ovenbird	*Seiurus aurocapilla*	2023-06-02, 2023-06-13, 2023-07-04	PO	1,2,8
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	2023-06-02, 2023-06-13	PO	1,2,4,5
Ring-billed Gull	*Larus delawarensis*	2023-06-02, 2023-06-13, 2023-07-04	PO	1,2,5,6,8
Red-breasted Nuthatch	*Sitta canadensis*	2023-06-02	PO	2
Red-eyed Vireo	*Vireo olivaceus*	2023-06-02, 2023-06-13	PO	1,2,3,5
Ruffed Grouse	*Bonasa umbellus*	2023-06-13	PO	2
Red-winged Blackbird	*Agelaius phoeniceus*	2023-06-02, 2023-06-13, 2023-07-04	PO	4,5
Savannah Sparrow	*Passerculus sandwichensis*	2023-06-02, 2023-06-13	PO	7,8
Song Sparrow	*Melospiza melodia*	2023-06-02, 2023-06-13, 2023-07-04	PO	1,2,3,4,5,6,7,8
Swamp Sparrow	*Melospiza georgiana*	2023-06-02, 2023-06-13	PO	8
Tree Swallow	*Tachycineta bicolor*	2023-06-02	PO	6
Veery	*Catharus fuscescens*	2023-06-02	PO	2
Warbling Vireo	*Vireo gilvus*	2023-06-13	PO	2
Wild Turkey	*Meleagris gallopavo*	2023-06-02, 2023-06-13	PO	1,2,4,7
Winter Wren	*Troglodytes hiemalis*	2023-06-02	PO	4
Wood Thrush	Hylocichla mustelina	2023-07-04	PO	1
White-throated Sparrow	*Zonotrichia albicollis*	2023-06-02, 2023-06-13	PO	1,2,4,8
Yellow Warbler	*Setophaga petechia*	2023-06-02, 2023-06-13, 2023-07-04	PO	1,5,6,8

Appendix H Species at Risk Assessment

Name (*Taxonomic Name*)	Status under ESA	Status under SARA	Observation Record Sources (within 10 km of the Site)	Habitat Description	Suitable Habitat on or Adjacent (within 120 m) to the Site	Potential to Interact with Development of the Site
Birds						
Bald Eagle (*Haliaeetus leucocephalus*)	**Special Concern**	**Not at Risk**	Cornell Lab of Ornithology (2022); California Academy of Sciences and National Geographic Society (2022)	Nest in mature forests near open water. In large trees such as pine and poplar.	The available open water near the Site is limited to the Faulkner SWM Pond, which would not provide feeding habitat suitable to support the species.	Negligible
Bank Swallow (*Riparia riparia*)	**Threatened**	**Threatened**	Birds Canada et al. (2009); Cornell Lab of Ornithology (2022)	Colonial nester; burrows in eroding silt or sand banks, sand pit walls, and human-made sand piles. Often found on banks of rivers and lakes.	The open meadows and farm fields of the western portion of the site provide some potential as feeding habitat, but no banks suitable for nesting are evident on or adjacent to the Site.	Low
Barn Swallow (*Hirundo rustica*)	**Threatened (Special Concern as of Jan 25, 2023)**	**Threatened**	Birds Canada et al. (2009); MNRF (2022a); MNRF (2022b); Cornell Lab of Ornithology (2022)	Nests on barns and other structures. Forages in open areas for flying insects. Lives in close association with humans and prefers to nest on structures such as open barns, under bridges, and in culverts.	The open meadows and farm fields of the western portion of the site provide some potential as feeding habitat. While houses to the north, south and east of the Site likely provide limited nesting potential, suitable barns are present within 100 m of the western edge of the Site.	High – note, however, that the species will not no longer be subject to protections currently provided by the ESA by the start of the project.
Black Tern (*Chlidonias niger*)	**Special Concern**	**Not at Risk**	n/a	Build floating nests in loose colonies in shallow marshes with abundant emergent vegetation, especially in cattails.	There is no suitable habitat near the Site and the species is not known to occur in the vicinity.	Negligible
Bobolink (*Dolichonyx oryzivorus*)	**Threatened**	**Threatened**	Birds Canada et al. (2009); MNRF (2022a); MNRF (2022b); Cornell Lab of Ornithology (2022)	Breeds in hayfields, pastures, agricultural fields, and abandoned fields with tall grass that are ≥5 ha, and preferably >30 ha.	Cultural meadow areas on the western half of the site are too small to support the species. Cultural meadows on the eastern side of the site are becoming sufficiently shrubby to reduce the likelihood of use by the species, but still offer suitable breeding habitat. Active agricultural areas in the southeast corner may provide suitable habitat depending on the selection of crop species.	High
Canada Warbler (*Cardellina canadensis*)	**Special Concern**	**Threatened**	MNRF (2022a)	Prefers moist forests with dense shrub layers. Nests located on or near the ground on mossy logs or roots, along stream banks or on hummocks. Area-sensitive species that usually require a minimum of 30	Most of the western half of the Site provides highly suitable nesting habitat.	High

Name (*Taxonomic Name*)	Status under ESA	Status under SARA	Observation Record Sources (within 10 km of the Site)	Habitat Description	Suitable Habitat on or Adjacent (within 120 m) to the Site	Potential to Interact with Development of the Site
				ha of continuous forest for breeding habitat (OMNR, 2000).		
Cerulean Warbler (*Setophaga cerulea)*	**Threatened**	**Endangered**	n/a	Prefers mature deciduous forests. Area-sensitive species that require large forests (>100 ha) (OMNR, 2000).	Deciduous forest cove in the central portion of the Site is of a suitable type but is too small to provide habitat and the species is not known to occur in the vicinity.	Negligible
Chimney Swift (*Chaetura pelagica*)	**Threatened**	**Threatened**	Cornell Lab of Ornithology (2022)	Nests in traditional-style open brick chimneys (and rarely in hollow trees). Tends to stay close to water.	Houses on or adjacent to the Site appear to have modern chimneys that would not provide suitable nesting or roosting habitat. Some trees on Site may be suitable but these are not the preferred habitat of the species.	Moderate
Common Nighthawk (*Chordeiles minor*)	**Special Concern**	**Threatened**	Birds Canada et al. (2009); Cornell Lab of Ornithology (2022)	Nests in a wide variety of open sites, including beaches, fields, and gravel rooftops with little to no ground vegetation. They also nest in cultivated fields, orchards, urban parks, mine tailings and along gravel roads/railways but tend to occupy more natural sites.	Open areas on the Site provide marginal nesting conditions.	Moderate
Eastern Meadowlark (*Sturnella magna*)	**Threatened**	**Threatened**	Birds Canada et al. (2009); MNRF (2022a); MNRF (2022b); Cornell Lab of Ornithology (2022)	Breeds in hayfields, pastures, agricultural fields, and abandoned fields with tall grass that are ≥5 ha, and preferably >30 ha.	Cultural meadow areas on the western half of the site are too small to support the species. Cultural meadows on the eastern side of the site are becoming sufficiently shrubby to reduce the likelihood of use by the species, but still offer suitable breeding habitat. Active agricultural areas in the southeast corner may provide suitable habitat depending on the selection of crop species.	High
Eastern Whip-poor-will (*Antrostomus vociferus*)	**Threatened**	**Threatened**	Birds Canada et al. (2009); MNRF (2022a)	Suitable breeding habitats generally include open and half treed areas and often exhibit a scattered distribution of treed and open space. Lays eggs directly on the forest floor. Roosts are typically located in forest habitat on a low branch or directly on the ground. Home range size varies from 20 to 500 ha (mean 136 ha) (ECCC, 2018).	The entire western half of the site provides suitable habitat.	High

Name (*Taxonomic Name*)	Status under ESA	Status under SARA	Observation Record Sources (within 10 km of the Site)	Habitat Description	Suitable Habitat on or Adjacent (within 120 m) to the Site	Potential to Interact with Development of the Site
Eastern Wood-Pewee (*Contopus virens*)	**Special Concern**	**Special Concern**	Birds Canada et al. (2009); Cornell Lab of Ornithology (2022)	Woodland species often found in the mid-canopy layer near clearings and edges of intermediate age and mature deciduous and mixed forests with little understory.	The entire western half of the site provides suitable habitat.	High
Evening Grosbeak (*Coccothraustes vespertinus*)	**Special Concern**	**Special Concern**	Birds Canada et al. (2009); Cornell Lab of Ornithology (2022)	Nests in trees or large shrubs. Prefers mature coniferous forests (fir and/or spruce dominated), but will also use deciduous forests, parklands, and orchards. Its abundance is strongly linked to the cycle of Spruce Budworm.	Forest habitat on the Site is suitable but not optimal.	Moderate
Golden Eagle (*Aquila chrysaetos*)	**Endangered**	**Not at Risk**	n/a	Nests in remote, undisturbed areas, usually building their nests on ledges on a steep cliff/riverbank or large trees if needed. Most hunting is done near open areas such as large bogs or tundra. Migration only; no reported nests in Ottawa.	There is no suitable habitat near the Site and the species is not known to occur in the vicinity.	Negligible
Golden-winged Warbler (*Vermivora chrysoptera*)	**Special Concern**	**Threatened**	n/a	Ground-nests in areas of young shrubs surrounded by mature forest. Often found in areas that have recently been disturbed such as field edges, hydro or utility right-of-ways, or logged areas. Requires >10 ha of habitat (OMNR, 2000).	The center of the site between mature forests and shrubby meadows provides optimal habitat, but the species is not known to occur in the vicinity.	Low
Grasshopper Sparrow (*Ammodramus savannarum*)	**Special Concern**	**Special Concern**	Birds Canada et al. (2009)	Lives in open grassland areas with well-drained sandy soil. Will also nest in hayfields and pastures, as well as alvars, prairies, and occasionally grain crops such as barley. It prefers areas that are sparsely vegetated, and its nests are well hidden in the field, woven from grasses in a small cup-like shape.	The cultural meadows of the eastern half of the Site have limited suitability given their expanding shrub coverage, but the active agricultural areas in the southeast corner may be highly suitable depending on crop selection.	Moderate
Henslow's Sparrow (*Ammodramus henslowii*)	**Endangered**	**Endangered**	n/a	Prefers poorly drained grasslands with tall, dense grass where it can easily conceal its small ground nest. Tends to avoid fields that have been grazed or are crowded with trees and shrubs. Prefer ≥50 ha areas, but can inhabit ≥5 ha.	Habitat is suitable but the species is not known to occur in the vicinity.	Negligible
Horned Grebe (*Podiceps auritus*)	**Special Concern**	**Special Concern**	n/a	Nest in small ponds, marshes, and shallow bays that contain areas of open water and emergent vegetation.	There is no suitable habitat near the Site and the species is not known to nest in the vicinity.	Negligible

Name (*Taxonomic Name*)	Status under ESA	Status under SARA	Observation Record Sources (within 10 km of the Site)	Habitat Description	Suitable Habitat on or Adjacent (within 120 m) to the Site	Potential to Interact with Development of the Site
				Migrant only; no reported nests in Ottawa.		
Hudsonian Godwit (*Limosa haemastica*)	**Threatened**	**No Status**	Cornell Lab of Ornithology (2022)	They use a wide variety of habitats during migration, such as freshwater marshes, saline lakes, flooded fields, shallow ponds, coastal wetlands, and mudflats. Migrant only; breeds in far north.	There is no suitable habitat near the Site and the species is not known to nest in the vicinity.	Negligible
Least Bittern (*Ixobrychus exilis*)	**Threatened**	**Threatened**	MNRF (2022a)	Found in a variety of wetland habitats, but strongly prefers cattail marshes with a mix of open pools and channels. They prefer larger marshes >5 ha in size and are intolerant of loss of habitat and human disturbance (OMNR, 2000).	There is no suitable habitat near the Site.	Negligible
Lesser Yellowlegs (*Tringa flavipes*)	**No Status (Threatened as of Jan 25, 2023)**	**No Status (Threatened as of Jan 25, 2023)**	Cornell Lab of Ornithology (2022)	Breeds in boreal wetlands. Nests on dry ground or forest openings near peatlands, marshes, and ponds in the boreal forest and taiga. Migrant only; nests in far north (Government of Canada, 2021).	There is no suitable habitat near the Site and the species is not known to nest in the vicinity.	Negligible
Loggerhead Shrike (*Lanius ludovicianus*)	**Endangered**	**Endangered**	n/a	Prefers grazed pastures or other grasslands with scattered low trees and shrubs, especially hawthorns. Lives in fields or alvars (areas of exposed bedrock) with short grass, which makes it easier to spot prey.	Habitat potential near the Site is very limited and the species is not known to nest in the vicinity.	Negligible
Louisiana Waterthrush (*Seiurus motacilla*)	**Threatened**	**Threatened**	n/a	Found in large tracts of mature deciduous or mixed forests in steep, forested ravines with running streams. Clear headwater streams and associated wetlands are preferred sites, but it will also inhabit wooded swamps (Environment Canada, 2011).	Habitat potential near the Site is very limited and the species is not known to nest in the vicinity.	Negligible
Olive-sided Flycatcher (*Contopus cooperi*)	**Special Concern**	**Threatened**	Cornell Lab of Ornithology (2022)	Found along coniferous or mixed forest edges and openings. Will use forests that have been logged or burned if there are ample tall snags and trees to use for foraging perches.	The center of the site between mature forests and shrubby meadows provides suitable habitat.	High
Peregrine Falcon (*Falco peregrinus*)	**Special Concern**	**Special Concern**	Cornell Lab of Ornithology (2022); California Academy of Sciences and	Nests on tall, steep cliff ledges close to large bodies of water. Urban peregrines raise their young on ledges of tall buildings, even in busy downtown areas.	There is no suitable habitat near the Site.	Negligible

Name (*Taxonomic Name*)	Status under ESA	Status under SARA	Observation Record Sources (within 10 km of the Site)	Habitat Description	Suitable Habitat on or Adjacent (within 120 m) to the Site	Potential to Interact with Development of the Site
			National Geographic Society (2022)			
Red Knot (*Calidris canutus rufa*)	**Endangered**	**Endangered**	n/a	Prefer open beaches, mudflats, and coastal lagoons where they feast on molluscs, crustaceans, and other invertebrates. Migrant only; nests in far north.	There is no suitable habitat near the Site and the species is not known to nest in the vicinity.	Negligible
Red-headed Woodpecker (*Melanerpes erythrocephalus*)	**Endangered**	**Endangered**	n/a	Lives in open woodland and woodland edges and is often found in parks, golf courses, and cemeteries. These areas typically have many dead trees, which the birds use for nesting and perching.	The entire western half of the site provides suitable habitat, but the species is not known to occur in the vicinity.	Negligible
Red-necked Phalarope (*Phalaropus lobatus*)	**Special Concern**	**Special Concern**	n/a	Lives in coastal and inland marshes where it feeds in shallow ponds and nests on the grassy edges. Always near water during migration. Migrant only; nests in far north.	There is no suitable habitat near the Site and the species is not known to nest in the vicinity.	Negligible
Rusty Blackbird (*Euphagus carolinus*)	**Special Concern**	**Special Concern**	Cornell Lab of Ornithology (2022)	Prefers wet wooded or shrubby areas. Nests at edges of boreal wetlands and coniferous forests. These areas include bogs, marshes, and beaver ponds.	The northwestern portion of the Site provides a small area of potential habitat of limited suitability.	Low
Short-eared Owl (*Asio flammeus*)	**Special Concern (Threatened as of Jan 25, 2023)**	**Special Concern**	n/a	Lives in open areas such as grasslands, marshes, and tundra where it nests on the ground and hunts for small mammals.	The eastern half of the site provides potentially suitable habitat, but the species is not known to nest in the vicinity.	Negligible
Wood Thrush (*Hylocichla mustelina*)	**Special Concern**	**Threatened**	Birds Canada et al. (2009); MNRF (2022a); Cornell Lab of Ornithology (2022)	Lives in mature deciduous and mixed forests. They seek moist stands of trees with well-developed undergrowth and tall trees for singing and perching. Prefers nesting in large forest mosaics, but will also use fragmented forests. Usually build nests in Sugar Maple or American Beech.	Much of the western half of the site provides suitable habitat.	High
Yellow Rail (*Coturnicops noveboracensis*)	**Special Concern**	**Special Concern**	n/a	Lives deep in the reeds, sedges, and marshes of shallow wetlands, where they nest on the ground. The marshy areas used by Yellow Rails have an overlying dry mat of dead vegetation that is used to make roofs for nests.	There is no suitable habitat near the Site and the species is not known to nest in the vicinity.	Negligible
Mammals						

Name (*Taxonomic Name*)	Status under ESA	Status under SARA	Observation Record Sources (within 10 km of the Site)	Habitat Description	Suitable Habitat on or Adjacent (within 120 m) to the Site	Potential to Interact with Development of the Site
Algonquin Wolf (*Canis* sp.)	**Threatened**	**Special Concern**	n/a	Not restricted to a specific habitat type but typically occurs in deciduous and mixed forest landscapes.	This species only occurs in Algonquin Provincial Park and surrounding townships, along with other areas in central Ontario including in and around Killarney Provincial Park, Kawartha Highlands Signature Site, and Queen Elizabeth II Wildlands (MECP, 2019a).	None
Eastern Cougar (*Puma concolor*)	**Endangered**	**No Status**	n/a	Lives in large, undisturbed forests or other natural areas where there is little human activity.	The proximity of urban development makes the Site unsuitable as habitat.	None
Eastern Small-footed Myotis (*Myotis leibii*)	**Endangered**	**Not Listed**	Humphrey (2017)	In the spring and summer, Eastern Small-footed Myotis will roost in a variety of habitats, including in or under rocks, in rock outcrops, in buildings, under bridges, or in caves, mines, or hollow trees. Overwinters in caves and abandoned mines.	Habitat on site is generally suitable, but the species is considered rare in Ottawa with only historical records from the downtown core.	Low
Gray Fox (*Urocyon cinereoargenteus*)	**Threatened**	**Threatened**	n/a	Lives in deciduous forests and marshes. Their dens are usually found in dense shrubs close to a water source, but they will also use rocky areas, hollow trees, and underground burrows dug by other animals.	The range of this species has recently been reduced to west of Lake Superior in the Rainy River District and on Pelee Island in west Lake Eerie (MECP, 2020a).	None
Little Brown Myotis (*Myotis lucifugus*)	**Endangered**	**Endangered**	Humphrey and Fotherby (2019)	During the day they roost in trees and buildings. They often select attics, abandoned buildings, and barns for summer colonies where they can raise their young. They can squeeze through very tiny spaces (as small as six millimetres across) allowing them access to many different roosting areas.	Habitat on site is generally suitable.	Moderate
Northern Myotis / Northern Long-eared Bat (*Myotis septentrionalis*)	**Endangered**	**Endangered**	Humphrey and Fotherby (2019)	Associated with deciduous and mixed forests, choosing to roost under loose bark and in the cavities of trees. They forage along and within forests as well as in hayfields and pastures adjacent to mixed forests.	Habitat on site is generally suitable.	Moderate

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Tri-colored Bat / Eastern Pipistrelle (*Perimyotis subflavus*)	**Endangered**	**Endangered**	Humphrey and Fotherby (2019)	Roosts mainly in trees during summer; overwinters in caves and mines along with other species, but often uses deeper parts of the hibernaculum. Foraging occurs in forested riparian areas, over water, and within gaps in forest canopies.	Habitat on site is generally suitable.	Moderate
Hoary Bat (*Lasiurus cinereus*)	**Endangered (January 2025)**	**No Status**	n/a	Roosts in both deciduous and coniferous forests of any age, among canopy foliage with open flight space below. Maternity roosts are often in large diameter, tall trees. Foraging occurs in open areas, wetlands, grasslands and open fields, with sparse trees.	Habitat on site is generally suitable.	Moderate
Silver-haired Bat (*Lasionycteris noctivagans*)	**Endangered (January 2025)**	**No Status**	n/a	Roosts under bark and in large decaying deciduous and coniferous tree cavities. Foraging occurs in young and mature forest openings and along forest edges.	Habitat on site is generally suitable.	Moderate
Eastern Red Bat (*Lasiurus borealis*)	**Endangered (January 2025)**	**No Status**	n/a	Roosts in both deciduous and coniferous forests of any age, among canopy foliage with open flight space below. Maternity roosts are often in large diameter, tall trees. Foraging occurs in forested and non-forested areas, above and below forest canopies.	Habitat on site is generally suitable.	Moderate
Amphibians						
Western Chorus Frog (*Pseudacris triseriata*)	**Not Listed**	Great Lakes/ St. Lawrence population: **Threatened**	Ontario Nature (2019); MNRF (2022a)	Inhabits forest openings around woodland ponds but can also be found in or near damp meadows, marshes, bottomland swamps, and temporary ponds in open country, or even urban areas.	Drainage ditch/stream, pond and wetland areas on the Site provide suitable habitat.	Moderate
Reptiles						
Blanding's Turtle (*Emydoidea blandingii*)	**Threatened**	**Endangered**	Ontario Nature (2019); MNRF (2022a); MNRF (2022b); California Academy of Sciences and National	Quiet lakes, streams, and wetlands with abundant emergent vegetation. Also frequently occurs in adjacent upland forests.	The Faulkner Drain was subject to cleanout by the City in the fall of 2022 and is unlikely to provide suitable wetland space for the species. Other than the Faulkner SWM pond, which similarly has low suitability, no suitable wetland features occur within >500 m of the Site. Following provincial guidance	Low

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			Geographic Society (2022)		on the species, no Category 2 or 3 habitat is considered to occur on the Site.	
Eastern Milksnake (*Lampropeltis triangulum*)	**Not Listed**	**Special Concern**	Ontario Nature (2019); MNRF (2022a); MNRF (2022b); California Academy of Sciences and National Geographic Society (2022	Found in variety of open, scrubby or edge habitats, including pastures.	As a habitat generalist, much of the Site may be considered suitable for the species.	High – but the species is not protected as a SAR within the context of the development of the Site.
Eastern Musk Turtle / Stinkpot (*Sternotherus odoratus*)	**Special Concern**	**Special Concern**	n/a	Found in ponds, lakes, marshes, and rivers that are generally slow-moving, have abundant emergent vegetation, and muddy bottoms that they burrow into for winter hibernation.	Other than the Falkner SWM Pond, which is marginal at best, the Site does not generally provide suitable habitat, and the species is not known to occur in the vicinity.	Negligible
Eastern Ribbonsnake *(Thamnophis sauritus)*	**Special Concern**	**Special Concern**	n/a	The Eastern Ribbonsnake is semi-aquatic. It is most frequently found along the edges of shallow ponds, streams, marshes, swamps, or bogs bordered by dense vegetation that provides cover. Abundant exposure to sunlight is also required, and adjacent upland areas may be used for nesting.	Wet areas around the Site provide suitable habitat, but the species is not known to occur in the vicinity.	Low
Midland Painted Turtle (*Chrysemys picta marginata*)	**Not Listed**	**Special Concern**	Ontario Nature (2019); MNRF (2022a); California Academy of Sciences and National Geographic Society (2022)	Inhabits waterbodies, such as ponds, marshes, lakes and slow-moving creeks that have a soft bottom and provide abundant basking sites and aquatic vegetation. Often bask on shorelines or on logs and rocks that protrude from the water.	The Faulkner SWM Pond provides some habitat suitability.	High – but the species is not protected as a SAR within the context of the development of the Site.
Northern Map Turtle (*Graptemys geographica*)	**Special Concern**	**Special Concern**	MNRF (2022a); California Academy of Sciences and National Geographic Society (2022)	Lives in rivers and lakeshores where it basks on emergent rocks and fallen trees throughout the spring and summer. In winter, they hibernate on the bottom of deep, slow-moving sections of river.	Water features on or near the Site are generally too small to support the species.	Low
Snapping Turtle (*Chelydra serpentina*)	**Special Concern**	**Special Concern**	Ontario Nature (2019);	Spend most of their lives in the water. Prefer shallow waters so they can hide under the soft mud and leaf litter	The Faulkner SWM Pond provides some habitat suitability. Other water features	High – but the species is not protected as a SAR within the

Name (*Taxonomic Name*)	Status under ESA	Status under SARA	Observation Record Sources (within 10 km of the Site)	Habitat Description	Suitable Habitat on or Adjacent (within 120 m) to the Site	Potential to Interact with Development of the Site
			MNRF (2022a); MNRF (2022b); California Academy of Sciences and National Geographic Society (2022)	with only their noses exposed to the surface to breathe.	on or near the Site are generally too small to support the species.	context of the development of the Site.
Spiny Softshell (*Apalone spinifera*)	**Endangered**	**Endangered**	n/a	Found primarily in rivers and lakes but also in creeks, ditches, and ponds near rivers. Habitat requirements are open sand or gravel nesting areas, shallow muddy or sandy areas to bury in, deep pools for hibernation, areas for basking, and suitable habitat for crayfish and other food species.	The Faulkner SWM Pond provides some habitat suitability. Other water features on or near the Site are generally too small to support the species. Regardless, the species is not known to occur in the vicinity.	Negligible
Spotted Turtle (*Clemmys guttata*)	**Endangered**	**Endangered**	n/a	Semi-aquatic and prefers ponds, marshes, bogs, and even ditches with slow-moving, unpolluted water and an abundant supply of aquatic vegetation.	The Site provides some habitat suitability, but the species is not known to occur in the vicinity.	Negligible
Wood Turtle (*Glyptemys insculpta*)	**Endangered**	**Threatened**	n/a	Prefers clear rivers, streams, or creeks with a slight current and sandy or gravelly bottom. Wooded areas are essential habitat, but they are found in other habitats such as wet meadows, swamps, and fields.	The Site provides some habitat suitability, but the species is not known to occur in the vicinity.	Negligible
Arthropods						
American Bumble bee (*Bombus pensylvanicus*)	**No Status (Special Concern as of Jan 25, 2023)**	**No Status**	n/a	Habitat generalist. Requires a variety of habitat throughout it's life stages. Often found in or adjacent to open fields and meadows, grasslands, farmlands, and other undisturbed open habitats (Government of Canada, 2019).	As a habitat generalist, much of the Site may be considered suitable, but the species is not known to occur in the vicinity.	Negligible – but the species is not protected as a SAR within the context of the development of the Site anyway.
Bogbean Buckmoth (*Hemileuca* sp. 1)	**Endangered**	**Endangered**	n/a	Restricted to open, chalky, low shrub fens containing large amounts of bogbean, an emergent wetland flowering plant.	There is no suitable habitat near the Site, and the species is not known to occur in the vicinity.	None
Gypsy Cuckoo Bumble Bee (*Bombus bohemicus*)	**Endangered**	**Endangered**	n/a	Live in diverse habitats including open meadows, mixed farmlands, urban areas, boreal forest, and montane meadows. Host nests occur	Currently only known to occur in Pinery Provincial Park (MECP, 2019b).	None

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				in abandoned underground rodent burrows and rotten logs.		
Macropis Cuckoo Bee *(Epeoloides pilosulus)*	**Not Listed**	**Endangered**	n/a	Found in habitats supporting both Macropis bees and their food plant, Yellow Loosestrife (*Lysimachi*a).	Has not been observed in Ontario in over 45 years (COSEWIC, 2011).	None
Monarch (*Danaus plexippus*)	**Special Concern**	**Special Concern**	California Academy of Sciences and National Geographic Society (2022); Toronto Entomologists' Association (2022)	Milkweeds are the sole food plant for Monarch caterpillars. These plants predominantly grow in open and periodically disturbed habitats such as roadsides, fields, wetlands, prairies, and open forests.	The cultural meadows of the eastern half of Site support Milkweed and are considered suitable habitat.	High – but the species is not protected as a SAR within the context of the development of the Site.
Mottled Duskywing (*Erynnis martialis*)	**Endangered**	**No Status**	n/a	Requires host plants such as the New Jersey Tea and Prairie Redroot. These plants grow in dry, well-drained soils or alvar habitat within oak woodland, pine woodland, roadsides, riverbanks, shady hillsides, and tall grass prairies.	There is no suitable habitat near the Site, and the species is not known to occur in the vicinity.	None
Nine-spotted Lady Beetle (*Coccinella novemnotata*)	**Endangered**	**No Status**	n/a	Occurs within agricultural areas, suburban gardens, parks, coniferous forests, deciduous forests, prairie grasslands, meadows, riparian areas, and isolated natural areas.	There have been no records of this species in Ontario since the mid-1990s (MECP, 2019c).	None
Rusty-patched Bumble Bee (*Bombus affinis*)	**Endangered**	**Endangered**	n/a	Can be found in open habitat such as mixed farmland, urban settings, savannah, open woods, and sand dunes.	The range of this species is limited to southwestern Ontario (MECP, 2019e).	None
Suckley's Cuckoo Bumble Bee (*Bombus suckleyi*)	**No Status (Endangered as of Jan 25, 2023)**	**No Status**	n/a	Habitat generalist. Host nests occur in meadows, old fields, farmlands, croplands, urban areas, and woodlands (Government of Canada, 2020).	As a habitat generalist, much of the Site may be considered suitable, but the species is not known to occur in the vicinity.	Negligible - but the species is not protected as a SAR within the context of the development of the Site anyway.
Transverse Lady Beetle (*Coccinella transversoguttata*)	**Endangered**	**Special Concern**	n/a	Able to live in a wide range of habitats, including agricultural areas, suburban gardens, parks, coniferous forests, deciduous forests, prairie	There have been no records of the species in Ontario since 1990 (MECP, 2020b).	None

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				grasslands, meadows, and riparian areas.		
West Virginia White butterfly (*Pieris virginiensis*)	**Special Concern**	**No Status**	n/a	Lives in moist, deciduous woodlots. Requires a supply of toothwort, a small, spring-blooming plant that is a member of the mustard family, since it is the only food source for larvae.	The forests of the western half of the Site may be suitable, but the species is not known to occur in the vicinity.	Negligible
Yellow-banded Bumble Bee (*Bombus terricola*)	**Special Concern**	**Special Concern**	MNRF (2022a)	This species is a forage habitat generalist, able to use a variety of nectaring plants and environmental conditions. Can be found in mixed woodlands, particularly for nesting and overwintering, as well as a variety of open habitat such as native grasslands, farmlands, and urban areas.	As a habitat generalist, much of the Site may be considered suitable.	Moderate – but the species is not protected as a SAR within the context of the development of the Site.
Fish						
American Eel (*Anguilla rostrata*)	**Endangered**	**No Status**	n/a	Primarily nocturnal, hiding in soft substrate or submerged vegetation during the day.	There is no suitable habitat near the Site, and the species is not known to occur in the vicinity.	None
Bridle Shiner (*Notropis bifrenatus*)	**Special Concern**	**Special Concern**	n/a	Prefers clear water with abundant vegetation over silty or sandy substrate.	There is no suitable habitat near the Site, and the species is not known to occur in the vicinity.	None
Channel Darter (*Percina copelandi*)	**Special Concern**	**Special Concern**	n/a	Prefers clean streams and lakes with moderate current over sandy or rocky substrate.	There is no suitable habitat near the Site, and the species is not known to occur in the vicinity.	None
Cutlip Minnow (*Exoglossum maxillingua)*	**Threatened**	**Special Concern**	n/a	Lives in warmer rivers and creeks with clear, slow-moving water, and a rocky or gravel bottom.	There is no suitable habitat near the Site, and the species is not known to occur in the vicinity.	None
Lake Sturgeon (*Acipenser fulvescens*)	**Endangered**	**No Status**	n/a	Only found in large lakes and rivers. Forages in cool water, 4-9 m deep over soft substrate; spawns in shallower, fast-flowing areas over rocks or gravel.	There is no suitable habitat near the Site, and the species is not known to occur in the vicinity.	None
Northern Brook Lamprey (*Ichthyomyzon fossor*)	**Special Concern**	**Special Concern**	n/a	Inhabits clear, coolwater streams. The larval stage requires soft substrates such as silt and sand for burrowing which are often found in the slow-moving portions of a stream. Adults are found in areas associated with spawning, including fast flowing riffles comprised of rock or gravel.	There is no suitable habitat near the Site, and the species is not known to occur in the vicinity.	None

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Northern Sunfish (*Lepomis peltastes*)	**Special Concern**	**Special Concern**	n/a	Lives in shallow vegetated areas of quiet, slow flowing rivers and streams, as well as warm lakes and ponds with sandy banks or rocky bottoms.	There is no suitable habitat near the Site, and the species is not known to occur in the vicinity.	None
River Redhorse (*Moxostoma carinatum*)	**Special Concern**	**Special Concern**	n/a	Prefers fast-flowing, clear rivers over rocky substrate.	There is no suitable habitat near the Site, and the species is not known to occur in the vicinity.	None
Silver Lamprey (*Ichthyomyzon unicuspis*)	**Special Concern**	**Special Concern**	n/a	Requires clear water where they can find fish hosts, relatively clean stream beds of sand and organic debris for larvae to live in, and unrestricted migration routes for spawning. Larvae live 4-7 years in burrows (prefer soft substrates); filter-feed on plankton.	There is no suitable habitat near the Site, and the species is not known to occur in the vicinity.	None
Molluscs						
Hickorynut (*Obovaria olivaria*)	**Endangered**	**Endangered**	n/a	Live on the sandy beds in large, wide, deep rivers – usually more than two or three metres deep – with a moderate to strong current. Ottawa River.	There is no suitable habitat near the Site, and the species is not known to occur in the vicinity.	None
Vascular Plants						
American Chestnut (*Castanea dentata*)	**Endangered**	**Endangered**	n/a	Typical habitat is upland deciduous forests on sandy acidic soils. Occurs with Red Oak, Black Cherry, Sugar Maple, and beech.	The Site may be suitable, but the species is not known to occur in the vicinity.	Negligible
American Ginseng (*Panax quinquefolius*)	**Endangered**	**Endangered**	n/a	Grows in rich, moist, but well-drained, and relatively mature, deciduous woods dominated by Sugar Maple, White Ash, and American Basswood.	The Site is not generally suitable and there are no records of the species in the vicinity.	Negligible
Black Ash (*Fraxinus nigra*)	**Endangered**	**No Status**	MNRF (2022a); California Academy of Sciences and National Geographic Society (2022)	Predominantly a wetland species found in swamps, floodplains, and fens.	The entire Site is generally suitable for the species and individuals were observed there.	High – note, the implementation of legal protections for the species under the ESA has been delayed.
Butternut (*Juglans cinerea*)	**Endangered**	**Endangered**	MNRF (2022a)	Commonly found in riparian habitats but is also found on rich, moist, well-drained loams and well-drained gravels, especially those of limestone origin.	The entire Site is generally suitable for the species and individuals were observed there.	High

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Eastern Prairie Fringed-orchid (*Platanthera leucophaea*)	**Endangered**	**Endangered**	n/a	Populations are found in three main habitat types: fens, tallgrass prairie, and moist old fields.	There is no suitable habitat near the Site, and the species is not known to occur in the vicinity.	None
Lichens						
Black-foam Lichen (*Anzia colpodes*)	**No Status**	**Threatened**	n/a	Grows on the trunks of mature deciduous trees growing on level or sloped land where high humidity is supplied by nearby wetlands, lakes, or streams. The most common host is Red Maple but it also occurs on White Ash, Sugar Maple, Red Oak, and very occasionally on other species.	Assumed to no longer occur in Ontario (COSEWIC, 2015).	None
Flooded Jellyskin (*Leptogium rivulare*)	**No Status**	**Special Concern**	MNRF (2022a); MNRF (2022b)	Grows in seasonally flooded habitats, typically on the bark of deciduous trees, on rocks along the margins of seasonal ponds, and on rocks along shorelines and stream/riverbeds.	Treed areas along water features have some potential to support the species.	Moderate – but the species is not protected as a SAR within the context of the development of the Site.

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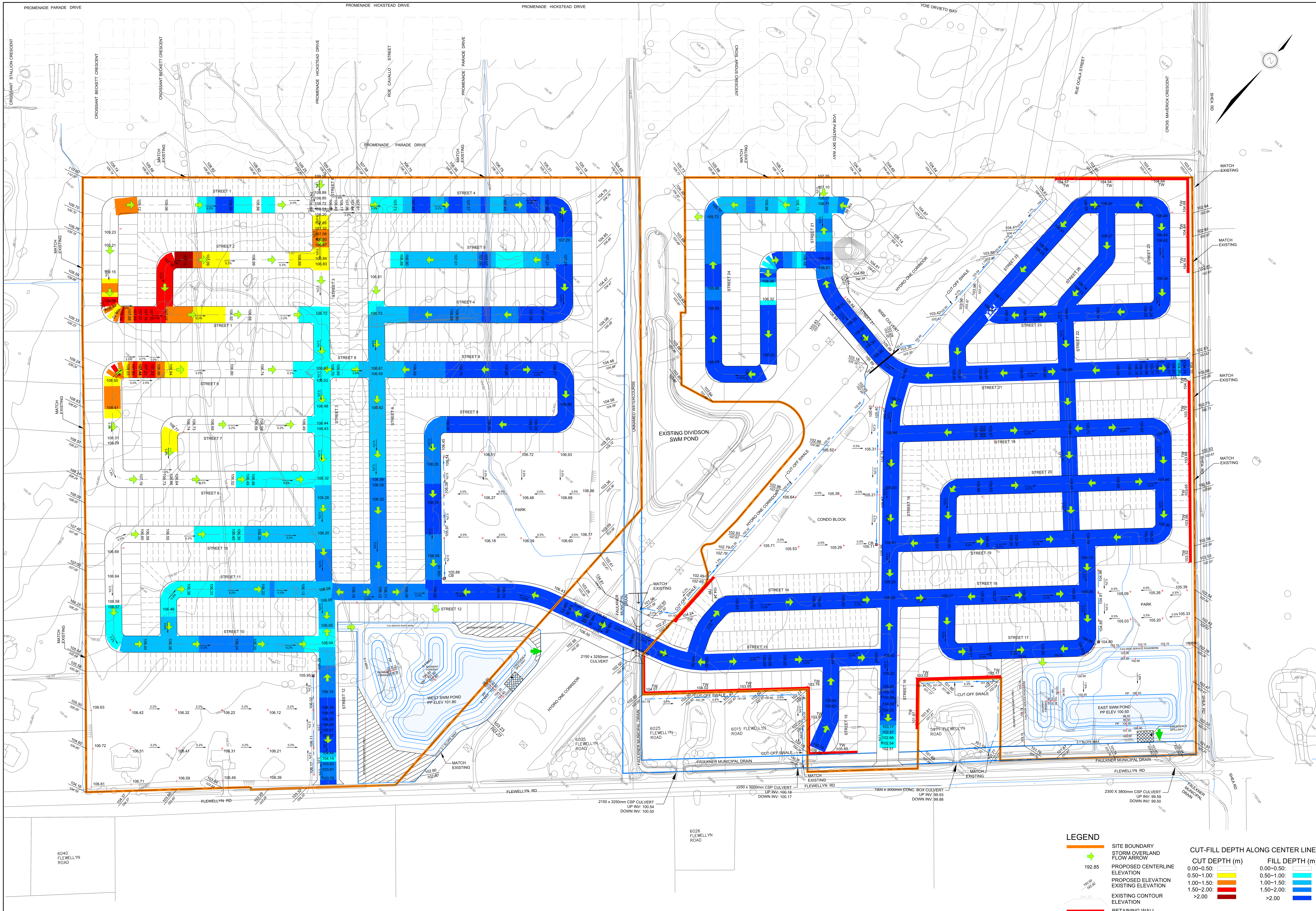
Appendix I Significant Woodlands – 1963 Air Photo


29000 m
429200 m
429400 m
429600 m
429800 m
430000 m
430200 m
430400 m
430600 m
5011050 m
5010800 m
5010600 m
5010400 m
5010200 m
5010000 m
Appendix H
Significant Woodlands – 1963
Air Photo
Site
Significant Woodland
Portions on Site
Roads
N
0
1000 m
Project: CAIV 1300
Map File: CAIV 1300 2309a
Universal Transverse Mercator - Zone 18 (N)
Printed on: 2024-01-18
KILGOUR
& Associates

Appendix J Conceptual Grading Plan (DSEL)



LEGEND

- SITE BOUNDARY
- STORM OVERLAND FLOW ARROW
- 192.85 — PROPOSED CENTERLINE ELEVATION
- 193.50 / 193.50 — PROPOSED ELEVATION / EXISTING ELEVATION
- 244.50 — EXISTING CONTOUR ELEVATION
- RETAINING WALL

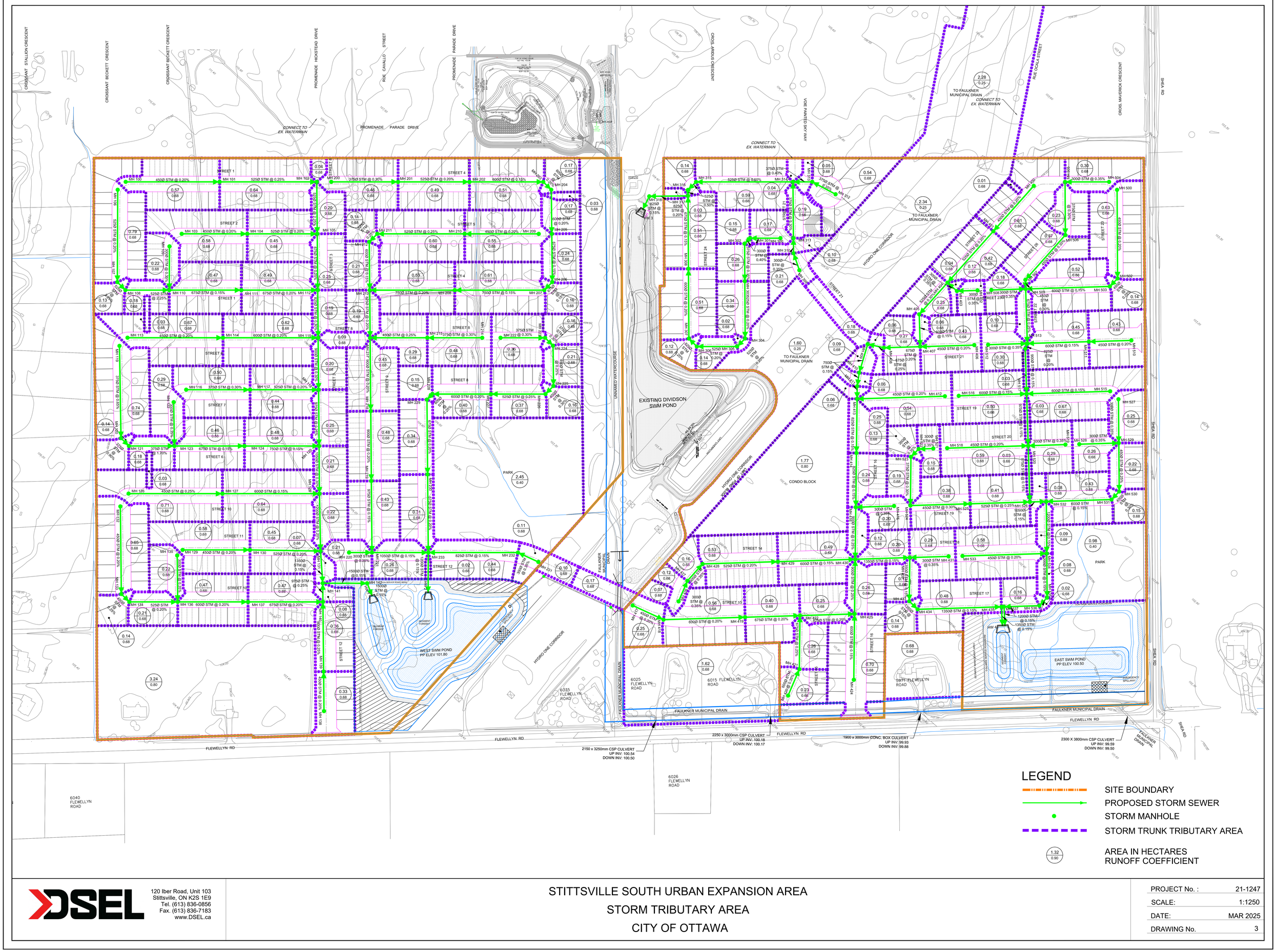
CUT-FILL DEPTH ALONG CENTER LINE:

CUT DEPTH (m)	FILL DEPTH (m)
0.00~0.50:	0.00~0.50:
0.50~1.00:	0.50~1.00:
1.00~1.50:	1.00~1.50:
1.50~2.00:	1.50~2.00:
>2.00	>2.00

DSEL
120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

STITTSVILLE SOUTH URBAN EXPANSION AREA
CONCEPTUAL GRADING PLAN
CITY OF OTTAWA

PROJECT No. :	21-1247
SCALE:	1:1250
DATE:	MAR 2025
DRAWING No.	1

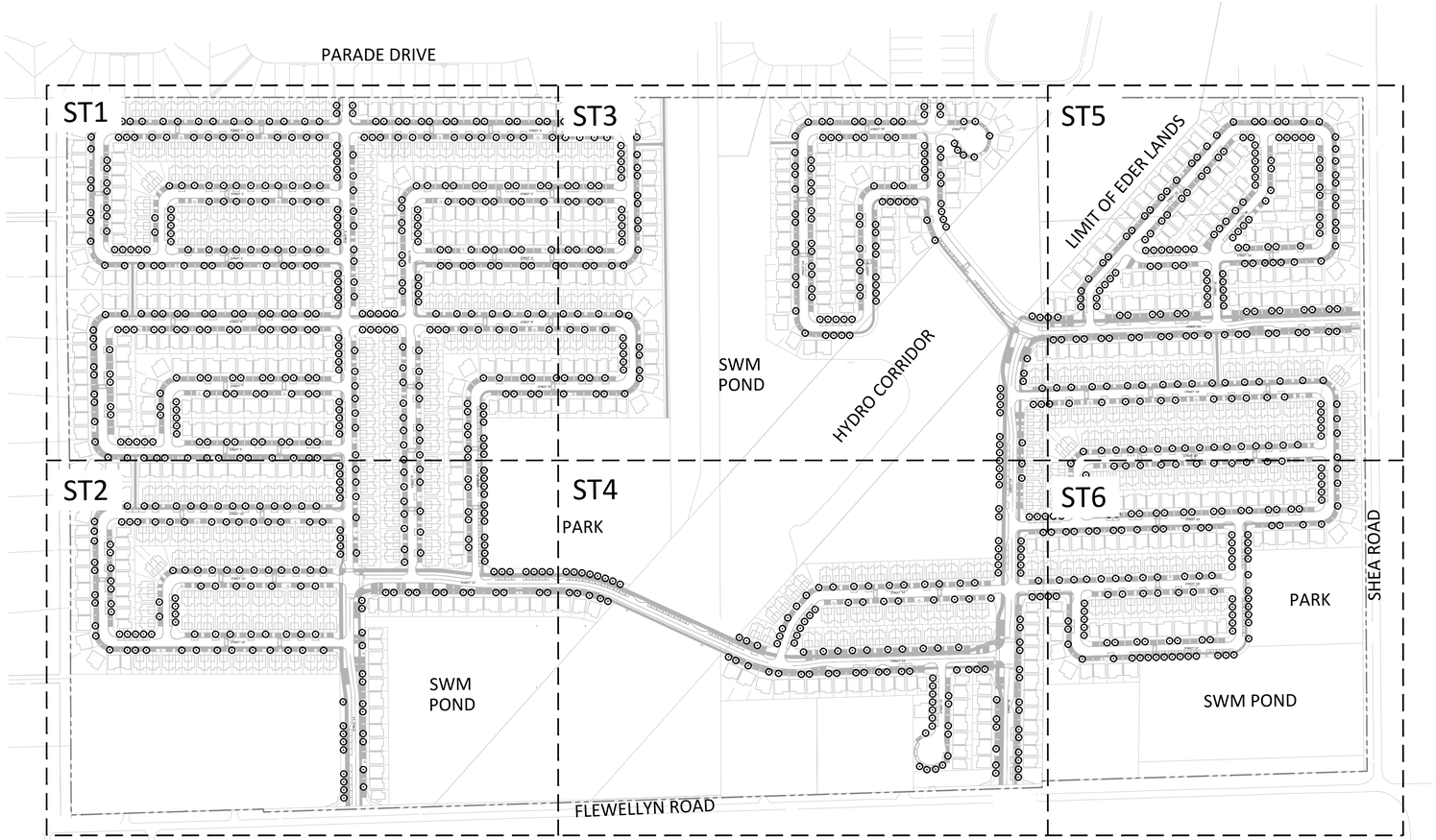


DSEL
120 Iber Road, Unit 103
Stittsville, ON K2S 1E9
Tel. (613) 836-0856
Fax. (613) 836-7183
www.DSEL.ca

STITTSVILLE SOUTH URBAN EXPANSION AREA
STORM TRIBUTARY AREA
CITY OF OTTAWA

PROJECT No. :	21-1247
SCALE:	1:1250
DATE:	MAR 2025
DRAWING No.	3

Appendix K Preliminary Streetscape Plan (Canopy Cover and Soil Volumes)



CAIVAN

STITTSVILLE WEST

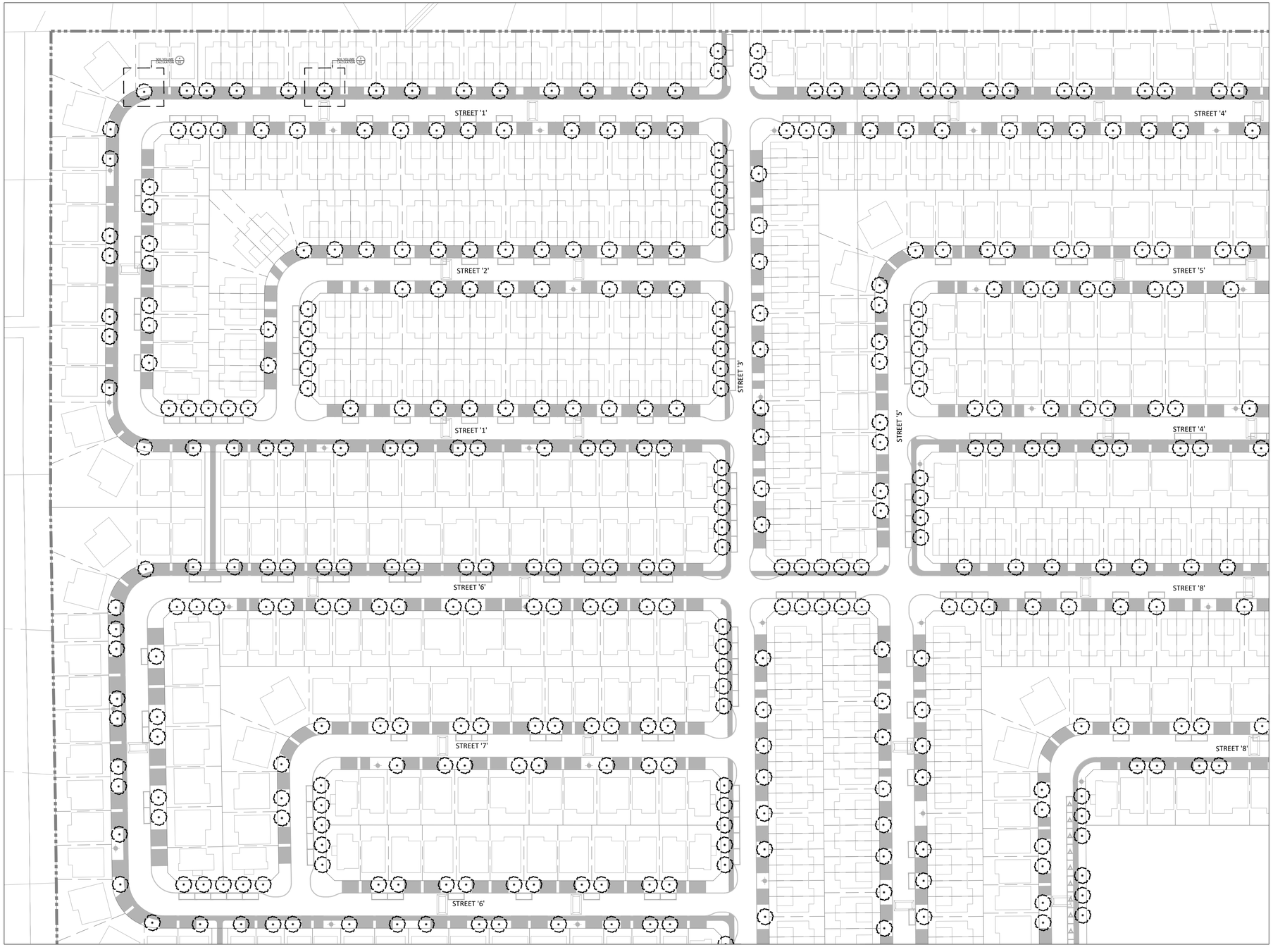
CAIVAN COMMUNITIES

NAK design strategies

LIST OF DRAWINGS:

KEYMAP
NTS

PROJECT 21-273 - STITTSVILLE WEST - CAIVAN - PRELIMINARY STREETSCAPE - JULY 2024



PROPOSED TREE CANOPY PROJECTIONS

TREE TYPE/SIZE	CROWN AREA PER TREE STANDARD RANGE (m^2)	CROWN AREA PER TREE USED FOR CALC. (m^2)	SITE CANOPY COVER
MEDIUM/ LARGE (1229)	35-250*	±138	***CANOPY (W. OVERLAP): 162,886m^2

*RANGE OF CROWN AREAS IS IN ACCORDANCE WITH PROPOSED TREES SPECIES

SITE: 502,665m^2

**CROWN AREAS ARE ACCORDING TO THE AVERAGE MATURE CANOPY SIZE OF THE RESPECTIVE SPECIES. CANOPY SIZING HAS BEEN DETERMINED IN REFERENCE TO VARIOUS ARBORICULTURAL AND BOTANICAL SOURCES, SUCH AS: ONTARIO MINISTRY OF NATURAL RESOURCES & FORESTRY (OMNRF); US FOREST SERVICE; FARRAR, J.L. *TREES IN CANADA*, UNIVERSITY OF GUELPH ARBORETUM, *VARIOUS PUBLICATIONS*

TOTAL PERCENT COVER: 32%

***NOTES:

- CANOPY COVERAGE BASED ON AVERAGE EXPECTED MATURE DIAMETER OF ~12.5m, AREA OF ~138m² (COMBINATION OF MEDIUM AND LARGE SIZE TREES).
- CALCULATION ACCOUNTS FOR CANOPY OVERLAP BETWEEN TREES AND EXCLUDES CANOPY OVERLAP TO NON-RESIDENTIAL LANDS.
- GRAPHICS ARE NOT TO SCALE.

TREE SOIL VOLUMES

TREE TYPE/SIZE	SINGLE TREE SOIL VOLUME	MULTIPLE TREE SOIL VOLUME (m3/TREE)
ORNAMENTAL	15	9
COLUMNAR	15	9
SMALL	20	12
MEDIUM	25	15
LARGE	30	18
CONIFER	25	15

TYPICAL STREET TREE PLANTING REQUIREMENTS

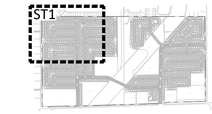
1 TREE PER INTERIOR SINGLE (NON-CORNER) LOTS
2 TREES PER EXTERIOR SINGLE (CORNER) LOTS
1 TREE PER EXTERIOR TOWNHOUSE (CORNER) LOT
2 TREES PER 3 MULTIPLE-UNITS TOWNHOUSE
2 TREES PER 4 MULTIPLE-UNITS TOWNHOUSE
3 TREES PER 5 MULTIPLE-UNITS TOWNHOUSE
3 TREES PER 6 MULTIPLE-UNITS TOWNHOUSE

INTERIOR SINGLE (NON-CORNER) LOTS (597): 597 TREES
EXTERIOR SINGLE (CORNER) LOTS (65): 130 TREES
EXTERIOR TOWNHOUSE (CORNER) LOT (40): 40 TREES
3 MULTIPLE-UNITS TOWNHOUSE (18): 36 TREES
4 MULTIPLE-UNITS TOWNHOUSE (18): 36 TREES
5 MULTIPLE-UNITS TOWNHOUSE (87): 261 TREES
6 MULTIPLE-UNITS TOWNHOUSE (46): 138 TREES

TOTAL NUMBER OF TREES REQUIRED:	1,238
NUMBER OF STREET TREES SHOWN ON PLAN:	1,229
NUMBER OF WALKWAY BLOCK TREES:	00
TOTAL NUMBER OF TREES ON PLAN:	1,229
DIFFERENCE:	-9

*PRELIMINARY - STREET TREE LOCATIONS ARE SUBJECT TO CHANGE DURING DETAILED DESIGN AND SITE PLAN CONTROL APPLICATIONS.

Key Plan



LEGEND

PROPERTY LINE

PLANTING

AR — DECIDUOUS STREET TREE

No.	Description	Date
-		
-		
-		
5	Issued for Preliminary Streetscape Resubmission	Apr.14/25
4	Issued for Preliminary Streetscape Resubmission	Mar.24/25
3	Issued for Preliminary Streetscape Resubmission	Aug.9/24
2	Issued for Preliminary Streetscape Resubmission	Aug.2/24
1	Issued for Preliminary Streetscape Submission	July.18/24

Revision

City Approval Stamp

ASSOCIATION OF LANDSCAPE ARCHITECTS ONTARIO — SILVANO TARGETA — OALA — MEMBER

NAK design strategies
1285 WELLINGTON STREET, OTTAWA, ON K1Y 3A8 CANADA
T 613.237.2345 NAKDESIGNSTRATEGIES.COM

Project

STITTSVILLE WEST

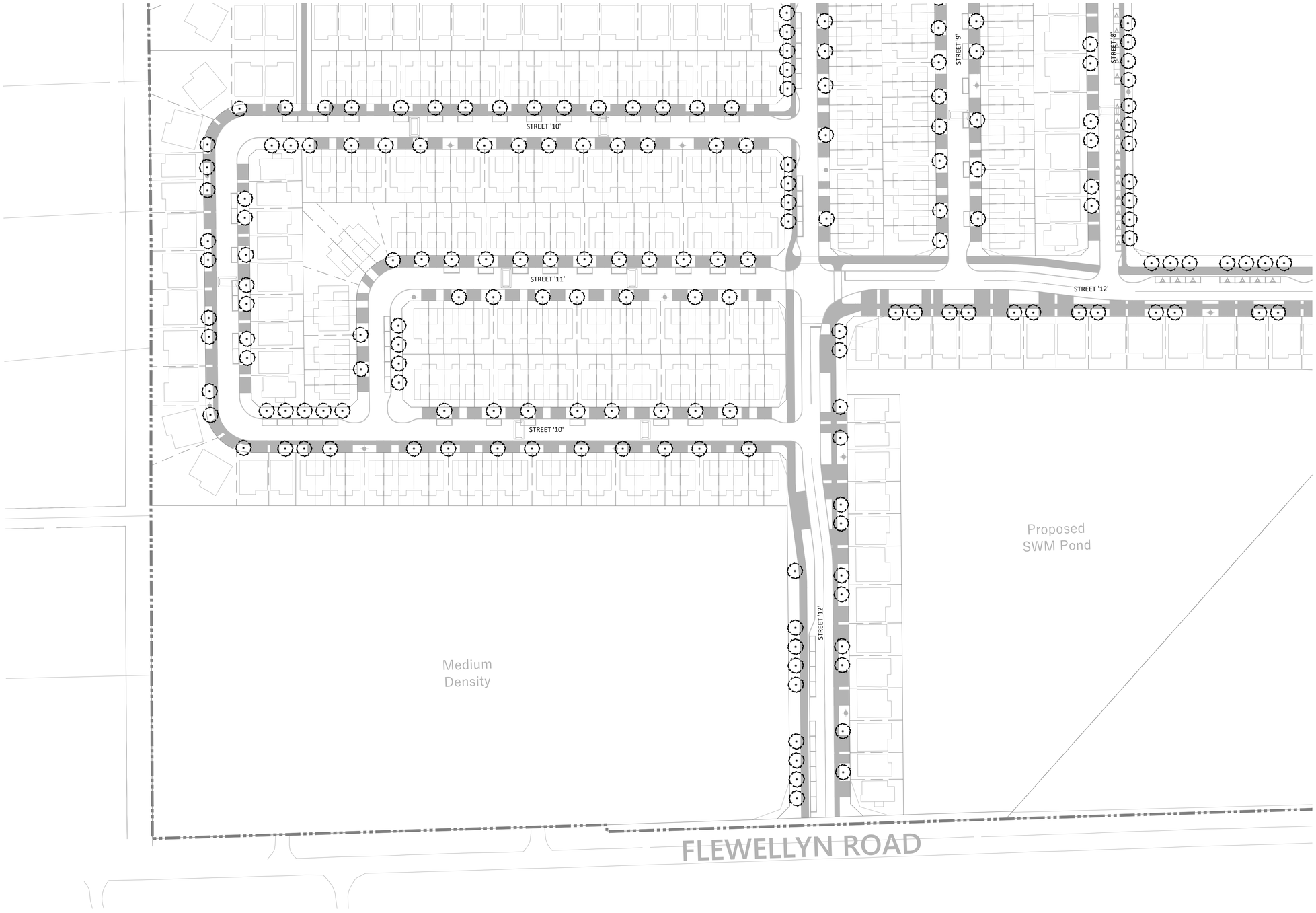
Title

PRELIMINARY STREETSCAPE PLAN

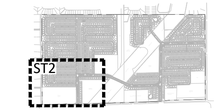
Date	2024-06-20
Scale	1:750
Drawn	NM
Checked	SE
Job No.	21-273

Sheet

ST1



Key Plan



LEGEND

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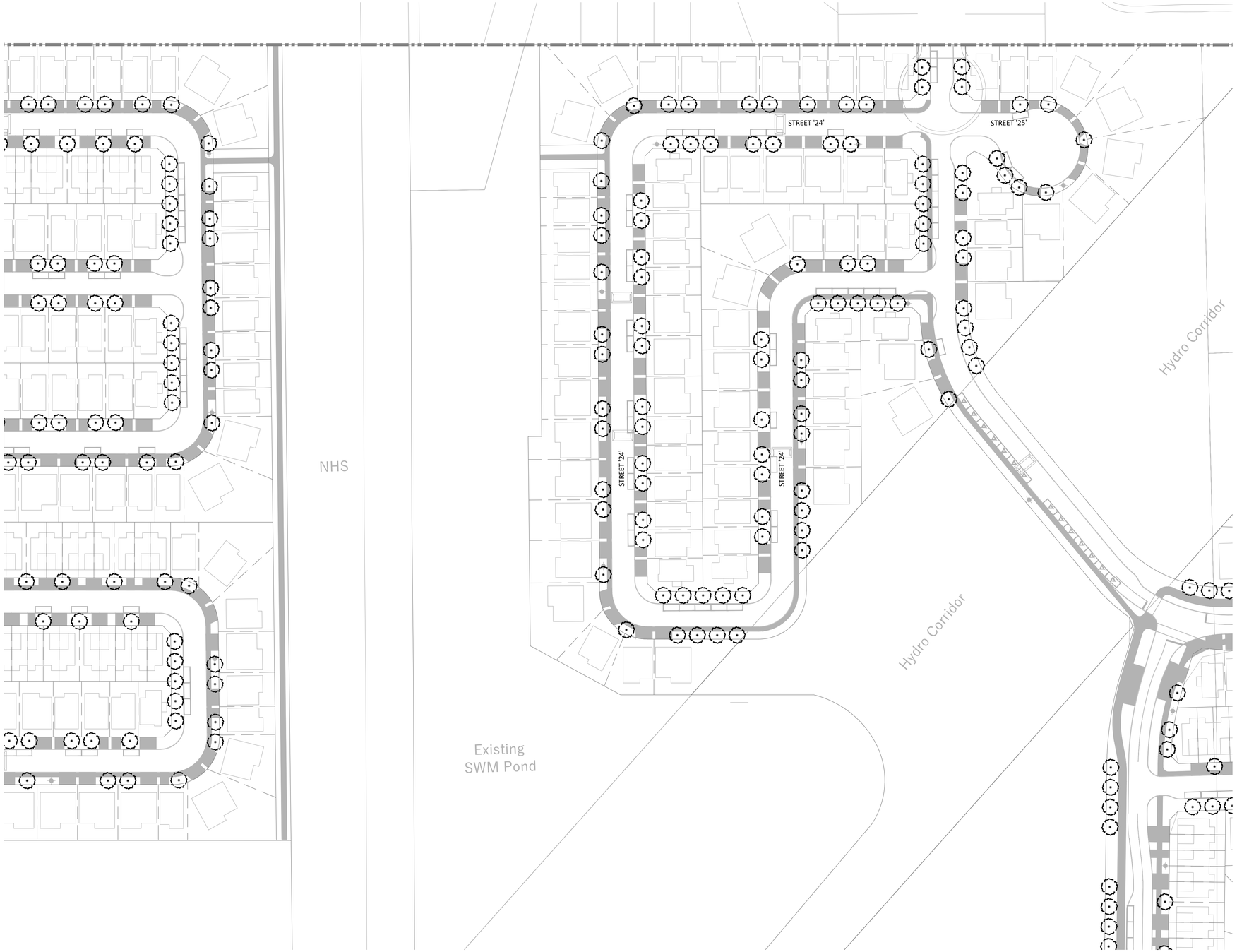
Date 2024-06-20
Scale 1:750
Drawn NM
Checked SE
Job No. 21-273

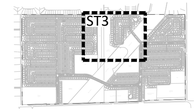
Sheet

ST2



Contractor shall check all dimensions on the work and report any discrepancy to the Landscape Architect before proceeding. All drawings and specifications are the property of the Landscape Architect and must be returned at the completion of the work. This drawing is not to be used for construction until signed by the Landscape Architect.

Key Plan



LEGEND

PROPERTY LINE

PLANTING

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Date	2024-06-20
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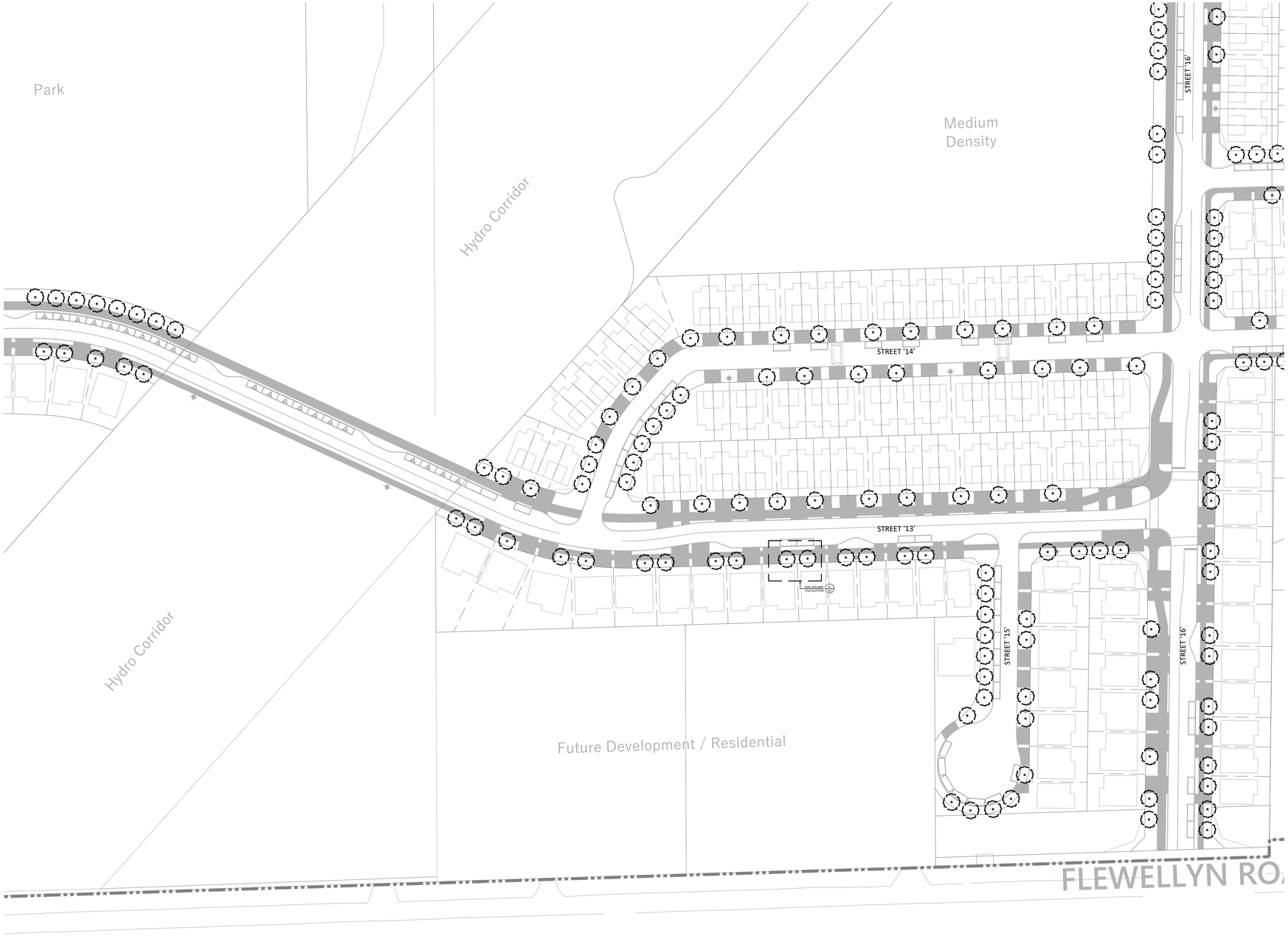
Drawn	NM
Checked	SE
Job No.	21-273

Sheet

ST3



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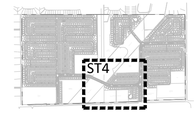

LEGEND

PROPERTY LINE

PLANTING

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1	Issued for Preliminary Streetscape Submission	July.18/24

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PRELIMINARY STREETSCAPE PLAN

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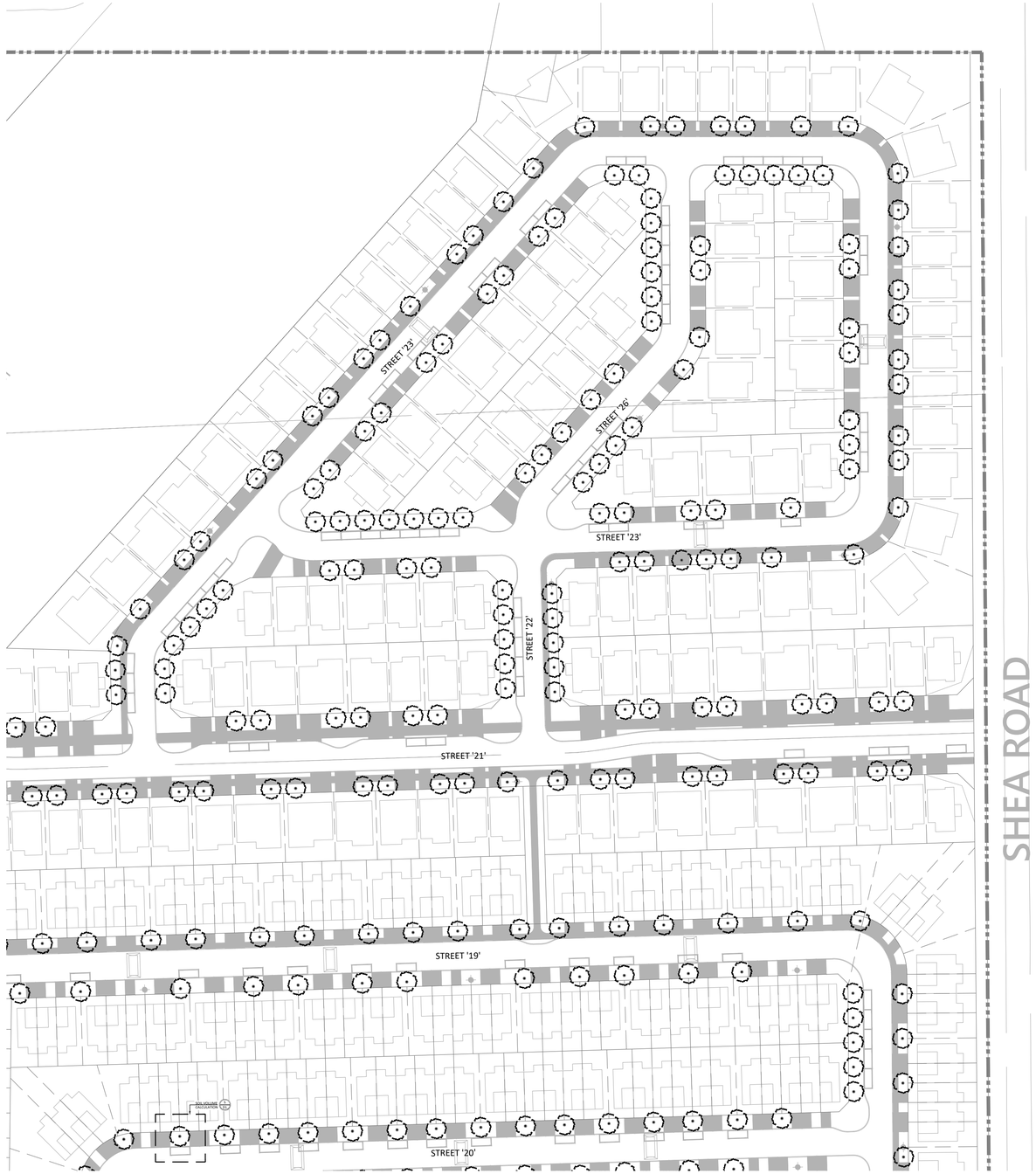
Job No. 21-273

Sheet

ST4



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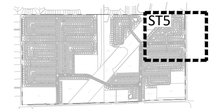

LEGEND

PROPERTY LINE

PLANTING

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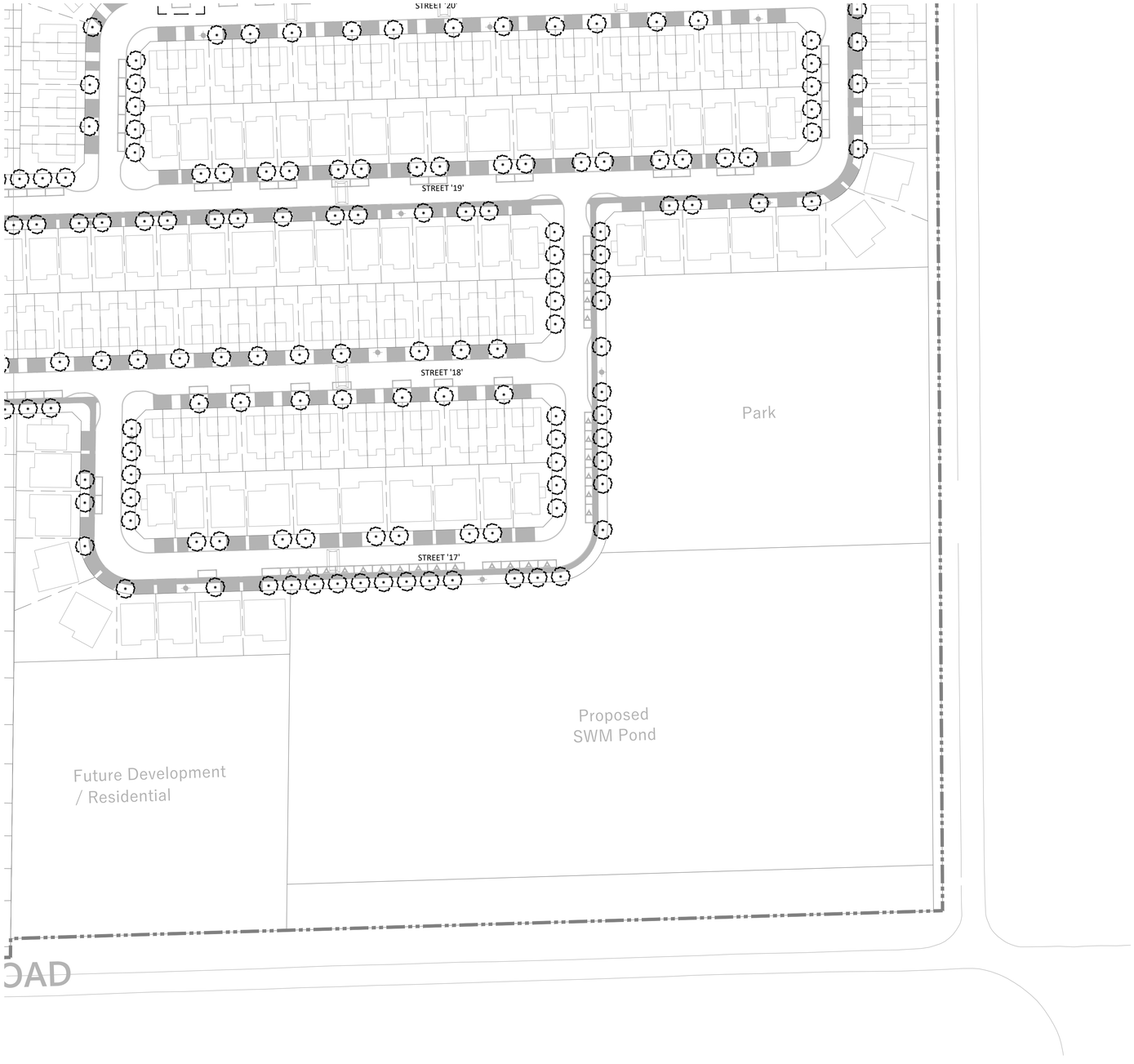
Date	2024-06-20
Scale	1:750
Drawn	NM
Checked	SE
Job No.	21-273

Sheet

ST5



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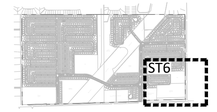

LEGEND

PROPERTY LINE

PLANTING

AR

DECIDUOUS STREET TREE

No.	Description	Date
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-		
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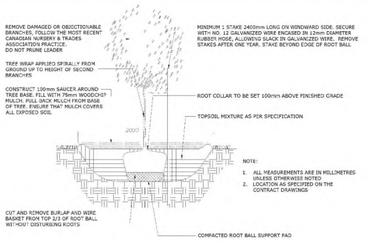
Title

PRELIMINARY STREETSCAPE PLAN

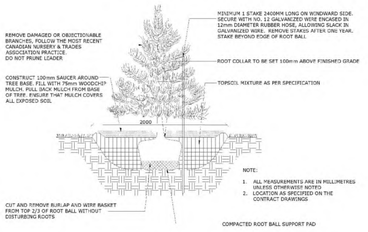
Date	2024-06-20
Scale	1:750
Drawn	NM
Checked	SE
Job No.	21-273

Sheet

ST6



DECIDUOUS TREE PLANTING

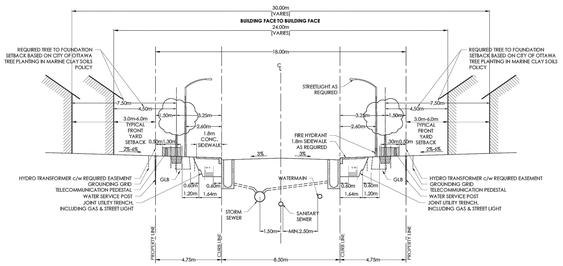


CONIFEROUS TREE PLANTING

Ottawa	TITLE: PLANTING PIT, WELL DRAINED SOILS (ROAD ALLOWANCE)	DATE: MAY 2001 REV: JAN 2017 DWG No: L3

1 DECIDUOUS TREE PLANTING
N.T.S.

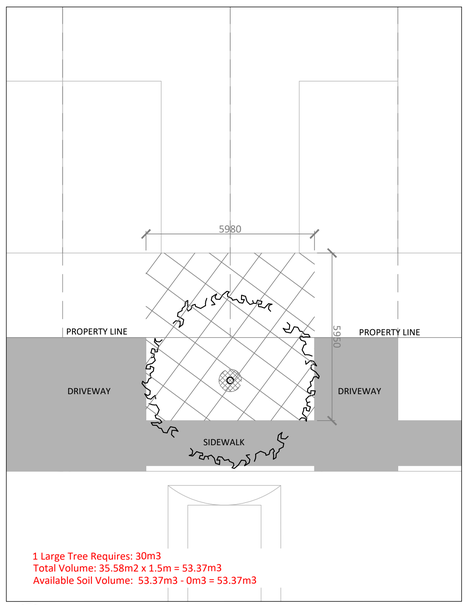
1. STANDARD CROSS-SECTIONS TO BE READ IN CONJUNCTION WITH THE GENERAL STANDARD CROSS-SECTION NOTES AND OTHER APPLICABLE CITY AND UTILITY PLANS AND DETAILS.
2. 18M RIGHT-OF-WAY NOT TO BE USED ON STREETS WITH BUS SERVICE.
3. CONCRETE CURBS TO BE CONSTRUCTED AS PER CITY OF OTTAWA STANDARD DETAILS.
4. TYPICAL FRONT YARD SETBACK IS TO BE CLEAR AND UNENCUMBERED OF ANY SUBSURFACE BUILDING ENCROACHMENTS.
5. FIRE HYDRANTS TO BE LOCATED ON THE WATERMAIN SIDE OF THE STREET.
6. CATCH BASINS TO BE PER CITY OF OTTAWA DETAIL S2.
7. CATCH BASINS TO BE LOCATED A MINIMUM 5.0m DISTANCE FROM STRUCTURES E.G. CATCH BASINS AND HYDRANTS) AND 1.2 M FROM TREE ROOT BALL.
8. STREETLIGHTS CAN BE LOCATED ON EITHER SIDE OF THE RIGHT-OF-WAY.
9. JOINT-USE UTILITY TRENCH (JUT) UNDER SIDEWALK AS PER DETAIL UE0004R - HELD BY HYDRO OTTAWA.
10. GRADE LEVEL BOX (GLB) AS DRAWN SHOWS GLB36AD, EXACT LOCATION TO BE CONFIRMED.
11. THIS CROSS-SECTION CANNOT BE USED WHERE A CONCRETE ENCASED HYDROELECTRIC DUCT OR ANOTHER SEPARATE UTILITY DUCT IS REQUIRED.
12. TREE CLEARANCES TO HYDRO OTTAWA PLANT SHALL FOLLOW GC0020B.
13. CLEARANCES SHOWN ARE MINIMUMS.



Ottawa	18.0m ROW CROSS SECTION	REV.DATE: AUG. 2022 DWG. No. ROW-18.0

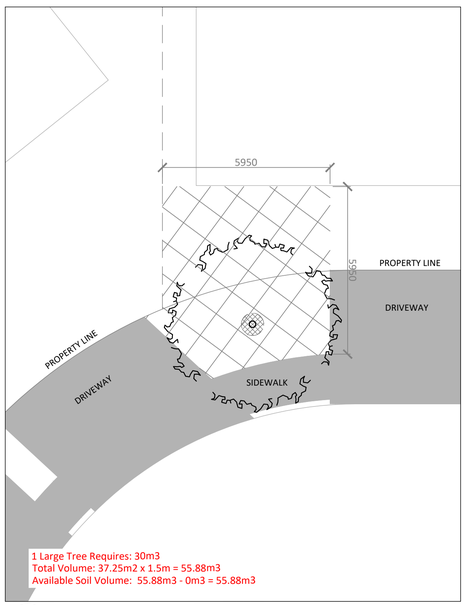
2 STANDARD ROW CROSS SECTIONS
N.T.S.

TREE SOIL VOLUMES		
TREE TYPE/SIZE	SINGLE TREE SOIL VOLUME	MULTIPLE TREE SOIL VOLUME (m3/TREE)
ORNAMENTAL	15	9
COLUMNAR	15	9
SMALL	20	12
MEDIUM	25	15
LARGE	30	18
CONIFER	25	15



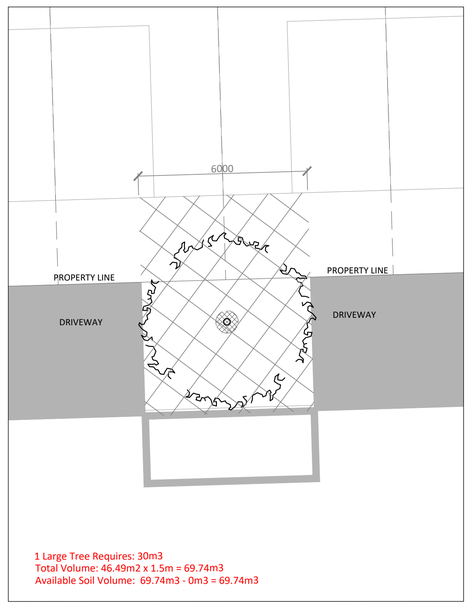
1 Large Tree Requires: 30m3
Total Volume: 35.58m2 x 1.5m = 53.37m3
Available Soil Volume: 53.37m3 - 0m3 = 53.37m3

3 SOIL VOLUME CALCULATION (SCALE 1:100)
18M ROW - STREET 1



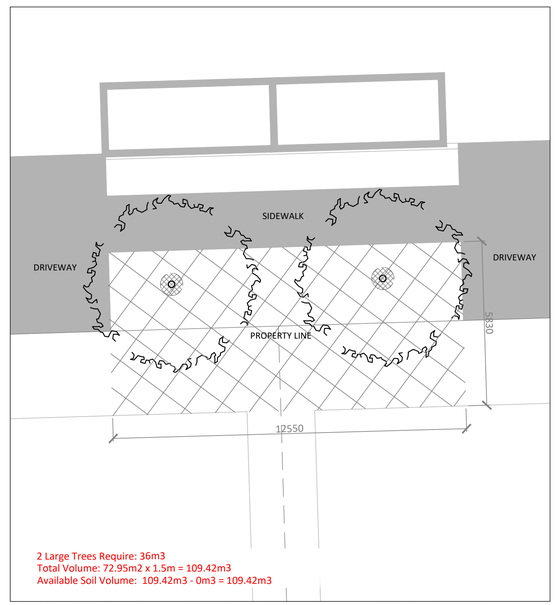
1 Large Tree Requires: 30m3
Total Volume: 37.25m2 x 1.5m = 55.88m3
Available Soil Volume: 55.88m3 - 0m3 = 55.88m3

4 SOIL VOLUME CALCULATION (SCALE 1:100)
18M ROW - STREET 1



1 Large Tree Requires: 30m3
Total Volume: 46.49m2 x 1.5m = 69.74m3
Available Soil Volume: 69.74m3 - 0m3 = 69.74m3

5 SOIL VOLUME CALCULATION (SCALE 1:100)
18M ROW - STREET 20

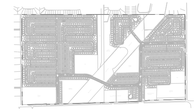


2 Large Trees Require: 36m3
Total Volume: 72.95m2 x 1.5m = 109.42m3
Available Soil Volume: 109.42m3 - 0m3 = 109.42m3

6 SOIL VOLUME CALCULATION (SCALE 1:100)
24M ROW - STREET 13

Contractor shall check all dimensions on the work and report any discrepancy to the Landscape Architect before proceeding. All drawings and specifications are the property of the Landscape Architect and must be returned at the completion of the work. This drawing is not to be used for construction until signed by the Landscape Architect.

Key Plan



No.	Description	Date
-		
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5	Issued for Preliminary Streetscape Resubmission	Apr.14/25
4	Issued for Preliminary Streetscape Resubmission	Mar.24/25
3	Issued for Preliminary Streetscape Resubmission	Aug.9/24
2	Issued for Preliminary Streetscape Resubmission	Aug.2/24
1	Issued for Preliminary Streetscape Submission	July.18/24

Revision

City Approval Stamp

ASSOCIATION OF LANDSCAPE ARCHITECTS ONTARIO — SILVANO TARGETA — OALA — MEMBER

NAK design strategies
1285 WELLINGTON STREET, OTTAWA, ON K1Y 3A8 CANADA
T 613.237.2345 NAKDESIGNSTRATEGIES.COM

Project

STITTSVILLE WEST

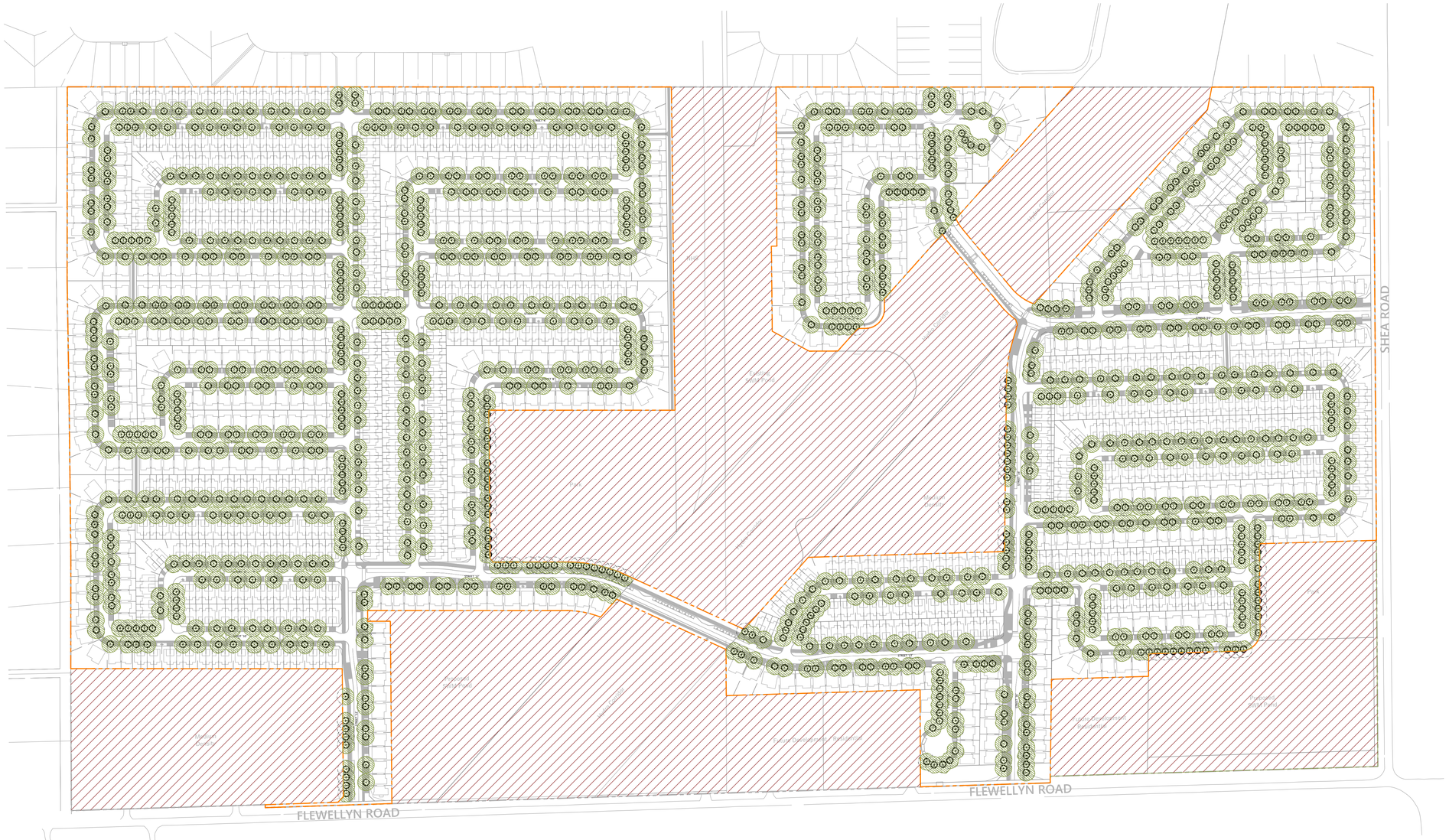
Title

DETAILS

Date	2024-06-20
Scale	1:750
Drawn	NM
Checked	SE
Job No.	21-273

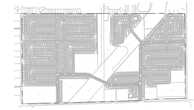
Sheet

D1



Contractor shall check all dimensions on the work and report any discrepancy to the Landscape Architect before proceeding. All drawings and specifications are the property of the Landscape Architect and must be returned at the completion of the work. This drawing is not to be used for construction until signed by the Landscape Architect.

Key Plan



LEGEND

- PROPERTY LINE
- RESIDENTIAL LANDS BOUNDARY
- AR — STREET TREE CANOPY PROJECTION
- MATURE CANOPY COVERAGE (INCLUDES OVERLAP)
- NON-RESIDENTIAL LANDS

PROPOSED TREE CANOPY PROJECTIONS

TREE TYPE/SIZE	CROWN AREA PER TREE STANDARD RANGE (m^2)	CROWN AREA PER TREE USED FOR CALC. (m^2)	SITE CANOPY COVER
MEDIUM/ LARGE (1229)	35-250*	±138	***CANOPY (W. OVERLAP): 162,886m^2
*RANGE OF CROWN AREAS IS IN ACCORDANCE WITH PROPOSED TREES SPECIES			SITE: 502,665m^2
**CROWN AREAS ARE ACCORDING TO THE AVERAGE MATURE CANOPY SIZE OF THE RESPECTIVE SPECIES. CANOPY SIZING HAS BEEN DETERMINED IN REFERENCE TO VARIOUS ARBORICULTURAL AND BOTANICAL SOURCES, SUCH AS: ONTARIO MINISTRY OF NATURAL RESOURCES & FORESTRY (OMNRF), US FOREST SERVICE; FARRAR, J.L. *TREES IN CANADA*, UNIVERSITY OF GUELPH ABORETUM, *VARIOUS PUBLICATIONS*			TOTAL PERCENT COVER: 32%

***NOTES:

- CANOPY COVERAGE BASED ON AVERAGE EXPECTED MATURE DIAMETER OF ~12.5m, AREA OF ~138m^2 (COMBINATION OF MEDIUM AND LARGE SIZE TREES).
- CALCULATION ACCOUNTS FOR CANOPY OVERLAP BETWEEN TREES AND EXCLUDES CANOPY OVERLAP TO NON-RESIDENTIAL LANDS.
- GRAPHICS ARE NOT TO SCALE.

TREE SOIL VOLUMES

TREE TYPE/SIZE	SINGLE TREE SOIL VOLUME	MULTIPLE TREE SOIL VOLUME (m3/TREE)
ORNAMENTAL	15	9
COLUMNAR	15	9
SMALL	20	12
MEDIUM	25	15
LARGE	30	18
CONIFER	25	15

TYPICAL STREET TREE PLANTING REQUIREMENTS
1 TREE PER INTERIOR SINGLE (NON-CORNER) LOTS
2 TREES PER EXTERIOR SINGLE (CORNER) LOTS
1 TREE PER EXTERIOR TOWNHOUSE (CORNER) LOT
2 TREES PER 3 MULTIPLE-UNITS TOWNHOUSE
2 TREES PER 4 MULTIPLE-UNITS TOWNHOUSE
3 TREES PER 5 MULTIPLE-UNITS TOWNHOUSE
3 TREES PER 6 MULTIPLE-UNITS TOWNHOUSE

INTERIOR SINGLE (NON-CORNER) LOTS (597): 597 TREES
EXTERIOR SINGLE (CORNER) LOTS (65): 130 TREES
EXTERIOR TOWNHOUSE (CORNER) LOT (40): 40 TREES
3 MULTIPLE-UNITS TOWNHOUSE (18): 36 TREES
4 MULTIPLE-UNITS TOWNHOUSE (18): 36 TREES
5 MULTIPLE-UNITS TOWNHOUSE (87): 261 TREES
6 MULTIPLE-UNITS TOWNHOUSE (46): 138 TREES

TOTAL NUMBER OF TREES REQUIRED:	1,238
NUMBER OF STREET TREES SHOWN ON PLAN:	1,229
NUMBER OF WALKWAY BLOCK TREES:	00
TOTAL NUMBER OF TREES ON PLAN:	1,229
DIFFERENCE:	-9

*PRELIMINARY - STREET LOCATIONS ARE SUBJECT TO CHANGE DURING DETAILED DESIGN AND SITE PLAN CONTROL APPLICATIONS.

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PRELIMINARY STREETSCAPE PLAN

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ST10