Environmental Impact Study and Tree Protection Plan

8100 Dorchester Road
Riverfront Secondary Plan
Commercial Core Lands

Niagara Falls, Ontario

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Issues and Revisions Registry

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Statement of Conditions

This Report / Study (the “Work”) has been prepared at the request of, and for the exclusive use of, GR (CAN) Investments Ltd. and its affiliates, the City of Niagara Falls, Niagara Region, and the Niagara Peninsula Conservation Authority (the “Intended Users”). No one other than the Intended Users has the right to use and rely on the Work without first obtaining the written authorization of GEI Consultants Ltd. and GR (CAN) Investments Ltd. GEI Consultants Ltd. expressly excludes liability to any party except the Intended Users for any use of, and/or reliance upon, the work.

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1. Introduction

GEI Consultants Ltd. (GEI) was retained to prepare an Environmental Impact Study (EIS) on behalf of GR (CAN) Investment Co. Ltd. for the proposed development of the lands at 8100 Dorchester Road within the Riverfront Secondary Plan area (herein referred to as the Subject Lands. These lands are also referred to as the Commercial Core (Blocks A01 to A06) Lands within the larger 195 ha Riverfront Secondary Plan area in Niagara Falls, Ontario (**Figure 1**, **Appendix A**). The Subject Lands are located within the Urban Limits of the City, generally north of the Welland River and east of the Ontario Power Generation Inc. (OPG) Chippawa Power Canal. The Study Area is bisected by the Conrail Drainage Ditch (Conrail Drain) and a railway line. South of the Commercial Core is the previously approved Riverfront Residential lands which currently remain in development.

1.1 Summary of Previous Studies

Portions of the Study Area have been referred to in Subwatershed Studies completed by the Niagara Peninsula Conservation Authority (NPCA). Pertinent background reference lands include the Lower Welland River Characterization report (NPCA 2011) and the South Niagara Falls Watershed Report (NPCA 2008). The NPCA Natural Areas Inventory reports also include useful technical summary reporting (2010), and the Study Area is part of a larger area described and assessed in the Niagara River Corridor Conservation Action Plan (Jalava et al. 2010).

The broader Riverfront Secondary Plan Area was evaluated through a series of baseline ecological surveys from March through November 2015. Those investigations were summarized in preliminary reporting in late 2015 and finalized in a Characterization and Environmental Impact Study Report (Dougan & Associates 2015, 2016). Additional fieldwork was undertaken by Savanta Inc. (now GEI), and an Environmental Impact Study for the Riverfront Secondary Plan area was prepared in 2017 (Savanta 2017). In addition to these studies, components of Block A01-A06 were assessed within the approved EIS for the Riverfront Residential Lands (Savanta 2018, 2019a,b). This EIS is an update of these original reports and should be viewed in association with earlier reporting. It should also be viewed in association with other reports developed by the GR (CAN) Investment Co. Ltd. consulting team.

1.2 Purpose of the Current Study

This Environmental Impact Study (EIS) provides an ecological characterization of the natural features within and adjacent to the proposed development footprint and assesses their significance in accordance with the policies of the Provincial Policy Statement (PPS; MMAH 2020), the City of Niagara Falls, the Regional Municipality of Niagara (Niagara Region), and the Niagara Peninsula Conservation Authority (NPCA). The study components include the following:

- A review of existing natural heritage background information, policies, and legislation applicable to the Subject Lands in its regional context;

- A field review of the natural heritage features on the Subject Lands through the completion of ecological surveys and inventories;
- An evaluation of the sensitivity of the natural heritage features and associated functions on the Subject Lands;
- An assessment of whether any of the natural heritage features within the Subject Lands meet the test of “significant” as defined by the PPS or within the relevant official plans; and
- A description of the proposed undertaking and development proposal.

This information was used to assess the potential impacts of the proposed development on the natural heritage features and associated functions on the Subject Lands. This EIS also provides information on specific mitigation measures and outlines the proposed restoration plan for the Subject Lands. This EIS has been prepared in accordance with the Terms of Reference (TOR; **Appendix C**). The Terms of Reference was circulated for comment to the City of Niagara Falls and Niagara Region on April 14, 2023, and to the Niagara Peninsula Conservation Authority on May 3, 2023. No comments on the Terms of Reference have been received at this time.

2. Natural Heritage Planning Considerations

The Subject Lands are subject to municipal, provincial, and federal legislation as well as land use policies established by the City of Niagara Falls, Regional Municipality of Niagara, and the NPCA. GEI assessed the quality and extent of natural heritage features on the Subject Lands and the adjacent 120 m and evaluated potential impacts to these features from the proposed development in accordance with the following natural heritage planning documents:

- Provincial Policy Statement (2020);
- Niagara Region Official Plan (2022);
- City of Niagara Falls Official Plan (2019);
- Ontario Regulation 155/06;
- Endangered Species Act, 2007;
- Fisheries Act, 1985; and
- Migratory Birds Convention Act, 1994.

2.1 Provincial Policy Statement

The PPS (MMAH 2020) provides direction on matters of provincial interest related to land use planning and development. It “supports improved land use planning and management, which contributes to a more effective and efficient land use planning system.” The PPS is to be read in its entirety and land use planners and decision-makers need to consider all relevant policies and how they work together.

This EIS report addresses those policies that are specific to Natural Heritage (section 2.1) with some reference to other policies with relevance to Natural Heritage and impact assessment considerations and areas of overlap (e.g., those related to Efficient and Resilient Development and Land Use Patterns, section 1.1; Sewage, Water and Stormwater, section 1.6.6; Water, section 2.2; Natural Hazards, section 3.1).

Eight types of significant natural heritage features are defined in the PPS, as follows:

- Significant wetlands;
- Significant coastal wetlands;
- Significant woodlands;
- Significant valleylands;
- Significant wildlife habitat (SWH);
- Fish habitat;
- Habitat of Endangered and Threatened species; and
- Significant Areas of Natural and Scientific Interest (ANSIs).

Development and site alteration shall not be permitted in significant wetlands within Ecoregions 5E, 6E or 7E, or in significant coastal wetlands. Development and site alteration shall not be permitted in significant woodlands, significant valleylands, significant wildlife habitat, or significant ANSIs, unless it is demonstrated that there will be no negative impacts on the natural features or their ecological functions. Development and site alteration shall not be permitted in the habitat of endangered and threatened species or in fish habitat, except in accordance with provincial and federal requirements. Development and site alteration may be permitted on lands adjacent to fish habitat provided it has been demonstrated that there will be no negative impacts on the natural feature or their ecological functions.

2.2 Niagara Region Official Plan

Schedule A depicts the Subject Lands as being part of a Settlement Area, and not part of any Provincial Natural Heritage Systems. Schedule B (Regional Structure) of the Niagara Region Official Plan (2022) depicts the Subject Lands as being primarily located within a mixture of the Built-Up Urban Area Designation and the Designated Greenfield Designation. Schedule C2 (Natural Environment System) documents the presence of Other Woodlands, Provincially Significant Wetlands and Permanent and Intermittent Streams as Key Natural Heritage Features on or adjacent to the Subject Lands.

Development and site alteration shall not be permitted in Provincially Significant Wetlands, Significant Coastal Wetlands or Significant Woodlands (Section 3.1.9.5). Development and site alteration that is adjacent to a natural heritage feature shall require an EIS to determine that there will be no negative impacts on the natural features or their ecological functions in accordance with the adjacent lands' distances below:

- 120 m from a Provincially Significant Wetland;
- 120 m from a Significant Coastal Wetland;
- 120 m from a Significant Woodland;
- 50 m from Other Woodlands;
- 50 m from Significant Valleylands;
- 50 m from Significant Wildlife Habitat; and
- 50 m from areas of natural and scientific interest.

Development and site alteration shall not be permitted within the following natural heritage features and areas unless it has been demonstrated through the preparation of an EIS that there will be no negative impacts on the natural features or their ecological functions:

- Other woodlands;
- Significant valleylands;
- Significant wildlife habitat; and
- Areas of natural and scientific interest.

Within settlement areas, a mandatory buffer on all natural heritage features is required, the width of which is to be determined through an EIS (Section 3.1.9.9).

Policies in section 3.1.15 also address Supporting Features and Areas, which are lands that have been or have the potential of being restored that support adjacent natural heritage features and areas, and include non-significant wildlife habitats, valleylands, grasslands, thickets, meadows, and enhancement areas. Where present, supporting features and areas are to have their ecological function and relationship to the adjacent feature assessed, determine whether it should be protected, and conditions that may be attached to the approval of the proposed development.

Policies in section 3.1.16 addresses enhancement areas, which are areas that could be restored to increase the size, improve connectivity between, improve the shape of, or protect critical function zones and important catchment areas of natural heritage features and areas. Enhancement areas are to be assessed as a component of an EIS, and where it is recommended that they be identified, the area should be assessed for ecological benefit, identify the recommended shape, identify how the area could be designed in relationship to the development, and assess potential for compatible uses within the enhancement area.

Further to the above, it is noted that where a development is located within a secondary plan area that was approved after July 1, 2012, that the portions that are not subject to a draft approved plan of subdivision (such as the Subject Lands) shall be approved in accordance with the approved mapping and policies of the secondary plan (Section 3.1.30.4).

2.3 City of Niagara Falls Official Plan

As depicted within the City of Niagara Falls Official Plan (2019), the Subject Lands are located within the Riverfront Secondary Plan Area and Special Policy Area 56. Schedule A6 depicts the Commercial Core area as Mixed-Use with some Environmental Protection Areas. Schedule A6 (a) shows potential woodland removal areas within the Commercial Core, and locations of Provincially Significant Wetlands (Environmental Protection Areas).

Part 5 Section 4 – Riverfront Community Plan and Part 2 Section 13.56 – Special Policy Area 56 of the City of Niagara Falls Official Plan (2018) documents the development review procedures and policies of the City regarding the Subject Lands. Specifically, Part 2 Section 13.56.5 states that refinement to the extent of the Environmental Protection Area and other designations and the establishment of appropriate setbacks and linkages will occur at the Secondary Plan, zoning by-law, plan of subdivision, plan of condominium and site plan control stages and shall be based on detailed Environmental Impact Studies. Part 5 Section 4 also indicates the submission and approval of an Environmental Impact Study as required through the subdivision and development application process.

2.4 Niagara Peninsula Conservation Authority

NPCA administers the Development, Interference with Wetlands, Alterations to Shorelines and Watercourses Regulation, (O. Reg.) 155/06, which defines the areas of interest that allow NPCA to:

- Prohibit, regulate, or provide permission for straightening, changing, diverting or interfering in any way with the existing channel of a river, creek, stream, watercourse or changing or interfering with a wetland; and

- Prohibit, regulate, or provide permission for development if the control of flooding, erosion, dynamic beaches, pollution or the conservation of land may be affected by the development.

NPCA implements its authority under O.Reg. 155/06 in accordance with the NPCA Policy Document: Policies for the Administration of Ontario Regulation 155/06 and the Planning Act (NPCA 2022).

2.5 Ontario *Endangered Species Act, 2007*

The provincial *Endangered Species Act, 2007* (ESA 2007) was developed to:

- Identify species at risk, based upon best available science;
- Protect species at risk and their habitats and to promote the recovery of species at risk; and
- Promote stewardship activities that would support those protection and recovery efforts.

The ESA 2007 protects all threatened, endangered and extirpated species listed on the Species at Risk in Ontario (SARO) list. These species are legally protected from harm or harassment and their associated habitats are legally protected from damage or destruction, as defined under the ESA 2007.

2.6 Fisheries Act, 1985

Fisheries and Oceans Canada (DFO) administers the federal *Fisheries Act, 1985* (amended 2019), which defines fish habitat as “spawning grounds and other areas, including nursery, rearing, food supply, and migration areas, on which fish depend directly or indirectly in order to carry out their life processes” [subsection (2)1]. The *Fisheries Act* prohibits the death of fish by means other than fishing [subsection 34.4 (1)] and the harmful alteration, disruption, or destruction of fish habitat [HADD; subsection 35. (1)]. A HADD is defined as “any temporary or permanent change to fish habitat that directly or indirectly impairs the habitat’s capacity to support one or more life processes”.

Some projects may be eligible for exemption from the DFO review process, as specified under Step 3 of the DFO Fish and Fish Habitat Protection Program review process. Examples of exemptions include clear-span bridges and bridge maintenance projects where DFO mitigation measures are applied, artificial waterbodies with no hydrological connection to occupied fish habitat, and projects that follow the Standards and Codes of Practice defined by DFO.

All other projects or activities that have the potential to impact fish or fish habitat should be submitted to DFO through the “Request for Review” process. DFO will review the proposed project to determine whether there is potential to:

I. impact an aquatic species at risk;
II. cause the death of fish; or
III. result in HADD of fish habitat.

The death of fish by means other than fishing or a HADD of fish habitat can be authorized by DFO under paragraphs 34.4(2)(b) or 35(2)(b) of the *Fisheries Act*. Authorizations require the preparation and submission of an application package identifying the impacts on fish and fish habitat; the avoidance, mitigation, and offsetting measures that will be implemented; and any monitoring that is proposed.

2.7 Migratory Bird Convention Act, 1994

Environment and Climate Change Canada (ECCC) administers the *Migratory Birds Convention Act, 1994* (amended 2017), which protects the nests of migratory bird species from destruction, including incidental take (i.e., the unintentional destruction of a nest), as well as from disturbance. In its application, it requires best management practices to detect and avoid disturbance to active nests during development activities. The *Migratory Birds Convention Act* does not provide a set date where activities, such as tree removal, can be completed without the risk of incidental harm to the nests of birds. The requirement to ensure that there are no bird nests present within the work area rests with the proponent of the activity.

3. Data Collection Approach and Methodology

For the purposes of this EIS, GEI studied the Subject Lands, and the adjacent 120 m. GEI assessed the significance and sensitivity of the natural heritage features and associated functions through a combination of background information review and field studies.

3.1 Background References

GEI reviewed previous reports and existing background information to gather data on the Subject Lands' existing natural heritage features and associated functions. Previous reports reviewed include the following:

- Preliminary Natural Heritage Characterization (Draft), Thundering Waters Secondary Plan (Dougan & Associates 2015);
- Characterization and Environmental Impact Study, Thundering Waters Secondary Plan (Dougan & Associates 2016);
- Response to Peer Review Comments (Dougan & Associates 2016);
- Environmental Impact Study (Savanta 2017); and
- Environmental Impact Study Addendum, Riverfront Community OPA (Savanta 2018)
- Environmental Impact Study – Riverfront Residential Lands (Savanta 2019a)
- Environmental Impact Study Addendum – Riverfront Residential (Savanta 2019b).

Other background information reviewed include the following:

- Ministry of Natural Resources and Forestry (MNRF) Land Information Ontario (LIO) Natural Heritage Areas mapping;
- Natural Heritage Information Centre (NHIC) database;
- Provincial wildlife atlases; and
- Fisheries and Oceans Canada's (DFO) Aquatic Species at Risk Map.

Figure 2 (**Appendix A**) illustrates the existing natural heritage features within the Subject Lands as described in the following subsections. The information gathered through background review was used to define field survey efforts and identify target species on and adjacent to the Subject Lands.

3.1.1 Ministry of Natural Resources and Forestry

The MNRF Information Gathering Form (IGF) pertaining to Species at Risk on, and adjacent to, the Subject Lands was submitted on January 23, 2018. The IGF identified several species that could have the potential to occur in the overall GR(Can) Land Holdings, including the following species listed as Endangered or Threatened on the SARO List:

- Acadian Flycatcher (*Empidonax virescens*);
- Dense Blazing Star (*Liatris spicata*);

- Kentucky Coffeetree (*Gymnocladus dioicus*);
- Eastern Small-footed Myotis (*Myotis leibii*);
- Little Brown Myotis (*Myotis lucifugusi*);
- Northern Myotis (*Myotis septentrionalis*); and
- Tri-coloured Bat (*Perimyotis subflavus*).

As per the Information Gathering Form, which was approved by MECP on November 5, 2021, the deciduous forest and swamp communities on and adjacent to the Commercial Core Lands are treated as maternity roosting habitat for Northern Myotis and Little Brown Myotis, with foraging habitat for those species and Eastern Small-footed Myotis identified within both locations. In addition, the larger deciduous swamp units northeast of the Commercial Core Lands were identified as potentially suitable habitat for Acadian Flycatcher.

3.1.2 Land Information Ontario Natural Heritage Areas

Based on the MNRF LIO (2023) Natural Heritage Areas geographic database, the primary natural heritage features of interest within the Subject Lands are units of the Niagara Falls Slough Forest Provincially Significant Wetland (PSW) complex and various woodland communities. It is noted that portions of the PSW complex were re-evaluated in 2023 and found to be not provincially significant, and the LIO mapping has been updated accordingly. Current mapping is shown within Figure 2.

3.1.3 Natural Heritage Information Centre

GEI accessed the NHIC database (MNRF 2023) to search for records of species at risk, provincially rare species (S1 to S3), and rare vegetation communities within the Subject Lands. The database provides occurrence data by 1 km x 1 km squares, which include areas outside of the Subject Lands. NHIC squares 17PH5368, 17PH5648, and 17PH5568 overlap the Subject Lands.

Several species records were returned, with the following species of interest noted:

- Species listed as Extirpated on the SARO List:
  - Timber Rattlesnake (*Crotalus horridus*).
- Species listed as Endangered or Threatened on the SARO List:
  - Northern Bobwhite (*Colinus virginianus*);
  - Eastern Meadowlark (*Sturnella magna*);
  - Eastern Pondmussel (*Ligumia nasuta*);
  - Pink Milkwort (*Polygala incarnata*) and
  - Round Hickorynut (*Obovaria subrotunda*).
- Species of Conservation Concern (i.e., listed as Special Concern on the SARO List or identified as an S1–S3 species):
  - Eastern Wood-Pewee (*Contopus virens*);
  - Wood Thrush (Hylocichla mustelina);
  - Tufted Titmouse (*Baeolophus bicolor*);
  - Grass Pickerel (*Esox americanus*);

- Greater Redhorse (Moxostoma valenciennesi);
- Biennial Gaura (*Oenothera gaura*);
- Schreber's Aster (*Eurybia schreberi*);
- Heart-leaved Tearthumb (*Persicaria arifolia*);
- Deer-tongue Panicgrass (*Dichanthelium clandestinum*);
- Churchmouse Threeawn Grass (*Aristida dichotoma*);
- Black Gum (*Nyssa sylvatica*); and
- Great Plains Ladies'-tresses (*Spiranthes magnicamporum*).

3.1.4 Ontario Breeding Bird Atlas

The Ontario Breeding Bird Atlas Data Summary: 2001–2005 (Birds Canada 2020) contains detailed information on the population and distribution status of birds in Ontario. The database provides occurrence data by 10 km x 10 km squares. The Subject Lands is located within the atlas square 17PH56, which was used to determine a potential bird species list for the area. The Subject Lands is a small component of the overall atlas square, and therefore all the bird species listed for this atlas square may not be found within the Subject Lands. Habitat type, availability, and size are all contributing factors to bird species presence and use.

A total of 96 bird species were recorded in atlas square 17PH56, with the following species of interest noted:

- Species listed as Endangered or Threatened on the SARO List:
  - Bobolink (*Dolichonyx oryzivorus*);
  - Chimney Swift (*Chaetura pelagica*); and
  - Eastern Meadowlark.
- Species of Conservation Concern (i.e., listed as Special Concern on the SARO List or identified as an S1–S3 species):
  - Barn Swallow (*Hirundo rustica*);
  - Eastern Wood-Pewee;
  - Grasshopper Sparrow (*Ammodramus savannarum*);
  - Purple Martin (*Progne subis*); and
  - Wood Thrush.

3.1.5 Ontario Reptile and Amphibian Atlas

The Ontario Reptile and Amphibian Atlas (Ontario Nature 2023) contains detailed information on the population and distribution status of reptiles and amphibians in Ontario. The database provides occurrence data by 10 km x 10 km squares. The Subject Lands is located within the atlas square 17PH56, which was used to determine a potential reptile and amphibian species list for the area. The Subject Lands is a small component of the overall atlas square, and therefore all the reptile and amphibian species listed for this atlas square may not be found within the Subject Lands. Habitat type, availability, and size are all contributing factors to reptile and amphibian species presence and use.

A total of 20 reptile and amphibian species were recorded in atlas square 17PH56, including five turtle species, five snake species, eight frog and toad species, and two salamander species. The following species of interest were noted:

- Species listed as Endangered or Threatened on the SARO List:
  - Blanding's Turtle (*Emydoidea blandingii*).
- Species of Conservation Concern (i.e., listed as Special Concern on the SARO List or identified as an S1–S3 species):
  - Eastern Musk Turtle (*Sternotherus odoratus*);
  - Northern Map Turtle (*Graptemys geographica*);
  - Snapping Turtle (*Chelydra serpentina*); and
  - Eastern Ribbonsnake (*Thamnophis sauritus*).

3.1.6 Ontario Butterfly and Moth Atlases

The Ontario Butterfly and Moth Atlases (Toronto Entomologists' Association 2023a, 2023b) contain detailed information on the population and distribution status of butterflies and moths in Ontario. The database provides occurrence data by 10 km x 10 km squares. The Subject Lands is located within the atlas square 17PH56, which was used to determine a potential butterfly and moth species list for the area. The Subject Lands is a small component of the overall atlas square, and therefore all the butterfly and moth species listed for this atlas square may not be found within the Subject Lands. Habitat type, availability, and size are all contributing factors to reptile and amphibian species presence and use.

A total of 32 butterfly species and 11 moth species were recorded in atlas square 17PH56. Of these reported species, one is a species of Conservation Concern (i.e., listed as Special Concern on the SARO List or identified as an S1–S3 species): Monarch (*Danaus plexippus*).

3.1.7 Aquatic Species at Risk Map

The DFO Aquatic Species at Risk Map (2023) was reviewed to identify any known occurrences of aquatic SAR, including fish and mussels, within or adjacent to the Subject Lands. No aquatic species are risk occurrences were noted within the watercourses on the Subject Lands.

Spotted Sucker (*Minytrema melanops*), identified as Special Concern in Ontario and Canada, was noted as potentially being present within the Welland River upstream from the OPG Power Canal. Grass Pickerel, which is also a Special Concern species in Ontario and Canada was identified as potentially being present in Grassy Brook, which discharges to the Welland River south of the Subject Lands.

3.2 Technical Methods and Field Studies

GEI completed ecological field studies on the Subject Lands in 2020 and 2023.

These studies consisted of the characterization of the vegetation communities, spring botanical inventory, surveys for breeding birds, calling amphibians, basking turtles, snakes, aquatic habitat assessment and fisheries surveys.

Incidental observations of wildlife or evidence of their presence (e.g., tracks, scat, and nests) were recorded during all field surveys. Individual field surveys dates are provided in **Table 1** (**Appendix B**).

3.2.1 Vegetation Survey Methods

In 2023, a spring and summer botanical inventory was completed within the Commercial Core Lands. A fall botanical inventory is also planned to be completed later in 2023.

Existing Ecological Land Classification (ELC; Lee et al. 1998) mapping was completed by Dougan & Associates in 2015 and 2016 and refined by GEI in subsequent years as identified through previous studies. Wetland boundaries of the small non-provincially significant wetlands were confirmed during site investigations completed in July 2023, and reviewed on site with Niagara Region and Niagara Peninsula Conservation Authority

Woodland canopy review was subject to further study as outlined below.

Woodland and Canopy Cover Analysis

The purpose of this exercise was to identify and quantify tree canopy cover through drone imagery analysis. Applied definitions of tree canopy cover are derived from Lee et al (1998) – Ecological Land Classification (ELC) for Southern Ontario.

ELC in Ontario subdivides the vertical structure of vegetation into four categories: canopy, subcanopy, understory, and ground cover. In woodland communities, trees constitute the canopy and are described as:

- Forest (>60% canopy cover);
- Cultural Woodland (36-60% canopy cover); and
- Cultural Savannah (25-35% canopy cover)

Traditional survey methods require the surveyor to visually estimate canopy cover percent, which can sometimes be a difficult task to do accurately. Surveyors must determine the height range of woody cover that constitutes the canopy and estimate percent-cover while excluding lower woody strata, such as the subcanopy and understory. This task can be simple in traditional mature forests but becomes complex when maturity and/or coverage varies.

Recognizing the subjectivity associated with visually estimating canopy cover, GEI developed an objective approach to quantifying the canopy cover. The approach was to generate a 3D model of the feature, identify pixels representing a specified elevation and then quantify those pixels relative to the area of a specified ELC polygon.

To achieve this, a drone flight was completed on June 19, 2023, in both the east and west Study Areas. Five ground control points were used to improve horizontal and vertical accuracy; these were positioned at varying topographic positions in the Study Area and were mapped using a submeter GPS. A drone flight path was prepared using Drone Deploy software. A 3D model of each Study Area was then prepared in Drone Deploy using a process known as Structure from Motion. This data served as the Digital Surface Model (DSM), representing the heights of natural and anthropogenic objects on the landscape.

To calculate height values, a Digital Terrain Model (DTM) of the Study Areas was obtained from the MNRF, which provided baseline terrain elevation values. Feature heights were calculated by subtracting the DSM from the DTM. To supplement this data, height measurements of objects in the Study Areas were also taken using a clinometer. This data was collected on June 16, 2023. The objects measured included predominantly canopy trees, but also shrubs and taller herbaceous species, such as European Reed.

The end result of this process shows the drone-derived basemap and delineations of canopy based on a predetermined height threshold. The height thresholds constitute canopy height minimums and are derived from clinometer measurements and field observations. As part of this process, multiple canopy height models are prepared (i.e., 8 m, 9 m, and 10 m) with the purpose of ensuring the output aligns with field observations and measurements; for these Study Areas, it was determined that the canopy height started at 8 m. This height was chosen because it most accurately accounts for the transition from subcanopy to canopy. Many of the tall shrubs, such as European Buckthorn (*Rhamnus cathartica*) and Hawthorn (*Crataegus* spp.) were reaching heights of ± 8 m.

Based on the results of the woodland canopy analysis, ELC limits within the Commercial Core Lands were updated.

3.2.2 Wildlife Survey Methods

Breeding Birds

GEI conducted breeding bird surveys on the Subject Lands following the protocols of the Atlas of the Breeding Birds of Ontario 2001–2005 (Cadman et al. 2007) and the Ontario Forest Bird Monitoring Program (Cadman et al., 1998). Surveys were conducted during the peak breeding season on June 9 and June 30, 2020, in the Commercial Core Lands. These survey dates were chosen to ensure favourable weather conditions, without thick fog or precipitation and wind speeds generally below 19 km/h. Surveys were completed between dawn and five hours after dawn. Point-count stations were selected (**Figure 3**, **Appendix A**) in different habitat types within the Subject Lands and combined with area searches to help determine the presence, variety, and abundance of bird species. Each point count station was surveyed for 10 minutes for birds within 100 m and beyond 100 m. All species recorded at a point count station were mapped to provide spatial information and were observed for signs of breeding behaviour.

Calling Amphibians

GEI conducted amphibian call count surveys for anurans (i.e., frogs and toads) on the Subject Lands following the Marsh Monitoring Program (MMP) methodology (Birds Studies Canada 2009). Surveys were conducted on warm nights with little wind, with the Commercial Core Lands surveyed on April 8, May 20, and June 11, 2020. In accordance with the protocols, the first survey round was completed at a nighttime air temperature of 5°C or greater, the second round was completed at 10°C or greater, and the third round was completed at 15°C or greater. Surveys began half an hour before dusk and ended before midnight. Survey stations were identified based on previous survey efforts and a site reconnaissance survey conducted on April 8, 2020, in the Commercial Core Lands (**Figure 3**, **Appendix A**).

Each survey station was surveyed for three minutes and the MMP call level codes system was used to identify frog activity: Level 1 when calls are not simultaneous and calling individuals can be counted, Level 2 when some calls are simultaneous but individual calls are distinguishable and the number of individuals can be estimated, and Level 3 when calls are continuous and overlapping in a full chorus. If loud noise such as from plane, train, or road traffic was present, the three-minute monitoring period was delayed until a quieter period. Information recorded included the date and time of each calling survey, the air temperature, wind speed, degree of cloud cover, and level of precipitation if applicable.

Snake Visual Encounter

Three rounds of snake area search surveys and road mortality surveys were conducted using the MNRF's *Survey Protocol for Ontario's Species at Risk Snakes* (2016). Within the Commercial Core Lands, five areas were identified for area search surveys, and one transect was searched along Dorchester Road for road morality. Survey locations are shown on **Figure 3** (**Appendix A**). Surveys were completed during the spring emergence period (April to June), when the probability of observing snake species is higher. Surveys were conducted on mild spring mornings (minimum 8°C) between 8:00 AM and 2:00 PM, with sunny or overcast conditions. Surveys were completed in the Commercial Core Lands on April 24, May 2, and May 20, 2020.

Area search surveys were conducted by visually scanning the transect paths for snakes in various habitat types, where present, within the Subject Lands. Cover objects such as logs, rock and man-made debris were searched as well as open-canopy habitats for basking individuals, with particular attention to suitable hibernacula habitat (e.g., rocks, debris piles). Data recorded during snake surveys included species observed and locations (UTM coordinates), air temperature, start and end time, and weather conditions.

Basking Turtles

Potentially suitable aquatic habitat for turtles was identified in the Commercial Core Lands based on aerial photography and previous survey efforts (i.e., ponds, open wetlands, and riparian or lacustrine areas). Two ponds were identified, and one survey station was selected at each pond. Three rounds of spring turtle basking surveys were conducted at each station on April 24, May 2, and May 20, 2020. Surveys were conducted on sunny mornings between 8:00 AM and 12:00 PM, with low to no wind and air temperatures between 5°C and 20°C. Surveys were completed at a total of four stations, two at each of two ponds, as shown on **Figure 3** (**Appendix A**).

Binoculars were used to scan the edge and surface of each waterbody for basking turtles from a distance, for 30 minutes per station. Data recorded included water and air temperatures (basking is prevalent when the air is warmer than the water), water depth (measured an arm reach from shoreline), vegetation composition around the water body, percent slope leading to water edge, percentage of pond containing basking features (e.g., logs, floating vegetation mats, floating or emergent debris like tires), and percent canopy cover overhanging the pond.

Suitable ponds were not identified on the Industrial Lands, and so targeted Turtle Basking surveys were not completed.

Bats

Bat Habitat Assessment

A bat habitat assessment, consisting of a cavity density survey, was completed within the overall GR(Can) Land Holdings, including the Subject Lands. The surveys were completed using a combination of MNRF survey guidelines as outlined in “Bats and Bat Habitats: Guidelines for Wind Power Projects” (MNR 2011) and professional experience.

Areas to be surveyed were determined through the use of ELC mapping of the Subject Lands. Targeted ELC communities on the Subject Lands were Deciduous Forests (FOD) and Deciduous Swamp (SWD). For the purposes of these surveys, Cultural Woodlands (CUW) were also targeted as they can provide SAR bat habitat. In certain instances, Cultural Thicket (CUT) communities were also included where there was a standing-dead canopy layer of Ash trees, which provide potential habitat for Species at Risk bats. Cultural Woodlands and Cultural Thickets are not eligible vegetation types for bat significant wildlife habitat. Surveys were conducted during the leaf-off period on days when visibility was good. Each community that was surveyed was assigned a unique polygon identification number.

ELC communities greater than 1 ha in size were surveyed using a plot-based approach, which consisted of randomly selecting 10 or more plots within the community. Each plot had a radius of 12.6 m (0.05 ha) and a GPS waypoint was recorded at each plot center. Within each plot, all trees greater than or equal to 10 cm diameter at breast height (DBH) were visually inspected using binoculars to document any suitable roosting features (such as cavities, crevices, loose bark) along the trunk or large branches. Each tree containing suitable roosting features had the following information recorded: UTM, species, DBH, approximate height, decay class, canopy cover, total number of cavities and height information for the top three cavities. Each vegetation community that was surveyed also was photographed to give a representation of the habitat potential.

For all vegetation communities less than 1 ha, the entire community was surveyed using a transect approach, where transects were 5 m to 20 m apart (depending on visibility).

The results were then used to assess the quality of the area for bat maternity roost SWH and inform habitat potential for bat SAR. A minimum density of >10 suitable roosting trees with >25 cm DBH/ha is required for a feature to be considered candidate bat SWH, while there.

Habitat assessment polygons are shown on **Figure 3** (**Appendix A**).

Bat Acoustic Monitoring Surveys

Bat acoustic monitoring surveys enable, with reasonable certainty, the identification of bat species using analysis of sonographic characteristics from recordings of ultrasonic calls used by bat echolocate. Survey methods were developed based on professional experience and MNRF survey guidelines as outlined in “Bats and Bat Habitats: Guidelines for Wind Power Projects” (MNR 2011).

Surveys to detect bat species were carried out for candidate bat SWH polygons on and adjacent to the Subject Lands in June 2018. Additional surveys were completed at secondary stations in July in wooded areas beyond the 120 m adjacent lands to the site. Surveys to detect bat species in candidate SAR bat habitat polygons occurred in June, July and extended into August. Surveys were completed using Wildlife Acoustics Song Meter SM3BAT/SM4BAT recording devices over a duration of ten consecutive evenings. Passive bat recording stations were in areas inside and outside of the construction footprint to provide a complete understanding of the relative importance of the available habitats on the Subject Lands.

Survey stations were selected based on aerial interpretation, ELC vegetation community types, and ground-truthing for suitable bat micro-habitat such as clusters of ≥10 cm DBH trees with peeling bark, leaf clusters, and cavities. A total of 50 stations were identified on the Subject Lands. Stations were situated within and adjacent to the proposed development area as well as control stations in woodlands well beyond the Riverfront Residential Area, as requested by MNRF.

Passive acoustic recorders were programmed to begin recording at sunset and to end recording at sunrise. In addition, the SM3BAT/SM4BAT passive recorder microphones were elevated approximately 2 m above the ground to reduce background noise and echo. Acoustic Monitoring Stations are shown on **Figure 3** (**Appendix A**).

All ultrasonic recordings were filtered to eliminate recordings with high levels of noise and that contained no bat calls, and then further analyzed using SonoBat's auto-classification tool. Any calls with a positive identification were manually vetted by a wildlife ecologist with training in bat species identification by sonogram.

All species of bats can make calls that range in frequencies and sonogram characteristics, depending on the behavior at the time of call recording (i.e., social calls, foraging calls, feeding buzzes). Calls recorded during a bat's search phase are the most reliable for an accurate species identification, and these calls were used preferentially to identify recorded species from the Subject Lands. Calls can be classified as not identifiable by the program due to the high level of confidence needed when classifying recordings, quality of the calls, overlap of multiple bat calls, and/or too much environmental background noise). High frequency calls that were not identifiable to species were manually reviewed by a wildlife ecologist with training in bat species identification by sonogram to identify those calls with characteristics of Species at Risk bats (i.e., calls with frequencies greater than 40kHz). The four species of bats listed on the SARO list all show characteristics of high frequency calling within the search phase, and therefore are readily distinguished from most other species of bats.

3.2.3 Aquatic Survey Methods

Aquatic Habitat Assessment

Aquatic habitat assessments (AHA), consisting of visual assessments, were completed within the Conrail Drain in early spring (April 11, 2023) and late spring (May 16, 2023) to document fish habitat characteristics. Multiple assessments were completed to document habitat conditions resulting from a range of spring flows within these watercourses. During each assessment, stream characteristics such as morphology (e.g., riffles, runs, pools), bankfull and wetted channel

dimensions, channel bed and bank substrate, in-stream cover (e.g., woody debris, undercut banks), bank stability and instream and riparian vegetation communities were assessed to determine the overall fish habitat available within the system, as well as the suitability of habitat for providing a range of life cycle functions for the fish community. Tributary surface water drainage features were also assessed during the surveys.

Fish Community Survey

A fish community survey was completed within the Conrail Drain on June 6, 2023, to confirm the distribution and extent of direct fish habitat in these features, identify species diversity and relative abundance within and between sampling locations. Prior to commencing these surveys, GEI obtained a License to Collect Fish for Scientific Purposes from the MNRF.

Fish community sampling was completed using a Halltech HT-2000 backpack electrofisher and two D-frame dip nets with a 500-micron mesh size. Sampling was generally conducted along defined transects using the Ontario Stream Assessment Protocol standard single pass survey method (Stanfield 2017), although spot sampling (not along a defined transect) was completed at several locations to assess fish presence in targeted areas. Sampling locations are shown in **Figure 3** (**Appendix A**). The survey effort included one transect and two spot sampling locations in the Conrail Drain.

At each transect sampling location, the transect was first established in accordance with the guidance in Stanfield (2017). A minimum length of 40 m was used, although transects could be longer, depending on habitat conditions and cross-over locations. Once the transect was established, electrofishing commenced at the downstream end. Prior to sampling within the transect, testing was completed downstream from the transect to ensure that the electrofisher settings (voltage and frequency) were adequate to stun fish without overloading the unit or providing too much shock that could potentially injure fish. During electrofishing sampling, the crew slowly moved upstream through the transect, ensuring to sample all locations and following the effort guidance of Stanfield (2017). All fish captured during sampling were held in aerated buckets until sampling was completed. Processing included identifying each captured fish to species, enumerating all individuals, measuring the shortest and longest specimens of each species and bulk weighing by species. All fish were released back to the watercourse following process.

4. Biophysical Characterization

The Subject Lands are located within a naturally vegetated landscape, the primary natural heritage features being units of the Niagara Falls Slough Forest PSW complex. Other land uses on the broader landscape include residential, commercial, and industrial. The following subsections describe the biophysical baseline characteristics of the Subject Lands.

4.1 Physiography

The Subject Lands are situated in the Haldimand Clay Plain physiographic region (Chapman and Putnam 1984). The soils are characterized as being poorly drained, and the water table is usually located close to the surface until late spring. Surface cracking is common during dry periods. The surface horizon ranges from 15–20 cm deep and has a texture of clay loam to clay, while the subsoils are heavy clays.

4.2 Landscape Ecology

The Subject Lands occur within the Lake Erie-Lake Ontario Ecoregion 7E, which extends from Windsor and Sarnia east to the Niagara Peninsula and Toronto, with shoreline on Lakes Huron, Erie, and Ontario. Ecoregion 7E is within the Deciduous Forest Region in the Great Lakes Watershed. This is an area of mild climate where remnants of Carolinian forests can still be found and where deciduous species such as Sugar Maple (*Acer saccharum*), American Beech (*Fagus grandifolia*), and White Ash (*Fraxinus americana*) dominate, but can be found with associations with coniferous species such as Eastern Hemlock (*Tsuga canadensis*) and Eastern White Pine (*Pinus strobus*). A variety of locally rare species are also known to occur in the vicinity of the Subject Lands, including Black Gum (*Nyssa sylvatica*) and Pignut Hickory (*Carya glabra*).

Consideration of the larger ecological matrix or landscape contributes to a better understanding of potential ecological linkages between natural heritage areas. The Subject Lands are predominantly naturally vegetated, and they form part of a larger terrestrial linkage feature across the landscape. In terms of aquatic linkages, the Conrail Drain, a deep, straight, artificial channel lined with riprap, runs through the Subject Lands and flows into the Chippawa Power Canal located 100 m west of the Subject Lands.

4.3 Vegetation

Existing ELC mapping was completed by Dougan & Associates in 2015 and 2016 and refined by GEI in subsequent years. Since the original ELC assessment and refinements, landscape changes to tree cover have continued to occur resulting presence of Emerald Ash Borer (EAB; *Agrilus planipennis*), which has led to extensive Ash (*Fraxinus* sp.) dieback, as well as the continued spread of invasive species within the area.

Woodlands

Analysis of data collected through the drone survey has determined that in some areas, woodland communities have grown from previous reporting, while in others, canopy cover is insufficient to meet the definition of a woodland community. Updated ELC mapping, showing limits of woodlands, is provided on **Figure 4 (Appendix A)**.

Wetlands

Four wetland communities (**Figure 4; Appendix A**) are found within the limits of the Commercial Core lands and reflects some changes from the prior mapping of wetland communities (**Figure 2; Appendix A).** Changes are are discussed below:

- SWT2-8: This small Silky Dogwood Mineral Deciduous Thicket Swamp was added near the FOD community within the Subject Lands.
- SWD: This Deciduous Swamp (SWD) community likely exists due to its location next to the main trail line and former tracks, which have resulted in impeded drainage due to high embankments. Mapping of the feature limits in 2023 confirmed that the feature size is now smaller.
- An area formerly identified as a swamp thicket adjacent to Dorchester Road now no loner meets the criteria to be considered a wetland and is now mapped as a Cultural Thicket.
- SWD4-2: Formerly mapped as two separate communities, this community has been confirmed to be connected and is now mapped as such. There is a small component of Buttonbush within this community, however it was previously noted that the Buttonbush is being crowded out by Gray Dogwood, and that has continued to the point where mapping of a distinct Buttonbush community is no longer warranted. In addition to these wetland units, there are three evaluated non-provincially significant wetlands, and two components of the provincially significant wetland present within the adjacent lands.

4.4 Wildlife

GEI observed a variety of wildlife species on the Subject Lands during field surveys, as described in the following subsections. Locally significant wildlife species were determined based on the Niagara Peninsula Conservation Authority's *Natural Areas Inventory 2006–2009: Volume 2* (NPCA 2010) and NHIC S-Ranks (2022). A complete list of wildlife species is provided in **Table 2** (**Appendix B**).

Where relevant, Commercial Core and Industrial Lands are addressed separately.

4.4.1 Birds

A total of 39 bird species were observed within the Commercial Core Lands. Of this total, two species are confirmed, 21 are probable, and nine are possible breeders on the Commercial Core Lands. The remaining seven bird species are considered non-breeders, flyovers, or migrants. One additional species was observed only on surrounding lands within 120 m. The observed breeding bird species are discussed in the sections below. All species observed on the Commercial Core Lands are listed in **Table 3** (**Appendix B**).

All 32 (100%) of the confirmed, probable, or possible breeders are provincially ranked S5 (common and secure), S4 (apparently common and secure), or SNA (species not native to Ontario). None of the observed bird species are considered provincially rare (S1–S3) by the NHIC (2023).

The following locally rare or uncommon bird species (NPCA 2010) were observed on or adjacent to the Commercial Core Lands:

- Wild Turkey (*Meleagris gallopavo*; uncommon);
- Yellow-billed Cuckoo (*Coccyzus americanus*; uncommon);
- Great Egret (*Ardea alba;* rare);
- Northern Rough-winged Swallow (*Stelgidopteryx serripennis*; uncommon);
- Wood Thrush (uncommon);
- Brown Thrasher (*Toxostoma rufum*; uncommon);
- Field Sparrow (*Spizella pusilla*; uncommon);
- Eastern Towhee (*Pipilo erythrophthalmus*; uncommon);
- Orchard Oriole (*Icterus spurius*; uncommon-rare); and
- Blue-winged Warbler (*Vermivora cyanoptera*; uncommon).

The following bird species of conservation concern were observed on or adjacent to the Commercial Core Lands:

- Barn Swallow (Special Concern): Several individuals were observed in flight over the subject lands. No suitable nesting structures were observed within the Commercial Core Lands. It is presumed that these birds likely were associated with nesting sites outside of the Subject Lands.
- Wood Thrush (Special Concern): Singing males were detected during the surveys. The large provincially significant wetland appears to provide the optimal habitat for the species, through individuals were also observed outside of this feature.

4.4.2 Anurans

A total of seven anuran (i.e., frog and toad) species were recorded at five of the six survey stations within the Commercial Core Lands during the 2020 calling amphibian surveys, two of these species were also heard outside of the Subject Lands on adjacent lands:

- American Toad (*Anaxyrus americanus*);
- American Bullfrog (*Lithobates catesbeianus*);
- Gray Treefrog (*Hyla versicolor*);
- Green Frog (*Rana clamitans*);
- Western Chorus Frog (*Pseudacris triseriata*);
- Spring Peeper (*Pseudacris crucifer*); and
- Wood Frog (Lithobates sylvaticus).

These species are all provincially ranked S5 (common and secure) or S4 (apparently common and secure by the NHIC (2020a) and are considered widespread by the NPCA (2010). Detailed results of the calling amphibian surveys are provided in **Table 4** (**Appendix B**).

4.4.3 Snakes

A total of two snake species were recorded within two of the areas searched within the Subject Lands during the 2020 visual encounter surveys:

- DeKay's Brownsnake (*Storeria dekayi*); and
- Eastern Gartersnake (*Thamnophis sirtalis sirtalis*).

A third species, Eastern Milksnake (*Lampropeltis triangulum*) was observed outside the Subject Lands on the railway tracks. No snakes were observed along the Dorchester Road transect, which was identified in previous years as a wildlife crossing area. This decreased road mortality and therefore lack of observations during the 2020 field surveys was likely attributable to decreased traffic as a result of the ongoing pandemic. One potentially suitable hibernacula feature is present within AS1, a depression caused by the presence of an old building foundation, with cervices and holes allowing access below the frostline. However, this feature has been targeted for survey efforts in years previous with no evidence of it's use as overwintering habitat for snake species, survey efforts this year yielded the same results, with only one Eastern Gartersnake observed in AS1 approximately 50 m away from the feature.

The observed species are all provincially ranked S5 (common and secure) or S4 (apparently common and secure by the NHIC (2020a). The two species observed on the Subject Lands are considered widespread by the NPCA (2010), and Eastern Milksnake is considered localized (i.e., not widely distributed, but not of local conservation concern). Detailed results of the snake visual encounter surveys are provided in **Table 5** (**Appendix B**).

4.4.4 Turtles

Despite three rounds of basking turtle surveys at two survey stations in the Commercial Core Lands, GEI did not observe any turtles on the Subject Lands during the 2020 field surveys. Detailed results of the basking turtle surveys are provided in **Table 6** (**Appendix B**).

4.4.5 Bats

Based on the bat habitat assessments, suitable bat maternity roosting habitat is present throughout the landscape. The results of the habitat assessment as they relate to significant wildlife habitat (SWH) and SAR habitat are discussed in sections 5.4 and 5.6, respectively.

Seven bat species were confirmed to be present through acoustic call surveys on the Subject Lands: Big Brown Bat *(Eptesicus fuscus),* Silver-haired Bat *(Lasionycteris noctivagans),* Hoary Bat *(Lasiurus cinereus*), Eastern Red Bat (*Lasiurus borealis*), Little Brown Myotis *(Myotis lucifugus),* Northern Myotis (*Myotis septentrionalis*) and Eastern Small-footed Myotis (*Myotis leibii).* The three Myotis species identified above are all listed as Endangered on the SARO list.

4.5 Aquatics

4.5.1 Aquatic Habitat Assessment Results

The Conrail Drain originates approximately 2.5 km upstream from the Subject Lands and discharges into the OPG Power Canal approximately 100 m downstream from the Dorchester Road culvert. The AHA was completed over an approximately 715-m long stretch of the Conrail Drain upstream from the culvert at Dorchester Road. In general, the Conrail Drain is a wide and deep linear excavated drain with a small low flow channel in the bottom. The top width and depth of the excavated drain are approximately 23 m and 5-10 m, respectively. The bottom of the drain is nearly entirely rip rap-lined while the side slopes consist of soil and varying densities of vegetation, primarily meadow, with some low shrub growth.

The Dorchester Road culvert consists of an approximately 5-m diameter, open bottom corrugated steel pipe arch structure. The invert of the culvert contained water during each of the surveys and doesn't appear to be a barrier to upstream fish movement. However, the upstream face of the culvert consists of a steel grate, which had collected a substantial amount of debris including vegetation, wood and garbage. The section of the drain downstream from the culvert could not be accessed due to lack of property access.

The drain was observed to be flowing during both the April and May 2023 sampling events. Based on the presence of fish during the fish community survey in early June 2023, it is expected that the drain retains at least some water throughout the year. The April 2023 survey occurred after peak freshet flows. Based on deposited mud on the rip rap in the drain, it was estimated that peak flow dimensions within the drain were approximately 5 m wide and 1 m in depth. The low flow channel in the bottom of the drain varied in wetted dimensions between the April and May 2023 surveys. In April, wetted width generally ranged from 1.4 to 2.4 m with one area being approximately 4 m. Wetted depth in April ranged from 0.12 to 0.35 m. Low flow channel bankfull dimensions were difficult to assess due to the constructed nature of the drain, but where a bankfull channel was evident (generally artificially constructed out of rip rap) it generally ranged from 2.5 to 4.5 m in width and 0.80 to 1.0 m in depth.

Flows had decreased by the May 2023 survey and accordingly, wetted channel dimensions were generally lower. Wetted width generally ranged from 0.75 to 1.5 m and wetted depth ranged from 0.10 to 0.20 m.

The channel is lined with rip rap, which also extends varying widths up the drain side slopes. In some locations, the rip rap has been sculpted to provide a low flow channel, while in other areas, this sculpting is absent. Fine sediment accumulation is evident in numerous areas of the channel and vegetation, including cattail and common reed are present along much of its length. Rip rap has also been used to create grade control structures across the channel in multiple locations along the studied length. During the April 2023 survey, flow through the grade control structures was generally interstitial and these would have been a barrier to fish movement. The barrier effect was more pronounced during the May 2023 survey when flows were lower, with longer stretches (up to 80 m) of areas with only interstitial flow through the rip rap. During higher flow periods, flow would be over the grade control structures and they would not likely be a barrier.

Riparian vegetation is variable along the length of the drain. In some locations, riparian vegetation adjacent to the low flow channel consists only of sparse meadow or limited shrubs, while in other areas, grasses and shrubs, and even small trees are present in higher densities. Dense common reed patches are scattered along the length of the channel.

Instream habitat cover is primarily provided by rip rap substrate or overhanging or instream vegetation. Limited woody debris is scattered throughout the reach.

Overall, while the drain provides direct fish habitat, it is relatively impaired due to its highly artificial nature as a linear constructed, rip-rap lined drain.

Along the length of the drain throughout the Subject Lands, it receives inputs from four tributary drainage features from the adjacent tablelands (**Figure 5**, **Appendix A**). Generally, these inputs originate from adjacent wetlands. Three of the four drainage features drain into the Conrail Drain via open cut, rip rap lined channels that flow down the side slopes, while the fourth feature discharges via a culvert through the drain side slope. Drain 1 was dry during the April and May surveys. Drains 2, 3 and 4 were all flowing (<0.5 L/sec) during the April survey, but 2 and 4 were dry during the May survey. Drain 3 had a very minor flow during the May survey, essentially amounting to a drip from the perched culvert. None of these lateral drains provide any direct fish habitat, but Drains 2, 3 and 4 may provide minor contributing habitat functions due to their ephemeral/intermittent flow contributions.

4.5.2 Fish Community Survey Results

Fish community survey results for the Conrail Drain are provided in **Table 7** (**Appendix B**).

Sampling was completed at one full transect near the upstream end of the study area, approximately 830 m upstream from the mouth at the OPG Power Canal. Sampling was also completed at two other spot locations that appeared suitable to hold fish, although completion of a full transect at either location was not possible due to lack of suitable connected habitat (at location CD-1) or presence of a wide, deep culvert that prevented effective sampling (at location CD-2).

A total of three species were observed in the Conrail Drain during the 2023 study including Brook Stickleback, Pumpkinseed and Green Sunfish. Brook Stickleback was the most numerous species and were observed at all three sampling locations. At the uppermost sampling location (CD-3) hundreds of YOY stickleback were observed, indicating that the species is successfully reproducing.

In addition, a dead Golden Shiner was observed at sampling location CD-2 during the AHA in April 2023. Golden Shiner was not observed during the June 2023 fish community survey.

Sampling completed in 2015 (Dougan & Associates, 2016) found only low numbers of Brook Stickleback in the Conrail Drain.

Although Brook Stickleback are a coolwater species, they are generally associated with a range of thermal conditions and are known to be able to exploit marginal habitats. Pumpkinseed and Green Sunfish are typically warmwater fish species that prefer sluggish streams or larger bodies of water.

Based on the sampling results, the Conrail Drain provides direct fish habitat along its length, although distribution of fish, particularly during low water periods, appears limited to relatively isolated areas that provide refuge habitat.

5. Analysis of Ecological and Natural Heritage Significance

Eight types of significant natural heritage features are defined in the PPS (MMAH 2020), as follows:

- Significant wetlands;
- Significant coastal wetlands;
- Significant woodlands;
- Significant valleylands;
- Significant wildlife habitat (SWH);
- Fish habitat;
- Habitat of endangered and threatened species; and
- Significant Areas of Natural and Scientific Interest (ANSIs).

In addition, the Niagara Region Official Plan contains policies that relate to the occurrence of wetlands, other woodlands, and permanent and intermittent streams.

The presence or absence of these elements on or adjacent to the Subject Lands is discussed in the following subsections. The *Natural Heritage Reference Manual* (MNR 2010a) was referenced to assess the potential significance of natural areas and associated functions. Where significant natural heritage features are present, the sensitivity of those features is also discussed.

5.1 Provincially Significant Wetlands

Within Ontario, PSWs are identified through an evaluation completed in accordance with the Ontario Wetland Evaluation System (MNRF 2022). Other evaluated or unevaluated wetlands may be identified for conservation by the municipality or the conservation authority.

The Niagara Falls Slough Forest PSW complex is located within the broader Riverfront Secondary Plan Area, and components of this PSW complex are found adjacent to both the Commercial Core and Industrial Lands. This PSW complex is generally described in the following extract from the wetland evaluation (MNR 2010b):

> Niagara Falls Woodlot #1 is a PSW wetland complex comprised of 18 wetland units separated by less than 750 m. The area in between the wetland units is drier land with early successional vegetation communities and previously filled lands with extensive drainage. Important linkages include the slough pattern of permanent to semipermanent pools, a small (N-S) watercourse in the eastern portion which enters the Welland River (Chippawa Channel), a super ditch running SW to NE entering the Power Canal, a RXR corridor extending through the wetland swinging northward through the City to the Whirlpool Area of the Niagara Gorge and the Welland

> River (Chippawa channel) to the south. Deer movement along the RXR corridor have been documented and wintering concentrations of deer have been identified (MNR files). Several amphibian species are recorded present through the wetland units. These species have complex lifecycles requiring permanent to semi-permanent water areas adjacent to uplands and must be able to move between these habitats to complete their lifecycle. Since they are shortlived and exist throughout the wetland they must be moving effectively in this complex and meeting their life cycle needs.

The limits of the wetland features within the Subject Lands were staked by Dougan & Associates and the MNRF in 2015 and 2016.

In 2022, the Ontario Wetland Evaluation System was revised to remove the establishment of wetland complexes in most situations. Following this change, units of the Niagara Falls Slough Forest PSW complex were re-evaluated by GEI at the request of GR (Can) Holdings Ltd. Several units were reviewed based on data collected by both Dougan & Associates and GEI. Based on the results of the evaluation, it was determined that these units did not meet the requirements of provincial significance, and so have been removed from the PSW wetland complex. The remainder of the PSW complex remains designated as such regardless of these removals.

5.2 Other Wetlands

As identified in the section above, several wetland units are identified within the Riverfront Secondary Plan Area that do not meet the definition of PSW but are identified as wetlands. As they are classified as wetlands according to the Ecological Land Classification, these areas would meet the definition of Other Wetlands under the Niagara Region Official Plan.

5.3 Significant Woodlands

The PPS notes that significant woodlands should be defined and designated by the planning authority using criteria established by the MNRF. The Niagara Region Official Plan defines woodlands as follows:

> “Treed areas that provide environmental and economic benefits to both the private landowner and the general public, such as erosion prevention, hydrological and nutrient cycling, provision of clean air and the long-term storage of carbon, provision of wildlife habitat, outdoor recreational opportunities, and the sustainable harvest of a wide range of woodland products. Woodlands include treed areas, woodlots or forested areas and vary in their level of significance at the local, regional and provincial levels. Woodlands will be delineated according to the Province’s Ecological Land Classification system definition for forest (PPS, 2020). For the purposes of this definition, forests include terrestrial vegetation communities as defined in accordance with the Ecological Land Classification (ELC) system, where the tree cover is greater than 60 per cent.”

Further, Niagara Region identifies that the only ELC communities that are considered for identification as significant woodlands are those meeting the Forest (FO) or Treed Agriculture (TAG) classification as ELC. Given this, there is one woodland community within the Commercial Core Lands that meets this requirement.

Niagara Region further defines significant woodlands as those "that are ecologically important in terms of features such as species composition, age of trees and stand history; functionally important due to its contribution to the broader landscape because of its location, size or due to the amount of forest cover in the planning area; or economically important due to site quality, species composition, or past management history (PPS, 2020)." Criteria for the establishment of significant woodlands are identified within the Niagara Region OP as:

- Woodlands 2 ha or greater in size
- Woodlands 1 ha or greater in size meeting at least one of the following criteria:
    - naturally occurring (i.e., not planted) trees (as defined in the species list of Appendix D in the Greenbelt Technical Paper);
    - treed areas planted with the intention of restoring woodland;
    - 10 or more trees per hectare greater than 100 years old or 50 cm or more in diameter;
    - wholly or partially within 30 m of a provincially significant wetland or habitat of an endangered or threatened species;
    - overlapping or abutting one or more of the following features: permanent streams or intermittent streams, fish habitat, and significant valleylands;
- Woodlands 0.5 ha or greater in size meeting at least one of the following criteria:
    - a provincially rare, treed vegetation community with an S1, S2 or S3 in its ranking by the NHIC;
    - habitat of a woodland plant species with an S1, S2 or S3 in its ranking or an 8, 9, or 10 in its Southern Ontario Coefficient of Conservatism by the NHIC, consisting of 10 or more individual stems or 100 or more sqm of leaf coverage;
    - any woodland overlapping or abutting one or more of the following features: significant wildlife habitat, habitat of threatened species and endangered species, or non-provincially significant wetlands.
- Any size overlapping or abutting one or more of the following features:
    - provincially significant wetland; and
    - life science area of natural and scientific interest.

The following discussion is provided as it relates to the identification of significant woodlands:

- FOD7-3 – At less than 0.5 ha, this woodland can only be considered significant if it overlaps or abuts a provincially significant wetland or a life science ANSI. As it does not, this woodland is not considered a significant woodland, but will be considered as it relates to Other Woodland criteria.

5.4 Other Woodlands

The Niagara Region Official Plan defines other woodlands as

> "Woodlands determined to be ecologically important in terms of features, functions, representation, or amount, and contributing to the quality and diversity of an identifiable geographic area or natural heritage system. Other woodlands include all terrestrial treed vegetation communities where the percent tree cover is greater than 25 per cent. Other woodlands would not include woodlands meeting the criteria as significant woodlands."

The Niagara Region Official Plan provides criteria for identification of Other Woodlands as a terrestrial treed area with ≥ 25 per cent tree cover and meeting one or more of the following criteria:

- an average minimum width of 40 m and is ≥ 0.3 ha, measured to crown edges; or
- any size abutting a significant woodland, wetland or permanent stream.

Treed areas that "abut" a significant woodland, wetland or permanent stream are considered adjacent when located within 20 m of each other. Other woodlands are identified based on the Ecological Land Classification methodology, with several communities potentially meeting the 25% threshold.

Terrestrial vegetation communities that would meet the ≥ 25 per cent tree cover include Forest, Cultural Woodland and Cultural Savannah communities. These are addressed further below.

- North of the Conrail Drain and west of the former rail spur, a woodland comprised of the FOD7-3, CUW1 and CUS units would meet the definition of Other Woodlands given the size of the community and it's abutting of the SWD1-3 unit north of the Commercial Core Lands.
- North of the Conrail Drain and east of the former rail spur, two woodlands, separately comprised of a CUS1 and CUW1 would meet the requirements of Other Woodland given size (CUS1 only) and abutting of the SWT unit (both units).

5.5 Significant Valleylands

Significant valleylands should be defined and designated by the planning authority.

Niagara Region established the following criteria for the delineation of significant valleylands:

- all streams with well-defined valley morphology (i.e., floodplains, riparian zones, meander belts and/or valley slopes) of an average width of 25 metres or more; the physical boundary is defined by the stable top of bank (as defined by the conservation authority);
- all spillways and ravines with the presence of flowing or standing water for a period of no less than two months in an average year. Such features must be greater than 50 metres in length (as defined from the point of valley formation downstream to the confluence of the valley being assessed); 25 metres in average width with a well-defined morphology (i.e., two valley walls of 15 per cent slope or greater with a minimum height of 5 metres, and valley floor), and having an overall area of 0.5 hectares or greater; or

- additional features or areas beyond the ones described above that have been identified by the Region, Local Area Municipality, or the Niagara Peninsula Conservation Authority as providing one or more of the features or functions described in the table contained in Appendix A of the Greenbelt Plan 2005 Technical Definitions and Criteria for Key Natural Heritage Features in the Natural Heritage System of the Protected Countryside Area (MNRF, 2012).

The Welland River south of Riverfront Secondary Plan area is a significant valleyland, however this feature is more than 120 m from the Commercial Core Lands.

5.6 Significant Wildlife Habitat

Significant Wildlife Habitat (SWH) is one of the more complex natural heritage features to identify and evaluate. There are several provincial documents that discuss identifying and evaluating SWH: the NHRM (MNR 2010a), the Significant Wildlife Habitat Technical Guide (MNR 2000), and the SWH Ecoregion Criteria Schedules (e.g., MNR 2015). The Subject Lands are in Ecoregion 7E and were therefore assessed using the *Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E* (MNRF 2015).

SWH types are grouped into four broad categories: seasonal concentration areas, rare vegetation communities and specialized wildlife habitat, habitats of species of conservation concern, and animal movement corridors. Each of these broad categories is discussed in the following subsections in relation to the Subject Lands. The SWH analysis is summarized in **Table 8** (**Appendix B**).

5.6.1 Seasonal Concentration Areas

Seasonal concentration areas are those sites where large numbers of a species gather at one time of the year, or where several species congregate. Seasonal concentration areas include deer yards; wintering sites for snakes, bats, raptors and turtles; waterfowl staging and molting areas; bird nesting colonies; shorebird staging areas; and migratory stopover areas for passerines or butterflies. Only the best examples of these concentration areas are designated as SWH. Areas that support Special Concern species or provincially vulnerable to imperiled species (S1–S3) or that support a large proportion of the population are examples of seasonal concentration areas that should be designated as significant.

5.6.2 Rare Vegetation Communities and Specialized Wildlife Habitat

Rare habitats are those with vegetation communities that are considered rare in the province. S-Ranks are rarity rankings applied to species at the provincial level and are part of a system developed by the Nature Conservancy (Arlington, VA). Generally, community types with S-Ranks of S1–S3 (extremely rare to rare/uncommon in Ontario), as defined by the NHIC (2022b), could qualify. It is assumed that these habitats are at risk and that they are also likely to support significant wildlife species.

Specialized habitats are microhabitats that are critical to some wildlife species. The NHRM (MNR 2010a) defines specialized habitats as those that provide for species with highly specific habitat requirements, areas with exceptionally high species diversity or community diversity, and areas that provide habitat that greatly enhances species' survival. Only habitats identified as exceptional examples, such as supporting a great diversity of species or large number of individuals, are typically designated as significant.

5.6.3 Habitats of Species of Conservation Concern

Species of conservation concern include those that are Special Concern and provincially rare (S1–S3, SH). Several specialized wildlife habitats are also included in this SWH category, i.e., terrestrial crayfish habitat and significant breeding bird habitats for marsh, open country, and early successional bird species. Habitats of species of conservation concern do not include habitats of Endangered or Threatened species as identified by the ESA. Endangered and Threatened species are discussed in **Section 5.6**.

5.6.4 Animal Movement Corridors

Animal movement corridors are areas that are traditionally used by wildlife to move from one habitat to another. This is usually in response to different seasonal habitat requirements. Animal movement corridors are only identified as SWH where a confirmed or candidate significant wildlife habitat has been identified by MNRF or the planning authority.

For ecoregion 7E, animal movement corridors are only assessed where Amphibian Breeding Habitat SWH (wetlands) have been identified.

5.6.5 SWH Summary

Based on the results of GEI's investigations, the following SWH types were identified on or adjacent to the Subject Lands:

- Candidate Waterfowl Stopover and Staging Areas (aquatic);
- Bat Maternity Colonies;
- Deer Winter Congregation Areas;
- Rare Vegetation Type (Old Growth Forest);
- Candidate Woodland Raptor Nesting Habitat;
- Candidate Habitat for Woodland Area-Sensitive Bird Breeding Habitat; and
- Habitat for Species of Conservation Concern (Wood Thrush).

5.7 Fish Habitat

Fish habitat is defined in the federal *Fisheries Act, 1985* as "water frequented by fish and any other areas on which fish depend directly or indirectly to carry out their life processes, including spawning grounds and nursery, rearing, food supply and migration areas."

The Conrail Drain flows through the Subject Lands. This surface water feature consists of a deep, straight, artificial channel, lined with riprap along its entire length. The drain was found to be providing habitat for three fish species during the fish community survey in June 2023. Therefore, it is direct fish habitat.

5.8 Permanent and Intermittent Streams

Two watercourses are present within or adjacent to the Subject Lands that would meet the definition of permanent or intermittent streams. These include the Conrail Drain and the Chippawa Power Canal. These features are mapped on **Figure 5 (Appendix A).**

5.9 Habitat of Endangered and Threatened Species

Endangered and Threatened species are listed by the MECP based on Committee on the Status of Species at Risk in Ontario (COSSARO) assessments and recommendations.

GEI reviewed existing background information and identified known Endangered and Threatened species records from the broader landscape surrounding the Subject Lands, as summarized in **Section 3.1**.

Based on the results of the surveys completed within the Subject Lands, the following are concluded with the respect to Endangered and Threatened Species:

- Acadian Flycatcher: Suitable habitat polygons are present northeast of the Commercial Core Lands. This species has not been detected during breeding bird surveys since 2015, and it is considered unlikely that the species is present on the landscape. However, as these features are not proposed to be directly impacted by the development, they are treated as habitat for these species as a conservative measure.
- Endangered Species of Bats: Suitable bat maternity roosting habitat is present in the landscape within the large deciduous swamp blocks that form components of the retained PSW complex. Acoustic bat surveys have been undertaken within the smaller swamp communities that overlap with the Commercial Core. Low numbers of species at risk bats were detected throughout the landscape within both areas, with most features having recorded fewer than 10 of any individual species. As a result, given the low numbers detected within the vast landscape, it is determined that these areas are not providing habitat for endangered species of bats.

5.10 Areas of Natural and Scientific Interest

Areas of Natural and Scientific Interest (ANSI) are identified by the MNRF as having provincially or regionally significant representative geological or ecological features. There are no ANSIs located on or within 120 m of the Subject Lands.

5.11 Supporting Features and Areas

Consideration was given to the potential for supporting features and areas as defined within the Niagara Region Official Plan. Based on the definition the following assessment was made.

The following natural heritage features were identified adjacent to the Commercial Core Lands:

- PSW units and associated significant wildlife habitats (Candidate Waterfowl Stopover and Staging Areas (aquatic), Bat Maternity Colonies, Deer Winter Congregation Areas, Rare Vegetation Type (Old Growth Forest), Candidate Woodland Raptor Nesting Habitat, Candidate Habitat for Woodland Area-Sensitive Bird Breeding Habitat, Habitat for Species of Conservation Concern (Wood Thrush)) and habitats of endangered and threatened species (endangered species of bats and Acadian Flycatcher); and
- Permanent and intermittent streams (Conrail Drain and Chippawa Power Canal) and associated fish habitat.

Given the relatively naturalized state of the Subject Lands, consisting of cultural meadow, cultural thickets, cultural woodlands, small wetland and a deciduous forest community, the area provides habitat to a variety of wildlife species, including mammals, amphibians, birds and invertebrates. These areas extend throughout the Commercial Core Lands and into the adjacent naturalized areas.

The only true relationship between these lands and the surrounding landscape is one of proximity. Wildlife likely moves broadly through this landscape at present, while the natural areas in immediate proximity to the identified natural heritage features provide some benefits as they relate to supporting local microclimates and nutrient cycling within the feature edges.

The Chippawa Power Canal is separated from the Commercial Core Lands by a roadway, and so supporting features and areas are not recommended for that feature.

The Conrail Drain is a heavily impaired feature that provides limited fish habitat. As such, supporting features and areas are not recommended for that feature.

The provincially significant wetlands which are located adjacent to the Commercial Core Lands are vast features on the landscape. As identified, some broad wildlife movement between the features and the surrounding lands occurs, however these features extend well beyond the Commercial Core Lands, and so there is no critical support function occurring within this area. Similarly, though there is likely some benefit to the existing natural vegetation along the edge of the features, the incorporation of buffers will appropriately maintain those functions and identification of further support features and areas is not recommended.

5.12 Enhancement Areas

The identification of enhancement areas around the Commercial Core was assessed with respect to the adjacent natural heritage features. There are no features identified within the Subject Lands that would necessitate identification of an enhancement area.

5.13 Summary of Ecological Components Subject to Impact Assessment

An analysis of existing natural features on the Subject Lands was completed, followed by an evaluation of their significance against criteria in the Niagara Region Official Plan (2022), *Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E* (MNRF 2015) and criteria recommended in the NHRM (MNR 2010a), where appropriate.

The results of this analysis determined that the following significant natural features (as defined in the PPS) are present and will require assessment for potential impacts in **Section 7.0**:

- Significant wetlands;
- Other wetlands;
- Significant woodlands;
- Other woodlands;
- Significant wildlife habitat (SWH);
- Fish habitat;
- Permanent and intermittent streams; and
- Habitat of endangered and threatened species.

6. Proposed Development

The proposed development is discussed below.

The Commercial Core Lands are proposed to be developed around the Conrail Drain. Three street connections are proposed to Dorchester Road, with one to be situated south of the Conrail Drain between the Drain and the existing rail line, and two to be situated north of the Conrail Drain.

There are four development blocks proposed:

- Block A01: A 4.8 ha commercial/retail block, which will also contain a restaurant, indoor playground, 5 storey condo, and parking structure;
- Block A02: A 1.5 ha. 12 storey hotel condo and residential condo block;
- Block A05: A 1 ha, 7 storey senior condo/senior care home block; and
- Block A06: A 2.6 ha residential townhouse development with 64 townhouse units and 2 semi units.

The existing crossing of the Conrail Drain associated with the abandoned rail spur is proposed to be removed, and a new crossing installed further upstream. It is proposed that the entire Conrail Drain be re-designed using Natural Channel Design principles within its existing footprint. It has been envisioned that the slopes of the Conrail Drain will be planted with native vegetation species, but within an open and more manicured arrangement to promote views of the redesigned drain.

In addition, a platform has been proposed to extend over the side slopes of the Conrail Drain at one location to provide an enhanced public space and viewing platform, with a connecting walkway proposed over the Conrail Drain to connect the northern and southern spaces.

Stormwater from the proposed development is planned to be discharged to the Conrail Drain from where it will enter the Chippawa Power Canal. Given the location of the development quantity control is not required.

7. Impact Assessment and Mitigation

This section of the EIS assesses potential effects on the previously identified natural heritage features that could occur over the short-term and long-term, following implementation of the development plan discussed in section 6. Appropriate mitigation measures to avoid or minimize negative impacts and/or to enhance features and functions are discussed. The impact assessment concludes with a discussion of net effects (also commonly referred to as residual effects) after all avoidance, mitigation and enhancement measures have been considered.

Impacts from a proposed land development application can generally be considered in two broad categories, direct and indirect. Direct impacts are normally associated with the physical removal or alteration of natural features that could occur based upon a land use application, and indirect impacts may be changes or impacts to less visible functions or pathways that could cause negative impacts to natural heritage features over time.

7.1 Significant Wetlands

Three portions of the Niagara Falls Slough Forest PSW complex will be retained on lands adjacent to the proposed development. There are no direct impacts to the PSW complex proposed as a component of the development plan. As a result, this section addresses recommended buffer widths to this feature, and addresses potential indirect impacts.

7.1.1 Assessment of buffer widths

Four portions of the PSW complex are located within 120 m of the Commercial Core Lands.

Two of these are situated across the rail corridor, more than 25 m away on the opposite side of the proposed development, while a third is situated across the Conrail Drain, more than 45 m away on the opposite side of the proposed development. As a result, it has been determined that additional buffers beyond that already provided from the rail corridor and Conrail Drain are not required.

The final component of the PSW complex is a narrow, linear portion of SWD 1 that is situated northeast of the proposed residential development block (Block A06), between the Conrail Drain and the existing rail line. Given the narrow, linear nature of this feature and isolation from other features on the landscape, as well as the small portion of the feature in proximity to the proposed development, potential impacts on the feature are anticipated to be negligible and a minimum buffer width of 15 m is recommended.

A buffer of 15 m will ensure that the functions of the existing natural heritage features are protected from the effects of the proposed development. To preserve the identified functions, the buffers provide a role to:

- Limit anthropogenic encroachment (residents, domestic animals, etc.) into the natural heritage features;
- Screen the features from human disturbance through residual vegetation or tree/shrub planting within the buffers;

- Filter surficial runoff into vegetation communities to improve water quality and reduce contamination; and
- Protect the features from exotic/invasive species establishment.

It is important to note that buffers alone cannot protect natural heritage features from the impacts identified above. Buffers must function in conjunction with a range of mitigation measures, which are addressed further below.

The proposed buffer location will be assessed at the detailed design stage to assess the quality of existing vegetation and recommendations for in-planting to enhance the function of the buffer. Should buckthorn be present within the buffer at this location, the buckthorn should be removed, and treatment measures implemented. Plantings targeting woodland communities should be planted within these areas.

7.1.2 Assessment of indirect effects

Given the separation between the majority of the PSW units and the development, indirect effects are not anticipated.

Indirect effects to the wetland community adjacent to Block A06 may occur as a result of:

- Changes in water delivery to the wetland due to stormwater management and changes in infiltration associated with increased imperviousness;
- Erosion and sedimentation from the construction area; and
- Accidental spills (e.g., of contaminated soils, or fuel or oil from machinery) with transport of spilled material to watercourses.

Indirect effects may occur as a result of potential hydrologic changes affecting water flows to the wetland in the post-development setting. Given the small portion of area abutting this wetland that is proposed for development, impacts are anticipated to be minimal, however it is recommended that a water balance assessment be completed at detailed design to ensure there is no impact to this feature. If required, low impact development (LID) measures should be used to ensure balance is maintained. Provided that the ground and surface water balance can be maintained, no long-term impacts on the wetland water volumes are anticipated to occur due to stormwater management associated with the proposed development.

Erosion and sedimentation from the disturbed work area associated with the proposed development could potentially result in adverse effects to water quality (e.g., increased turbidity or sedimentation) in the wetland. At the time of preparing this report, an Erosion and Sediment Control (ESC) plan had not been established. An ESC plan should be implemented following the Erosion and Sediment Control Guideline for Urban Construction (TRCA 2019) to ensure that the PSW is protected. Through the installation of effective ESC measures and regular monitoring of the efficacy of the ESC measures throughout the construction period, disturbance caused by development and site alteration through ground disturbance and dislodgement of sediment will be limited.

In order to mitigate the potential for adverse effects on the PSW due to accidental spills during construction, it is recommended that the contractor prepare a Spill Prevention and Response Plan to outline the material handling and storage protocols, mitigation measures (e.g., spill kits on-site), monitoring measures and spill response plans (i.e., emergency contact procedures, including the Spills Action Centre, and response measures including containment and clean-up). Given the separation of workspace from the PSW, implementation of an effective Spill Prevention and Response Plan is anticipated to be largely effective in preventing adverse effects on the PSW due to accidental spills during construction.

7.2 Other Wetlands

Direct removal of two non-provincially significant wetland units, and the majority of a third, each less than 0.5 ha is proposed (community sizes total 0.79 ha, with individual communities of 0.11, 0.22, and 0.46 ha). It is possible that detailed design may protect 0.08 ha of the 0.46 ha wetland unit. Should that be the case, it would be recommended that the portion retained be deducted from the total above.

None of these features have been identified as significant wildlife habitats. It is proposed that the extent of other wetlands be replicated within the Subject Lands or in proximity, with locations to be confirmed during the detailed design phase. During detailed design, a Natural Heritage Design Brief will be prepared outlining design specifics and defining the extent of each wetland community.

Wetlands will be designed to provide the following functions:

- Provision of productive breeding habitat for a variety of calling amphibian species, including Western Chorus Frog;
- Provision of turtle over-wintering habitat, where feasible; and
- Establishment of a Buttonbush wetland community to replace the small area removed.

Target species compositions within each community will be verified within the Natural Heritage Design Brief upon further investigations and discussions, including understanding nearby plant nursery stock availability. Niagara Region will be consulted during the detailed design phase to provide input to the finalized wetland compensation plan.

Additional other wetland communities will be located in proximity to the development limits. The SWD community south of the Subject Lands is situated on lands controlled by Ontario Power Generation. It will not be situated adjacent to a roadway, in addition to the rail community to the south. Given existing constraints in this location, additional setbacks are not possible, and as the wetland is located on lands not controlled by the applicants, additional measures are not recommended.

Similarly, along the norther extent of the Subject Lands there is a narrow approach (approximately 10 m) to the proposed road network. Existing vegetation will likely provide protection to that feature. Following detailed design and grading, consideration can be given to whether enhancement should occur along that edge.

7.3 Other Woodlands

Direct removal of 3.30 ha of woodland communities that do not meet the definition of significant is proposed. Most of these communities are identified as cultural woodland or cultural savannah communities, with only 0.48 ha identified as belonging to a forest community. None of these features have been identified as significant wildlife habitats. It is proposed that the extent of other woodlands be replicated within the Subject Lands or in close proximity, with locations to be confirmed during the detailed design phase. During detailed design, a Natural Heritage Design Brief will be prepared outlining design specifics and defining the extent of the woodland community(ies).

Woodlands will be designed to provide the following functions:

- Provision of habitat for a variety of avian species throughout the early successional and late successional stages; and
- Incorporation of tree species capable of providing bat maternity roosting habitats at maturity.

Target species compositions within the replication areas will be verified within the Natural Heritage Design Brief upon further investigations and discussions, including understanding nearby plant nursery stock availability. Niagara Region will be consulted during the detailed design phase to provide input to the finalized wetland compensation plan.

7.4 Significant Wildlife Habitat/Habitat of Endangered and Threatened Species

Candidate and confirmed significant wildlife habitats and habitats of endangered and threatened species have been identified associated with the provincially significant wetland units outside of the proposed development limits. Mitigation measures identified associated with the provincially significant wetlands will also be effective at mitigation impacts to the significant wildlife habitats contained therein.

In addition to the impacts above, noise from construction activities may result in wildlife avoidance of the edges abutting active work areas during the construction period. Where possible, construction activities should be timed outside of the nighttime and early morning periods during the core of the bat and bird breeding seasons (typically May through July). Some localized movement of wildlife out of these edge areas may still occur during the construction phase. Given past developments in this area and presence of the rail corridor, wildlife in this area is already adjusted to a certain level of background noise and interference.

Following construction, increased noise in vicinity of the features from the commercial core is likely to occur, as well as the potential for increased predation pressure from domestic cats allowed to roam free outdoors, though opportunities for these types of pets would be expected to be limited to the townhome development area. It is recommended the eastern extent of Block A06 be fenced to prevent encroachment into the PSW to the east. Given the nature of the Commercial Core development, fencing along the entire exterior is not recommended. Further, given the size of the wetlands, and predominance of adjacent wetlands to the south, potential for ad hoc trail development to facilitate movement towards the Commercial Core is not anticipated.

Given the size of the retained natural heritage features and separation from the Commercial Core development, measurable alterations in wildlife composition are not anticipated following development. These potential effects may be further reduced through the development and distribution of a homeowner's manual to residents within the townhome complex in Block A06 that explains the relationship between the development and adjacent significant natural areas.

7.5 Fish Habitat/Permanent and Intermittent Streams

Two areas of fish habitat/permanent and intermittent streams are present within 120 m of the proposed development; the Chippawa Power Canal and the Conrail Drain. The Chippawa Power Canal is located well downstream of the Subject Lands and would only be impacted via discharges from the Conrail Drain. As a result, the focus of this discussion will relate to the Conrail Drain.

7.5.1 Direct Impacts

The Conrail Drain is a heavily anthropogenically influenced drainage feature that bisects portions of the Subject Lands. The proposal recommends that the Conrail Drain be subject to restoration via Natural Channel Design principles to create a feature with higher ecological function.

Given the existing state of the Conrail Drain, these works would provide a clear net gain to the ecological condition within this feature which would benefit fish and wildlife communities. During detailed design, a Natural Heritage Design Brief will be prepared outlining design specifics for the re-designed corridor that will:

- address fluvial geomorphologic requirements to ensure that the drain is capable of withstanding erosive forces from storm events and incorporate meander characteristics;
- provide riparian corridor plantings to improve the thermal regime within the drain and provide wildlife habitat along the feature; and
- identify target fish species for the drain to confirm elements for incorporate within the design.

Works should be completed in the dry to ensure no direct impacts on fish or other aquatic wildlife. Given that this feature conveys stormwater towards the Chippawa Power Canal, it will be important that measures be provided to convey these flows around the work area throughout the duration of construction works within the drain.

Niagara Region and NPCA will be consulted during the detailed design phase to provide input to the finalized wetland compensation plan. It is acknowledged that these works would be subject to permitting requirements from the NPCA and potentially Fisheries and Oceans Canada.

7.5.2 Indirect Impacts

Potential indirect impacts include:

- Erosion and sedimentation from the construction area;
- Effects due to stormwater management during and following construction; and
- Accidental spills (e.g., fuel or oil from machinery) with transport of spilled material to watercourses.

These measures have been previously addressed within section 7.1 as it relates to Significant Wetlands, and these measures would be anticipated to be effective at mitigating impacts on the Conrail Drain. It is noted that as the Drain feeds the Chippawa Power Canal, stormwater quantity control is not required, and only quality control will be provided to ensure that there is no resulting impairment of water quality as a result of the discharge of stormwater from the development.

7.6 Other considerations

As removal of natural vegetation communities will be required to support the development, the following mitigation measure is recommended to avoid impacts to wildlife:

- Any removal of native vegetation should occur outside of the period of April 1 and September 30 to avoid impacts to migratory birds and bats.
- Wherever possible, wetland communities should be removed in the dry. Should dewatering of a wetland community be required, requirements for wildlife salvage should be assessed prior to any dewatering occurring.

7.7 Cumulative Impacts

Consideration was given to the potential for cumulative impacts on the resulting natural areas as a result of the proposed development as it would relate to other potential developments in the area.

The proposed development is situated within the Riverfront Secondary Plan area. Potential interactions between the development blocks within the secondary plan area and the surrounding natural heritage features was considered at the time of approval of the Secondary Plan. Further assessment of cumulative impacts between those development blocks is not warranted.

Beyond the developments within the Riverfront Secondary Plan area, GEI is also aware of the proposed redevelopment of the Thundering Waters Golf Club which opened previously in 2005. Per materials available on the project website, the development will be situated along the eastern limits of the provincially significant wetland, with the nearest point approximately 300 m east of the eastern portion of the development.

Though this will result in an overall intensification of development within this local area, an extensive, connected natural heritage system will remain present within the landscape. Given the size of the retained features, they are anticipated to be resilient to the intensification of development and anticipated to continue to support a diverse assemblage of wildlife.

In addition, should improvements to the Conrail Drain be considered as a component of that development, the opportunity exists to provide a significant overall net gain to the aquatic environment in this area.

8. Tree Inventory and Protection Plan

As discussed within section 7.2 and 7.3, compensation for tree removals from Other Woodlands and Other Wetlands identified on **Figure 5** (**Appendix A**) will be provided on an area basis. As a result, inventory within these features is not proposed.

Prior to the commencement of construction, and following completion of detailed design and grading plans, a tree inventory of all trees greater than 10 cm diameter at breast heigh (DBH) is to be completed within (i) any portions of the development outside of the Other Woodlands and Other Wetlands and (ii) any areas within 3 m of the limits of development shown on **Figure 6** (**Appendix A**). The tree inventory will be completed in accordance with the Niagara Region Tree and Forest Conservation Bylaw (By-law No. 2020-79). The tree inventory will not include assessment of Common Buckthorn or Hawthorn species.

Tree Protection Zones

The area of protection around a tree is referred to as the Tree Protection Zone (TPZ) and is measured outward from the trunk. Each that is situated adjacent to the development limits will be assigned a target tree protection zone in accordance with the following requirements:

- A minimum of 2.4 m from any trees ≥10 cm and <40 cm diameter at breast heigh (DBH);
- A minimum of 3 m from any trees ≥40 cm and <50cm DBH;
- A minimum of 3.6 m from any trees ≥50 cm and <60cm DBH; and
- A minimum of 4.2 m from any tree ≥60 cm DBH.

The objective of the TPZ is to maximize protection of the tree to ensure its long-term survival. It is recognized, however, that encroachment into the TPZ will sometimes be necessary to facilitate construction. Some healthy trees are known to withstand construction impacts such as root cutting, soil compaction, and soil saturation; however, these individual responses are dependent on the species, site condition, and degree of impacts (Matheny & Clark 1998).

Protection of Retention Trees

There is potential for construction-related activities to occur within the TPZs of retained trees; however, protection and mitigation techniques may prevent these activities from impacting these trees. Recommended protection and mitigation techniques are outlined below:

- The limit of work areas should be delineated through fencing to prevent accidental encroachment into retained features, resulting in accidental harm or damage to trees. If a tree is accidentally damaged during construction, the Project Arborist should be contacted to review the damage and assess whether remediation measures are required.
- All relevant contractors should meet with the Project Arborist prior to the beginning of site alteration to review tree protection procedures.

- All tree removals should comply with the timing restrictions with regards to the protection of nesting birds and species at risk bats.
- Trees to be removed should be felled in a manner that drops the tree away from adjacent retention trees and their TPZs.
- Any brush clearing required within the TPZs should be completed using hand-operated equipment and should be lifted out and not skidded out.
- Tree roots damaged during construction should be exposed and cut cleanly using hand operated equipment.
- Sediment control fencing should be installed to provide a protective barrier between areas intended for stockpiling of excavated soil and retained trees. The sediment control fencing should be installed to Ontario Provincial Standard 219.130.
- Trees planted within the development should consist of native tree species where possible to compensate for those removed.

9. Ecological Monitoring

Monitoring components will include:

- Baseline monitoring (prior to commencement of construction);
- Compliance monitoring during construction;
- Post-construction effectiveness monitoring; and
- Post-construction performance monitoring.

A detailed monitoring plan will be prepared as a Condition of Draft Plan Approval; however, this section provides additional information on goals and objectives of that plan.

9.1 Baseline Ecological Monitoring

Baseline ecological monitoring is conducted to confirm the current status of ecological communities occurring on the Subject Lands prior to the commencement of construction of the proposed development. Baseline monitoring has been conducted between 2015 and 2023.

The results of these various baseline monitoring activities have been used to identify the natural features that currently exist on the property and will be used to establish the baseline ecological conditions for comparison with results of construction and post-construction monitoring surveys.

As part of the Detailed Monitoring Plan to be prepared at detailed design, a thorough data gap analysis will be conducted to confirm that suitable baseline data has been collected at repeatable monitoring stations using standardized survey protocols within retained natural features within the NHS. Should any data gaps be identified, they will be filled prior to commencement of any construction related disturbances within 120 m of the particular feature.

9.2 Compliance Monitoring During Construction

The purpose of compliance monitoring during construction is to verify that mitigation measures are adhered to (e.g., ecological timing constraints) and to ensure that mitigation measures are effective. The proposed compliance monitoring program includes the following elements:

- Sediment and erosion control monitoring;
- Adherence to identified timing restrictions to prevent impacts on aquatic species and wildlife.

Other construction compliance monitoring measures may be necessary, and these will be identified in the Detailed Monitoring Plan.

9.3 Post-Construction Monitoring

Post-construction monitoring includes effectiveness/performance monitoring to verify that mitigation/restoration activities have had the intended ecological effect (e.g., maintaining or enhancing habitat, supporting particular wildlife life history functions, achieving intended buffer functions) and success monitoring to confirm that planted vegetation material has met the survival requirements (typically completed in accordance with standard landscape architecture industry standards.

The Detailed Monitoring Plan will outline the purposes of the post-construction monitoring program, locations to be monitored, protocols to be followed, and frequency/duration of the post-construction monitoring program. A critical component of the program will be the assessment of the wetland and woodland replication habitats to ensure communities are functioning as designed.

10. Conclusions and Recommendations

This EIS was prepared as part of the planning process for the proposed Commercial Core Lands within the Riverfront Secondary Plan Area in Niagara Falls, Ontario.

Through prior studies and those completed as a component of this EIS, the following natural heritage features have been identified on or in the vicinity of the Commercial Core Lands:

- Significant wetlands;
- Other wetlands;
- Significant woodlands;
- Other woodlands;
- Significant wildlife habitat (SWH);
- Fish habitat;
- Permanent and intermittent streams; and
- Habitat of endangered and threatened species.

An assessment of impacts on the natural heritage features identified above and their associated functions has been conducted and discussed.

There will be no direct impact to significant wetlands, significant woodlands, significant wildlife habitats or habitats of endangered and threatened species.

Development within the Draft Plan of Subdivision boundary would result in:

- The removal of a portion (3.30 ha) of other woodland, which is a mixture of early successional woodlands with a small component of non-significant forest community;
- The removal of a 0.79 ha from 3 separate wetland communities; and
- Temporary alterations to fish habitat within the Conrail Drain.

It is proposed that the removals of the woodland and wetlands will be mitigated through replication either on other land holdings within the Riverfront Secondary Plan Area, or on other lands within the Niagara Region.

Potential indirect impacts to the retained natural heritage features will be mitigated through:

- Establishment of buffer plantings between Block A06 and the adjacent provincially significant wetland;
- Establishment of an effective erosion and sediment control plan;
- Identification of emergency spill response plan; and
- Assessment of water balance at the detailed design stage.

In addition, proposed restoration works within the Conrail Drain corridor will provide an overall net gain in terms of ecological functions on the Subject Lands.

Considering the above, development of the Subject Lands can be completed without negative impacts on the natural heritage features and associated functions.

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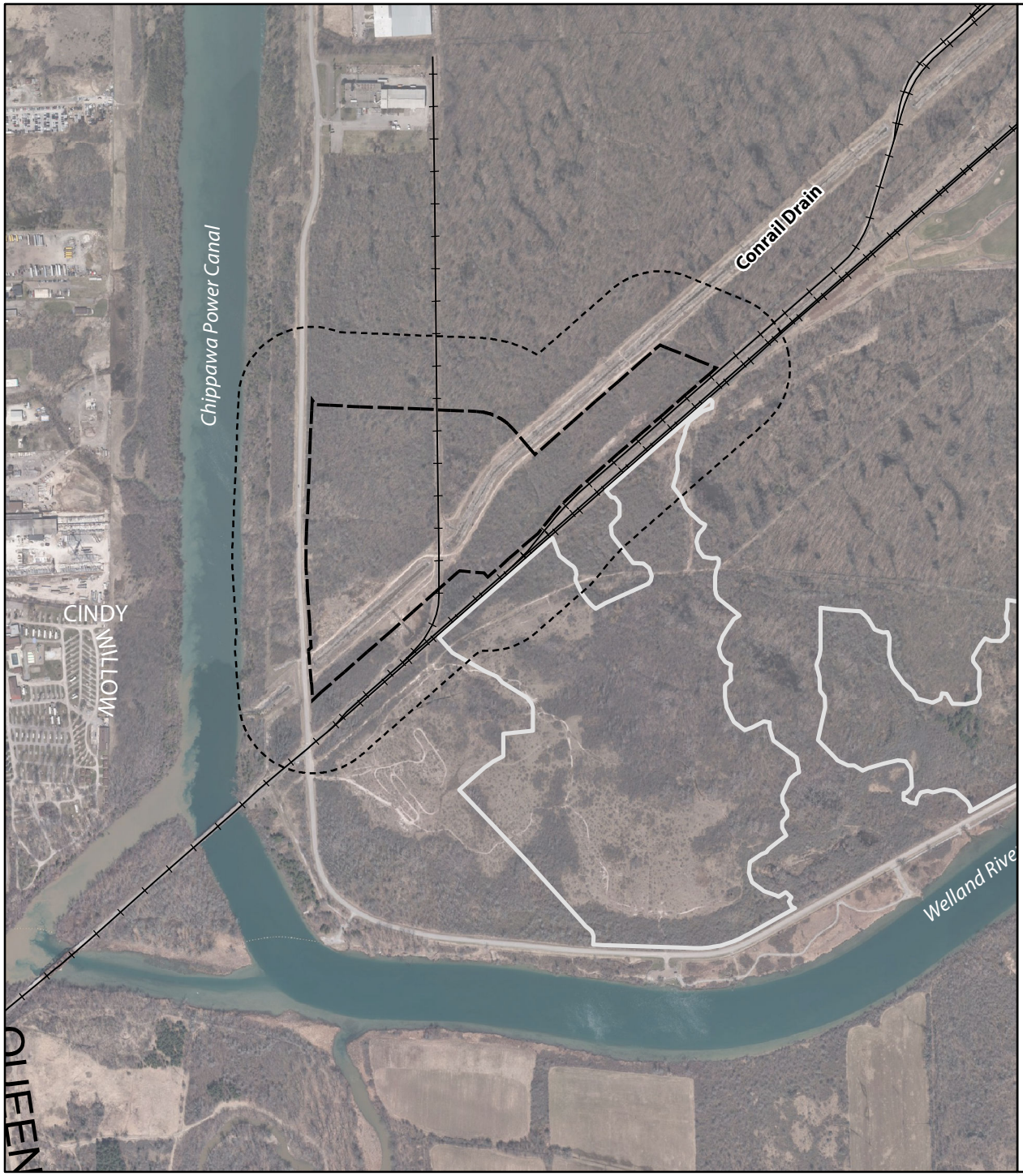
Appendix A

Figures



Legend

- Commercial Core Site Plan Block Area
- Commercial Core Site Plan Block Area + 120 metres
- Riverfront Residential (previously approved development application)
- Railway

NOTES:

1. Coordinate System: NAD 1983 UTM Zone 17N.
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Riverfront Commercial Core – Blocks A01 to A06
Environmental Impact Study

Figure 1
Commercial Core Site Plan Block Area

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GEI Consultants

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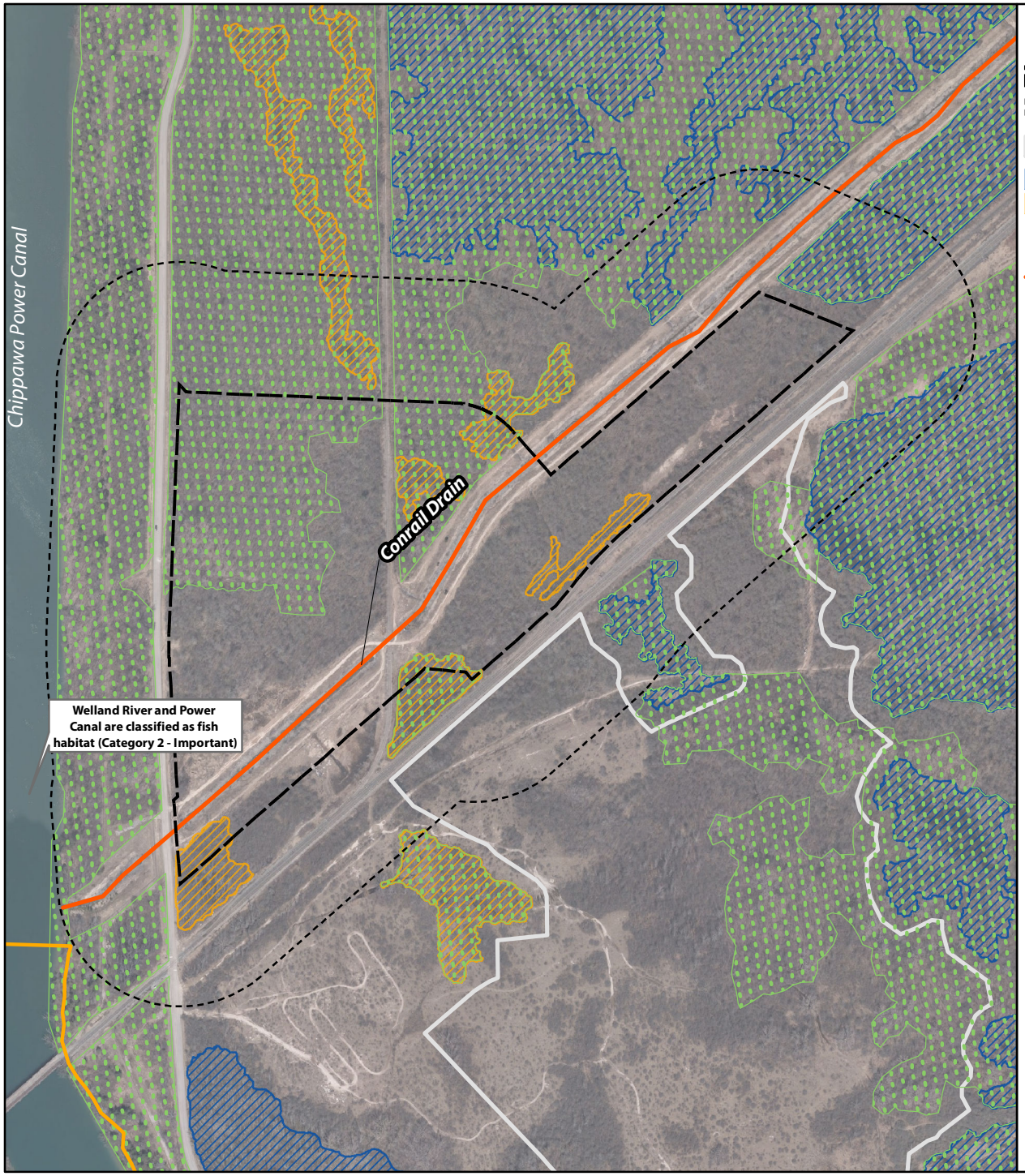

Legend

- Commercial Core Site Plan Block Area
- Commercial Core Site Plan Block Area + 120 metres
- Riverfront Residential (previously approved development application)
- Provincially Significant Wetland (MNRF)
- Wetland - Evaluated as Non-provincially Significant
- Significant Woodland (Niagara Region Official Plan, 2014 and NHRM, 2010)
- Fish Habitat (Category 3 - Marginal)

NOTES:

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Riverfront Commercial Core Lands – Blocks A01 to A06
Environmental Impact Study

Figure 2
Natural Heritage Feature Summary

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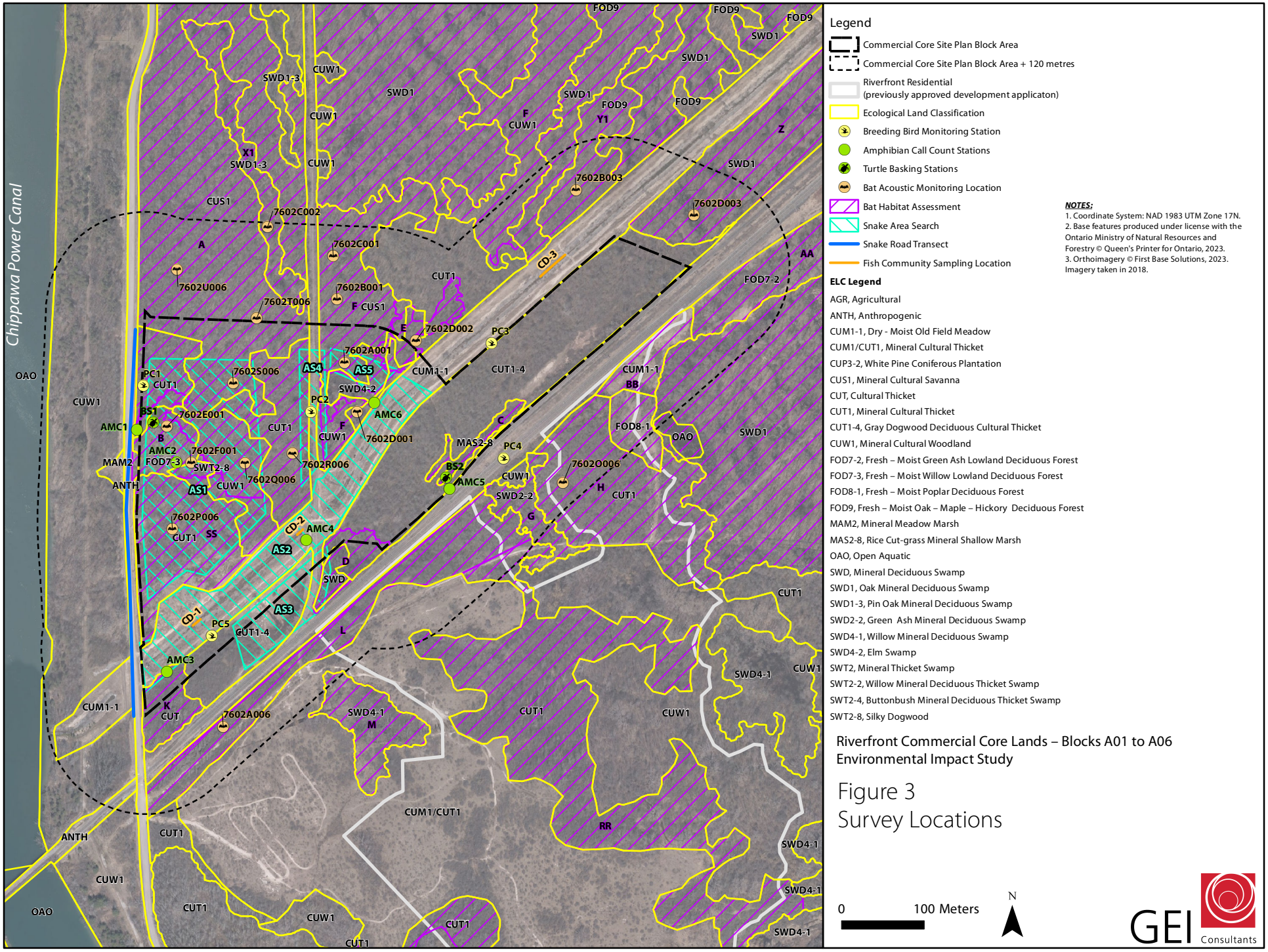

Legend

- Commercial Core Site Plan Block Area
- Commercial Core Site Plan Block Area + 120 metres
- Riverfront Residential (previously approved development applicaton)
- Ecological Land Classification
- Breeding Bird Monitoring Station
- Amphibian Call Count Stations
- Turtle Basking Stations
- Bat Acoustic Monitoring Location
- Bat Habitat Assessment
- Snake Area Search
- Snake Road Transect
- Fish Community Sampling Location

NOTES:

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ELC Legend

AGR, Agricultural
ANTH, Anthropogenic
CUM1-1, Dry - Moist Old Field Meadow
CUM1/CUT1, Mineral Cultural Thicket
CUP3-2, White Pine Coniferous Plantation
CUS1, Mineral Cultural Savanna
CUT, Cultural Thicket
CUT1, Mineral Cultural Thicket
CUT1-4, Gray Dogwood Deciduous Cultural Thicket
CUW1, Mineral Cultural Woodland
FOD7-2, Fresh – Moist Green Ash Lowland Deciduous Forest
FOD7-3, Fresh – Moist Willow Lowland Deciduous Forest
FOD8-1, Fresh – Moist Poplar Deciduous Forest
FOD9, Fresh – Moist Oak – Maple – Hickory Deciduous Forest
MAM2, Mineral Meadow Marsh
MAS2-8, Rice Cut-grass Mineral Shallow Marsh
OAO, Open Aquatic
SWD, Mineral Deciduous Swamp
SWD1, Oak Mineral Deciduous Swamp
SWD1-3, Pin Oak Mineral Deciduous Swamp
SWD2-2, Green Ash Mineral Deciduous Swamp
SWD4-1, Willow Mineral Deciduous Swamp
SWD4-2, Elm Swamp
SWT2, Mineral Thicket Swamp
SWT2-2, Willow Mineral Deciduous Thicket Swamp
SWT2-4, Buttonbush Mineral Deciduous Thicket Swamp
SWT2-8, Silky Dogwood

Riverfront Commercial Core Lands – Blocks A01 to A06
Environmental Impact Study

Figure 3
Survey Locations

0 100 Meters

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Legend

- Commercial Core Site Plan Block Area
- Commercial Core Site Plan Block Area + 120 metres
- Riverfront Residential (previously approved development application)
- Ecological Land Classification
- Provincially Significant Wetland (MNRF)
- Other Wetlands
- Other Woodlands

ELC Legend

AGR, Agricultural
ANTH, Anthropogenic
CUM1-1, Dry - Moist Old Field Meadow
CUM1/CUT1, Mineral Cultural Thicket
CUP3-2, White Pine Coniferous Plantation
CUS1, Mineral Cultural Savanna
CUT, Cultural Thicket
CUT1, Mineral Cultural Thicket
CUT1-4, Gray Dogwood Deciduous Cultural Thicket
CUW1, Mineral Cultural Woodland
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FOD7-3, Fresh – Moist Willow Lowland Deciduous Forest
FOD8-1, Fresh – Moist Poplar Deciduous Forest
FOD9, Fresh – Moist Oak – Maple – Hickory Deciduous Forest
MAM2, Mineral Meadow Marsh
MAS2-8, Rice Cut-grass Mineral Shallow Marsh
OAO, Open Aquatic
SWD, Mineral Deciduous Swamp
SWD1, Oak Mineral Deciduous Swamp
SWD1-3, Pin Oak Mineral Deciduous Swamp
SWD2-2, Green Ash Mineral Deciduous Swamp
SWD4-1, Willow Mineral Deciduous Swamp
SWD4-2, Elm Swamp
SWT2, Mineral Thicket Swamp
SWT2-2, Willow Mineral Deciduous Thicket Swamp
SWT2-4, Buttonbush Mineral Deciduous Thicket Swamp
SWT2-8, Silky Dogwood

* Communities where ELC Code was revised from that shown in March 2018 EIS Addendum.

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Riverfront Commercial Core Lands – Blocks A01 to A06
Environmental Impact Study

Figure 4
Vegetation Communities and Provincially Significant Wetlands

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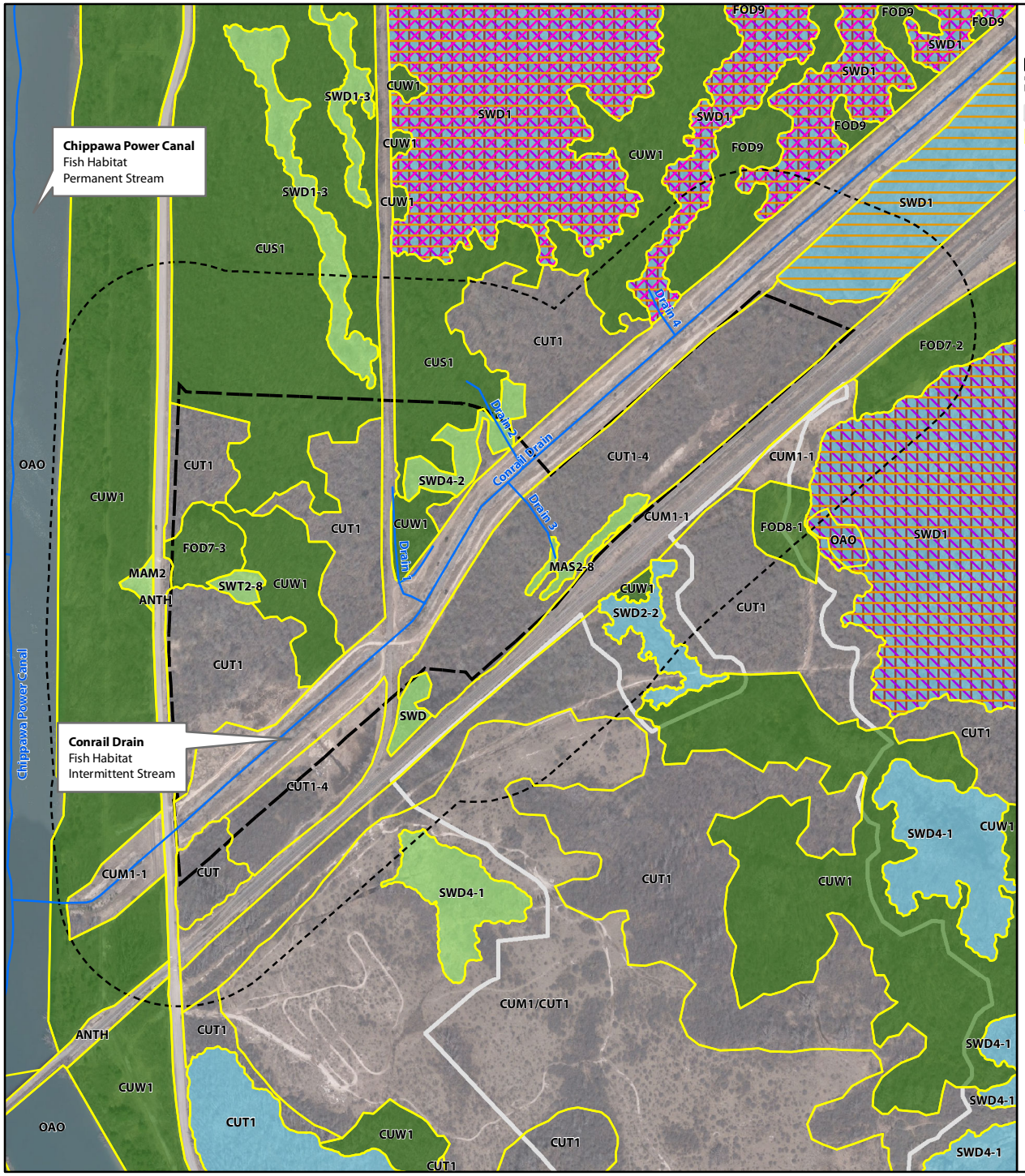

Legend

- Commercial Core Site Plan Block Area
- Commercial Core Site Plan Block Area + 120 metres
- Riverfront Residential (previously approved development application)
- Ecological Land Classification
- Provincially Significant Wetland (MNRF)
- Other Wetlands
- Other Woodlands
- Surface Water Drainage Feature
- Habitat of Endangered and Threatened Species (Acadian Flycatcher/Endangered Species of Bats)
- Significant Wildlife Habitat (Bat Maternity Colonies, Candidate Woodland Raptor Nesting Habitat, Candidate Woodland Area-Sensitive Bird Breeding Habitat)
- Significant Wildlife Habitat (Candidate Waterfowl Stopover and Staging Areas (aquatic), Habitat for Species of Conservation Concern (Wood Thrush))
- Significant Wildlife Habitat (Deer Winter Congregation Areas, Old-growth Forests)

ELC Legend

AGR, Agricultural
ANTH, Anthropogenic
CUM1-1, Dry - Moist Old Field Meadow
CUM1/CUT1, Mineral Cultural Thicket
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Pin Oak Mineral Deciduous Swamp
SWD2-2, Green Ash Mineral Deciduous Swamp
SWD4-1, Willow Mineral Deciduous Swamp
SWD4-2, Elm Swamp
SWT2, Mineral Thicket Swamp
SWT2-2, Willow Mineral Deciduous Thicket Swamp
SWT2-4, Buttonbush Mineral Deciduous Thicket Swamp
SWT2-8, Silky Dogwood

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Riverfront Commercial Core Lands – Blocks A01 to A06
Environmental Impact Study

Figure 5
Natural Heritage Features

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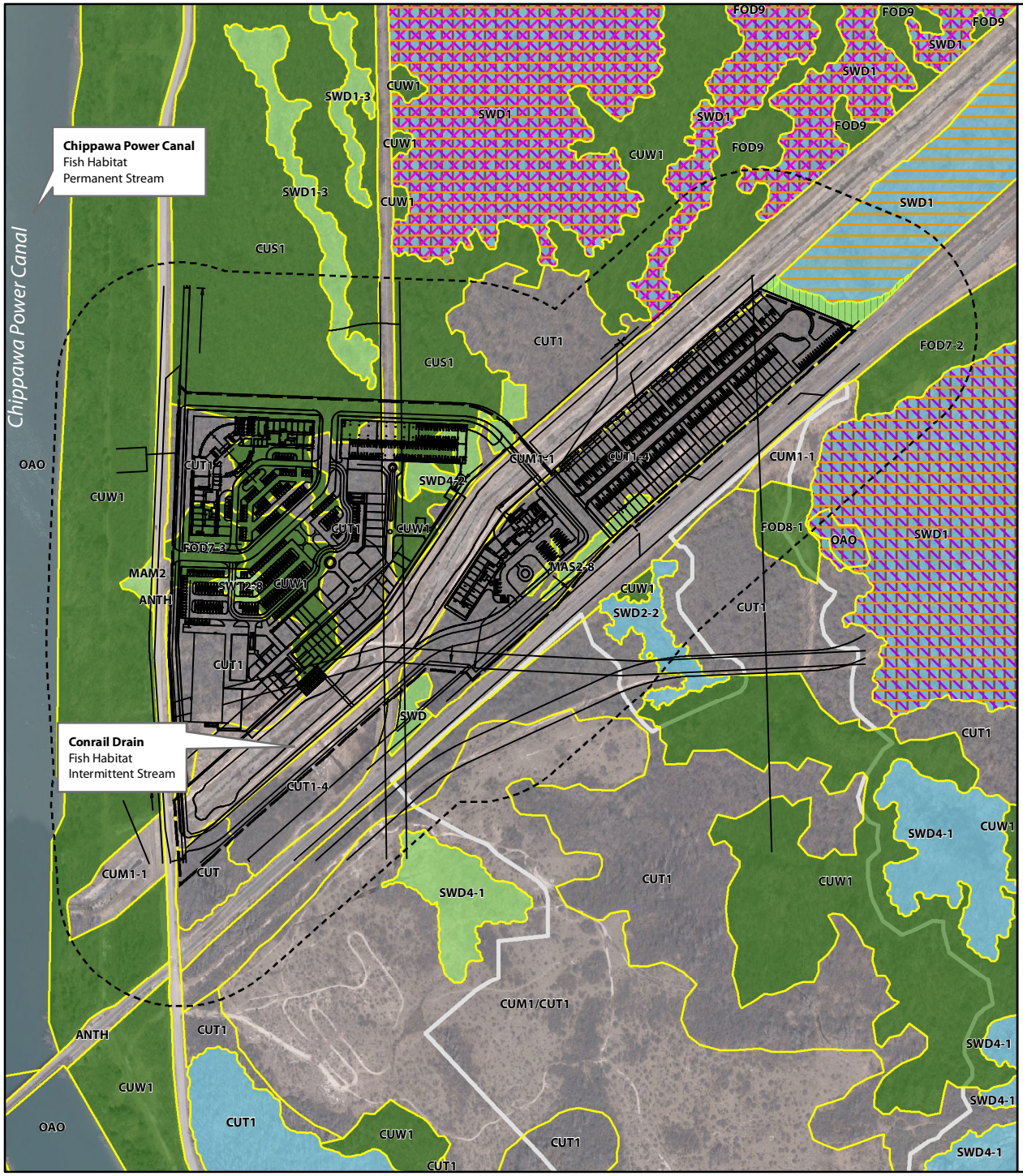

Legend

- Commercial Core Site Plan Block Area
- Commercial Core Site Plan Block Area + 120 metres
- Riverfront Residential (previously approved development application)
- Ecological Land Classification
- Provincially Significant Wetland (MNRF)
- Other Wetlands
- Other Woodlands
- Wetland Buffer
- Habitat of Endangered and Threatened Species (Acadian Flycatcher/Endangered Species of Bats)
- Significant Wildlife Habitat (Bat Maternity Colonies, Candidate Woodland Raptor Nesting Habitat, Candidate Woodland Area-Sensitive Bird Breeding Habitat)
- Significant Wildlife Habitat (Candidate Waterfowl Stopover and Staging Areas (aquatic), Habitat for Species of Conservation Concern (Wood Thrush))
- Significant Wildlife Habitat (Deer Winter Congregation Areas, Old-growth Forests)
- Site Plan (August 16, 2023)

ELC Legend

AGR, Agricultural
ANTH, Anthropogenic
CUM1-1, Dry - Moist Old Field Meadow
CUM1/CUT1, Mineral Cultural Thicket
CUP3-2, White Pine Coniferous Plantation
CUS1, Mineral Cultural Savanna
CUT, Cultural Thicket
CUT1, Mineral Cultural Thicket
CUT1-4, Gray Dogwood Deciduous Cultural Thicket
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FOD9, Fresh – Moist Oak – Maple – Hickory Deciduous Forest
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MAS2-8, Rice Cut-grass Mineral Shallow Marsh
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SWT2-8, Silky Dogwood

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Riverfront Commercial Core Lands – Blocks A01 to A06
Environmental Impact Study

Figure 6
Development Plan and Natural Heritage Buffer

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Appendix B

Tables

Table 1: Field Studies and Natural Inventories

FIELD DATE	NATURE OF INVESTIGATION	SURVEYOR
November 7-9, 2017 January 8, 11, 12, 15, 16, 2018 February 5, 2018	Bat habitat assessment	L. Williamson, M. Green, O. Robinson, J. Leslie
June through August 2018	Bat acoustic monitoring surveys	Overseen by E. Lee
April 8, 2020	First round calling amphibian survey	S. Lohnes, M. Rochon
April 24, 2020	First round turtle basking survey First round snake visual encounter survey	L. Williamson, M. Rochon
May 2, 2020	Second round turtle basking survey Second round snake visual encounter survey	L. Williamson, C. Zoladeski
May 20, 2020	Second round calling amphibian survey Third round turtle basking survey Third round snake visual encounter survey	L. Williamson, M. Rochon
June 9, 2020	First round breeding bird survey	P. Burke
June 11, 2020	Third round calling amphibian survey	L. Williamson, M. Rochon
June 24, 2020	Wetland survey	C. Zoladeski, A. Szabo
June 30, 2020	Second round breeding bird survey	P. Burke
May 5, 2023	Spring vegetation survey	J. Leslie
June 19, 2023	Drone survey for canopy analysis	E. Lee
August 3 and 4, 2023	Summer vegetation survey and Ecological Land Classification	J. Leslie
TBC	Fall vegetation survey	TBC

Inside Study Area	Outside Study Area	COMMON NAME	SCIENTIFIC NAME	Provincial Status (S RANK)	Global Status (G RANK)	SARO (MECP)	COSEWIC (Federal)	Niagara Region CA Status
X	X	**BUTTERFLIES**						
X		Monarch	*Danaus plexippus*	S4B, S2N	G4	SC	END	C
X	X							
X	X							
		AMPHIBIANS						
X		American Toad	*Anaxyrus americanus*	S5	G5			W
X		Gray Treefrog	*Hyla versicolor*	S5	G5			L
X		Western Chorus Frog (Carolinian population	*Pseudacris triseriata*	S4	G5	NAR	NAR	
X		Spring Peeper	*Pseudacris crucifer*	S5	G5			W
X		American Bullfrog	*Lithobates catesbeiana*	S4	G5			W
X		Northern Green Frog	*Lithobates clamitans*	S5	G5			W
X		Wood Frog	*Lithobates sylvatica*	S5	G5			L
X		Northern Leopard Frog	*Lithobates pipiens*	S5	G5		NAR	W
		REPTILES						
X		Eastern Gartersnake	*Thamnophis sirtalis*	S5	G5			
X		Dekay's Brownsnake	*Storeria dekayi*	S5	G5		NAR	L
	X	Eastern Milksnake	*Lampropeltis triangulum*	S4	G5	NAR	SC	I
X	X							
		BIRDS						L
X		Mallard	*Anas platyrhynchos*	S5	G5			U
X		Wild Turkey	*Meleagris gallopavo*	S5	G5			E
X		Rock Pigeon	*Columba livia*	SNA	G5			
X		Mourning Dove	*Zenaida macroura*	S5	G5			
X		Yellow-billed Cuckoo	*Coccyzus americanus*	S4B	G5			C
X		Ring-billed Gull	*Larus delawarensis*	S5	G5			
X		Double-crested Cormorant	*Phalacrocorax auritus*	S5B, S4N	G5			
X		Great Egret	*Ardea alba*	S2B	G5			U
X		Downy Woodpecker	*Dryobates pubescens*	S5	G5			
X		Great Crested Flycatcher	*Myiarchus crinitus*	S5B	G5			R
	X	Eastern Phoebe	*Sayornis phoebe*	S5B	G5			U
X		Warbling Vireo	*Vireo gilvus*	S5B	G5			
X		Blue Jay	*Cyanocitta cristata*	S5	G5			
X		Tree Swallow	*Tachycineta bicolor*	S4S5B	G5			C
X		Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	S4B	G5			C
X		Purple Martin	*Progne subis*	S3B	G5			U
X		Barn Swallow	*Hirundo rustica*	S4B	G5	SC	SC	U
X		Black-capped Chickadee	*Poecile atricapillus*	S5	G5			C

Inside Study Area	Outside Study Area	COMMON NAME	SCIENTIFIC NAME	Provincial Status (S RANK)	Global Status (G RANK)	SARO (MECP)	COSEWIC (Federal)	Niagara Region CA Status
X		House Wren	*Troglodytes aedon*	S5B	G5			U
X		Wood Thrush	*Hylocichla mustelina*	S4B	G4	SC	THR	
X		American Robin	*Turdus migratorius*	S5	G5			U
X		Gray Catbird	*Dumetella carolinensis*	S5B, S3N	G5			C
X		Brown Thrasher	*Toxostoma rufum*	S4B	G5			C
X		European Starling	*Sturnus vulgaris*	SNA	G5			U
X		Cedar Waxwing	*Bombycilla cedrorum*	S5	G5			
X		American Goldfinch	*Spinus tristis*	S5	G5			
X		Field Sparrow	*Spizella pusilla*	S4B, S3N	G5			R
X		Song Sparrow	*Melospiza melodia*	S5	G5			C
X		Eastern Towhee	*Pipilo erythrophthalmus*	S4B, S3N	G5			U
X		Orchard Oriole	*Icterus spurius*	S4B	G5			
X		Baltimore Oriole	*Icterus galbula*	S4B	G5			U
X		Red-winged Blackbird	*Agelaius phoeniceus*	S5	G5			C
X		Brown-headed Cowbird	*Molothrus ater*	S5	G5			C
X		Common Grackle	*Quiscalus quiscula*	S5	G5			
X		Blue-winged Warbler	*Vermivora cyanoptera*	S4B	G5			R
X		Common Yellowthroat	*Geothlypis trichas*	S5B, S3N	G5			
X		Yellow Warbler	*Setophaga petechia*	S5B	G5			
X		Northern Cardinal	*Cardinalis cardinalis*	S5	G5			U
X		Rose-breasted Grosbeak	*Pheucticus ludovicianus*	S5B	G5			C
X		Indigo Bunting	*Passerina cyanea*	S5B	G5			
X	X							
		MAMMALS						
X		Eastern Small-footed Myotis	*Myotis leibii*	S2S3	G4	END		
X		Little Brown Myotis	*Myotis lucifugus*	S3	G3	END	END	
X		Northern Myotis	*Myotis septentrionalis*	S3	G1G2	END	END	
X		Silver-haired Bat	*Lasionycteris noctivagans*	S4	G3G4		END	
X		Eastern Red Bat	*Lasiurus borealis*	S4	G3G4		END	
X		Big Brown Bat	*Eptesicus fuscus*	S4	G5			
X		Hoary Bat	*Lasiurus cinereus*	S4	G3G4		END	
X		Eastern Cottontail	*Sylvilagus floridanus*	S5	G5			
X		Red Squirrel	*Tamiasciurus hudsonicus*	S5	G5			
X		Northern Raccoon	*Procyon lotor*	S5	G5			
X		White-tailed Deer	*Odocoileus virginianus*	S5	G5			

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Table 3: Bird Species List

Commercial Core Lands
Riverfront Secondary Plan, Niagara Falls, ON

Common Name	Species Code	Scientific Name	Provincial Status (S-Rank)	Global Status (G-Rank)	ESA, 2007	SARA, 2002	SWH Indicator Species	Highest Breeding Evidence		Round 1 PC 1	Round 1 PC 2	Round 1 PC 3	Round 1 PC 4	Round 1 PC 5	Round 1 Incidental	Round 1 Off-site	Round 2 PC 1	Round 2 PC 2	Round 2 PC 3	Round 2 PC 4	Round 2 PC 5	Round 2 Incidental	Round 2 Off Site
									Date:	6/9/2020	6/9/2020	6/9/2020	6/9/2020	6/9/2020	6/9/2020	6/9/2020	6/29/2020	6/29/2020	6/29/2020	6/29/2020	6/29/2020	6/29/2020	6/29/2020
									Time:	5:46	7:17	6:58	6:29	6:02			5:35	6:17	6:48	7:25	5:49		
Anseriformes																							
Anatidae																							
Mallard	MALL	*Anas platyrhynchos*	S5	G5			X	OB-X					7	6									
Galliformes				`																			
Phasianinae																							
Wild Turkey	WITU	*Meleagris gallopavo*	S5	G5			X	PO-H							1								
Columbiformes																							
Columbidae																							
Rock Pigeon	ROPI	*Columba livia*	SNA	G5				OB-X														2	
Mourning Dove	MODO	*Zenaida macroura*	S5	G5				PO-H			1			1							2		1
Cuculiformes																							
Cuculidae																							
Yellow-billed Cuckoo	YBCU	*Coccyzus americanus*	S4B	G5				PR-T											1	1		1	
Charadriiformes																							
Laridae																							
Ring-billed Gull	RBGU	*Larus delawarensis*	S5B,S4N	G5			X	OB-X		1	1						1						
Suliformes																							
Phalacrocoracidae																							
Double-crested Cormorant	DCCO	*Phalacrocorax auritus*	S5B	G5				OB-X			1												
Ardeidae																							
Great Egret	GREG	*Ardea alba*	S2B	G5			X	OB-X					1										
Piciformes																							
Picidae																							
Downy Woodpecker	DOWO	*Dryobates pubescens*	S5	G5				CO-FY				3						1	2				
Passeriformes																							
Tyrannidae																							
Great Crested Flycatcher	GCFL	*Myiarchus crinitus*	S4B	G5				PR-T			1	1	1						1	2			
Eastern Phoebe	EAPH	*Sayornis phoebe*	S5B	G5				PO-S															1
Vireonidae																							
Warbling Vireo	WAVI	*Vireo gilvus*	S5B	G5				PO-S						1									
Corvidae																							
Blue Jay	BLJA	*Cyanocitta cristata*	S5	G5				PR-T		1	2		2	2				1	3				2
Hirundinidae																							
Tree Swallow	TRES	*Tachycineta bicolor*	S4B	G5				PO-H									1						
Northern Rough-winged Swallow	NRWS	*Stelgidopteryx serripennis*	S4B	G5			X	PO-H														1	
Purple Martin	PUMA	*Progne subis*	S3S4B	G5				OB-X									1						
Barn Swallow	BARS	*Hirundo rustica*	S5B	G5	SC	SC		OB-X						3			1			1	3		
Paridae																							
Black-capped Chickadee	BCCH	*Poecile atricapillus*	S5	G5				PR-P		1	2	2	1	1									1
Troglodytidae																							
House Wren	HOWR	*Troglodytes aedon*	S5B	G5				PR-T					1					1	1			1	
Turdidae																							
Wood Thrush	WOTH	*Hylocichla mustelina*	S4B	G4	SC	THR	X	PR-T		1	1	1	1				3	3	3	3	2		
American Robin	AMRO	*Turdus migratorius*	S5B	G5				PR-T		1	1	3	1	1				1	2	2			
Mimidae																							
Gray Catbird	GRCA	*Dumetella carolinensis*	S4B	G5				PR-T			3	1		1		1		2	1	2	1		
Brown Thrasher	BRTH	*Toxostoma rufum*	S4B	G5			X	PR-T						1						1			
Sturnidae																							
European Starling	EUST	*Sturnus vulgaris*	SNA	G5				PO-H									1						
Bombycillidae																							
Cedar Waxwing	CEDW	*Bombycilla cedrorum*	S5B	G5				PR-T			10		1							2			
Fringillidae																							
American Goldfinch	AMGO	*Spinus tristis*	S5B	G5				PR-T		1		2								1			
Passerellidae																							
Field Sparrow	FISP	*Spizella pusilla*	S4B	G5			X	PR-T			1	1	1	1				1	2	1	2		

Table 3: Bird Species List

Commercial Core Lands
Riverfront Secondary Plan, Niagara Falls, ON

Common Name	Species Code	Scientific Name	Provincial Status (S-Rank)	Global Status (G-Rank)	ESA, 2007	SARA, 2002	SWH Indicator Species	Highest Breeding Evidence		Round 1 PC 1	Round 1 PC 2	Round 1 PC 3	Round 1 PC 4	Round 1 PC 5	Round 1 Incidental	Round 1 Off-site	Round 2 PC 1	Round 2 PC 2	Round 2 PC 3	Round 2 PC 4	Round 2 PC 5	Round 2 Incidental	Round 2 Off Site
									Date:	6/9/2020	6/9/2020	6/9/2020	6/9/2020	6/9/2020	6/9/2020	6/9/2020	6/29/2020	6/29/2020	6/29/2020	6/29/2020	6/29/2020	6/29/2020	6/29/2020
									Time:	5:46	7:17	6:58	6:29	6:02			5:35	6:17	6:48	7:25	5:49		
Song Sparrow	SOSP	*Melospiza melodia*	S5B	G5				PR-T		1	1	2	4	3					3	2	2		
Eastern Towhee	EATO	*Pipilo erythrophthalmus*	S4B	G5			X	PR-T			3	1	3	1				1	1	3			
Icteridae																							
Orchard Oriole	OROR	*Icterus spurius*	S4B	G5				PO-S						1									
Baltimore Oriole	BAOR	*Icterus galbula*	S4B	G5				PR-T		1		3	1	2									1
Red-winged Blackbird	RWBL	*Agelaius phoeniceus*	S4	G5				CO-DD				1	1	9					7	6	7		
Brown-headed Cowbird	BHCO	*Molothrus ater*	S4B	G5				PR-P				4	1	1					1	3	1		
Common Grackle	COGR	*Quiscalus quiscula*	S5B	G5				PO-H		1	1	2	1				1	1	7	3	30		
Parulidae																							
Blue-winged Warbler	BWWA	*Vermivora cyanoptera*	S4B	G5				PR-T			1	2	1	1				1		2	1		
Common Yellowthroat	COYE	*Geothlypis trichas*	S5B	G5				PR-T			1		1	1							1		
Yellow Warbler	YWAR	*Setophaga petechia*	S5B	G5				PR-T			1	2	1	3					1	1	1		
Cardinalidae																							
Northern Cardinal	NOCA	*Cardinalis cardinalis*	S5	G5				PR-T			1		2			1		1	1	2			
Rose-breasted Grosbeak	RBGR	*Pheucticus ludovicianus*	S4B	G5				PR-T			1	2	2	2			2	2		1	1		1
Indigo Bunting	INBU	*Passerina cyanea*	S4B	G5				PO-S					1										

Species Common Name and Scientific Name: Chesser, R. T., K. J. Burns, C. Cicero, J. L. Dunn, A. W. Kratter, I. J. Lovette, P. C. Rasmussen, J. V. Remsen, Jr., D. F. Stotz, and K. Winker. 2019. Check-list of North American Birds (online). American Ornithological Society. Available online: http://checklist.aou.org/taxa

Species Code: Consistent with the American Ornithologists' Union. 2019. Species 4-Letter-Codes. Available online: http://www.birdsontario.org/atlas/codes.jsp?lang=en&pg=species

Highest Breeding Evidence: Codes assigned for breeding evidence are consistent with the Ontario Breeding Bird Atlas (OBBA). 2018. Breeding Evidence Codes. Available online: http://www.birdsontario.org/atlas/codes.jsp?lang=en&pg=breeding&sortorder=aou

S ranks: Provincial ranks are from the Natural Heritage Information Centre; S1 (critically imperiled), S2 (imperlied), S3 (vulnerable), S4 (apparently secure), S5 (secure); ranks were updated using NHIC species list December 2018. Available to download from: https://www.ontario.ca/page/get-natural-heritage-information

G ranks: Global ranks are from the Natural Heritage Information Centre; G1 (extremely rare), G2 (very rare), G3 (rare to uncommon), G4 (common), G5 (very common); ranks were updated using NHIC species list December 2018. Available to download from: https://www.ontario.ca/page/get-natural-heritage-information

COSSARO (MNRF): Ontario Species at Risk as listed by the Committee on the Status of Species at Risk in Ontario (from NHIC Table December 2018 and updates posted on Ontario Regulation 230/08 Species at Risk in Ontario website as of August 1, 2018: https://www.ontario.ca/laws/regulation/080230/); END - Endangered; THR - Threatened; SC - Special Concern; NAR - Not at Risk

COSEWIC: Assessed Species at Risk at the national level as listed by the Committee on the Status of Endangered Wildlife in Canada (from COSEWIC: https://wildlife-species.canada.ca/species-risk-registry/sar/index/default_e.cfm); END - Endangered, THR - Threatened, SC - Special Concern, NAR - Not at Risk

SWH Indicator Species: SWH refers to Significant Wildlife Habitat as defined by the MNRF (2015) Significant Wildlife Habitat Criteria Schedules for Ecoregions 7E and 6E (as appropriate for the Subject Lands). SWH indicator species are identified in this table and any potential SWH is discussed in the text of this report. Available online: http://www.townofnemi.on.ca/wp-content/uploads/2016/02/NEMI-OP-App-C-schedule-6e-jan-2015-access-ver-final-s.pdf

Table 4: Amphibian Call Count Survey Station Results

SURVEY ROUND	STATION NUMBER	SPECIES CODE												WATER
		NOAM	AMTO	FOTO	GRTR	SPPE	CHFR	WOFR	NLFR	PIFR	GRFR	BULL	MIFR	Present (Y/N)
1	AMC1	X												Y
2	AMC1	X												Y
3	AMC1										1(2)			Y
1	AMC2	X												Y
2	AMC2					1(1)								Y
3	AMC2	X												Y
1	AMC3						1(1)							Y
2	AMC3	X												Y
3	AMC3	X												Y
1	AMC4		1(3)				1(1)	1(2)						Y
2	AMC4		1(1)				1(1)							Y
3	AMC4	X												Y
1	AMC5					2(10)		1(1)						Y
2	AMC5				1(3)	1(6)								Y
3	AMC5				1(8)						1(4)	1(2)		Y
1	AMC6	X												Y
2	AMC6	X												Y
3	AMC6	DRY												N

LEGEND:

Table 4: Amphibian Call Count Survey Station Results

SPECIES CODE	COMMON NAME	SCIENTIFIC NAME
NOAM	No Amphibians	No amphibians despite survey effort
AMTO	American Toad	*Anaxyrus americanus*
FOTO	Fowler's Toad	*Anaxyrus fowleri*
GRTR	Gray Treefrog	*Hyla versicolor*
CHFR	Western Chorus Frog	*Pseudacris triseriata*
WOFR	Wood Frog	*Lithobates sylvaticus*
NLRF	Northern Leopard Frog	*Lithobates pipiens*
PIFR	Pickerel Frog	*Lithobates palustris*
GRFR	Green Frog	*Lithobates clamitans*
BULL	American Bullfrog	*Lithobates catesbeianus*
MIFR	Mink Frog	*Lithobates septentrionalis*

CALL CODES	
X	No amphibians heard
1	Calls can be counted without error
2	Calls overlap but can be reliably estimated
3	Calls overlap too much to estimate number

Note: For each species, the first number is the call code and the second number, which is in brackets, is the number of individuals of that species heard calling.

Table 5: Snake Survey Results

DATE SURVEYED	SURVEY ROUND	TRANSECT OR STATION NUMBER	SPECIES CODE														
			NOSN	EAGA	MISN	BRSN	RBSN	NWSN	RISN	BLRA	BUGA	FOSN	HOSN	MASS	RNSN	SGSN	QUSN
AP 24, 2020	1	AS1	X														
MA 02, 2020	2	AS1	X														
MA 20, 2020	3	AS1		1													
AP 24, 2020	1	AS2	X														
MA 02, 2020	2	AS2				1											
MA 20, 2020	3	AS2		1													
AP 24, 2020	1	AS3	X														
MA 02, 2020	2	AS3	X		Off-site												
MA 20, 2020	3	AS3	X														
AP 24, 2020	1	AS4	X														
MA 02, 2020	2	AS4	X														
MA 20, 2020	3	AS4	X														
AP 24, 2020	1	AS5	X														
MA 02, 2020	2	AS5	X														
MA 20, 2020	3	AS5	X														
AP 24, 2020	1	Road Transect	X														
MA 02, 2020	2	Road Transect	X														
MA 20, 2020	3	Road Transect	X														

LEGEND:

SPECIES CODE	COMMON NAME	SCIENTIFIC NAME
NOSN	No Snakes	No snakes despite survey effort
EAGA	Eastern Gartersnake	*Thamnophis sirtalis sirtalis*
MISN	Eastern Milksnake	*Lampropeltis triangulum*
BRSN	DeKay's Brownsnake	*Storeria dekayi*
RBSN	Northern Red-bellied Snake	*Storeria occipitomaculata occipitomaculata*
NWSN	Northern Watersnake	*Nerodia sipedon sipedon*

DATE	
MONTH	CODE
January	JA
February	FE
March	MR
April	AP
May	MA
June	JN

Table 5: Snake Survey Results

RASN	Gray Ratsnake	*Pantherophis spiloides*
RISN	Eastern Ribbonsnake	*Thamnophis sauritus*
BLRA	Blue Racer	*Coluber constrictor foxii*
BUGA	Butler's Gartersnake	*Thamnophis butleri*
FOSN	Eastern Foxsnake	*Pantherophis gloyd*
HOSN	Eastern Hog-nosed Snake	*Heterodon platifhinos*
MASS	Massassauga	*Sistrusus catenatus catenatus*
RNSN	Ring-necked Snake	*Diadophis punctatus*
SGSN	Smooth Greensnake	*Opheodrys vernalis*
QUSN	Queensnake	*Regina septemvittata*

July	JL
August	AU
September	SE
October	OC
November	NO
December	DE

Table 6: Turtle Survey Results

DATE SURVEYED	SURVEY ROUND	TRANSECT OR STATION NUMBER	SPECIES CODE								
			NOTU	MPTU	SNTU	MATU	BLTU	SSTU	WOTU	STIN	SPTU
AP 24, 2020	1	BS1	X								
MA 02, 2020	2	BS1	X								
MA 20, 2020	3	BS1	X								
AP 24, 2020	1	BS2	X								
MA 02, 2020	2	BS2	X								
MA 20, 2020	3	BS2	X								

LEGEND:

SPECIES CODE	COMMON NAME	SCIENTIFIC NAME
NOTU	No Turtles	No turtles despite survey effort
MPTU	Midland Painted Turtle	*Chrysemys picta marginata*
SNTU	Snapping Turtle	*Chelydra serpentina*
MATU	Northern Map Turtle	*Graptemys geographica*
BLTU	Blanding's Turtle	*Emydoidea blandingii*
SSTU	Spiny Soft-shelled Turtle	*Apalone spinifera*
WOTU	Wood Turtle	*Glyptemys insculpta*
STIN	Stinkpot Turtle	*Stemotherus odoratus*
SPTU	Spotted Turtle	*Clemmys guttata*

DATE	
MONTH	CODE
January	JA
February	FE
March	MR
April	AP
May	MA
June	JN
July	JL
August	AU
September	SE
October	OC
November	NO
December	DE

Table 7: Fish Community Survey Results

SPECIES		Number of Fish Caught		
		Conrail Drain		
		Transect Number	Spot Sampling Locations	
Common Name	Scientific Name	CD-3	CD-1	CD-2
Central Mudminnow	*Umbra limi*	-	-	-
White Sucker	*Catostomus commersonii*	-	-	-
Emerald Shiner	*Notropis atherinoides*	-	-	-
Spottail Shiner	*Notropis hudsonius*	-	-	-
Bluntnose Minnow	*Pimephales notatus*	-	-	-
Creek Chub	*Semotilus atromaculatus*	-	-	-
Brown Bullhead	*Ictalurus nebulosus*	-	-	-
Brook Stickleback	*Culaea inconstans*	10 adults 100's YOY	4	1 (Observed)
Green Sunfish	*Lepomis cyanellus*	1	-	-
Pumpkinseed	*Lepomis gibbosus*	5	-	-
Largemouth Bass	*Micropterus salmoides*	-	-	-
Total Fish Caught		TNTC	4	1
Species Richness		3	1	1
Electrofishing Effort (sec)		391	248	194
Catch per Unit Effort (fish/100 sec)		n/a	1.6	0.51
Length of Stream Sampled		40 m	12 m	10 m

Legend
TNTC – To numerous to count

Table 8: Significant Wildlife Habitat Assessment

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
1. SEASONAL CONCENTRATION AREAS					
Waterfowl Stopover and Staging Areas (terrestrial)	Yes (CUM, CUT)	No – No evidence of annual spring flooding	N/A	N/A	No
Waterfowl Stopover and Staging Areas (aquatic)	Yes (SWD)	Small SWD units are too small to support large congregations of migratory waterfowl Large SWD units northeast and southeast of Commercial Core Lands treated as SWH for migratory waterfowl	N/A	N/A	Candidate SWH for migratory waterfowl associated with PSW units.
Shorebird Migratory Stopover Areas	Yes – MAM unit located within 120 m of Commercial Core Lands west of Dorchester Road.	No - Small MAM unit is too small to support large congregations of migratory shorebirds	N/A	N/A	No
Raptor Wintering Areas	Yes – FOD, CUM, CUT, CUS, CUW	No – At less than 0.5 ha, FOD units are too small to form the required component of this habitat type.	N/A	N/A	No
Bat Hibernacula	No	N/A	N/A	N/A	No

Table 8: Significant Wildlife Habitat Assessment

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
Bat Maternity Colonies	Yes (FOD, SWD)	Small FOD and SWD units are too small to support significant wildlife habitat due to limited number of suitable roost trees present within these features owing to size. Large SWD units northeast and southeast of Commercial Core Lands provide abundant maternity roosting habitat at a high calculated density (greater than 100 trees per hectare)	Yes	Abundant numbers of Big Brown Bat were recorded within the unit northeast of the Commercial Core Lands to meet significant criteria. Numbers within the unit southeast of the Commercial Core Lands were significantly lower and so this unit is not considered to meet the threshold for significance.	Yes (SWD unit northeast of the Commercial Core Lands).
Turtle Wintering Areas	Yes (SW, MA)	The majority of areas with standing water did not contain sufficient depth to support turtle over-wintering, however two small pools were identified that may provide suitable conditions.	Yes	No - No turtles were identified during basking surveys completed in 2020.	No
Colonial Bird Nesting Sites (bank/cliff)	Yes (CUM, CUS, CUT)	No – No steep eroding banks, sandy hills, borrow pits, slopes, and sand piles.	N/A	N/A	No

Table 8: Significant Wildlife Habitat Assessment

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
Colonial Bird Nesting Sites (tree/shrubs)	Yes (SWD)	Yes	Yes	No –Nesting colonies not identified during breeding bird surveys. One Great Egret was observed flying over the Commercial Core Lands, but there was no evidence that it was nesting in the area.	No
Colonial Bird Nesting Sites (ground)	Yes (CUM, CUT, CUS)	Yes	Yes	No – Brewer's Blackbird were not identified during bird surveys	No
Reptile Hibernacula	Yes – Suitable habitat features may be found within all ecosites	Suitable hibernacula features were not identified, but could be present	Yes	No – Insufficient numbers of snakes detected during area transects to meet criteria	No
Migratory Butterfly Stopover Areas	Yes (FOD, CUM, CUT, CUS)	No – Not within 5 km of Lake Erie or Lake Ontario	N/A	N/A	No
Migratory Landbird Stopover Areas	Yes (FOD, SWD)	No – Not within 5 km of Lake Erie or Lake Ontario	N/A	N/A	No

Table 8: Significant Wildlife Habitat Assessment

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
Deer Winter Congregation Areas	Yes – As identified by MNRF	Yes	N/A – habitat was identified by MNRF and refined by GEI in consultant with MNRF to match suitable ELC types on the Subject Lands	N/A	Yes (SWD units around the eastern edge of the Commercial Core are considered Deer Winter Congregation Areas).
2. RARE VEGETATION COMMUNITIES OR SPECIALIZED HABITAT FOR WILDLIFE					
2a. Rare Vegetation Communities					
Rare Vegetation Types (cliffs, talus slopes, sand barrens, alvars, old-growth forests, savannahs, and tallgrass prairies)	Yes – Older growth forests have been identified within the SWD1 units surrounding the eastern portion of the Subject Lands	Yes	Yes	Yes	Yes
Other Rare Vegetation Types (S1 to S3 communities)	Yes – A minor component of a Buttonbush Swamp is present on the Subject Lands. However given that this community type is more common within Niagara Region, and is of a small size, it is not considered to be candidate SWH.	N/A	N/A	N./A	No

Table 8: Significant Wildlife Habitat Assessment

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
2b. Specialized Wildlife Habitat					
Waterfowl Nesting Area	Yes (SWD, MAM)	Yes	Yes	No – Only Mallard observed, no breeding evidence recorded	No
Bald Eagle and Osprey Habitats	Yes (FOD, SWD)	Yes	Yes	No – No breeding evidence by either species in local area	No
Woodland Raptor Nesting Habitat	Yes (FOD, SWD)	Yes – Only the large SWD unit northeast of the Subject Lands meets the required size criteria and is treated as candidate SWH	N/A	N/A	Candidate SWH for Woodland Raptor Nesting Habitat
Turtle Nesting Areas	No	N/A	N/A	N/A	No
Seeps and Springs	No	N/A	N/A	N/A	No
Woodland Amphibian Breeding Habitats (within or < 120m from woodland)	Yes (several vernal pools present within the FOD and SWD units)	Yes - Large SWD unit treated as candidate significant woodland amphibian breeding habitat. Other units subject to detailed investigations	Yes	No – Surveys completed in 2020 did not identify sufficient numbers of amphibians to meet significant criteria. A large number of Western Chorus Frog egg masses was identified within a small vernal pool in 2019, however given the absence of significant	No

Table 8: Significant Wildlife Habitat Assessment

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
				numbers of other species from this feature, it does not meet SWH requirements.	
Wetland Amphibian Breeding Habitats (wetland >120m from woodland)	Yes (SW and MA)	Yes	Yes	No – None of the surveyed features met criteria for significance.	No
Woodland Area-Sensitive Bird Breeding Habitat	Yes (SW and FO)	Yes – Large SWD unit northeast of the Subject Lands meets the required size criteria and is treated as SWH	N/A	N/A	Candidate habitat for Woodland Area-Sensitive Bird Breeding Habitat
3. SPECIES OF CONSERVATION CONCERN					
Marsh Bird Breeding Habitat	Yes (MA)	No – Small size in proximity to roadway would not support SWH	N/A	N/A	No
Open Country Bird Breeding Habitat	Yes (CUM)	No – Size is less than 30 ha	N/A	N/A	No
Shrub/Early Successional Bird Breeding Habitat	Yes (CUS, CUT, CUW)	Yes – Greater than 10 ha in size	Yes	No – Though one Brown Thrasher was observed in 2020, it was located in a smaller portion of habitat south of the Commercial Core Lands habitat.	No

Table 8: Significant Wildlife Habitat Assessment

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
Terrestrial Crayfish	No – SWD communities are present however Terrestrial Crayfish require access to the water table and groundwater interaction not present on-site	No	No	No – No chimneys observed during field investigations	No
Special Concern and Rare Wildlife Species					
(i) Wood Thrush	Yes – Mature forest communities provide habitat for this species. This habitat type is present within the broader SWD communities	Yes	yes	Yes – Wood Thrush were identified during breeding bird surveys and the large SWD communities are considered to be the limits of the SWH. Though Wood Thrush were recorded outside of these units, these locations are not considered to be SWH due to the marginal nature of the habitat and the proximity to core habitat. These locations are more likely to be unpaired males and not successful breeding locations	Yes (Large SWD communities adjacent to the eastern portion of the Subject Lands)
4. ANIMAL MOVEMENT CORRIDORS					

Table 8: Significant Wildlife Habitat Assessment

SIGNIFICANT WILDLIFE HABITAT (SWH) TYPE	ELC ECOSITE(S) PRESENT	HABITAT CRITERIA MET	TARGETED FIELD STUDIES REQUIRED	DEFINING CRITERIA MET (MINIMUM ABUNDANCES AND/OR DIVERSITY REQUIRED TO CONFIRM SWH)	SWH TYPE PRESENT
Amphibian Movement Corridors	N/A – No wetland amphibian breeding habitats identified	N/A	N/A	N/A	No

Appendix C

Terms of Reference

April 13, 2023

GR (CAN) Investments Ltd
4342 Queen Street, Ste 203
Niagara Falls, ON L2E 7J7

Attention: Feng Shi - Chief Engineer

Dear Mr. Shi:

RE: Scoped Environmental Impact Study Terms of Reference, Blocks A01-A06 and Block 22 - Riverfront, Niagara Falls, ON

GEI Consultants Ltd. (GEI) has been retained by GR (CAN) Investments Ltd. to complete natural heritage investigations for two areas of interest within the Riverfront Secondary Plan area, namely Blocks A01-06 and Block 22 (together referred to as the Subject Lands). The Subject Lands are located centrally within the City of Niagara Falls, north of the Welland River/Chippawa Parkway east of the Ontario Power Generation Inc (OPG)/Chippawa Power Canal, south of Oldfield Road and West of Stanley Avenue (**Figure 1**). The Subject Lands are bisected by the Conrail Drainage Ditch (Conrail Drain) and a railway line, with Blocks A01-06 located to the west of the railway line and Block 22 to the east.

This Terms of Reference (TOR) has been prepared to document planning considerations, field investigations conducted for the site to date and outline future proposed work in support of the ultimate preparation of a scoped Environmental Impact Study (EIS). The Terms of Reference was prepared in consideration of Niagara Peninsula Conservation Authority (NPCA)'s Interim EIS Guidelines (NPCA 2022) and Niagara Region's EIS Guidelines (Niagara Region 2018)

1. NATURAL HERITAGE PLANNING CONSIDERATIONS

GEI has undertaken a review of a variety of background material and relevant planning policy and guideline resources, as input to the implementation of natural heritage approaches, including the following:

Provincial Policy Statement (MMAH 2020)

The PPS (MMAH 2020) provides direction on matters of provincial interest related to land use planning and development. It "supports improved land use planning and management, which contributes to a more effective and efficient land use planning system." The PPS is to be read in its entirety and land use planners and decision-makers need to consider all relevant policies and how they work together. The PPS (MMAH 2020) came into effect May 1, 2020 and replaces the previous PPS issued April 30, 2014.

This report addresses those policies that are specific to Natural Heritage (Section 2.1) with some reference to other policies with relevance to Natural Heritage and impact assessment considerations and areas of overlap (e.g., those related to Efficient and Resilient Development and Land Use Patterns, Section 1.1; Sewage, Water and Stormwater, Section 1.6.6; Water, Section 2.2; Natural Hazards, Section 3.1).

Eight types of significant natural heritage features are defined in the PPS, as follows:

- Significant wetlands;
- Significant coastal wetlands;
- Significant woodlands;
- Significant valleylands;
- Significant wildlife habitat;
- Fish habitat;
- Habitat of endangered and threatened species; and
- Significant Areas of Natural and Scientific Interest (ANSIs).

Development and site alteration shall not be permitted in significant wetlands within Ecoregions 5E, 6E or 7E, or in significant coastal wetlands. Development and site alteration shall not be permitted in significant woodlands, significant valleylands, significant wildlife habitat or significant ANSIs, unless it is demonstrated that there will be no negative impacts on the natural features or their ecological functions.

Development and site alteration shall not be permitted in the habitat of endangered and threatened species or in fish habitat, except in accordance with provincial and federal requirements.

Niagara Region Official Plan

Schedule A depicts the Subject Lands as being part of a Settlement Area, and not part of any Provincial Natural Heritage Systems. Schedule B (Regional Structure) of the Niagara Region Official Plan (2022) depicts the Subject Lands as being primarily located within a mixture of the Built-Up Urban Area Designation and the Designated Greenfield Designation, with a small portion of Block 22 being additionally located within a designated Employment Area. Schedule C2 (Natural Environment System) documents the presence of Other Woodlands, Provincially Significant Wetlands and Permanent and Intermittent Streams as Key Natural Heritage Features on or adjacent to the Subject Lands.

Development and site alteration shall not be permitted in Provincially Significant Wetlands, Significant Coastal Wetlands or Significant Woodlands (Section 3.1.9.5). Development and site alteration that is adjacent *to* a natural heritage feature shall require an EIS to determine that there will be no negative impacts on the natural features or their ecological functions in accordance with the adjacent lands distances below:

- 120 m from a Provincially Significant Wetland;
- 120 m from a Significant Coastal Wetland;
- 120 m from a Significant Woodland;
- 50 m from Other Woodlands;
- 50 m from Significant Valleylands;
- 50 m from Significant Wildlife Habitat; and
- 50 m from areas of natural and scientific interest.

Development and site alteration shall not be permitted within the following natural heritage features and areas unless it has been demonstrated through the preparation of an EIS that there will be no negative impacts on the natural features or their ecological functions:

- Other woodlands;
- Significant valleylands;
- Significant wildlife habitat; and
- Areas of natural and scientific interest.

Within settlement areas, a mandatory buffer on all natural heritage features is required, the width of which is to be determined through an EIS (Section 3.1.9.9).

Further to the above, it is noted that where a development is located within a secondary plan area that was approved after July 1, 2012, that the portions that are not subject to a draft approved plan of subdivision (such as the Subject Lands) shall be approved in accordance with the approved mapping and policies of the secondary plan (Section 3.1.30.4).

City of Niagara Falls Official Plan

As depicted within the City of Niagara Falls Official Plan (2019), the Subject Lands are located within the Riverfront Secondary Plan Area and Special Policy Area 56. Schedule A6 depicts Blocks A01-06 as Mixed-Use with some Environmental Protection Areas. Schedule A6 (a) shows potential woodland removal areas within Blocks A01-A06, and locations of Provincially Significant Wetlands (Environmental Protection Areas). Block 22 is depicted between two Provincially Significant Wetlands according to Schedule A6, and includes locations for potential woodland enhancement/restoration as shown in Schedule A6 (a).

Part 5 Section 4 – Riverfront Community Plan and Part 2 Section 13.56 – Special Policy Area 56 of the City of Niagara Falls Official Plan (2018) documents the development review procedures and policies of the City regarding the Subject Lands. Specifically, Part 2 Section 13.56.5 states that refinement to the extent of the Environmental Protection Area and other designations and the establishment of appropriate setbacks and linkages will occur at the Secondary Plan, zoning by-law, plan of subdivision, plan of condominium and site plan control stages and shall be based on detailed Environmental Impact Studies. Part 5 Section 4 also indicates the submission and approval of an Environmental Impact Study as required through the subdivision and development application process.

Niagara Peninsula Conservation Authority

NPCA administers the Development, Interference with Wetlands, Alterations to Shorelines and Watercourses Regulation, (O. Reg.) 166/06, which defines the areas of interest that allow NPCA to:

- Prohibit, regulate, or provide permission for straightening, changing, diverting or interfering in any way with the existing channel of a river, creek, stream, watercourse or changing or interfering with a wetland; and

- Prohibit, regulate, or provide permission for development if the control of flooding, erosion, dynamic beaches, pollution or the conservation of land may be affected by the development.

The Regulation Limit delineates hazardous lands, wetlands, shorelines, and areas susceptible to flooding and associated allowances. The Subject Lands include the NPCA regulation limits, which include provincially evaluated wetlands.

Pursuant to the Development, Interference with Wetland and Alterations to Shorelines and Watercourse Regulation (Ontario Regulation 166/06), any development in or on areas defined in the Regulation (e.g., river or stream valleys, hazardous land, wetlands) requires permission from the Conservation Authority. The Conservation Authority may grant permission for development in or on these areas if, in its opinion, the control of flooding, erosion, dynamic beaches, pollution or the conservation of land will not be affected by the development. The Regulation also states that it is prohibited to straighten, change, divert or interfere in any way with the existing channel of a river, creek, stream, or watercourse or change or interfere in any way with a wetland without permission from the Conservation Authority.

The Policies for Planning and Development in the Watersheds of the Niagara Peninsula Conservation Authority (2022) contains the principles, goals, objectives, and policies approved by the NPCA for their planning and development approvals process. This document outlines policies related to Environmental Impact Studies and recommended buffer widths for features under their jurisdiction, including floodplains, wetlands, and watercourses, as well as requirements for development in proximity to natural hazards, such as valleylands.

Fisheries Act (1985)

Fisheries and Oceans Canada (DFO) administers the federal Fisheries Act (1985) which defines fish habitat as “spawning grounds and other areas, including nursery, rearing, food supply and migration areas, on which fish depend directly or indirectly in order to carry out their life processes” [subsection (2)1]. The Fisheries Act prohibits the death of fish by means other than fishing [subsection 34.4 (1)] and the harmful alteration, disruption or destruction of fish habitat [HADD; subsection 35. (1)]. A HADD is defined as “any temporary or permanent change to fish habitat that directly or indirectly impairs the habitat’s capacity to support one or more life processes” (DFO 2021).

Some projects may be eligible for exemption from the DFO review process, as specified under Step 3 of the DFO Fish and Fish Habitat Protection Program review process, such as clear-span bridges and bridge maintenance projects where DFO mitigation measures are applied, artificial waterbodies with no hydrological connection to occupied fish habitat, and projects that follow the Standards and Codes of Practice defined by DFO (DFO, 2021). All other projects or activities that have the potential to impact fish or fish habitat should be submitted to DFO through the “Request for Review” process. DFO will review the proposed project to determine whether there is potential to (1) impact an aquatic species at risk, (2) cause the death of fish or (3) result in HADD of fish habitat. The death of fish by means other than fishing or a HADD of fish habitat can be authorized by DFO under paragraphs 34.4(2)(b) or 35(2)(b) of the Fisheries Act. Authorizations require the preparation and submission of an application package identifying the impacts on fish and fish habitat as well as the avoidance, mitigation and offsetting measures that will be implemented as well as any monitoring that is proposed.

Migratory Birds Convention Act (1994)

The MBCA (1994) provides protection to migratory birds, their habitats and nests at the federal level by prohibiting the destruction of active migratory bird nests. Currently, 700 migratory bird species are protected under this Act, including songbirds, woodland birds, waterfowl, shorebirds and seabirds. Although no permit is required by the legislation, appropriate timing constraints on potentially disruptive activities such as vegetation clearing (e.g., tree removal) where migratory birds may be nesting are required to avoid contravention of this Act.

Endangered Species Act (2007)

The provincial Endangered Species Act (ESA), 2007 was developed to:

- Identify Species at Risk (SAR), based upon best available science;
- Protect SAR and their habitats and to promote the recovery of SAR; and
- Promote stewardship activities that would support those protection and recovery efforts.

The ESA (2007) protects all threatened, endangered, and extirpated species on the Species at Risk in Ontario (SARO) list. These species are legally protected from harm or harassment and their associated habitats are legally protected from damage or destruction, as defined under the ESA (2007).

It should be noted that for the purposes of this memo SAR will be considered those species designated as either Endangered or Threatened on the SARO list. Habitats for species with a designation of Special Concern on the SARO list are treated as a Species of Conservation Concern (SOCC) and are protected under the PPS as a type of Significant Wildlife Habitat (SWH).

2. SUMMARY OF PREVIOUS NATURAL HERITAGE STUDIES

The Subject Lands exist within a broader Study Area of lands owned, or previously owned, by GR (CAN) Investments Ltd. as shown in **Figure 1**. Portions of the Study Area have been referred to in Subwatershed Studies completed by NPCA. Pertinent background reference documents include the Lower Welland River Characterization report (NPCA 2011a) and the South Niagara Falls Watershed Report (NPCA 2008). The NPCA Natural Area Inventory reports also include useful technical summary reporting (2010) and the Study Area is part of a larger area described and assessed in the Niagara River Corridor Conservation Action Plan (Jalava et al. 2010).

Most recently, GEI completed an Environmental Impact Study (EIS; 2017) for the broader Study Area that overlaps with the Subject Lands. The previous EIS encompassed a series of ecological surveys conducted in 2015 by Dougan & Associates and GEI in 2017 (Dougan & Associates 2015, 2016a; GEI 2017). In addition to these studies, Block 22 and components of Block A01-A06 were assessed within the approved EIS for the Riverfront Residential Lands (GEI 2019).

Vegetation communities and wetlands evaluated by GEI within the Study Areas are depicted in **Figure 2**. GEI completed a re-evaluation according to the Ontario Wetland Evaluation System of several of the small wetland units that occur on or within the vicinity of the Study Areas (provided under separate cover); none of these units were found to be provincially significant and so are mapped as evaluated non-provincially significant in the attached. The following natural heritage features were also previously noted within the broader Study Area and overlapping with the Subject Lands, as summarized in **Figure 3**.

Study Area associated with Blocks A01-06:

- Provincially significant wetlands (within 120 m)
- Non-provincially significant wetland;
- Candidate and confirmed significant wildlife habitat;
- Significant woodlands that are primarily areas of cultural woodlands contiguous to larger forest and swamp blocks, as defined by Dougan & Associates; and
- Fish Habitat (Category 3 – Marginal) within the Conrail Drain.

Study Area overlapping with Block 22:

- Provincially significant wetlands located adjacent to the Subject Lands (within 120 m);
- Non-provincially significant wetlands;
- Significant woodlands, which generally overlap with significant wetlands on adjacent land (within 120 m) but also include contiguous areas of cultural woodlands, as defined by Dougan & Associates;
- Candidate and confirmed significant wildlife habitat
- Significant Valleyland; and
- Fish habitat (Category 2); and

Additional investigations have been undertaken by GEI Consultants Ltd within the study area since that time, including amphibian call count monitoring and breeding bird surveys.

Given that some of the surveys completed previously for Blocks A01 to A06 and Block 22 are more than 5 years old, follow-up surveys are planned in 2023, as outlined below.

3. ECOLOGICAL SURVEY METHODOLOGY

The following field work is proposed to be completed in 2023:

- Three season botanical investigation;
- Breeding bird surveys (two rounds);
- Reptile and amphibian surveys;
- Aquatic Habitat Assessment; and
- Fish Community Sampling;

Bat surveys were completed within both Study Areas in 2018, and no further updates are recommended at this time. In addition to the above noted surveys, incidental wildlife observations and general habitat characterizations will also be recorded to inform whether Species at Risk (SAR) habitat and/or Significant Wildlife Habitat (SWH) is present within the Subject Lands.

Botanical Inventory and Woodland Analysis

During the growing season in 2023, GEI will complete detailed vegetation assessments that will consists of a two-season (spring and summer) botanical inventory. Data collected will be used to note the presence of rare species, if any. Species names generally follow nomenclature from the Database of Vascular Plants of Canada (Brouillet et al., 2010+).

The provincial status of all plant species and vegetation communities is based on NHIC (2022). Identification of potentially sensitive native plant species is based on their assigned coefficient of conservatism (CC) value, as determined by Oldham et al. (1995). The CC value, ranging from 0 (low) to 10 (high), is based on a species tolerance of disturbance and fidelity to a specific natural habitat. Species with a CC value of 9 or 10 generally exhibit a high degree of fidelity to a narrow range of habitat parameters.

Woodlands

As noted through previous ELC investigation, woodland polygons are present within the Subject Lands (**Figure 3, Appendix A**). This includes cultural woodland and cultural thicket within both Blocks A01-06 and Block 22. Given ongoing decline of ash trees within Niagara Region, GEI intends to verify the limits of woodland communities within the Study Areas.

During the spring botanical inventory, GEI will measure stem density within plots in each polygon to confirm if the feature meets the definition of woodland according to Niagara Region (Niagara Region Official Plan 2022). GEI will also conduct a 3D analysis of canopy cover and canopy health using a multispectral drone camera flown during leaf-off conditions, to supplement stem-density plots. These results will be used to define the limits of woodland communities on the Subject Lands.

Aquatic Habitat Assessment

Two aquatic habitat assessments (AHA) will be completed for each watercourse (the Conrail Drain and Eastern Watercourse) during early spring and late spring/early summer. The AHA will assess the fish habitat characteristics within the watercourse across the Subject Lands. Stream characteristics such as stream morphology (e.g., riffles, runs, pools), channel bed and bank substrate, in-stream cover (e.g., woody debris, undercut banks), bank stability and instream and riparian vegetation communities will be assessed to determine the overall fish habitat available within the system, as well as the suitability of habitat for providing a range of life cycle functions for the fish community. The AHAs will consist of visual surveys to assess aquatic habitat and tributary drainage features flowing into either watercourse.

Fish Community Sampling

Two fish community sampling events will be completed to confirm the distribution and extent of direct fish habitat in the Conrail Drain feature on the Subject Lands, identify species diversity and relative abundance. Both sampling events will be completed in late spring/early summer, sampling areas near the culvert and near the mouth of the watercourse which may provide seasonal fish habitat. Potential spot sampling in other suitable areas may also be required.

Prior to commencing these surveys, GEI will obtain a License to Collect Fish for Scientific Purposes from the MNDMNRF. During these sampling events, a Halltech HT-2000 Battery Backpack Electrofisher and two D-frame dip nets with a 500-micron mesh size will be used to retrieve fish and semi-aquatic organisms (e.g., frogs). Sampling will be conducted using the Ontario Stream Assessment Protocol standard single pass survey method (Stanfield 2017). All data recorded will be reported to the MNDMNRF in accordance with the License requirements.

Breeding bird surveys

Breeding bird surveys by GEI for Blocks A01 to A06 in 2020. Breeding bird surveys will be conducted for Block 22 following protocols set forth by the Ontario Breeding Bird Atlas (Cadman et al. 2007) and the Ontario Forest Bird Monitoring Program (Cadman et al. 1998). Surveys will be conducted between dawn and five hours after dawn under suitable weather conditions (i.e., suitable wind conditions, no thick fog or precipitation) (Cadman et al. 2007).

Point count stations will be surveyed in various habitat types, where present, within the Subject Lands and combined with area searches to help determine the presence, variety, and abundance of bird species. Each point count station will be surveyed for ten minutes for birds within 100 m and outside 100 m. All species will be recorded on a point-count and will be mapped to provide specific spatial information and were observed for signs of breeding behaviour.

Reptile and Amphibian Surveys

Reptile and amphibian surveys were completed in Blocks A01 to A06 in 2020 and no further surveys are proposed at this time.

A spring habitat assessment will be completed to assess for amphibian breeding habitat and potential snake hibernacula features.

Should suitable snake hibernacula features be identified, area searches will be completed throughout the early spring (i.e. April/May) to look for snakes.

Where suitable amphibian breeding habitats are identified, egg mass and amphibian call count surveys will be completed in the spring in accordance with the requirements of the Marsh Monitoring Program (BSC 2014).

4. ENVIRONMENTAL IMPACT STUDY REPORTING

Introduction

The scoped EIS will briefly describe the proposed undertaking, the present nature of the Subject lands, the reason for undertaking the IES, and the scope of the EIS based upon this approved TOR.

Biophysical Characterization

The scoped EIS will characterize the biophysical environment of the Subject Lands by outlining the results of the background review, 2023 ecological field data collection efforts and any relevant data from previous studies or those completed by other consultants retained to support the overall development application.

Analysis of Ecological and Natural Heritage Significance

The scoped EIS will present and discuss the natural heritage features and associated functions that occur on, and adjacent to, the Subject Lands. Where appropriate, the EIS will confirm or re-assess significance of all natural heritage features identified on and within 120 m of the Subject Lands. Significance will be assessed in accordance with the requirements of the City of Niagara Falls Official Plan, the Region of Niagara Official Plan, or the Natural Heritage Reference Manual, as appropriate. Similarly, all regulated features and their limits will be identified and described within the text.

Development Opportunities, Constraints and Proposal

In consideration of the results of the previous analysis, a description of the constraints and opportunities to development will be discussed. Finally a description of the development will be provided, along with any relevant technical information available from other consultants retained to support the overall development application

Impact Assessment and Mitigation

Where available, results presented in engineering reports will be incorporated into the impact assessment to assess potential impacts to the Subject Lands. The scoped EIS will assess whether potential impacts are being appropriately mitigated by the proposed development plan. Appropriate mitigation will be recommended, including setback requirements from natural features and appropriate timing windows for vegetation removal.

The scoped EIS will provide mapping to depict the limits of the natural heritage features and associated setbacks as well as potential enhancement areas, as required.

Restoration/Enhancement Measures

If required, an overview of the objectives for any areas identified for restoration and/or enhancement will be provided within the EIS.

Monitoring

A monitoring will be identified where required to assess the implementation and efficacy of mitigation measures before, during and following construction.

CONCLUSION

Following completion of the proposed 2023 field investigations, the EIS will be prepared to document the existing natural heritage conditions and studies, results of the proposed field investigations, analysis of feature significance, impact assessment and mitigation measures.

If you have any questions regarding the information presented within this TOR, please contact one of the undersigned.

Yours truly,
GEI Consultants

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Attachments

- Figures (3)

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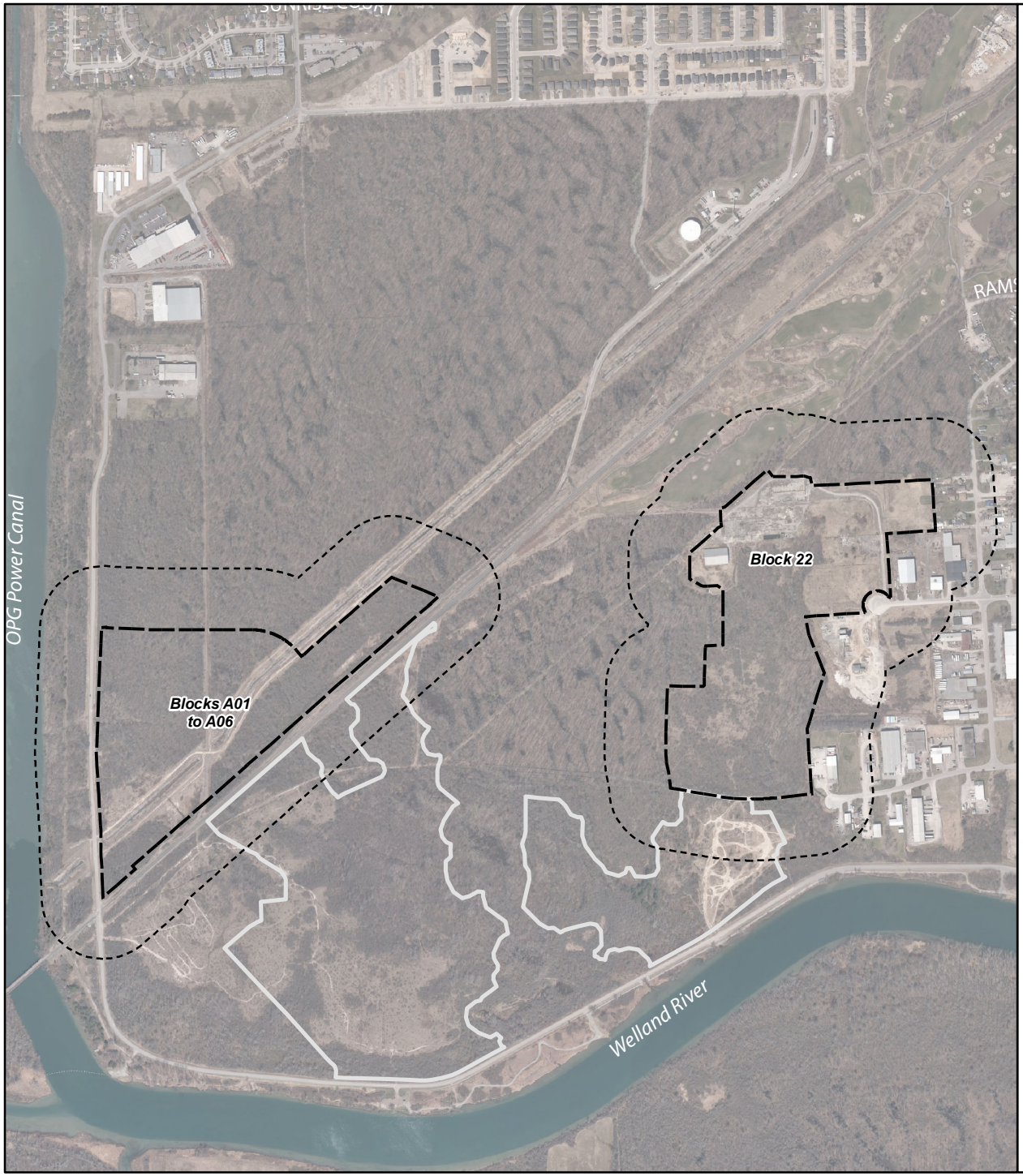

Site Plan Block Area

Site Plan Block Area + 120 metres

Riverfront Residential

Riverfront – Blocks A01 to A06 and Block 22
Terms of Reference

Figure 1
Site Plan Block Areas

0 100 Meters

N

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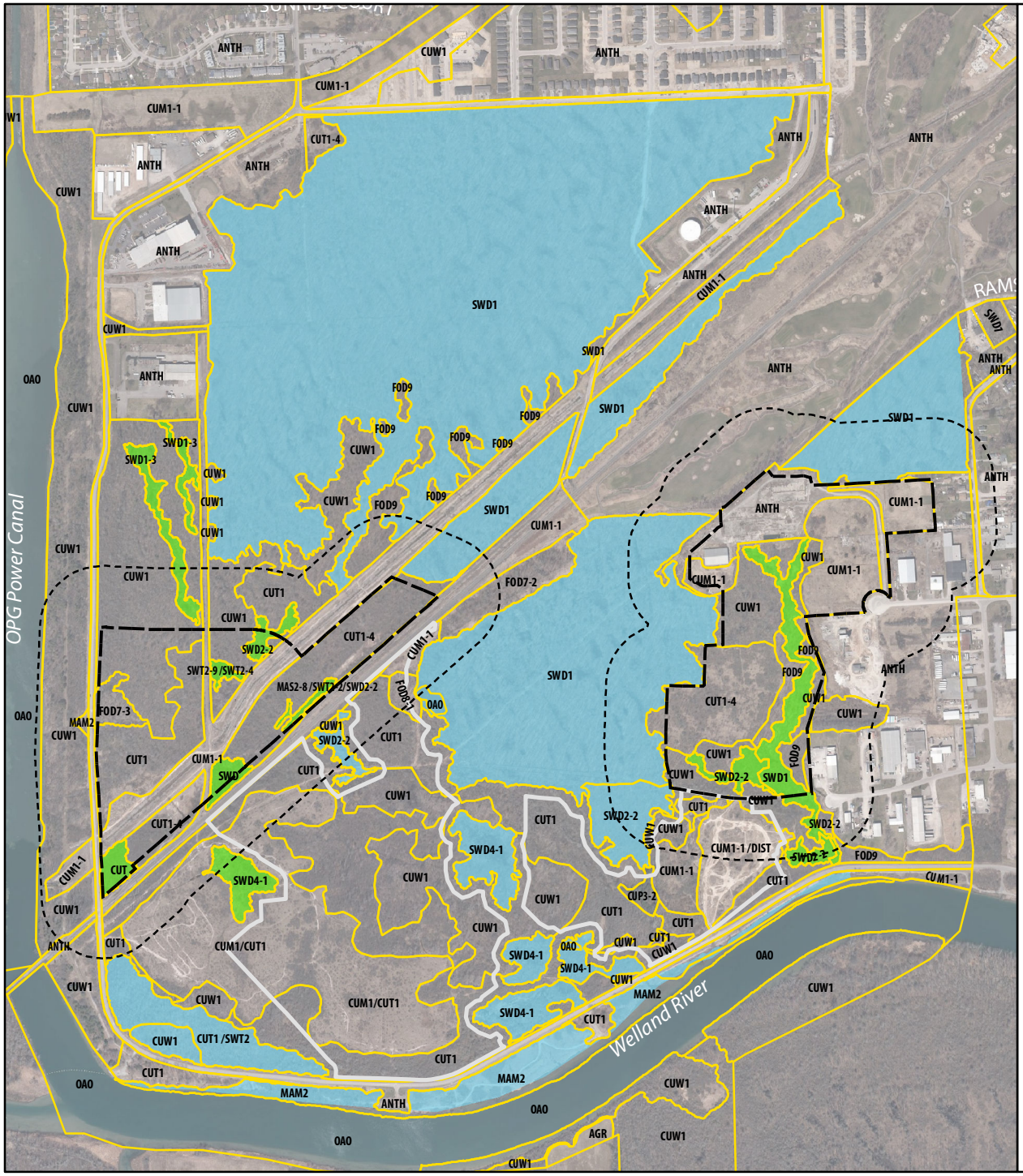


- Site Plan Block Area
- Site Plan Block Area + 120 metres
- Riverfront Residential
- Ecological Land Classification (updated area within/ adjacent to Riverfront Residential, Savanta 2018)
- Provincially Significant Wetland (MNRF)
- Wetland - Evaluated as Non-provincially Significant

Vegetation Community (ELC Code)

AGR, Agricultural
ANTH, Anthropogenic
CUM1-1, Dry - Moist Old Field Meadow
CUM1/CUT1, Mineral Cultural Thicket
CUP3-2, White Pine Coniferous Plantation
CUT, Cultural Thicket
CUT1, Mineral Cultural Thicket
CUT1-4, Gray Dogwood Deciduous Cultural Thicket
CUW1, Mineral Cultural Woodland
FOD7-2, Fresh – Moist Green Ash Lowland Deciduous Forest
FOD7-3, Fresh – Moist Willow Lowland Deciduous Forest
FOD8-1, Fresh – Moist Poplar Deciduous Forest
FOD9, Fresh – Moist Oak – Maple – Hickory Deciduous Forest
MAM2, Mineral Meadow Marsh
MAS2-8, Rice Cut-grass Mineral Shallow Marsh
OAO, Open Aquatic
SWD, Mineral Deciduous Swamp
SWD1, Oak Mineral Deciduous Swamp
SWD1-3, Pin Oak Mineral Deciduous Swamp
SWD2-2, Green Ash Mineral Deciduous Swamp
SWD4-1, Willow Mineral Deciduous Swamp
SWT2, Mineral Thicket Swamp
SWT2-2, Willow Mineral Deciduous Thicket Swamp
SWT2-4, Buttonbush Mineral Deciduous Thicket Swamp
SWT2-9, Grey Dogwood Mineral Deciduous Thicket Swamp

* Communities where ELC Code was revised from that shown in March 2018 EIS Addendum.

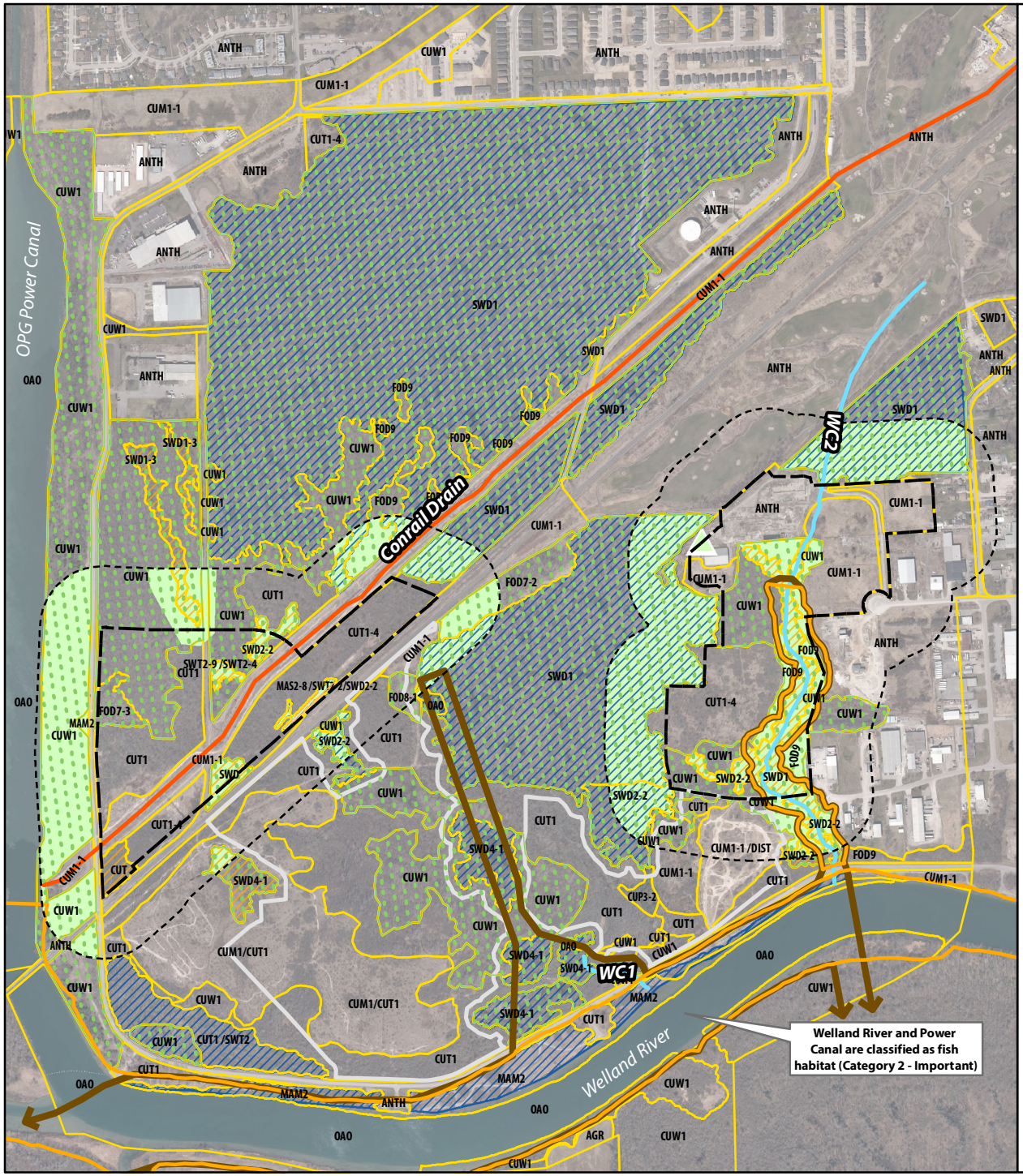
Riverfront – Blocks A01 to A06 and Block 22
Terms of Reference

Figure 2
Vegetation Communities and Provincially Significant Wetlands

0 100 Meters

N

GEI Consultants



Riverfront – Blocks A01 to A06 and Block 22
Terms of Reference

Figure 3
Natural Heritage Feature Summary