

Appendix C

Natural Heritage Investigation

Natural Heritage Report

MAIN AND WHITNEY (HD17A) WATER PUMPING STATION

for:

ARCADIS PROFESSIONAL SERVICE
(CANADA) INC.

ON BEHALF OF:

THE CITY OF HAMILTON

by:

LGL Limited
environmental research associates

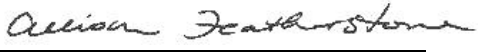
OCTOBER 2023

LGL FILE NO. TA9185



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Version: 1-Draft background report
2-updated expanded study area, and with list of alternative sites
3- short-listed alternative sites, revised figures and text.
4-Final report, updated with preferred alternative site.

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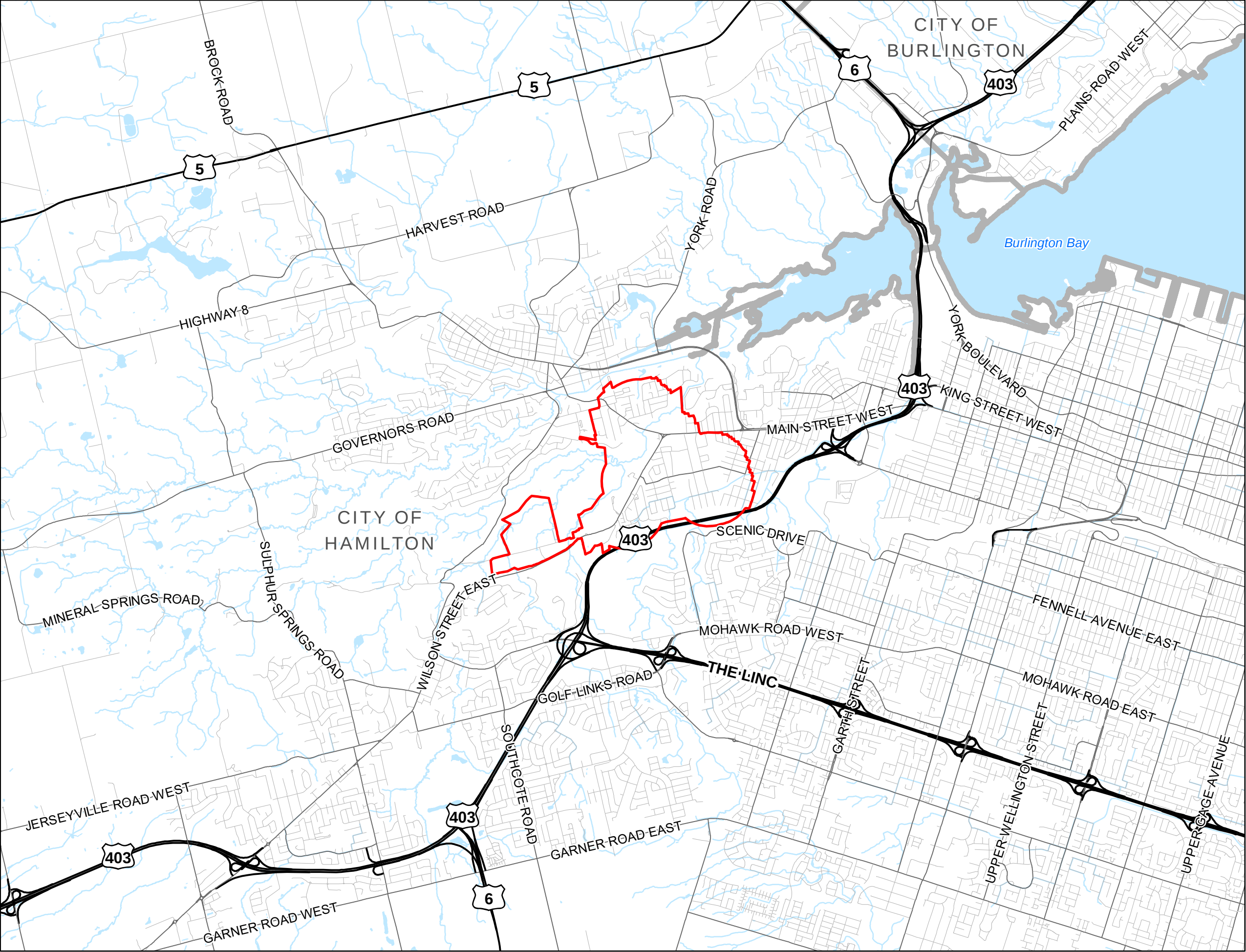
APPENDIX B PHOTOS

1.0 INTRODUCTION

LGL Limited (LGL) has been retained by Arcadis Professional Services (Canada (Inc) on behalf of the City of Hamilton (City) to provide natural heritage consultation to support the Main and Whitney Water Pumping Station (WPS) project. The project is a Schedule B Municipal Class Environmental Assessment (EA) and Conceptual Design to replace Main and Whitney subsurface WPS (HD17A) with a new WPS that is above-ground and meets the City's design standards.

The existing WPS, HD17A is on Main Street (See Figure 1) and services Pressure District 17. The preliminary proposed location for the new WPS is along Main Street between the White Chapel Memorial Gardens to the Rail Trail in Ainslie Woods neighbourhood of the City (see Figure 1). The study area includes or is adjacent to various natural habitats and encompasses several overlapping natural heritage designations, including the Niagara Escarpment Natural Area, Greenbelt Plan Protected Countryside, the Dundas Valley Environmentally Significant Area (ESA) and Conservation Area (CA), Tiffany Falls ESA and CA, Iroquois Heights ESA and CA and City of Hamilton Significant Woodlands (see Figure 2). Figure 2 also indicates the locations of the long and short list of alternative sites. In addition, the area is within the jurisdiction of Hamilton Conservation Authority (HCA), and much of the area is regulated under Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses (Ontario Regulation 161/06) (see Figure 3).

LGL's Baseline Natural Features Assessment Report provided a summary of the environmental sensitivities present within the study area as determined through a records review for Technical Memorandum #1. The report was then revised to provide an update on the long-listed alternative sites, the short-listed alternative sites, and an assessment of the short-listed sites. This final report identifies the preferred alternative site chosen through the EA process after PIC 2 and provides mitigation recommendations and proposed further studies to be completed at detailed design.



LEGEND

- Study Area
- Local Road
- Major Road
- Highway
- Watercourse
- Municipal Boundary
- Waterbody

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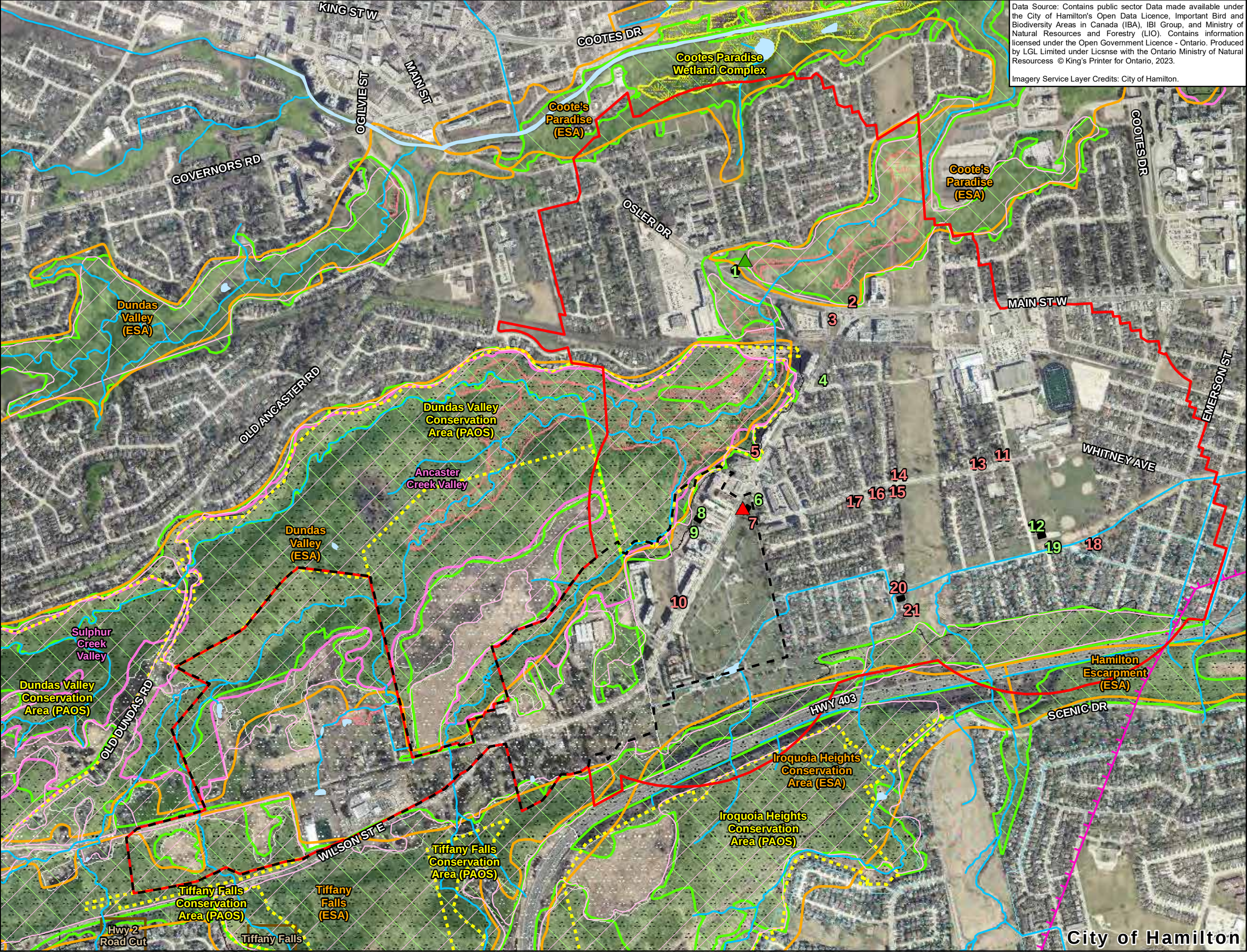
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Main and Whitney Pumping Station

Key Map

Project: TA9185	Figure: 1
Date: January, 2023	Prepared By: AM
Scale: 1:50,000	Verified By: DC



Data Source: Contains public sector Data made available under the City of Hamilton's Open Data Licence, Important Bird and Biodiversity Areas in Canada (IBA), IBI Group, and Ministry of Natural Resources and Forestry (LIO). Contains information licensed under the Open Government Licence - Ontario. Produced by LGL Limited under License with the Ontario Ministry of Natural Resources © King's Printer for Ontario, 2023.

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LEGEND

Main and Whitney WPS (HD17A)

Osler WPS (HD011)

Study Area

Pressure District 17

Watercourse

ANSI - Earth Science

ANSI - Life Science

Environmentally Sensitive Area (City of Hamilton)

Important Bird and Biodiversity Area (IBA)

Significant Woodlands (City of Hamilton)

Waterbody

Wetland - Provincially Significant

Wetland - Unevaluated as per OWES

White-tailed Deer Wintering Area (Stratum 2)

Wooded Area

Niagara Escarpment Parks and Open Space

Niagara Escarpment Plan Designation

Escarpment Protection Area (NHS Area)

Escarpment Natural Area (NHS Area)

Urban Area

Alternative Site Screening

Short Listed Alternative Site

Long Listed Alternative Site



Main and Whitney Pumping Station
Natural Heritage
Alternative Site Screening



Project: TA9185	Figure: 2
Date: January, 2023	Prepared By: AM
Scale: 1:12,000	Verified By: DC

2.0 POLICY CONTEXT

Relevant legislation, planning studies and Natural Heritage policies to this assessment are provided for reference below, as they inform how the proposed pumping station can be appropriately designed.

2.1 PROVINCIAL POLICY STATEMENT (2020)

The Provincial Policy Statement (PPS) describes the government's policies on land use planning. The PPS is applicable to a number of the natural heritage features within the study area, as discussed further in this report. This includes the presence of Dundas Valley ESA, fish habitat, and the potential presence of Significant Habitat of Endangered and Threatened Species, Significant Wildlife Habitat and provincially Significant Woodlands. Specific policies relevant to the proposed works and natural heritage are listed below.

2.1.1 Provincial Policy Statement 2.1 – Natural Heritage

- Policy 2.1.1 Natural features and areas shall be protected for the long term.
- Policy 2.1.2 The diversity and connectivity of natural features in an area and the long-term ecological function and biodiversity of natural heritage systems, should be maintained, restored or, where possible, improved, recognizing linkages between and among natural heritage features and areas; surface water features and ground water features;
- Policy 2.1.3 Natural heritage systems shall be identified in Ecoregions 6E and 7E recognizing that natural heritage systems will vary in size and form in settlement areas, rural areas, and prime agricultural areas;
- Policy 2.1.4 Development and site alteration shall not be permitted in: a) significant wetlands in Ecoregions 5E, 6E and 7E1; and b) significant coastal wetlands;
- Policy 2.1.5 Unless it has been demonstrated that there will be no negative impacts on natural features or their ecological functions, development and site alteration shall not be permitted in:
- b) Significant woodlands in Ecoregions 6E and 7E
 - c) Significant valleylands in Ecoregions 6E and 7E
 - d) Significant wildlife habitat;
 - e) Significant areas of natural and scientific interest;
- Policy 2.1.6 Development and site alteration shall not be permitted in fish habitat except in accordance with provincial and federal requirements;
- Policy 2.1.7 Development and site alteration shall not be permitted in habitat of endangered species and threatened species except in accordance with provincial and federal requirements;
- Policy 2.1.8 Development and site alteration shall not be permitted on adjacent lands to the natural heritage features and areas identified in policies 2.1.4, 2.1.5, and 2.1.6 unless the ecological function of the adjacent lands has been evaluated and it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions.

2.2 URBAN HAMILTON OFFICIAL PLAN (2013) AND THE RURAL HAMILTON OFFICIAL PLAN (2012)

This project is subject to policies of the City of Hamilton Urban Hamilton Official Plan (UHOP; 2013) as well as the Rural Hamilton Official Plan (RHUP; 2012). Natural Heritage policies of the UHOP and RHOP that are relevant to this application, are provided for reference below. Note the policy numbers listed below are from the UHOP document.

2.2.1 Niagara Escarpment Plan

The study area lies partially within Escarpment Natural Area (NHS Area).

Policy C.1.1.1 Any development within the Niagara Escarpment Plan area, as shown on Schedule A – Provincial Plans, shall meet the requirements of this Plan and the Niagara Escarpment Plan and Section 3.3 of the Greenbelt Plan.

Policy C.1.1.6 To minimize the impact and further encroachments in the Escarpment environment, for those lands located within the Niagara Escarpment Plan area identified on Schedule A - Provincial Plans, the following policies shall apply:

- a) The design of the development shall be compatible with the visual and natural environment;
- b) Setbacks and screening adequate to minimize the visual impact of development on the Escarpment landscape shall be required; and
- c) No new lots shall be created in Escarpment Natural or Protection Areas unless such lot creation is for the purposes of correcting conveyances, enlarging existing lots or acquisition by a public body or authority.

2.2.2 General Policies

Policy C.2.2.2 The boundaries of Core Areas and Linkages, shown on Schedule B – Natural Heritage System, are general in nature. Minor refinements to such boundaries may occur through Environmental Impact Statements, *watershed* studies or other appropriate studies accepted by the City without an amendment to this Plan. Major changes to boundaries, the removal or addition of *Core Areas* and Linkages identified on Schedule B - Natural Heritage System and Schedules B-1-8 – Detailed Natural Heritage Features require an amendment to this Plan.

2.2.3 Core Area

Policy C.2.3 It is the intent of this policy to preserve and enhance Core Areas and to ensure that any development or site alteration within or adjacent to them shall not negatively impact their natural features or their ecological functions.

Policy C.2.3.3 The natural features and ecological functions of *Core Areas* shall be protected and where possible and deemed feasible to the satisfaction of the City enhanced. To accomplish this protection and enhancement, vegetation removal and encroachment into *Core Areas* shall generally not be permitted, and appropriate *vegetation protection zones* shall be applied to all *Core Areas*.

- Policy C.2.5.3 New *development* and *site alteration* shall not be permitted within *fish habitat*, except in accordance with provincial and federal requirements.
- Policy 2.5.4 New development and site alteration shall not be permitted within significant woodlands, significant valleylands, significant wildlife habitat and significant areas of natural and scientific interest unless it has been demonstrated that there shall be no negative impacts on the natural features or on their ecological functions.
- Policy C.2.5.5 New *development* and *site alteration* shall not be permitted on *adjacent lands* to the natural heritage features and areas identified in Section C.2.5.2 to C.2.5.4 unless the *ecological function* of the *adjacent lands* has been evaluated and it has been demonstrated that there shall be no *negative impacts* on the natural features or on their *ecological functions*.
- Policy C.2.5.7 Streams are mapped in Schedule B - Natural Heritage System. Streams have been separated into two classes: Coldwater Watercourse/Critical Habitat and Warmwater Watercourse/Important/ Marginal Habitat. If the stream has not been classified as part of an EIS, subwatershed study, or other study, a scoped EIS is required to determine the classification.
- Policy C.2.5.8 New development or site alteration subject to Policies C.2.5.3 to C.2.5.7 requires, prior to approval, the submission and approval of an Environmental Impact Statement which demonstrates to the satisfaction of the City and the relevant Conservation Authority that:
- a) There shall be no negative impacts on the *Core Area*'s natural features or their ecological functions.
 - b) Connectivity between *Core Areas* shall be maintained, or where possible, enhanced for the movement of surface and ground water, plants and wildlife across the landscape.
 - c) The removal of other natural features shall be avoided or minimized by the planning and design of the proposed use or site alteration wherever possible.
- Policy C.2.5.9 An Environmental Impact Statement shall propose a vegetation protection zone which:
- a) has sufficient width to protect the *Core Area* and its *ecological functions* from impacts of the proposed land use or *site alteration* occurring during and after construction, and where possible and deemed feasible to the satisfaction of the City, restores or enhances the *Core Area* and/or its *ecological functions*; and,
 - b) is established to achieve and be maintained as *natural self-sustaining vegetation*.
- Policy C.2.5.10 Where vegetation protection zone widths have not been specified by watershed and sub-watershed plans, secondary, Environmental assessments and other studies, the following vegetation protection zone widths shall be evaluated and addressed by Environmental Impact Statements. Other agencies, such as Conservation Authorities, may have different vegetation protection zone requirements.
- a) Coldwater Watercourse and Critical Habitat – 30-metre vegetation protection zone on each side of the watercourse, measured from the bankfull channel.

- b) Warmwater Watercourse and Important and Marginal Habitat – 15 metre vegetation protection zone on each side of the watercourse, measured from the bankfull channel.
- c) Provincially Significant Wetlands – 30-metre vegetation protection zone, measured from the boundary of the wetland, as approved by the Conservation Authority or Ministry of Natural Resources.
- d) Unevaluated wetlands – Unevaluated wetlands and locally significant wetlands require a 15 metre vegetation protection zone, measured from the boundary of the wetland, as approved by the Conservation Authority or Ministry of Natural Resources, unless an Environmental Impact Statement recommends a more appropriate *vegetation protection zone*.
- e) Woodlands – 10-metre vegetation protection zone, measured from the edge (drip line) of the woodland.
- f) Significant woodlands – 15-metre vegetation protection zone, measured from the edge (drip line) of the significant woodland.
- g) Areas of Natural and Scientific Interest (ANSI) – Life and Earth Science ANSIs require a 15-metre vegetation protection zone.
- h) Significant Valleylands – As required by the relevant Conservation Authority.
- i) Significant Habitat of Threatened or Endangered Species and Significant Wildlife Habitat: the minimum vegetation protection zone shall be determined through Environmental Impact Statements, dependent on the sensitivity of the feature.

Policy C.2.5.11 *Vegetation protection zone* widths greater or less than those specified in a) to i) above may be required if ecological features and functions warrant it, as determined through an approved Environmental Impact Statement. Widths shall be determined on a site-specific basis, by considering factors such as the sensitivity of the habitat, the potential impacts of the proposed land use, the intended function of the *vegetation protection zone*, and the physiography of the Subject Lands.

Policy C.2.5.12 Permitted uses within a *vegetation protection zone* shall be dependent on the sensitivity of the feature and determined through approved studies. Generally, permitted uses within a *vegetation protection zone* shall be limited to low impact uses, such as vegetation restoration, resource management, and open space. Permitted uses within the *vegetation protection zone* shall be the same uses as those within the Core Area in Policy C.2.5.1 and the *vegetation protection zone* should remain in or be returned to a natural state.

Policy C.2.5.13 All plantings within *vegetation protection zones* shall use only **non-invasive plant species** native to Hamilton. The City may require that applicants for *development or Site alteration* develop a restoration or management plan for the *vegetation protection zone* as a condition of approval.

2.2.4 Linkages

Policy C.2.7 It is the intent of this policy that Linkages (natural areas within the landscape that ecologically connect Core Areas) be protected, restored, and enhanced to sustain the Natural Heritage System wherever possible.

- Policy C.2.7.1 The City shall encourage the connection of Core Areas within the municipality and adjacent to its municipal boundaries through the identification of Linkages in Environmental Impact Statements, Secondary Plans, watershed plans, and other studies.
- Policy C.2.7.2 On its own properties, including road rights-of-way, utilities, major infrastructure facilities, and storm water management ponds the City shall enhance Linkages by restoring natural habitat, where appropriate. The City shall support the naturalization of vegetation in inactive sections of parks and open space areas, where appropriate.
- Policy C.2.7.3 The City shall require the incorporation of Linkages into a design of new development requiring approval by this Plan to retain and enhance the cultural, aesthetic, and environmental qualities of the landscape, wherever possible and deemed feasible to the satisfaction of the City.
- Policy C.2.7.7 In addition to the Linkages identified on Schedule B – Natural Heritage System, there may be Hedgerows that are worthy of protection, especially where:
- a) they are composed of mature, healthy trees and generally provide a wide, unbroken linkage between Core Areas;
 - b) there is evidence that wildlife regularly use them as movement corridors or habitat;
 - c) they contain tree species which are threatened, endangered, special concern, provincially or locally rare; or,
 - d) groupings of trees which are greater than 100 years old.

2.2.5 Tree and Woodland Protection

- Policy C.2.11.3 Where the City is undertaking **infrastructure work**, existing woodland resources shall be protected and preserved, where feasible. If it is necessary for infrastructure works to destroy any trees, excluding trees that are listed as threatened or endangered species, the **City shall endeavour to compensate by re-planting on site and/or planting trees elsewhere.**
- Policy C.2.11.4 The City shall maintain and update as necessary a Woodland Conservation By-law and Tree Protection Policy. A Woodland Protection Strategy to protect tree cover on new development sites within urban and rural settlement areas and provides technical direction and practices to protect trees and other vegetation during construction shall be prepared to minimize the impacts on trees and woodlands to be retained.

The study area partially falls within the Greenbelt Plan Natural Heritage System, specifically Protected Countryside, and is subject to the Greenbelt Plan. The Greenbelt is a broad band of protected land which:

- Protects against the loss and fragmentation of the agricultural land base and supports agriculture as the predominant land use;
- Gives protection to the natural heritage and water resource systems that sustain ecological and human health and that form the environmental framework around which major urbanization in south-central Ontario will be organized;

- Provides for a diverse range of economic and social activities associated with rural communities, agriculture, tourism, recreation and resource uses; and,
- Builds resilience to and mitigates climate change.

Areas of Ontario have been designated Protected Countryside as part of the Plan with the following goals:

- Protection, maintenance and enhancement of natural heritage, hydrologic and landform features, areas and functions, including protection of habitat for flora and fauna and particularly species at risk;
- Protection and restoration of natural and open space connections between the Oak Ridges Moraine, the Niagara Escarpment, Lake Ontario, Lake Simcoe and the major river valley lands while also maintaining connections to the broader natural systems of southern Ontario beyond the Greater Golden Horseshoe, such as the Great Lakes Coast, the Carolinian Zone, the Lake Erie Basin, the Kawartha Highlands and the Algonquin to Adirondacks Corridor;
- Protection, improvement or restoration of the quality and quantity of ground and surface water and the hydrological integrity of watersheds; and
- Provision of long-term guidance for the management of natural heritage and water resources when contemplating such matters as watershed/subwatershed and stormwater management planning, water and wastewater servicing, development, infrastructure, open space planning and management, aggregate rehabilitation and private or public stewardship programs.

The requirements of the NEP, established under the Niagara Escarpment Planning and Development Act, continue to apply and the Protected Countryside policies do not apply, with the exception of Parkland, Open Space and Trails.

2.3 NIAGARA ESCARPMENT PLAN (2017)

This project is located within the Niagara Escarpment Plan Area (NEP) and falls under the plan designations for Escarpment Natural Area, Urban Area and Niagara Escarpment Parks and Open Space System (see Figure 2). The NEP seeks to protect the geologic feature of the Niagara Escarpment and lands within its vicinity substantially as a continuous natural environment, while only allowing for compatible development. The land use designations of this Plan focus on the continuous landform of the Escarpment and provide a series of connected and protected areas. These land use designations ensure a broader landscape approach to protecting the natural environment and should be implemented in a way that recognizes the natural heritage system of the Niagara Escarpment and associated natural heritage features.

2.3.1 Escarpment Natural Area

This designation includes Escarpment features that are in a relatively natural state and associated valleylands, wetlands and woodlands that are relatively undisturbed. Within the project limits, this designation covers the majority of the natural areas present (escarpment valley, brow and tableland) as outlined on Figure 2. These are the most sensitive natural and scenic resources of the Escarpment.

2.3.2 Niagara Escarpment Parks and Open Space System

The Niagara Escarpment Plan has a system of parks and open spaces which are connected by the Bruce Trail. The system is identified as the Niagara Escarpment Parks and Open Space System (the NEPOSS). The NEPOSS provides opportunities for recreation, tourism, and play a fundamental role in the protection of cultural heritage resources and the Escarpment's natural heritage.

The development of zone mapping and zone policies is required for orderly planning, compatible development and effective management of a park or open space. The project limits fall under the Natural Environment Zones, which include scenic landscapes in which minimum development is permitted to support recreational activities that have minimal impacts on the Escarpment environment.

2.3.3 Urban Area

This designation identifies Urban Areas in which the Escarpment and closely related lands are located. This includes areas which remain largely undeveloped but surrounded by existing development, or areas within tremendous urban growth. The objective of this designation is to minimize the impact and prevent further encroachment of urban growth on the Escarpment environment. Within the project limits, the Urban Area designation includes all lands around the NEPOSS and NHS designations.

The following Development Criteria of the NEP are relevant to this project, in relation to the protection of Key natural heritage features and functions. Within the NEP, key natural features are:

- Wetlands
- Habitat of endangered species and threatened species
- Fish habitat
- Life Science Areas of Natural and Scientific Interest
- Earth Science Areas of Natural and Scientific Interest
- Significant Valleylands
- Significant Woodlands
- Significant Wildlife Habitat
- Habitat of special concern species in Escarpment Natural and Escarpment Protection Areas

Excerpts of relevant Criteria are listed below.

Criteria 2.7.2 Development is not permitted in key natural heritage features with the exception of the following, which may be permitted subject to compliance with all other relevant policies of this Plan:

- a) development of a single dwelling and accessory facilities outside a wetland on an existing lot of record, provided that the disturbance is minimal and where possible temporary;
- b) forest, fisheries and wildlife management to maintain or enhance the feature;
- c) conservation and flood or erosion control projects, after all alternatives have been considered;
- d) the Bruce Trail, and other trails, boardwalks and docks on parks and open space lands that are part of the Parks and Open Space System; and

e) infrastructure, where the project has been deemed necessary to the public interest and there is no other alternative.

Criteria 2.7.3 The diversity and connectivity between key natural heritage features and key hydrologic features shall be maintained, and where possible, enhanced for the movement of native plants and animals across the landscape.

Criteria 2.7.6 If in the opinion of the implementing authority, a proposal for development within 120 metres of a key natural heritage feature has the potential to result in a negative impact on the feature and/or its functions, or on the connectivity between key natural heritage feature and key hydrologic features, a natural heritage evaluation will be required that:

- a) demonstrates that the development, including any alteration of the natural grade or drainage, will protect the key natural heritage feature or the related functions of that feature;
- b) identifies planning, design and construction practices that will minimize erosion, sedimentation and the introduction of nutrients or pollutants and protect and, where possible, enhance or restore the health, diversity and size of the key natural heritage feature;
- c) determines the minimum vegetation protection zone required to protect and where possible enhance the key natural heritage feature and its functions; and
- d) demonstrates that the connectivity between key natural heritage features and key hydrologic features located within 240 metres of each other will be maintained and where possible enhanced for the movement of native plants and animals across the landscape.

except with respect to a key natural heritage feature that is solely the habitat of endangered species or threatened species, which is subject to Part 2.7.8 below.

Criteria 2.7.8 Development within the habitat of endangered species and threatened species:

- a) located within Escarpment Natural Areas and Escarpment Protection Areas, is not permitted, except for development referred to in Parts 2.7.2 a, b, c, d or e, which may be permitted provided it is in compliance with the Endangered Species Act, 2007; and
- b) located within Escarpment Rural Areas, Mineral Resource Extraction Areas, Urban Areas, Minor Urban Centres and Escarpment Recreation Areas, is not permitted unless it is in compliance with the Endangered Species Act, 2007.

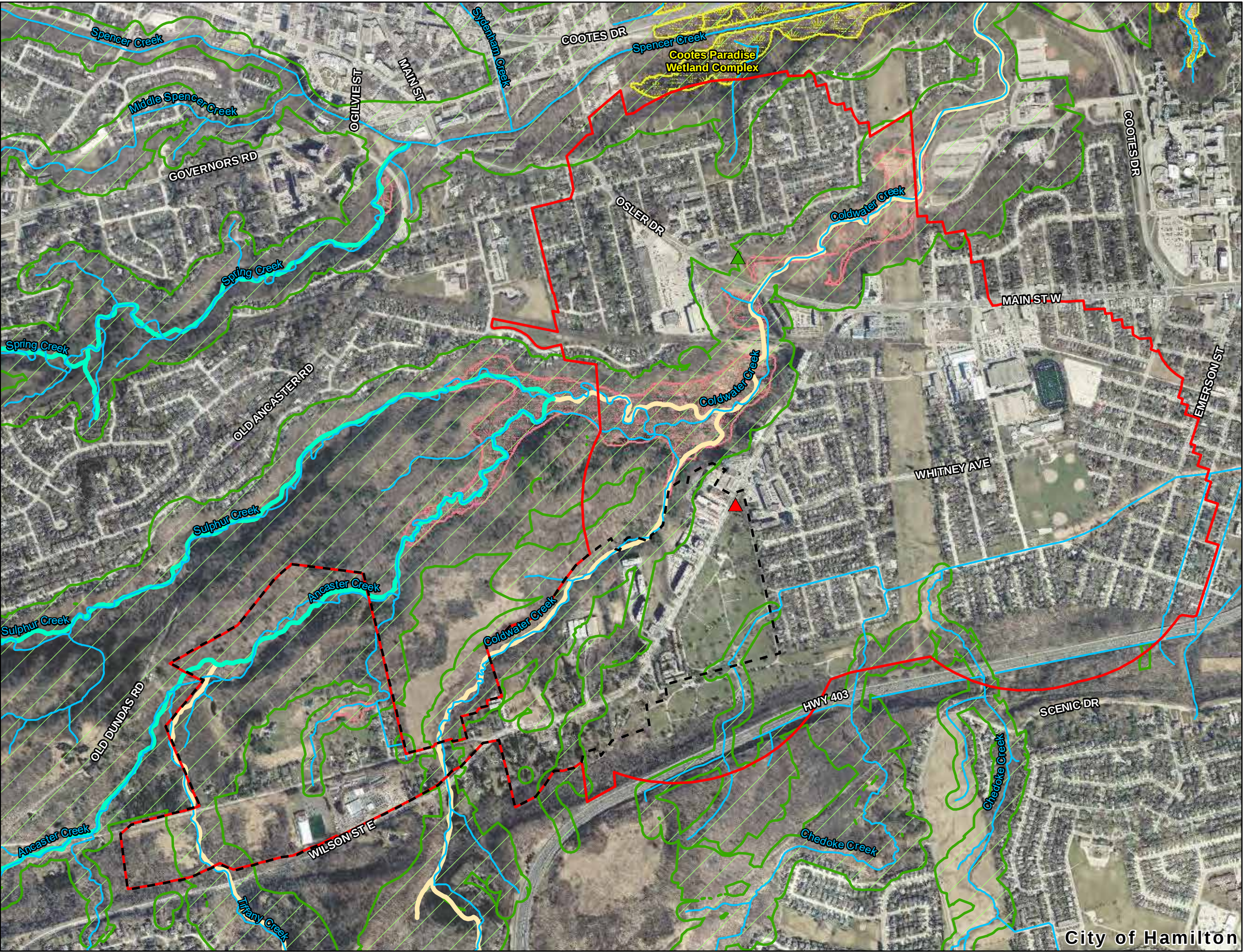
Criteria 2.7.12 Development where permitted in woodlands should protect and where possible enhance the woodland and associated wildlife habitat. All development involving the cutting of trees requires approval from the implementing authority, subject to the following criteria:

- a) **cutting of trees and removal of vegetation shall be limited to the minimum necessary to accommodate the permitted use;**
- b) **using tree-cutting methods designed to minimize negative impacts on the natural environment, including surface drainage and groundwater;**
- c) minimizing disruption to wildlife habitat in the area;
- d) retaining the diversity of native species;
- e) aiming over the long term to protect and where possible enhance the quality and biodiversity of the woodland;
- f) **protecting trees and vegetation to be retained by acceptable means during construction;** and
- g) maintaining existing tree cover or other stabilizing vegetation, on steep slopes in excess of 25 per cent (1:4 slope).

2.4 HAMILTON CONSERVATION AUTHORITY-REGULATIONS AND POLICIES

The Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses (Ontario Regulation 161/06), is a regulation issued under Conservation Authorities Act, R.S.O. 1990. Through this regulation, the HCA has the responsibility to regulate activities in natural and hazardous areas, including ravines, valleys, sections of the Niagara Escarpment or other steep slopes, areas in and near rivers, streams, floodplains of Dundas Valley land, wetlands, Hamilton Harbour and the Lake Ontario shoreline and adjacent lands to the natural features listed above. The project limits are located within HCA regulated lands, as it is located on the Niagara Escarpment and within the Davis Creek valley. Therefore, a permit will be required from the HCA under the O. Reg. 161/06 to proceed with site alteration within these areas (see Figure 3).

Any ground disturbance activities within regulated areas would require permits under O. Reg. 161/06. A portion of the project limits are owned by HCA, therefore a separate land access permit is required for all activities on HCA lands. Mapped Regulated area is found on Figure 3.

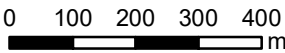


LEGEND

- ▲ Main and Whitney WPS (HD17A)
- ▲ Osler WPS (HD011)
- Study Area
- Pressure District 17
- ARA - Cold Water Thermal Regime
- ARA - Warm Water Thermal Regime
- Watercourse
- Regulated Area (Hamilton Conservation Authority)
- Waterbody
- Wetland - Provincially Significant
- Wetland - Unevaluated as per OWES

Data Source: Hamilton Conservation Authority. Contains public sector Data made available under the City of Hamilton's Open Data Licence, Important Bird and Biodiversity Areas in Canada (IBA), IBI Group, and Ministry of Natural Resources and Forestry (LIO). Contains information licensed under the Open Government Licence - Ontario. Produced by LGL Limited under License with the Ontario Ministry of Natural Resources © King's Printer for Ontario, 2023.

Imagery Service Layer Credits: City of Hamilton.



Main and Whitney Pumping Station
Waterbody Features



Project: TA9185	Figure: 3
Date: January, 2023	Prepared By: AM
Scale: 1:12,000	Verified By: DC

3.0 BACKGROUND INFORMATION

3.1 BACKGROUND SOURCES AND AGENCY CONSULTATION

To characterize the study area, LGL has gathered information from available background sources. Information where available was requested or collected from:

- City of Hamilton;
- Hamilton Conservation Authority (HCA)
- Land Information Ontario (LIO) database;
- Ministry of the Environment, Conservation, and Parks (MECP);
- Natural Heritage Information Centre (NHIC);
- Ministry of Natural Resources and Forestry (MNRF);
- eBird;
- Ontario Reptile Atlas;
- Ontario Breeding Bird Atlas (OBBA); and
- Ontario Nature.

This background review was used to identify the known constraints present within the study area as summarized in the following sections.

3.2 ENVIRONMENTAL DESIGNATIONS

3.2.1 Dundas Valley ESA (DUND-41)

The Dundas Valley Environmental Significant Area (ESA), is a 2028-ha area is situated on the fringe of the Hamilton/Dundas/Ancaster urban center. Coldwater Creek, Ancaster Creek and Sulphur Springs Creek are all found within this ESA. The area was designated an ESA due to the significant earth science feature of the escarpment, and the significant ecological function. The area contains a high diversity of plant species and biotic communities. This summary is taken from the Hamilton Natural Areas Inventory Project, 3rd Edition (Hamilton Conservation Authority, 2014).

The escarpment functions as a natural environment corridor within the Niagara Escarpment as there are significant vegetation communities along the escarpment slopes (including Broadleaf upland woods which contains a high concentration of Butternut (*Juglans cinerea*)).

Dundas Valley ESA is considered a Significant Natural Area, Regional Earth Science ANSI. The feature has associations with the Niagara Escarpment Plan (Escarpment Natural Area, Protection Area and Urban Area).

Soil development (the main soil type being Ancaster Silt loam) along the escarpment and small ravines is limited. There are 25 species of fish (none at risk) observed in the creeks in the ESA. In addition, the most recent wildlife surveys have documented 70 bird species, 10 species of herpetofauna, 6 mammal species,

22 species of butterflies and 33 odonate species. All of these species are listed in the background wildlife list provided in **Appendix A**.

3.2.2 Cootes Paradise ESA (DUND-15)

The Cootes Paradise ESA is a 1026-ha area is situated on the fringe of the Hamilton/Dundas/Ancaster urban center that is centered on the Cootes Paradise open water/marsh habitat that was created behind the Hamilton Bar landform. Coldwater Creek flows through the portion of the ESA that is in the study area. The area was designated an ESA due to the significant earth science feature of the escarpment, and the significant ecological and hydrological function. The area contains a high diversity of plant species and biotic communities (Hamilton Conservation Authority, 2014).

Cootes Paradise ESA is considered a Significant Natural Area, Regional Earth Science ANSI and Provincially Significant Wetland.

Soil development is good in the ESA (the main soil type being Grimsby sand loam and Springvale sandy loam), however along the escarpment and small ravines soil development is limited. There are 57 species of fish (creek and lake species) observed in the in the ESA. In addition, the most recent wildlife surveys have documented 97 bird species, 21 species of herpetofauna, 13 mammal species, 28 species of butterflies and 32 odonate species. All of these species are listed in the background wildlife list provided in **Appendix A**.

3.2.3 Tiffany Falls ESA (ANCA-11)

The Tiffany Falls ESA is a 124-ha area is situated just outside (to the south west) of the study area . Tiffany Creek, a tributary of Sulphur Springs Creek is found within this ESA. The area was designated an ESA due to the significant earth science feature of the escarpment, and the significant ecological function. The area contains a high diversity of plant species and biotic communities (Hamilton Conservation Authority, 2014).

Parts of the Tiffany Falls ESA are considered a Significant Natural Area. The feature has associations with the Niagara Escarpment Plan (Escarpment Natural Area, Protection Area and Urban Area).

Soil development (the main soil type being Ancaster silt loam and Ancaster-Oneida silt loam) along the escarpment and small ravines is limited. There are eight species of fish (none at risk) observed in the creek in the ESA. In addition, the most recent wildlife surveys have documented 30 bird species, four species of herpetofauna, seven mammal species, 18 species of butterflies and five odonate species. All of these species are listed in the background wildlife list provided in **Appendix A**.

3.2.4 Iroquois Heights Conservation Area ESA (ANCA-12)

The Iroquois Heights Conservation Area ESA is a 112-ha area is situated just outside (to the southeast) of the study area. an Intermittent headwater stream of Chedoke Creek is found within this ESA. The area was designated an ESA due to the significant earth science feature of the escarpment, and the significant ecological function. The area contains a high diversity of plant species and biotic communities (Hamilton Conservation Authority, 2014).

Parts of the Tiffany Falls ESA are considered a Significant Natural Area, Regional Earth Science ANSI. The feature has associations with the Niagara Escarpment Plan (Escarpment Natural Area, Protection Area and Urban Area).

Soil development (the main soil type being Ancaster silt loam and Ancaster-Oneida silt loam) along the escarpment and small ravines is limited. There are 8 species of fish (none at risk) observed in the creek in the ESA. In addition, the most recent wildlife surveys have documented 30 bird species, four species of herpetofauna, seven mammal species, 18 species of butterflies and five odonate species. All of these species are listed in the background wildlife list provided in **Appendix A**.

3.2.5 Hamilton Escarpment ESA

The southeast study area limit contains the western edge of the Hamilton Escarpment ESA. This ESA is a long (11km) narrow segment of the escarpment within the City of Hamilton. It is a significant earth science feature and provides a significant ecological function (Hamilton Conservation Authority, 2014). No aquatic habitat is found within this area. The treed talus in this area is unique. The most recent wildlife surveys have documented 38 bird species, 2 species of herpetofauna, five mammal species, two species of butterflies and two odonate species.

3.2.6 Cootes Paradise Provincially Significant Wetland

At the northern study area limit is the Cootes Paradise Provincially Significant Wetland (PSW). The wetland is 122 hectares of swamp (81%) and marsh (19%) and is found within the Cootes Paradise ESA.

3.2.7 Dundas Valley and Cootes Paradise Important Bird Area.

The study area is mostly within an Important Bird Area (IBA). This IBA, which includes Dundas Valley as well as Cootes Paradise (also referred to as Dundas Marsh), contains a nationally significant forest bird community. This is due to the presence of breeding evidence for at least five nationally vulnerable, threatened, or endangered species. Hooded Warbler (*Setophaga citrina*) and Louisiana Waterthrush (*Parkesia motacilla*) are present in nationally significant numbers. Around 100 species of breeding birds have been recorded in the valley. Cootes Paradise is an important area for migrating waterfowl, shorebirds, herons, raptors, gulls, terns, and songbirds. Breeding evidence of three national SAR has been found in the area, Least Bittern (*Ixobrychus exilis*), Cerulean Warbler (*Setophaga cerulea*), and Prothonotary Warbler (*Protonotaria citrea*).

3.2.8 Land Information Ontario (LIO) database

The Land Information Ontario (LIO) database was consulted, and the following features were confirmed and mapped on Figure 2.

- Coldwater Creek, warmwater thermal regime;
- Sulphur Creek and Ancaster Creek, coldwater thermal regimes

- Ancaster Creek Valley Natural and Scientific Interest (ANSI)

3.2.9 Natural Heritage Information Centre (NHIC) Summary

The NHIC database was searched for species at risk (MNR 2022). Of note is that data provided by the NHIC database is not necessarily the most current information available. According to the NHIC, a long list of SAR species have been observed in the study area (see Table 1).

Table 1: NHIC Summary for Study Area

Common Name	Scientific Name	SARA	SARO
American Chestnut	<i>Castanea dentata</i>	END	END
American Eel	<i>Anguilla rostrata</i>	THR	END
Barn Swallow	<i>Hirundo rustica</i>	THR	THR
Blanding's Turtle	<i>Emydoidea blandingii</i>	END	THR
Bobolink	<i>Dolichonyx oryzivorus</i>	THR	THR
Butternut	<i>Juglans cinerea</i>	END	END
Canada Warbler	<i>Cardellina canadensis</i>	THR	SC
Chimney Swift	<i>Chaetura pelagica</i>	THR	THR
Common Hop-tree	<i>Ptelea trifoliata</i>	SC	SC
Eastern Flowering Dogwood	<i>Cornus florida</i>	END	END
Eastern Meadowlark	<i>Sturnella magna</i>	THR	THR
Eastern Pondmussel	<i>Ligumia nasuta</i>	SC	END
Eastern Ribbonsnake	<i>Thamnophis sauritus</i>	SC	SC
Fern-leaved Yellow False Foxglove	<i>Aureolaria pedicularia</i>	THR	
Least Bittern	<i>Ixobrychus exilis</i>	THR	THR
Louisiana Waterthrush	<i>Parkesia motacilla</i>	THR	THR
Midland Painted Turtle	<i>Chrysemys picta marginata</i>	SC	
Northern Bobwhite	<i>Colinus virginianus</i>	END	END
Northern Brook Lamprey	<i>Ichthyomyzon fossor</i>	SC	SC
Northern Map Turtle	<i>Graptemys geographica</i>	SC	SC
Red Mulberry	<i>Morus rubra</i>	END	END
Redside Dace	<i>Clinostomus elongatus</i>	END	END
Rusty-patched Bumble Bee	<i>Bombus affinis</i>	END	END

Snapping Turtle	<i>Chelydra serpentina</i>	SC	SC
Spiny Softshell	<i>Apalone spinifera</i>	END	END
Spotted Wintergreen	<i>Chimaphila maculata</i>	THR	THR
Timber Rattlesnake	<i>Crotalus horridus</i>	EXP	EXP
Wood Thrush	<i>Hylocichla mustelina</i>	THR	SC
Yellow-breasted Chat	<i>Icteria virens</i>	END	END

Endangered (END) = A species facing imminent extinction or extirpation in Ontario which is a candidate for regulation under Ontario's Endangered Species Act.

Threatened (THR) = A species that is at risk of becoming endangered in Ontario if limiting factors are not reversed.

Special Concern = A species with characteristics that make it sensitive to human activities or natural events.

4.0 EXISTING CONDITIONS

The following sections provide a detailed description of existing conditions from the background information review.

4.1 PHYSIOGRAPHY, DRAINAGE AND SOILS

This section incorporates information from The Physiography of Southern Ontario (Chapman and Putnam 1984). The study area is within the Niagara Escarpment physiographic region, and the Norfolk Sand Plain. The surficial Quaternary geology of the Niagara Escarpment is primarily a veneer of clayey silt / sandy silt and a silt-based glacial till overlying dolostone bedrock. The Dundas Valley is a notable break the Niagara Escarpment. It is outlined by bluffs, but the valley has many deep gullies with beds of sand and silty clay. The Norfolk Sand Plain is characterized by sands and silts.

Coulsen et al. (1886) describe the soils of Cootes Paradise as 100% clay, loam or silts. The uplands around Cootes are sandy loam lacustrine soils.

4.2 VEGETATION AND VEGETATION COMMUNITIES

4.2.1 Background Information

An Ecological Land Classification (ELC) is available for the Dundas Valley ESA within the study area from the 2014 Natural Areas Inventory (HCA 2014). Figure 4 below is taken from that inventory. ELC is described as the following community types summarized in Table 2. Data from Cootes Paradise ESA was not available as the area was not surveyed for the inventory.

Table 2: ELC for Dundas Valley ESA (HCA 2014)

Polygon Number	ELC Code	Description
63	CGL_2	Parkland
165	WODM5	Fresh-Moist Deciduous Woodland Ecosite
198	THDM2-8	Gray Dogwood Deciduous Shrub Thicket Type
200	WODM4-4	Dry-Fresh Black Walnut Deciduous Woodland Type
204	MEFM1-1	Goldenrod Fresh Forb Meadow Type
205	FODM5-8	Dry-Fresh Sugar Maple-White Ash Deciduous Forest Type
210	MASM1-1	Cattail Mineral Shallow Marsh Type
211	MASM1-1	Cattail Mineral Shallow Marsh Type
220	FODM1-1	Dry-Fresh Red Oak Deciduous Forest Type
402	FOMM6-1	Fresh-Moist Sugar Maple-Hemlock Mixed Forest Type
406	FOMM6-1	Fresh-Moist Sugar Maple-Hemlock Mixed Forest Type

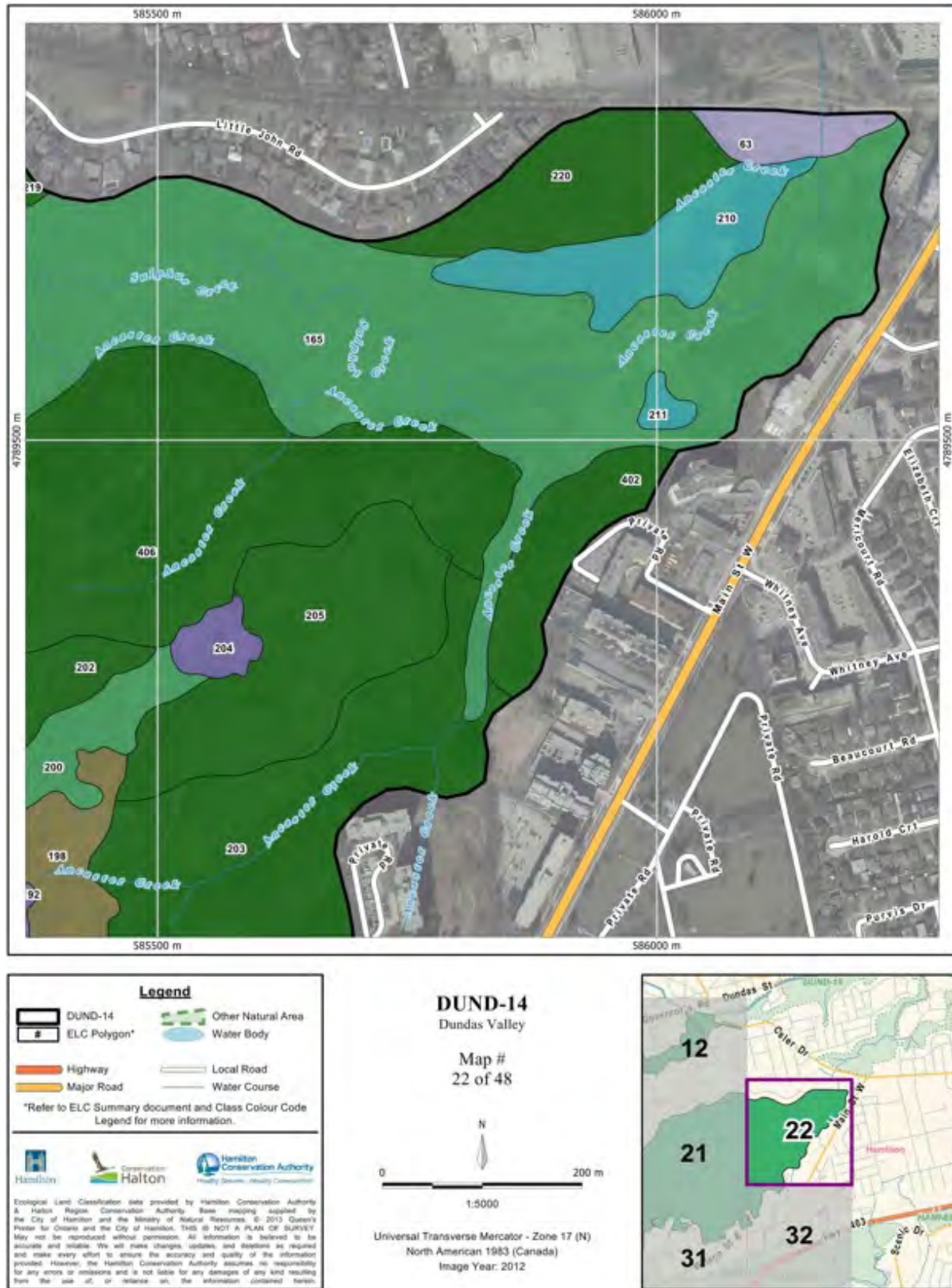


Figure 4: Dundas Valley ESA ELC (HCA 2014)

4.2.2 Existing Conditions Information

A field visit was conducted on November 1, 2022 to confirm ELC for the short-listed alternative sites. The study area containing the alternative pumping station locations is within the urban setting of Hamilton. Many of the sites are contained within residential and commercial property that are either paved or have manicured lawns and ornamental trees. Other sites either back on to or are within a treed ravine slopes. Descriptions of the proposed alternative sites are included below. Figures 5a-e

Site 1

This site is located within the Dundas Valley in a clearing near the existing Osler WPS. Ornamental trees were planted within the manicure lawn adjacent to Osler Drive. The valley slope contains natural forested vegetation. The forested slopes are dominated by upland deciduous forest (FOD4), Lowland Deciduous Forest (FOD7) and Cultural Savanah (CUS) on the north side of Osler Drive) and Sugar Maple Deciduous Forest (FOD5) and Cultural Savanah (CUS) (on the south side of Osler Drive). Ornamental plantings of Crabapple (*Malus baccata*), Common Hackberry (*Celtis occidentalis*), Kentucky Coffee Tree (*Gymnocladus dioica*), Red Maple (*Acer rubrum*) and Honey Locust (*Gleditsia triacanthos*). The Kentucky Coffee Tree is a planted ornamental tree not protected under the ESA.

Site 4

This site is located within a residential property at the intersection of Main Street and Ofield Road. A large Black Walnut (*Juglans nigra*) tree occurs at the rear of the property along with a small sized oak trees recently planted along the road side. Behind the house, the yard slopes downwards towards Main Street to the east. This slope is dominated by Black Walnut and Norway Maple (*A. platanoides*) and with ground cover dominated by Virginia Creeper (*Parthenocissus quinquefolia*).

Site 6

This site is located at the intersection Main Street West and Whitney Avenue within a commercial property. Mature trees of Black Walnut and Little Leaf Linden (*Tilia cordata*) occur within a hedgerow along the edge of its parking lot next to the cemetery.

Sites 8 and 9

These sites are directly adjacent to each other, and are located 1870 and 1872 Main Street West at the Haven Inn Motel and Westdale Car Service properties, approximately 120m south of Site 6. Four small trees are growing in the flower beds close to the road. A Siberian Elm (*Ulmus pumila*) and Black Walnut forest (FOD4) occurs behind the property on the valley slope. Planted and naturalized trees occur along the southern property boundary and are composed of Norway Maple, Siberian Elm, Manitoba Maple, Black Walnut, White Spruce (*Picea glauca*) and White Pine (*Pinus strobus*).

Site 12

This site is located within the manicured lawn of Alexander Park next to the baseball diamond. Mature trees are evenly spaced along the Riffle Range Road. Several trees were recently planted within the vicinity of the proposed pumping station. It is understood that the pumping station could be sited anywhere within the property boundary of this site.

Site 19

The site is located within a church property. Natural features are restricted to an ornamental Norway Maple tree near the road.

4.2.3 Flora

A total of 57 vascular plant species were recorded within the natural areas and ornamental features as show in Figures 5a-e. Twenty-seven of these plant species, which represents 47% of the total flora, are considered introduced and non-native to Ontario.

Two species of significance were recorded within the study area. A Kentucky Coffee Tree which is typically considered Threatened by the *Endangered Species Act*, 2007 (ESA 2007). However, as a planted landscape feature it is not afforded protection under Sections 9 or 10 of the ESA 2007. Common Hackberry is a species identified as uncommon according to the Hamilton Natural Areas Inventory. This specimen is planted, and planted amenity trees should not be considered uncommon in status.



LEGEND

- Main and Whitney WPS (HD17A)
- Osler WPS (HD011)
- Short-listed Alternative
- Proposed Easement
- Watercourse
- Wetland - Unevaluated as per OWES

- LGL Field Survey
- Tree Resource
 - Vegetation Community Boundary (ELC)

Ecological Land Classification

CUS1/CUT1 - Mineral Cultural Savannah Ecosite / Mineral Cultural Thicket Ecosite

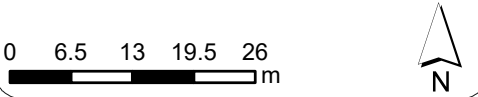
FOD4 - Dry-Fresh Deciduous Forest Ecosite

FOD5 - Dry-Fresh Sugar Maple Deciduous Forest Ecosite

M - Manicured

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Main and Whitney Pumping Station
Existing Conditions
Short-Listed
Site 1



Project: TA9185	Figure: 5-a
Date: October, 2023	Prepared By: VLG
Scale: 1:800	Verified By: DC



LEGEND

- Main and Whitney WPS (HD17A)
- Osler WPS (HD011)
- Short-listed Alternative
- Proposed Easement
- Watercourse
- Wetland - Unevaluated as per OWES

LGL Field Survey

- Tree Resource
- Vegetation Community Boundary (ELC)

Ecological Land Classification

CUS1/CUT1 - Mineral Cultural Savannah Ecosite / Mineral Cultural Thicket Ecosite

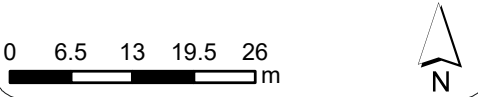
FOD4 - Dry-Fresh Deciduous Forest Ecosite

FOD5 - Dry-Fresh Sugar Maple Deciduous Forest Ecosite

M - Manicured

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Main and Whitney Pumping Station
Existing Conditions
Short-Listed
Site 1



Project: TA9185	Figure: 5-a
Date: October, 2023	Prepared By: VLG
Scale: 1:800	Verified By: DC



LEGEND

- Main and Whitney WPS (HD17A)
- Osler WPS (HD011)
- Short-listed Alternative
- Proposed Easement
- Watercourse
- Wetland - Unevaluated as per OWES

LGL Field Survey

- Tree Resource
- Vegetation Community Boundary (ELC)

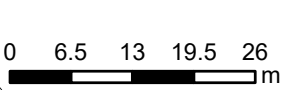
Ecological Land Classification

CUS/FOD4 - Cultural Savannah / Dry-Fresh
Deciduous Forest Ecosite

M - Manicured

Data Source: Contains public sector Data made available under the City of Hamilton's Open Data Licence, Important Bird and Biodiversity Areas in Canada (IBA), IBI Group, and Ministry of Natural Resources and Forestry (LFO). Contains information licensed under the Open Government Licence - Ontario. Produced by LGL Limited under License with the Ontario Ministry of Natural Resources © King's Printer for Ontario, 2023.

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**Main and Whitney Pumping
Station**
Existing Conditions
Short-Listed
Site 4



Project: TA9185	Figure: 5-b
Date: October, 2023	Prepared By: VLG
Scale: 1:800	Verified By: DC



LEGEND

- Main and Whitney WPS (HD17A)
- Osler WPS (HD011)
- Preferred Alternative
- Proposed Easement
- Watercourse
- Wetland - Unevaluated as per OWES

LGL Field Survey

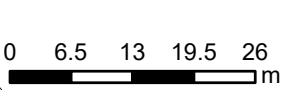
- Tree Resource
- Vegetation Community Boundary (ELC)

Ecological Land Classification

- H - Hedgerow
- M - Manicured

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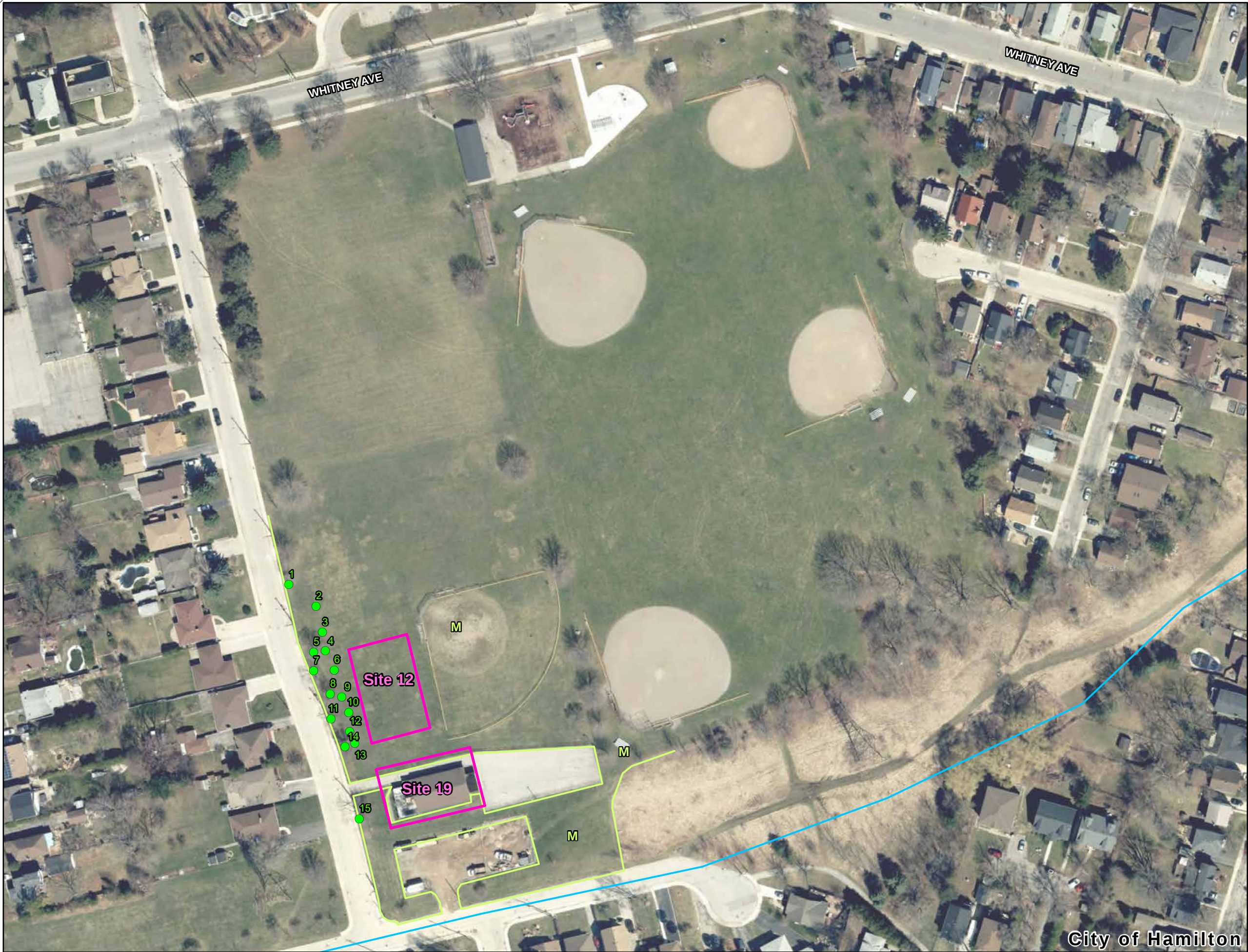
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Main and Whitney Pumping Station
Existing Conditions
Preferred
Site 6



Project: TA9185	Figure: 5-c
Date: October, 2023	Prepared By: VLG
Scale: 1:800	Verified By: DC



LEGEND

- Main and Whitney WPS (HD17A)
- Osler WPS (HD011)
- Short-listed Alternative
- Proposed Easement
- Watercourse
- Wetland - Unevaluated as per OWES

LGL Field Survey

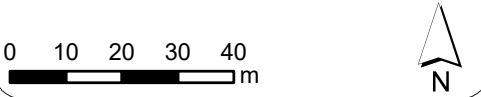
- Tree Resource
- Vegetation Community Boundary (ELC)

Ecological Land Classification

M - Manicured

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Main and Whitney Pumping Station
Existing Conditions
Short-Listed
Site 12 and 19



Project: TA9185	Figure: 5-e
Date: October, 2023	Prepared By: VLG
Scale: 1:1,350	Verified By: DC

4.3 AQUATIC HABITAT AND FISHERIES

4.3.1 Background Information

Most of the study area is within the Ancaster Creek subwatershed (HCA 2008). Sulphur Creek and Ancaster Creek are coldwater watercourses that converge within our study area and become part of Coldwater Creek (see Figures 2 and 3). The intermittent headwater tributaries of Chedoke Creek are also found at the south end of the study area. The watercourses and associated wetlands are regulated by Hamilton Conservation Authority under Ontario Regulation 161/06 (see Figure 3).

Background fisheries data was available for Coldwater, Sulphur and Ancaster Creeks (see Table 3). The Aquatic Resource Inventory (ARA) data indicates a mix of warmwater and coolwater species. No data was available for Chedoke Creek in the study area.

Table 3: Summary of Fish Species – Background Review.

Common Name	Scientific Name	Thermal Regime	Status	SARO/SARA	Coldwater Creek ²	Ancaster Creek ³	Sulphur Creek ⁴
Bluegill	<i>Lepomis macrochirus</i>	warmwater	G5, S5				X
Common Shiner	<i>Luxilus cornutus</i>	coolwater	G5, S5			X	X
Creek Chub	<i>Semotilus atromaculatus</i>	coolwater	G5, S5		X	X	X
Western Blacknose Dace	<i>Rhinichthys obtusus</i>	coolwater	G5, SNR		X	X	
Fantail Darter	<i>Etheostoma flabellare</i>	coolwater	G5, S4				X
Fathead Minnow	<i>Pimephales promelas</i>	warmwater	G5, S5				X
Johnny Darter	<i>Etheostoma nigrum</i>	coolwater	G5, S5		X	X	X
Largemouth Bass	<i>Micropterus salmoides</i>	warmwater	G5, S5		X	X	
Logperch	<i>Percina caprodes</i>	warmwater	G5, S5		X	X	
Longnose Dace	<i>Rhinichthys cataractae</i>	coolwater	G5, S5			X	X
Pumpkinseed	<i>Lepomis gibbosus</i>	warmwater	G5, S5			X	X
Rainbow Trout	<i>Oncorhynchus mykiss</i>	coldwater	G5, SNA		X	X	X
White Sucker	<i>Catostomus commersonii</i>	coolwater	G5, S5		X	X	X

Eakins, R. J. 2012. Ontario Freshwater Fishes Life History Database. Version 5.11. On-line database. (<http://www.ontariofishes.ca>), accessed 31 Jan 2022

² GU-1003-CWC in Figure 3, Source: MNRF LIO data

³ GU-1003-ANC in Figure 3, Source: MNRF LIO data

⁴ GU-1003-SUL in Figure 3, Source: MNRF LIO data

4.3.2 Field Investigation

A field investigation was conducted at Alternative Site 1 on March 8, 2022, at Alternative Sites 8 and 9 on November 10, 2022. Alternative Sites 4 and 6 are not adjacent to aquatic habitat. The watercourse mapped adjacent to Alternative Sites 12 and 19 is buried below the surface.

Site 1

Coldwater Creek is found approximately 115m to the east of Site 1. This watercourse flows in a northerly direction towards Cootes Paradise. At the time of the field investigation, it was flowing well, with a width of approximately 2m. The substrate consists of mainly cobble. The stream is well shaded by trees at this location. No evidence of bank instability (e.g., slumping, undercutting, failed erosion measures) was observed at this location.

Sites 8 and 9

Coldwater Creek flows in the valley behind the properties at 1870 and 1872 Main Street West, approximately 87, and 79m from the proposed alternative sites. The watercourse flows in a northerly direction towards the confluence with Ancaster Creek. At the time of the field investigation, flow rates were low. Stream width was approximately 0.75m with a depth of 10cm. The substrate was mainly silt. The stream is well shaded by trees at this location. No evidence of bank instability was observed at this location.

4.4 WILDLIFE AND WILDLIFE HABITAT

4.4.1 Background Information

Available background information from HCA (2014), Ontario Nature Reptile and Amphibian Atlas (Ontario Nature 2022), eBird (2022) and the Ontario Breeding Bird Atlas (OBBA 2022) was reviewed for the broader project area (see Appendix A). A summary of the NHIC, HCA fauna, Ontario Nature Atlas and Ontario Breeding Bird Atlas Data is provided in Appendix A. Data from the atlases contains bird, reptile, and amphibian data for an area 10km², therefore, while these species have some potential to be found in a larger area, there may not be available habitat for them on site. A total of 32 reptile and amphibian species were identified in the greater study area based on data from HCA and Ontario Nature Reptile Atlas. The Reptile Atlas species may be from up to 10km away from the study area, while records from the ESAs such as Dundas Valley and Cootes Paradise may be from habitat outside the study area. A total of 185 bird species were noted in the background databases. A total of 7 mammal species were noted in the greater study area by HCA, including two SAR bat species.

4.4.2 Field Investigations

Targeted field surveys were conducted for amphibians and birds, while incidental species and habitat observations were completed through visual and auditory observations as well as indirect incidental observations (ie tracks, scat, scents). Surveys were only completed at alternative locations that were in or adjacent to natural areas. All surveys were conducted during ideal weather conditions and dates set out in protocols (amphibian monitoring protocol, point count breeding birds survey protocol) Table 4 provides a summary of dates of field surveys and weather conditions.

Table 4 Weather Conditions for Wildlife Surveys.

Survey Date	Start Time	Temperature	Precipitation	Wind Speed	Sky
April 14, 2022	8:36pm	11°C	None	5km/hr	clear
May 5, 2022	9:09pm	14°C	None	2km/hr	clear
June 27, 2022	9:53pm	19°C	None	0km/hr	Mostly cloudy
June 27, 2022	7:00am	15°C	None	0km/hr	Light clouds
July 8, 2022	8:10am	24°C	None	0km/hr	clear

A total of 11 wildlife species were documented during the field investigations by LGL including 2 mammal species, and nine bird species. A list of all species documented by LGL in the study area is provided in Table 5. No rare wildlife or species at risk were detected during any field investigations.

Table 5 Wildlife Species Documented by LGL During Wildlife Surveys

Common Name	Scientific Name	Site 1	Site 8/9
American Goldfinch	<i>Spinus tristis</i>	x	
American Robin	<i>Turdus migratorius</i>	x	x
Blue Jay	<i>Cyanocitta cristata</i>	x	
Carolina Wren	<i>Thyothorus ludovicianus</i>	x	
European Starling	<i>Sturnus vulgaris</i>		x
House Sparrow	<i>Passer domesticus</i>	x	x
Northern Cardinal	<i>Cardinalis cardinalis</i>	X	
Northern Flicker	<i>Colaptes auratus</i>	x	
Rock Dove	<i>Columba livia</i>		x
Eastern Gray Squirrel	<i>Sciurus carolinensis</i>		x
Red Squirrel	<i>Sciurus vulgaris</i>	x	

Most of the bird species observed are considered migratory and are regulated under the Migratory Birds Convention Act (MBCA), while Blue Jay (*Cyanocitta cristata*) is regulated under the Fish and Wildlife Conventions Act (FWCA). Gray Squirrel (*Sciurus carolinensis*) is a game species under the FWCA. Some of the observed species are not under any legislative protection: House Sparrow (*Passer domesticus*); and, European Starling (*Sturnus vulgaris*).

With the study area being in a primarily commercial and residential setting, the natural area associated with the Dundas Conservation Area is the main habitat for wildlife in the study area. In addition, mature trees with cavities suitable for bat maternal roosting habitat were observed in the White Chapel Memorial Gardens property at 1895 Main Street West.

5.0 SPECIES AT RISK SCREENING

The *Endangered Species Act*, 2007 (ESA 2007) is administered by the MECP (as of April 1, 2019). Screening the project for potential Species at Risk (SAR) is a proponent driven process. A table of potential SAR species (see Table 6) has been compiled using information from various sources such as HCA Inventories, NHIC, OBBA, Ontario Nature, DFO Aquatic SAR Mapping. This is an extensive list. This list has been updated to identify where potential or SAR habitat may occur in the areas proposed for the new WPS.

Table 6: Species at Risk Screening for the Project.I

Type	Species	MNRF NHIC (Feb 2022)	HCA Natural Areas Inventory (2014)	Ontario Reptile and Amphibian Atlas	OBBA (2001-2005)	eBird	ESA	Habitat	Results of Site Screening	Recommendations
Vegetation	American Chestnut (<i>Castanea dentata</i>)	x	x				END	Generally found in deciduous or mixed forests with well drained soils. Most often found in the Carolinian zone in Ontario.	Species not observed. No suitable habitat identified in short-listed sites.	No further recommendations at this time.
	American Ginseng (<i>Panax quinquefolius</i>)		x				END	Found in mature deciduous forests dominated by sugar maple, white ash and American basswood.	Species not observed. No suitable habitat identified in short-listed sites.	No further recommendations at this time.
	Butternut (<i>Juglans cinerea</i>)	x	x				END	Generally grows in rich, moist, and well-drained soils often found along streams. It may also be found on well-drained gravel sites, especially those made up of limestone. It is also found, though seldom, on dry, rocky and sterile soils. In Ontario, the Butternut Generally grows alone or in small groups in deciduous forests as well as in hedgerows	Species not observed. No suitable habitat identified in short-listed sites. However suitable habitat found in the natural areas adjacent to sites 1, 8, and 9	No further recommendations at this time.
	Common Hoptree (<i>Ptelea trifoliata</i>)	x					SC	Grows along shorelines with nutrient poor sandy soils.	Species not observed. No suitable habitat identified in short-listed sites.	No further recommendations at this time.
	Eastern Flowering Dogwood (<i>Cornus florida</i>)	x	x				END	It is found under taller trees in mature deciduous and mixed forests. Often found on slopes, bluffs and in ravines	Species only observed as planted amenity tree. No suitable habitat identified in short-listed sites.	No further recommendations at this time.
	Red Mulberry (<i>Morus rubra</i>)	x	x				END	Found in moist forests with sandy and limestone based loam soils.	Species not observed. No suitable habitat identified in short-listed sites.	No further recommendations at this time.
	Spotted Wintergreen (<i>Chimaphila maculata</i>)	x					THR	Found in dry oak-pine woodland habitat with sandy soils.	Species not observed. No suitable habitat identified in short-listed sites.	No further recommendations at this time.
Bird	Bald Eagle (<i>Haliaeetus luecocephalus</i>)		x			x	SC	Prefers deciduous and mixed-deciduous forest; and habitat close to water bodies such as lakes and rivers; They roost in super canopy trees such as Pine	Species not observed. No suitable habitat identified in short-listed sites.	No further recommendations at this time.
	Barn Swallow (<i>Hirundo rustica</i>)	x	x			x	THR	Prefers farmland; lake/river shorelines; wooded clearings; urban populated areas; rocky cliffs; and wetlands. They nest inside or outside buildings; under bridges and in road culverts; on rock faces and in caves etc.	Species not observed. No suitable habitat identified in short-listed sites.	No further recommendations at this time.
	Bank Swallow (<i>Riparia riparia</i>)		x			x	THR	Nests in the vertical surfaces of silt and sand substrates. Often these surfaces are found on the banks of waterbodies or gravel pits.	Species not observed. No suitable habitat identified in short-listed sites.	No further recommendations at this time.
	Bobolink (<i>Dolichonyx oryzivorus</i>)	x	x			x	THR	This species occurs in tallgrass prairies, open meadows, and fallow agricultural fields. It’s also often found in hay fields.	Species not observed. No suitable habitat identified in short-listed sites.	No further recommendations at this time.
	Canada Warbler (<i>Cardellina canadensis</i>)	x				x	SC	Generally prefers wet coniferous, deciduous and mixed forest types, with a dense shrub layer. Nests on the ground, on logs or hummocks, and uses dense shrub layer to conceal the nest.	Species not observed. No suitable habitat identified in short-listed sites. However suitable habitat found in the natural areas adjacent to sites 1, 8, and 9	No further recommendations, provided project footprint remains outside the natural areas.

Type	Species	MNRF NHIC (Feb 2022)	HCA Natural Areas Inventory (2014)	Ontario Reptile and Amphibian Atlas	OBBA (2001-2005)	eBird	ESA	Habitat	Results of Site Screening	Recommendations
	Cerulean Warbler (<i>Setophaga cerulea</i>)		x				THR	This species breeds in mature deciduous forests with large trees and an open understory.	Species not observed.	No further recommendations at this time.
	Chimney Swift (<i>Chaetura pelagica</i>)	x	x			x	THR	Historically found in deciduous and coniferous, usually wet forest types, all with a well-developed, dense shrub layer; now most are found in urban areas in large uncapped chimneys.	Species not observed. No suitable habitat identified in short-listed sites.	No further recommendations at this time.
	Common Nighthawk (<i>Chordeiles minor</i>)		x			x	SC	Open habitats with little to no plants. Examples included rock barrens, forest clearings, and logged areas.	Limited suitable habitat identified in short-listed sites. This species may use anthropogenic features (such as store roof tops, gravel pads, etc). This species has been regularly recorded in and around the study area, as per eBird data.	Recommend a species specific survey for this bird if the preferred alternative site has suitable nesting area.
	Eastern Meadowlark (<i>Sturnella magna</i>)	x	x			x	THR	This species occurs in tallgrass prairies, open meadows, and fallow agricultural fields.	Species not observed. No suitable habitat identified in short-listed sites.	No further recommendations at this time.
	Eastern Wood-Pewee (<i>Contopus virens</i>)					x	SC	Mixed and deciduous forests in the mid-canopy layer near forest clearings and edges. The forests usually have little understory vegetation.	Species not observed. No suitable habitat identified in short-listed sites. However suitable habitat found in the natural areas adjacent to sites 1, 8, and 9	No further recommendations, provided project footprint remains outside the natural areas. Timing window for vegetation removals may be considered once impacts are better understood at detail design.
	Evening Grosbeak (<i>Coccothraustes vespertinus</i>)					x	SC	Prefers open, mature mixed wood forests dominated by fir species, white spruce, or trembling aspen	Species not observed. No suitable habitat identified in short-listed sites.	No further recommendations at this time.
	Least Bittern (<i>Ixobrychus exilis</i>)	x	x				THR	Found in wetland habitats with open water. They prefer cattail marshes.	Species not observed. No suitable habitat identified in short-listed sites.	No further recommendations at this time.
	Loggerhead Shrike (<i>Lanius ludovicianus</i> Eastern subspecies)					x	END	It is found in open pasture or grassland habitats as well as alvars with small trees or shrubs nearby.	Species not observed. No suitable habitat identified in short-listed sites.	No further recommendations at this time.
	Louisiana Waterthrush (<i>Parkesia motacilla</i>)	x				x	THR	Generally inhabits mature forests along steeply sloped ravines adjacent to running water. It prefers clear, cold streams and densely wooded swamps	Species not observed. No suitable habitat identified in short-listed sites.	No further recommendations at this time.
	Northern Bobwhite (<i>Colinus virginianus</i>)	x					END	Generally inhabits a variety of edge and grassland type - habitats including non-intensively farmed agricultural lands.	Species not observed. No suitable habitat identified in short-listed sites.	No further recommendations at this time.
	Peregrine Falcon (<i>Falco peregrinus</i>)					x	SC	Nesting sites include cliff faces and ledges as well as the ledges on tall buildings, bridges, and other anthropogenic structures. They have also been found nesting in quarries and open pit mines	Species not observed. No suitable habitat identified in short-listed sites.	No further recommendations at this time.

Type	Species	MNRF NHIC (Feb 2022)	HCA Natural Areas Inventory (2014)	Ontario Reptile and Amphibian Atlas	OBBA (2001-2005)	eBird	ESA	Habitat	Results of Site Screening	Recommendations
	Prothonotary Warbler (<i>Protonotaria citrea</i>)		x				END	This species nests in flooded woodlands or swaps. They nest in holes of dead or dying trees, particularly silver maple, ash and yellow birch.	Species not observed. No suitable habitat identified in short-listed sites.	No further recommendations at this time.
	Red-headed Woodpecker (<i>Melanerpes erythrocephalus</i>)					x	SC	Open woodlands and woodland edges. Sometimes found in cemeteries, parks and golf courses.	Species not observed. No suitable habitat identified in short-listed sites.	No further recommendations at this time.
	Rusty Blackbird (<i>Euphagus carolinus</i>)					x	SC	Found mainly in northern Ontario, in conifer dominated habitats associated with wetlands such as bogs and marshes.	Species not observed. No suitable habitat identified in short-listed sites.	No further recommendations at this time.
	Wood Thrush (<i>Hylocichla mustelina</i>)	x				x	SC	Mature deciduous and mixed woods. Nests regularly in Sugar Maple and American Beech.	Species not observed. No suitable habitat identified in short-listed sites.	No further recommendations at this time.
	Yellow-breasted Chat (<i>Icteria virens virens</i>)	x					END	Generally prefer dense thickets around wood edges, riparian areas, and in overgrown clearings	Species not observed. No suitable habitat identified in short-listed sites.	No further recommendations at this time.
	Whip-poor-will (<i>Caprimulgus vociferus</i>)		x				END	Generally found in areas with a mix of open and forested habitats.	No suitable habitat identified in short listed sites.	No further recommendations at this time.
Reptile and amphibian	Blanding’s Turtle (<i>Thamnophis sauritus</i>)	x	x	x			THR	Generally occur in freshwater lakes, permanent or temporary pools, slow-flowing streams, marshes and swamps. They prefer shallow water that is rich in nutrients, organic soil and dense vegetation. Adults are generally found in open or partially vegetated sites, and juveniles prefer areas that contain thick aquatic vegetation including sphagnum, water lilies and algae. They dig their nest in a variety of loose substrates, including sand, organic soil, gravel and cobblestone. Overwintering occurs in permanent pools that average about one metre in depth, or in slow-flowing streams	No suitable habitat identified in short-listed sites.	No further recommendations at this time.
	Eastern Musk Turtle (<i>Sternotherus odoratus</i>)		x	x			SC	They are found in ponds, lakes, marshes and slow moving rivers with plenty of emergent vegetation and muddy bottoms.		
	Eastern Ribbonsnake (<i>Thamnophis sauritus</i>)	x	x	x			SC	They are a semi aquatic species. Their habitat is forests near water, particularly marsh habitat within a forest.		
	Jefferson Salamander (<i>Ambystoma jeffersonianum</i>)		x	x			END	They are found in woodland and forest habitats and breed in vernal pools.		
	Northern Map Turtle (<i>Graptemys geographica</i>)	x	x	x			SC	They inhabit rivers and lakes that support molluscs (for prey).		
	Snapping Turtle (<i>Chelydra serpentina</i>)	x	x	x			SC	Aquatic setting such as lakes, ponds, bays and inlets. This is a highly aquatic species but may leave the water to seek out new aquatic habitats or to lay eggs.		
	Spiny Softshell (<i>Apalone spinifera</i>)	x	x				END	They are found in ponds, lakes, creeks and even ditches. They need open sand or gravel nearby for nesting.		

Type	Species	MNRF NHIC (Feb 2022)	HCA Natural Areas Inventory (2014)	Ontario Reptile and Amphibian Atlas	OBBA (2001-2005)	eBird	ESA	Habitat	Results of Site Screening	Recommendations
Fish and Mussels	Redside Dace (<i>Clinostomus elongatus</i>)	x					END	Found in small streams and headwaters with overhanging vegetation.	No aquatic surveys conducted. This species not known from watercourses adjacent to the alternative sites.	No further recommendations at this time.
	American Eel (<i>Anguilla rostrata</i>)	x					END	This species is found in Lake Ontario and some tributaries.		
	Eastern Pondmussel (<i>Ligumia nasuta</i>)	x					END	Inhabits sheltered areas in lakes and slow moving rivers and canals with sand or mud bottoms		
	Silver Shiner (<i>Cyprinella spiloptera</i>)		x				THR	Found in medium to large rivers with a swift current.		
	Northern Brook Lamprey (<i>Ichthyomyzon fossor</i>)	x					SC	They are found in clear coolwater streams with silt and sand for burrowing.		
Mammal	Eastern Small-footed Bat (<i>Myotis leibii</i>)						END	Overwintering habitat: Caves and mines Maternal Roosts: Caves, tree cavities, rock outcrops, bridges and buildings	Suitable maternal roosting trees identified in White Chapel Memorial Gardens Property and in valley behind alternative sites 1, 8 and 9.	Tree removals, if required, must consider if bats could roost in trees, particularly if trees associated with a larger natural area. Timing window for vegetation removals may be considered once impacts are better understood at detail design.
	Little Brown Bat (<i>Myotis lucifugus</i>)		x				END	Overwintering habitat: Caves and mines that remain above 0. Maternal Roosts: Often associated with buildings (attics, barns etc.). Occasionally found in trees (25-44 cm dbh).		
	Northern Long Eared Bat (<i>Myotis septentrionalis</i>)		x				END	Overwintering habitat: Caves and mines that remain above 0. Maternal Roosts: Often associated with cavities of large diameter trees (25-44 cm dbh) with cavities and crevices. Occasionally found in structures (attics, barns etc.)		
	Tri-Coloured Bat (<i>Perimyotis subflavus</i>)						END	Overwintering habitat: Caves and mines that remain above 0. Maternal Roosts: Often associated with clusters of dead leaves in large diameter Oak or Maple trees		
Invertebrates	Monarch (<i>Danaus plexippus</i>)	x					SC	Summer habitat in Ontario includes meadows and open areas where Milkweed grows. Caterpillars feed on milkweed, while adults feed on a variety of wildflowers	No suitable habitat identified in short-listed sites.	No further recommendations at this time.
	Rusty Patched Bumble Bee	x					END	Generally inhabits a range of diverse habitats including mixed farmland, sand dunes, marshes, urban and wooded areas. It usually nests underground in abandoned rodent burrows		

6.0 POTENTIAL NATURAL HERITAGE IMPACTS AND MITIGATION

Seven short-listed alternative sites were provided for evaluation from a natural heritage perspective. A preliminary impact assessment of the short-listed alternative sites has been prepared to evaluate the potential impacts to natural heritage resources for each proposed infrastructure location. Figure 2 indicates the locations of the long-listed alternative sites as well as the short list, and Appendix B has photos of all the short-listed alternative sites. The short-listed alternative sites include:

- Site 1. Adjacent to the Ostler PS HD011
- Site 4. 88 Ofield Road at Main Street West
- Site 6. 1845 Main Street West (The Treehouse Cannabis)
- Site 8. 1870 Main Street West (Haven Inn)
- Site 9. 1872 Main Street West (Westdale Car Service)
- Site 12. 125 Rifle Range Road (Conseil Scolaire Viamonde, French School Network)
- Site 19. 161 Rifle Range Road (Trustees of Meeting Rooms Association Hamilton-Burlington Area)

As described in section 4.0 above, the wildlife and vegetation in the study area are considered tolerant to anthropogenic influences. A summary of potential natural heritage impacts is provided in Table 7. This list includes impacts to terrestrial habitat, trees, aquatic resources and species at risk.

6.1 EVALUATION OF ALTERNATIVE SITES

At this point in the project, the best mitigation is avoidance. Efforts were made by the Project Team to choose alternative sites that had low potential for natural heritage impacts. Through the selection of the short-listed alternative sites, proposed infrastructure is situated outside of identified natural heritage features. As such, the potential impacts listed in this table can be mitigated through proper project planning. No alternative sites west of site 9 were put forward as the area is within the Escarpment Protection Area of the Niagara Escarpment Plan (2017). The following alternative evaluation has only considered the footprint provided to LGL in October 2023, and has not accounted for any access routes, laydown areas etc. Those potential impacts can be evaluated as the project progresses. None of the alternative sites assessed have major natural heritage impact potential. Alternative Site 1 has the most potential for natural heritage impacts as it is adjacent to a natural area. It was determined that alternative sites 6, 12 and 19 have the least potential for natural heritage impacts as they are either in parking lots or manicured grass, are not adjacent to a natural area, require limited to no tree removals and have lower risk of aquatic habitat impact. For all sites, site access, staging and laydown will need to be identified and should use existing disturbed/paved areas where feasible. For all sites, potential impacts are relatively minor and can be mitigated through standard mitigation measures which are further outlined below.

It was determined through the EA process, after PIC2, that Alternative Site 6 was the preferred alternative and was recommended to be taken forward. From a natural heritage perspective this was a good option to put forward as the site is a parking lot, with little potential for natural heritage impacts. Section 6.3 of this report recommends further work proposed at detailed design.

Table 7 Natural Heritage Evaluation of Alternative Sites

Alternative	1	4	6	8	9	12	19
Vegetation and Tree Impacts	Adjacent to natural area of Cootes Paradise ESA, some amenity tree removals may be required.	Minor vegetation removals associated with amenity trees.	No vegetation or tree impacts anticipated.	Adjacent to natural area, no vegetation or tree impacts anticipated within the proposed footprint. Possible impact to amenity trees for site access.	Adjacent to natural area, no vegetation or tree impacts anticipated within the proposed footprint. Possible impact to amenity trees for site access.	No vegetation impact anticipated within the proposed footprint. Possible impact to amenity trees depending on orientation of site within the property.	No vegetation or tree impacts anticipated within the proposed footprint. Possible impact to amenity trees for site access.
Wildlife Impacts	Potential for indirect impact through construction disturbance and noise. Disturbance expected to be temporary in nature.	Limited wildlife habitat removal is proposed within the hedgerow along Main Street West.	Wildlife habitat impact not anticipated, as proposed footprint entirely within a paved area.	Wildlife habitat removal anticipated to be limited to amenity trees on the lot as required. It is assumed no intrusion to the natural feature to the north.	Wildlife habitat removal anticipated to be limited to amenity trees on the lot as required. It is assumed no intrusion to the natural feature to the north.	Wildlife impact minimal and limited to possibly amenity trees.	Wildlife impact minimal and limited to possibly amenity trees.
Aquatic Impacts	No direct aquatic impacts anticipated. This area is regulated in part under O.Reg. 161/06. Approximately	No direct aquatic impacts anticipated. Approximately 148 meters from aquatic habitat of Coldwater Creek.	No direct aquatic impacts anticipated. Approximately 244 meters from aquatic habitat of Coldwater Creek.	No direct aquatic impacts anticipated. Approximately 87 meters from aquatic habitat of Coldwater Creek.	No direct aquatic impacts anticipated. Approximately 79 meters from aquatic habitat of Coldwater Creek.	No direct aquatic impacts anticipated. Not near an open aquatic habitat, but likely near a catch basin.	No direct aquatic impacts anticipated. Not near an open aquatic habitat, but likely near a catch basin.

	115 meters from aquatic habitat of Coldwater Creek. Best Management Practices and a robust Erosion and Sediment Control plan will minimize risk of indirect impact.	Best Management Practices and a robust Erosion and Sediment Control plan will minimize risk of indirect impact.	Best Management Practices and a robust Erosion and Sediment Control plan will minimize risk of indirect impact.	Best Management Practices and a robust Erosion and Sediment Control plan will minimize risk of indirect impact.	Best Management Practices and a robust Erosion and Sediment Control plan will minimize risk of indirect impact.	Best Management Practices and a robust Erosion and Sediment Control plan will minimize risk of indirect impact.	Best Management Practices and a robust Erosion and Sediment Control plan will minimize risk of indirect impact.
SAR Impact	No SAR or SAR habitat identified, therefore no anticipated impact.	No SAR or SAR habitat identified, therefore no anticipated impact.	No SAR or SAR habitat identified, therefore no anticipated impact.	No SAR or SAR habitat identified, therefore no anticipated impact.	No SAR or SAR habitat identified, therefore no anticipated impact.	No SAR or SAR habitat identified, therefore no anticipated impact.	No SAR or SAR habitat identified, therefore no anticipated impact.
Evaluation	3	2	1	2	2	1	1

6.2 GENERAL MITIGATION FOR PREFERRED ALTERNATIVE

This section focuses on the potential effects of the project on natural features and outlines the protection/mitigation measures proposed to manage potential adverse effects on terrestrial and aquatic ecosystems. Environmental effects are identified based on the current level of design detail (conceptual design) and the identified natural heritage sensitivities for the preferred alternative site 6.

The potential for impacts associated with construction can first be mitigated through good project planning and use of best practices. Minimizing the extent of disturbance wherever possible through coordination of all projects related planning, including design, staging, and scheduling is key. This includes the incorporation of construction timing windows established for the protection of fish and wildlife, where identified, into the overall project schedule. Consideration should be given to staging/grouping of project activities in such a way that disturbance within the same area would be coordinated to limit the duration of impact. The extent of construction related activity can also be effectively isolated and secured from adjacent natural lands through clear delineation of the work site. The isolation of the work area will also discourage the entry of wildlife into the work zone, thereby minimizing incidental encounters and the risk of incidental wildlife mortality during construction.

General mitigation measures for the project include but are not limited to the following:

- Employ methods to isolate the construction area;
- Effective Erosion and Sediment Control Plant measures shall be installed before starting work to prevent the entry of sediment into the watercourses or adjacent areas, including through stormwater drainage adjacent to the site. Inspect regularly during the course of construction and conduct regular maintenance and repairs as necessary;
- Develop a dewatering plan to dispose of any water accumulated onsite from dewatering or pooled stormwater to ensure it does not enter nearby watercourses;
- Minimize vegetation and tree removals through facility design;
- Minimize construction area to the extent possible;
- Use appropriate tree protection measures for any work around tree resources within the project area to protect trees identified to be retained;
- Use previously disturbed areas for construction laydown and staging to the extent possible;
- Clearly identify stockpiling and staging areas;
- No vegetation removal should occur between April 1 and August 30 of any given year in order to protect birds afforded protection under the Migratory Birds and Convention Act;
- Locate site maintenance; vehicle washing and refuelling stations where contaminants are handled of site; and,
- Ensure that a Spills Management Plan (including materials, instructions regarding their use, education of contract personnel, emergency contact numbers) is on-site at all times for implementation in event of an accidental spill during construction. An emergency spill kit shall

be kept on site. A response plan shall also be developed that is to be implemented immediately in the event of a sediment release.

6.3 FUTURE NATURAL HERITAGE STUDIES

It is recommended that a full arborist assessment be completed at detailed design for the and a tree protection plan be prepared according to the City of Hamilton guidelines.

7.0 SUMMARY AND CONCLUSION

This report summarizes that background review, field inventories, and alternative site evaluations. Multiple natural heritage features are known to occur in the study area and their features/functions and relatively well documented. Natural areas along Osler Road between Main Street and Grant Boulevard present the largest natural heritage constraint in the project area. The short-listed alternative sites are all found outside of these natural areas, though some are adjacent to them. An evaluation of the alternative sites has determined that Alternative Site 6 has the least potential for natural heritage impacts, however all alternative sites avoid major impacts. Through the EA process, it was recommended that this alternative site be chosen as the preferred. It is anticipated that impacts for the preferred alternative site 6 can be mitigated through proper project planning, timing, Best Management Practices and restoration of the sites.

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Appendix A Flora and Fauna List

Type	Scientific Name	Common Name	LGL Inventory	Dundas Valley Natural Area Inventory (2014)	Cootes Paradise Natural Area Inventory (2014)	NHIC	OBBA (2007)	Ontario Reptile and Amphibian Atlas (1928-2021)	eBird (2014-2022)	S-Rank	Schedule	SARA	SARO	FWCA	MBCA	SWH-TG Area Sensitive Species	Interior Species	Hamilton	Priority Species Hamilton Wentworth	Bird Nesting Habitat
Amphibian	<i>Lithobates catesbeianus</i>	American Bullfrog						x		S4				G		X (Stable water levels)		U		
Amphibian	<i>Anaxyrus americanus</i>	American Toad						x		S5								A		
Amphibian	<i>Ambystoma laterale</i>	Blue-spotted Salamander		x				x		S4				P				U		
Amphibian	<i>Notopthalmus viridescens</i>	Eastern (Red-spotted) Newt		x	x			x		S5								U		
Amphibian	<i>Plethodon cinereus</i>	Eastern Red-backed Salamander						x		S5				P				C		
Amphibian	<i>Hemidactylum scutatum</i>	Four-toed Salamander			x			x		S4				P				R		
Amphibian	<i>Hyla versicolor</i>	Gray Treefrog						x		S5				P				A		
Amphibian	<i>Lithobates clamitans</i>	Green Frog						x		S5								A		
Amphibian	<i>Ambystoma jeffersonianum</i>	Jefferson Salamander		x	x			x		S2	Schedule 1	THR	END	P				R		
Amphibian	<i>Necturus maculosus</i>	Mudpuppy			x			x		S4			NAR					R		
Amphibian	<i>Lithobates pipiens</i>	Northern Leopard Frog						x		S5								A		
Amphibian	<i>Lithobates palustris</i>	Pickereel Frog		x	x			x		S4								R		
Amphibian	<i>Ambystoma maculatum</i>	Spotted Salamander		x	x			x		S4				P				U		
Amphibian	<i>Pseudacris crucifer</i>	Spring Peeper						x		S5								A		
Amphibian	<i>Pseudacris triseriata</i>	Western Chorus Frog (Great Lakes/St. Lawrence Canadian Shield population)						x		S3	Schedule 1	THR						C		
Amphibian	<i>Lithobates sylvatica</i>	Wood Frog						x		S5								C		
Bird	<i>Empidonax virescens</i>	Acadian Flycatcher		x					x	S2S3B	Schedule 1	END	END		X	X (30ha mature forest with riparian)	X	R	level 1	
Bird	<i>Empidonax alnorum</i>	Alder Flycatcher								S5B					X			U	level 3	
Bird	<i>Botaurus lentiginosus</i>	American Bittern			x					S4B					X	X (habitat loss, human disturbance)		R	level 1	
Bird	<i>Anas rubripes</i>	American Black Duck		x	x				x	S4					X			R	level 2	
Bird	<i>Fulica americana</i>	American Coot			x					S4B					X	X (needs deep, open water, habitat loss)		EXT	level 1	
Bird	<i>Corvus brachyrhynchos</i>	American Crow					x		x	S5B								C		
Bird	<i>Spinus tristis</i>	American Goldfinch	x				x		x	S5B					X			A	level 3	
Bird	<i>Falco sparverius</i>	American Kestrel							x	S4				P				U	level 2	
Bird	<i>Anthus rubescens</i>	American Pipit							x	S4					X					
Bird	<i>Setophaga ruticilla</i>	American Redstart							x	S5B					X	X (>100ha forest)		U	level 2	
Bird	<i>Turdus migratorius</i>	American Robin	x				x		x	S5B					X			A		
Bird	<i>Spizelloides arborea</i>	American Tree Sparrow							x	S4B					X					
Bird	<i>Anas americana</i>	American Wigeon			x					S4					X			R	level 3	
Bird	<i>Scolopax minor</i>	American Woodcock							x	S4B					X			C	level 4	
Bird	<i>Haliaeetus leucocephalus</i>	Bald Eagle			x				x	S2N,S4B			SC	P		X (large, continuous, open forest around lakes, rivers 255ha)				
Bird	<i>Icterus galbula</i>	Baltimore Oriole					x		x	S4B					X			C		
Bird	<i>Riparia riparia</i>	Bank Swallow			x				x	S4B	Schedule 1	THR	THR		X			C	level 2	
Bird	<i>Hirundo rustica</i>	Barn Swallow		x	x	x			x	S4B	Schedule 1	THR	THR		X			A	level 4	
Bird	<i>Setophaga castanea</i>	Bay-breasted Warbler							x	S5B					X					
Bird	<i>Megasceryle alcyon</i>	Belted Kingfisher							x	S4B				P				U		
Bird	<i>Mniotilta varia</i>	Black-and-white Warbler							x	S5B					X	X (>100ha continuous forest)	X	U	level 3	
Bird	<i>Chlidonias niger</i>	Black Tern			x					S3B			SC		X	X (marshes >20ha, adjacent grassland)		EXT	level 1	
Bird	<i>Coccyzus erythrophthalmus</i>	Black-billed Cuckoo							x	S5B					X			U	level 2	
Bird	<i>Setophaga fusca</i>	Blackburnian Warbler							x	S5B					X	X (50ha mature forest)	X	R	level 2	
Bird	<i>Poecile atricapillus</i>	Black-capped Chickadee							x	S5					X			A	level 4	
Bird	<i>Nycticorax nycticorax</i>	Black-crowned Night Heron		x	x					S3B,S3N					X			R	level 1	
Bird	<i>Setophaga striata</i>	Blackpoll Warbler							x	S4B					X					
Bird	<i>Setophaga caerulescens</i>	Black-throated Blue Warbler							x	S5B					X	X (>100ha of dense forest)		R		
Bird	<i>Setophaga virens</i>	Black-throated Green Warbler		x	x				x	S5B					X	X (30ha variable forest)		R	level 2	
Bird	<i>Cyanocitta cristata</i>	Blue Jay	x				x		x	S5				P				A		forest
Bird	<i>Poliophtila caerulea</i>	Blue-gray Gnatcatcher							x	S4B					X	X (30ha forest)	X	U	level 3	marsh
Bird	<i>Anas discors</i>	Blue-winged Teal			x					S4					X				level 2	marsh
Bird	<i>Vermivora Cyanoptera</i>	Blue-winged Warbler							x	S4B					X			U	level 1	marsh
Bird	<i>Dolichonyx oryzivorus</i>	Bobolink		x	x	x			x	S4B	Schedule 1	THR	THR		X	X (>50ha dense grassland)		C	level 2	
Bird	<i>Buteo platypterus</i>	Broad-winged Hawk		x					x	S5B				P		X (dense aspen/birch forests >100ha)		R	level 2	
Bird	<i>Certhia americana</i>	Brown Creeper							x	S5B					X	X (30ha mature forest)	X	U	level 2	marsh
Bird	<i>Toxostoma rufum</i>	Brown Thrasher							x	S4B					X			U	level 1	
Bird	<i>Molothrus ater</i>	Brown-headed Cowbird							x	S4B								A		marsh
Bird	<i>Branta canadensis</i>	Canada Goose							x	S5					X			I; C		
Bird	<i>Cardellina canadensis</i>	Canada Warbler				x			x	S4B	Schedule 1	THR	SC		X	X (30ha dense forest with riparian)	X	R	level 2	
Bird	<i>Setophaga tigrina</i>	Cape May Warbler							x	S5B					X					
Bird	<i>Thryothorus ludovicianus</i>	Carolina Wren	x	x	x				x	S4					X			R	level 3	
Bird	<i>Hydroprogne caspia</i>	Caspian Tern							x	S3B					X			C		forest
Bird	<i>Bombycilla cedrorum</i>	Cedar Waxwing							x	S5B					X			C		
Bird	<i>Setophaga cerulea</i>	Cerulean Warbler		x	x					S3B	Schedule 1	END	THR		X	X (>100ha mature forest)		R	level 1	
Bird	<i>Setophaga pensylvanica</i>	Chestnut-sided Warbler							x	S5B					X			U	level 1	
Bird	<i>Chaetura pelagica</i>	Chimney Swift			x	x			x	S4B,S4N	Schedule 1	THR	THR		X			U		
Bird	<i>Spizella passerina</i>	Chipping Sparrow					x		x	S5B					X			A		forest
Bird	<i>Spizella pallida</i>	Clay-colored Sparrow							x	S4B					X			R	level 1	
Bird	<i>Petrochelidon pyrrhonota</i>	Cliff Swallow							x	S4B					X			U	level 4	open country
Bird	<i>Quiscalus quiscula</i>	Common Grackle					x		x	S5B								A		
Bird	<i>Gavia immer</i>	Common Loon							x	S5B,S5N					X	X (large, open, undisturbed lakes)			level 3	marsh
Bird	<i>Mergus merganser</i>	Common Merganser							x	S5B,S5N					X	X (clear water, nesting trees >50cm)				
Bird	<i>Gallinula galeata</i>	Common Gallinule			x					S4B					X			R	level 4	
Bird	<i>Chordeiles minor</i>	Common Nighthawk			x				x	S4B	Schedule 1	THR	SC		X			R	level 2	
Bird	<i>Corvus corax</i>	Common Raven							x	S5				P			X			marsh
Bird	<i>Carduelis flammea</i>	Common Redpoll							x	S4B					X					
Bird	<i>Sterna hirundo</i>	Common Tern							x	S4B					X			C	level 4	marsh
Bird	<i>Geothlypis trichas</i>	Common Yellowthroat							x	S5B					X			C		marsh
Bird	<i>Accipiter cooperii</i>	Cooper's Hawk							x	S4				P		X (dense Carolinian forest habitat >50ha)	X	R	level 3	
Bird	<i>Junco hyemalis</i>	Dark-eyed Junco							x	S5B					X					
Bird	<i>Phalacrocorax auritus</i>	Double-crested Cormorant							x	S5B								A		marsh
Bird	<i>Picoides pubescens</i>	Downy Woodpecker					x		x	S5					X			C		marsh
Bird	<i>Sialia sialis</i>	Eastern Bluebird							x	S5B					X			U	level 1	marsh
Bird	<i>Tyrannus tyrannus</i>	Eastern Kingbird							x	S4B					X			A	level 3	forest
Bird	<i>Sturnella magna</i>	Eastern Meadowlark		x	x	x			x	S4B	Schedule 1	THR	THR		X	X (open grasslands >10ha)		C	level 3	forest
Bird	<i>Savornis phoebe</i>	Eastern Phoebe							x	S5B					X			U	level 3	

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Bird	<i>Megascops asio</i>	Eastern Screech-Owl							x	S4				P				U		marsh
Bird	<i>Pipilo erythrophthalmus</i>	Eastern Towhee							x	S4B					X			U	level 2	forest
Bird	<i>Antrostomus vociferus</i>	Eastern Whip-poor-will			x					S4B	Schedule 1	THR	THR		X	X (dry, open forests >100ha)		R	level 2	forest
Bird	<i>Contopus virens</i>	Eastern Wood-Pewee							x	S4B	Schedule 1	SC	SC		X			C		forest
Bird	<i>Sturnus vulgaris</i>	European Starling	x				x		x	SNA								I; A		forest
Bird	<i>Coccothraustes vespertinus</i>	Evening Grosbeak							x	S4B	Schedule 1	SC	SC		X					forest
Bird	<i>Spizella pusilla</i>	Field Sparrow							x	S4B					X			C	level 3	
Bird	<i>Passerella iliaca</i>	Fox Sparrow							x	S4B					X					open country
Bird	<i>Anas strepera</i>	Gadwall			x					S4					X			R	level 2	
Bird	<i>Regulus satrapa</i>	Golden-crowned Kinglet							x	S5B					X		X	R	level 2	marsh
Bird	<i>Vermivora chrysoptera</i>	Golden-winged Warbler		x	x					S4B	Schedule 1	THR	SC		X			R	level 1	marsh
Bird	<i>Ammodramus savannarum</i>	Grasshopper Sparrow							x	S4B			SC		X	X (>10ha grassland)		U	level 3	marsh
Bird	<i>Dumetella carolinensis</i>	Gray Catbird							x	S4B					X			A		marsh
Bird	<i>Catharus minimus</i>	Gray-cheeked Thrush							x	S4B					X					
Bird	<i>Larus marinus</i>	Great Black-backed Gull							x	S2B					X			R		
Bird	<i>Ardea herodias</i>	Great Blue Heron							x	S4					X			U		
Bird	<i>Myiarchus crinitus</i>	Great Crested Flycatcher							x	S4B					X			C		marsh
Bird	<i>Ardea alba</i>	Great Egret							x	S2B					X					
Bird	<i>Bubo virginianus</i>	Great Horned Owl							x	S4				P				U		
Bird	<i>Anas crecca</i>	Green-winged Teal			x				x	S4					X			R		open country
Bird	<i>Picoides villosus</i>	Hairy Woodpecker							x	S5					X	X (forests with tall trees/snags >25cm)		U		
Bird	<i>Catharus guttatus</i>	Hermit Thrush							x	S5B					X	X (100ha of forest)	X			
Bird	<i>Larus argentatus</i>	Herring Gull							x	S5B, S5N					X			C		
Bird	<i>Lophodytes cucullatus</i>	Hooded Merganser		x	x					S5B,S5N					X			R	level 4	
Bird	<i>Setophaga citrina</i>	Hooded Warbler		x	x					S4B					X		X	R	level 1	
Bird	<i>Eremophila alpestris</i>	Horned Lark							x	S5B					X			C	level 3	
Bird	<i>Haemorhous mexicanus</i>	House Finch							x	SNA					X			I; A		marsh
Bird	<i>Passer domesticus</i>	House Sparrow	x				x		x	SNA								I; A		forest
Bird	<i>Troglodytes aedon</i>	House Wren							x	S5B					X			C		marsh
Bird	<i>Passerina cyanea</i>	Indigo Bunting							x	S4B					X			C		
Bird	<i>Geothlypis formosus</i>	Kentucky Warbler		x						SNA					X			R		
Bird	<i>Charadrius vociferus</i>	Killdeer							x	S5B,S5N					X			A		
Bird	<i>Ixobrychus exilis</i>	Least Bittern			x	x				S4B	Schedule 1	THR	THR		X	X (habitat loss, human disturbance)		R	level 1	marsh
Bird	<i>Empidonax minimus</i>	Least Flycatcher							x	S4B					X	X (open habitat >100ha)		U		
Bird	<i>Melospiza lincolni</i>	Lincoln's Sparrow							x	S5B					X					forest
Bird	<i>Lanius ludovicianus Eastern subspecies</i>	Loggerhead Shrike							x	S2B	No Schedule		END		X	X (habitat fragmentation, needs 25ha)		EXT	level 1	open country
Bird	<i>Parkesia motacilla</i>	Louisiana Waterthrush		x		x			x	S3B	Schedule 1	THR	THR		X			R	level 1	
Bird	<i>Setophaga magnolia</i>	Magnolia Warbler		x					x	S5B					X	X (30ha forest with dense shrubs)		R	level 1	
Bird	<i>Anas platyrhynchos</i>	Mallard							x	S5					X			C		
Bird	<i>Falco columbarius</i>	Merlin			x				x	S5B				P						
Bird	<i>Zenaidura macroura</i>	Mourning Dove					x		x	S5					X			A		forest
Bird	<i>Geothlypis philadelphia</i>	Mourning Warbler							x	S4B					X			U	level 2	open country
Bird	<i>Cygnus olor</i>	Mute Swan							x	SNA					X			I; R		forest
Bird	<i>Oreothlypis ruficapilla</i>	Nashville Warbler				x			x	S5B					X			U	level 2	forest
Bird	<i>Colinus virginianus</i>	Northern Bobwhite								S1	Schedule 1	END	END	G				I; R	level 1	forest
Bird	<i>Cardinalis cardinalis</i>	Northern Cardinal	x				x			S5								A		
Bird	<i>Colaptes auratus</i>	Northern Flicker	x						x	S4B					X			C		forest
Bird	<i>Circus cyaneus</i>	Northern Harrier		x					x	S4B				P		X (habitat size >30ha, loss)		R		forest
Bird	<i>Mimus polyglottos</i>	Northern Mockingbird					x		x	S4					X			U	level 1	
Bird	<i>Setophaga americana</i>	Northern Parula							x	S4B					X	X (100ha interior forest)				
Bird	<i>Anas acuta</i>	Northern Pintail			x				x	S5					X	X (habitat)		R		
Bird	<i>Stelgidopteryx serripennis</i>	Northern Rough-winged Swallow							x	S4B					X			C	level 2	
Bird	<i>Anas clypeata</i>	Northern Shoveler			x					S4					X			R		forest
Bird	<i>Lanius excubitor</i>	Northern Shrike							x	SNA					X					
Bird	<i>Parkesia noveboracensis</i>	Northern Waterthrush							x	S5B					X		X	C	level 2	forest
Bird	<i>Oreothlypis celata</i>	Orange-crowned Warbler							x	S4B					X					
Bird	<i>Icterus spurius</i>	Orchard Oriole							x	S4B					X			U	level 3	
Bird	<i>Pandion haliaetus</i>	Osprey			x				x	S5B				P				R	level 3	forest
Bird	<i>Seiurus aurocapilla</i>	Ovenbird							x	S4B					X	X (>70ha continuous forest)	X		level 4	forest
Bird	<i>Falco peregrinus/anatum/tundrius</i>	Peregrine Falcon							x	S3B	Schedule 1	SC	SC	P				R		open country
Bird	<i>Vireo philadelphicus</i>	Philadelphia Vireo							x	S5B					X					
Bird	<i>Podilymbus podiceps</i>	Pied-billed Grebe			x					S4B,S4N					X			R	level 2	
Bird	<i>Dryocopus pileatus</i>	Pileated Woodpecker							x	S5					X	X (40-260ha mature decid/mixed forest w/large diameter trees)	X	U	level 2	forest
Bird	<i>Spinus pinus</i>	Pine Siskin			x				x	S4B					X			EXT		
Bird	<i>Setophaga pinus</i>	Pine Warbler							x	S5B					X	X (15-30ha white pine forest)	X	U	level 3	
Bird	<i>Protonotaria citrea</i>	Prothonotary Warbler			x					S1B	Schedule 1	END	END		X	X (100ha flooded/swampy forest)		R	level 1	
Bird	<i>Haemorphous purpureus</i>	Purple Finch							x	S4B					X			R	level 3	
Bird	<i>Progne subis</i>	Purple Martin							x	S4B					X			U	level 2	
Bird	<i>Melanerpes carolinus</i>	Red-bellied Woodpecker							x	S4					X			U	level 1	open country
Bird	<i>Sitta canadensis</i>	Red-breasted Nuthatch							x	S5					X	X (10ha interior forest)	X	U	level 3	
Bird	<i>Vireo olivaceus</i>	Red-eyed Vireo							x	S5B					X		X	C		open country
Bird	<i>Melanerpes erythrocephalus</i>	Red-headed Woodpecker							x	S4B	Schedule 1	THR	SC		X			R	level 1	open country
Bird	<i>Buteo lineatus</i>	Red-shouldered Hawk							x	S4B				P		X (mature, dense forest >100ha)	X	R	level 1	
Bird	<i>Buteo jamaicensis</i>	Red-tailed Hawk							x	S5				P				C		forest
Bird	<i>Agelaius phoeniceus</i>	Red-winged Blackbird							x	S4								A		
Bird	<i>Larus delawarensis</i>	Ring-billed Gull							x	S5B,S4N					X			A		forest
Bird	<i>Columba livia</i>	Rock Pigeon	x						x	SNA								I; A		
Bird	<i>Pheucticus ludovicianus</i>	Rose-breasted Grosbeak							x	S4B					X			C		forest
Bird	<i>Buteo lagopus</i>	Rough-legged Hawk							x	S1B,S4N			NAR	P						marsh
Bird	<i>Regulus calendula</i>	Ruby-crowned Kinglet							x	S4B					X					forest
Bird	<i>Archilochus colubris</i>	Ruby-throated Hummingbird							x	S5B					X			U	level 3	forest
Bird	<i>Bonasa umbellus</i>	Ruffed Grouse							x	S4				G				U	level 3	open country
Bird	<i>Euphagus carolinus</i>	Rusty Blackbird							x	S4B	Schedule 1	SC	SC	P						forest

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Bird	<i>Antigone canadensis</i>	Sandhill Crane							x	S5B					X	X (wetlands >40ha, sensitive to nesting disturbance)				
Bird	<i>Passerculus sandwichensis</i>	Savannah Sparrow							x	S4B					X	X (>50ha grassland)		A	level 1	forest
Bird	<i>Piranga olivacea</i>	Scarlet Tanager							x	S4B					X	X (20ha mature forest)	X	U	level 2	forest
Bird	<i>Cistothorus platensis</i>	Sedge Wren			x					S4B					X			R	level 1	forest
Bird	<i>Accipiter striatus</i>	Sharp-shinned Hawk		x					x	S5				P		X (4ha dense canopy, forest habitat >30ha)		R	level 3	open country
Bird	<i>Plectrophenax nivalis</i>	Snow bunting							x	SNA					X					
Bird	<i>Vireo solitarius</i>	Blue-headed vireo		x					x	S5B					X	X (100ha of conif/mixed forest)	X	R	level 3	forest
Bird	<i>Melospiza melodia</i>	Song Sparrow					x		x	S5B					X			A		
Bird	<i>Actitis macularius</i>	Spotted Sandpiper							x	S5					X			C	level 3	
Bird	<i>Catharus ustulatus</i>	Swainson's Thrush							x	S4B					X		X			forest
Bird	<i>Melospiza georgiana</i>	Swamp Sparrow							x	S5B					X			C	level 2	forest
Bird	<i>Oreothlypis peregrina</i>	Tennessee Warbler							x	S5B					X					forest
Bird	<i>Tachycineta bicolor</i>	Tree Swallow							x	S4B					X			A		
Bird	<i>Baeolophus bicolor</i>	Tufted Titmouse		x	x				x	S4					X	X (4ha shrub/sapling growth near water)		R	level 3	forest
Bird	<i>Cygnus columbianus</i>	Tundra Swan							x	S4					X					forest
Bird	<i>Cathartes aura</i>	Turkey Vulture							x	S5B				P				U	level 3	
Bird	<i>Catharus fuscescens</i>	Veery							x	S4B					X	X (10ha young forest, habitat fragmentation)	X	C	level 3	
Bird	<i>Poocetes gramineus</i>	Vesper Sparrow							x	S4B					X			U	level 3	forest
Bird	<i>Vireo gilvus</i>	Warbling Vireo							x	S5B					X			C		forest
Bird	<i>Sitta carolinensis</i>	White-breasted Nuthatch							x	S5					X	X (10ha continuous forest)		C		forest
Bird	<i>Zonotrichia leucophrys</i>	White-crowned Sparrow							x	S4B					X					
Bird	<i>Zonotrichia albicollis</i>	White-throated Sparrow							x	S5B					X			U	level 2	forest
Bird	<i>Meleagris gallopavo</i>	Wild Turkey							x	S5				G				I; U		
Bird	<i>Empidonax traillii</i>	Willow Flycatcher							x	S5B					X			C		forest
Bird	<i>Phalaropus tricolor</i>	Wilson's Phalarope							x	S3B					X					
Bird	<i>Troglodytes hiemalis</i>	Winter Wren							x	S5B					X	X (30ha conif forest)	X	U	level 3	
Bird	<i>Aix sponsa</i>	Wood Duck							x	S5					X			U	level 4	
Bird	<i>Hylocichla mustelina</i>	Wood Thrush				x			x	S4B	Schedule 1	THR	SC		X		X	C	level 4	
Bird	<i>Setophaga palmarum palmarum</i>	Palm Warbler							x	S1B					X					
Bird	<i>Setophaga petechia</i>	Yellow Warbler							x	S5B					X			A		open country
Bird	<i>Empidonax flaviventris</i>	Yellow-bellied Flycatcher							x	S5B					X					
Bird	<i>Sphyrapicus varius</i>	Yellow-bellied Sapsucker							x	S5B					X	X (dry, second growth forests)		R	level 2	open country
Bird	<i>Coccyzus americanus</i>	Yellow-billed Cuckoo		x					x	S4B					X			R	level 3	open country
Bird	<i>Icteria virens virens</i>	Yellow-breasted Chat				x				S2B	Schedule 1	END	END		X			R	level 1	open country
Bird	<i>Setophaga coronata</i>	Yellow-rumped Warbler		x	x				x	S5B					X			R	level 4	
Invertebrates	<i>Euphyes conspicua</i>	Black Dash		x						S3								U		
Invertebrates	<i>Enallagma basidens</i>	Double-striped Bluet				x	x			S3										
Invertebrates	<i>Callophrys niphon</i>	Eastern Pine Elfin				x				S5								R		
Invertebrates	<i>Hylephila phyleus</i>	Fiery Skipper				x				SNA								R		
Invertebrates	<i>Feniseca tarquinius</i>	Harvester		x	x					S4								R		
Invertebrates	<i>Satyrium caryaevorus</i>	Hickory Hairstreak		x						S3								U		
Invertebrates	<i>Urbanus proteus</i>	Long-tailed Skipper			x					SNA										
Invertebrates	<i>Aglais milberti</i>	Milbert's Tortoiseshell		x						S5								R		
Invertebrates	<i>Danaus plexippus</i>	Monarch		x	x					S4B, S2N	Schedule 1	SC	SC	P				C		
Invertebrates	<i>Thorybes pylades</i>	Northern Cloudywing			x					S5								R		
Invertebrates	<i>Libellula semifasciata</i>	Painted Skimmer		x						S2										
Invertebrates	<i>Bombus affinis</i>	Rusty-patched Bumble Bee				x				S1	Schedule 1	END	END							
Invertebrates	<i>Aeshna mutata</i>	Spatterdock Darner		x						S1										
Invertebrates	<i>Papilio trailus</i>	Spicebush Swallowtail		x						S4				P				R		
Invertebrates	<i>Epieaschna heros</i>	Swamp Darner			x					S2S3										
Invertebrates	<i>Cordulegaster maculata</i>	Twin-spotted Spiketail		x						S4										
Invertebrates	<i>Arigomphus villosipes</i>	Unicorn Clubtail		x	x	x				S2S3										
Invertebrates	<i>Limenitis arthemis</i>	White Admiral		x						S5								U		
Mammals	<i>Eptesicus fuscus</i>	Big Brown Bat		x						S5				P				C		
Mammals	<i>Lasiurus borealis</i>	Eastern Red Bat			x					S4				P				C		
Mammals	<i>Lasiurus cinereus</i>	Hoary Bat		x						S4				P				C		
Mammals	<i>Cryptotis parva</i>	Least Shrew			x	x				SH				P				R		
Mammals	<i>Myotis lucifugus</i>	Little Brown Myotis		x						S4	Schedule 1	END	END	P				C		
Mammals	<i>Sciurpus vulgaris</i>	Gray Squirrel	x							S5B				C						
Mammals	<i>Glaucomys sabrinus</i>	Northern Flying Squirrel			x					S5				P		X (51-100ha continuous forest)	X	R		
Mammals	<i>Myotis septentrionalis</i>	Northern Myotis			x					S3	Schedule 1	END	END	P				C		
Mammals	<i>Sciurpus vulgaris</i>	Red Squirrel	x							S5				F				C		
Reptile	<i>Emdoidea blandingii</i>	Blanding's Turtle			x	x		x		S3	Schedule 1	THR	THR	P				R		
Reptile	<i>Storeria dekayi</i>	Dekay's Brown Snake						x		S5								C		
Reptile	<i>Thamnophis sirtalis sirtalis</i>	Eastern Gartersnake						x		S5								A		
Reptile	<i>Sternotherus odoratus</i>	Eastern Musk Turtle (Stinkpot Turtle)			x			x		S3	Schedule 1	SC	SC	P				R		
Reptile	<i>Thamnophis sauritus</i>	Eastern Ribbonsnake		x	x	x		x		S3	Schedule 1	THR	SC							
Reptile	<i>Lampropeltis triangulum</i>	Milksnake		x	x	x		x		S3	Schedule 1	SC		P				C		
Reptile	<i>Chrysemys picta marginata</i>	Midland Painted Turtle				x		x		S5				P				C		
Reptile	<i>Graptemys geographica</i>	Northern Map Turtle			x	x		x		S3	Schedule 1	SC	SC	P		X (aquatic corridors)		R		
Reptile	<i>Storeria occipitomaculata occipitomaculata</i>	Northern Red-bellied Snake		x	x			x		S5								U		
Reptile	<i>Nerodia sipedon sipedon</i>	Northern Watersnake		x	x			x		S5				P				U		
Reptile	<i>Trachemys scripta</i>	Pond Slider (red-eared slider)						x		SNA										
Reptile	<i>Diadophis punctatus</i>	Ring-necked Snake		x				x		S4										
Reptile	<i>Ophedryx vernalis</i>	Smooth Greensnake		x				x		S4				P				U		
Reptile	<i>Chelydra serpentina</i>	Snapping Turtle		x	x	x		x		S3	Schedule 1	SC	SC	G				C		
Reptile	<i>Apalone spinifera</i>	Spiny Softshell			x	x				S3	Schedule 1	END	END	P		X (intolerant of pollution, undisturbed corridors)		R		
Reptile	<i>Crotalus horridus</i>	Timber Rattlesnake				x				SX	Schedule 1	EXT	EXP					EXT		

Appendix B Photos

Photo Appendix



Photo 1: HD011 Pumping station at Alternative Site 1



Photo 2 Alternative Site 1



Photo 3: Coldwater Creek east of Alternative Site 1 (March 2022)



Photo 4: Alternative Site 4



Photo 5: Alternative Site 6



Photo 6: Alternative Site 8

Photo Appendix



Photo 7: Alternative 9



Photo 8: Coldwater Creek behind
alternative 8



Photo 9: Alternative Site 12



Photo 10: Alternative Site 19



Photo 11: South of Alternative Site 19,
buried watercourse