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City of Toronto and Toronto Transit Commission

Scarborough Subway Extension Environmental Project Report

Addendum 1

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Date: December 17, 2018

Project #: 60530166

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AECOM: 2015-04-13

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1. Introduction and Background

The Scarborough Subway Extension (SSE) is a planned 6.2 kilometre (km) extension of the existing Bloor-Danforth Subway (Line 2) from Kennedy Station to Scarborough Centre, via Eglinton Avenue, Danforth Road and McCowan Road. SSE Project elements include the alignment of the running structure, Scarborough Centre Station (subway station and bus terminal), ancillary features (emergency exit buildings (EEB), traction power substations (TPSS), etc.) and construction methods and sequencing. In August 2017, the Environmental Project Report (EPR) for the SSE was completed and the Project was granted a Notice to Proceed, with no conditions, by the Minister of the Environment, Conservation and Parks (formerly Minister of the Environment and Climate Change) in October 2017.The approved SSE EPR presents the location of TPSS 2 within a residential neighbourhood at 1 and 3 Bellechasse Street.

In the early planning phases prior to the initiation of the Transit Project Assessment Process (TPAP) for the SSE, TPSS 2 was proposed to be located within the Gatineau Hydro Corridor, but was relocated during the TPAP as it was not considered a compatible use of the Corridor by Hydro One. The Toronto Transit Commission (TTC) and the City of Toronto (the City) together with Hydro One continued discussing the possible relocation of TPSS 2 back into the Hydro Corridor following the publication of the SSE EPR. These discussions were successful and in June 2018, Hydro One confirmed that TPSS 2 could be relocated into the Gatineau Hydro Corridor, east of McCowan Road and just south of the location proposed in the SSE EPR at 1 and 3 Bellechase Street. See **Figure 1** for further details.

The TTC is proceeding with relocating TPSS 2 within the Gatineau Hydro Corridor and is documenting this change as an Addendum to the SSE EPR. It is important to note that the project change described herein reflects a confirmed change to the location of TPSS 2 and any further changes made to the SSE design through a subsequent project phase are not captured in this EPR Addendum and shall be documented separately.

1.1 TPAP Addendum Process

The SSE EPR was completed under the Ontario TPAP. *Ontario Regulation (O.Reg.) 231/08: Transit Project and Metrolinx Undertakings* outlines the various requirements and processes associated with the TPAP, including an addendum process for proponents to make design changes to a transit project after the Statement of Completion for the transit project has been submitted.

If a proponent wishes to make a change to a transit project that is inconsistent with its EPR, the proponent must prepare an addendum to the EPR. As per *O.Reg. 231/08* and Ontario's TPAP Guide (2014), pg. 11, an EPR addendum must contain the following information:

- A description of the change.
- The reasons for the change.
- The proponent's assessment and evaluation of any negative impacts that the change might have on the environment.
- A description of any proposed measures for mitigating any negative impacts that the change might have on the environment.
- A statement of whether the proponent is of the opinion that the change is significant (or not), and the reasons for the opinion.

1.1.1 A "Significant" Change

The determination on whether a change is considered to be "Significant" is made by the proponent. A change to a transit project is typically considered "Significant" if the change may have a negative impact on a matter of provincial importance that relates to the natural environment or has cultural heritage value or interest, or a constitutionally protected Indigenous or treaty right.

As per s.15 (3) of *O.Reg. 231/08* and the TPAP Guide (2014), if the proponent is of the opinion that a change is a "Significant" change to the transit project, the proponent must publish a notice for the addendum to inform and provide an opportunity for the review of the addendum, similar to the process followed after the publication of the Notice of Completion for an EPR.

1.1.2 A "Not Significant" Change

Where the results of additional studies (natural and cultural environments) do not reveal new potentially negative impacts, a proponent typically determines the project change to be "Not Significant". If a project change is "Not Significant" a notice of EPR addendum does not need to be published, and the change is to be documented in an addendum and remain on file with the proponent.

2. SSE EPR Addendum Process

As discussed in **Section 1**, TTC and the City began conversations with Hydro One before and during the TPAP regarding the proposed location of TPSS 2. At that time, Hydro One expressed to TTC and the City that TPSS 2 could not be located within the Gatineau Hydro Corridor. In an effort to be conservative and account for assessing impacts for a worst-case scenario, TTC and the City presented the location of TPSS 2 within the residential neighbourhood at 1 and 3 Bellechasse Street, just north of the Gatineau Hydro Corridor and east of McCowan Road in the SSE EPR. TTC and the City indicated to Hydro One during the TPAP that further discussions regarding the possible relocation of TPSS 2 into the Hydro Corridor would take place following the publication of the SSE EPR in August 2017.

The result of the discussion was to relocate TPSS 2 into the Gatineau Hydro corridor just south of 1 and 3 Bellechasse Street and east of McCowan Road. The change in location of TPSS 2 documented in the approved SSE EPR requires an addendum to be completed as per the requirements of *O.Reg. 231/08* discussed in **Section 1.1**.

A preliminary determination of significance for the proposed change was made by TTC and the City based on previous project experience and professional judgement. It is the TTC and City's opinion that the proposed change to relocate TPSS 2 into the Gatineau Hydro Corridor is "Not Significant", based on the premise that the proposed relocation is within the SSE Study Area assessed in the EPR (and thus, existing conditions in this area are already known and have been considered as part of the assessment provided in the EPR) and the relocation would result in considerably fewer impacts to the residential community. Notwithstanding these considerations, the TTC and the City agreed that additional assessment could be conducted to confirm that the relocation of TPSS 2 is a "Not Significant" change and does not result in new negative impacts.

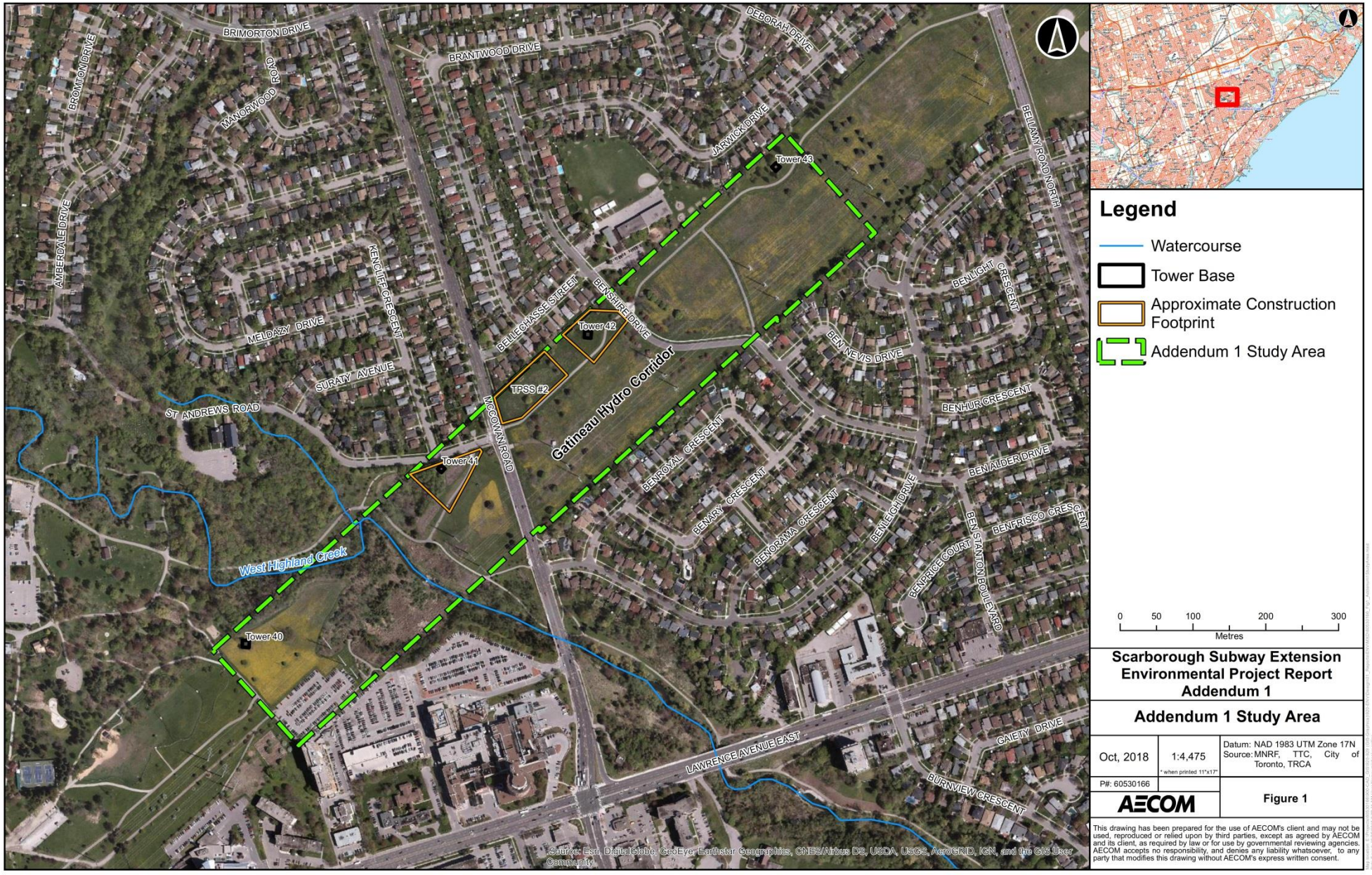
Based on an initial assessment of the nature of the proposed change, the natural environment and archaeological disciplines, if at all, are likely to indicate a "Significant" change as outlined in *O.Reg. 231/03* and described in **Section 1.1.1**. As such, impacts to the natural environment and archaeological resources, as a result of the project change, were assessed in support of Addendum 1. A description of the Project change is presented in **Section 3** and the results of the additional studies are discussed in **Section 4**.

3. Description of the Project Change

As discussed in Section 1, the TTC is proceeding with relocating TPSS 2 within the Gatineau Hydro Corridor, east of McCowan Road and just south of the location proposed in the SSE EPR at 1 and 3 Bellechase Street (see **Figure 1** for further details). To accommodate the relocation of TPSS 2 with the Gatineau Hydro Corridor, the existing overhead Hydro One powerlines of adjacent towers (41 and 42) will need to be raised to provide adequate clearance for the TPSS 2 building, which will consist of a single-storey structure. Construction footprints associated with TPSS 2 and the proposed raising of Towers 41 and 42 are shown on **Figure 1**. The boundaries of the Addendum 1 Study Area shown on **Figure 1** are limited to within the Gatineau Hydro Corridor extending approximately 500 metre (m) on either side of McCowan Road.

All work related to the construction of TPSS 2 and raising of the towers will be limited to the construction footprints depicted on **Figure 1**. It should also be noted, that all work related the raising of Towers 41 and 42, including required mitigation, permits, or additional studies, will be the responsibility of Hydro One; work related to TPSS 2 will be the responsibility of the TTC.

Figure 1: Addendum 1 Study Area



4. Potential Environmental Effects and Mitigation Measures

As noted in **Section1.1**, if the proponent makes a change to a transit project that is inconsistent with the EPR after the Statement of Completion has been submitted, an assessment of the changes to the transit project is required, including:

- The proponent's assessment and evaluation of any negative impacts that the change might have on the environment; and
- A description of any proposed measures for mitigating any negative impacts that the change might have on the environment.

Sections 4.1 and **4.2** below detail the findings from the natural environment and archaeological investigations, and proposed mitigation measures where required.

4.1 Natural Environment

A Natural Environment Memorandum has been prepared to support SSE EPR Addendum 1 and is included as **Appendix A.**

The Natural Environment Memorandum includes an assessment and evaluation of any potential impacts to the natural environment resulting from the relocation of TPSS 2 as well as the identification of future commitments required during the Detailed Design Phase of the SSE.

The Natural Environment Memorandum provided in **Appendix A** includes the following:

- Methods and results of a background review of secondary sources, agency consultation and site reconnaissance visit undertaken to supplement the natural environment existing conditions presented in the SSE EPR;
- Updated Species at Risk (SAR) Habitat Screening;
- Updated impact assessment and recommendations for mitigation based on new existing conditions and relocation of TPSS 2; and
- Identification of anticipated additional species-specific field work and future permitting needs related to the relocation of TPSS 2.

For the purposes of completing the desktop background information review, a 120 m buffer was applied to the Addendum 1 Study Area, while in-field site reconnaissance was largely limited to the Addendum 1 Study Area. A site visit was completed on July 19, 2018 to document the vegetation communities and plant species within the TPSS 2 construction footprint and a 50 m buffer around Hydro One Towers 41 and 42.

4.1.1 Summary of Potential Effects and Mitigation Measures

This section outlines whether the relocation of TPSS 2 may have a negative impact on a matter of provincial importance that relates to the natural environment. This determination was made for both terrestrial ecology features (i.e., designated natural areas, vegetation and vegetation communities, wildlife and wildlife habitat, and terrestrial SAR) and fisheries and aquatic habitat features (i.e., as it relates to aquatic SAR afforded protection

under the *Endangered Species Act* (2007)) based on the existing conditions described in Natural Environment Memorandum (**Appendix A**).

Table 4-1 in the Natural Environment Memorandum (**Appendix A**) provides a detailed summary of potential impacts (i.e., not previously addressed in the SSE EPR) on the terrestrial and aquatic natural environment as a result of the relocation of TPSS 2, recommended avoidance and mitigation measures, additional surveys, future commitments and required monitoring to avoid or minimize potential negative impacts.

During the site visit on July 19, 2018 no SAR were observed that were not previously documented in the SSE EPR. AECOM found the same five Butternut trees, suspected to be naturally occurring, and planted Kentucky Coffee trees previously identified by LGL Limited in the SSE EPR along the hydro corridor trail. These species are listed as Endangered and Threatened and both are protected under the *Endangered Species Act* (2007). The identified Kentucky Coffee and Butternut trees are located more than 50 m from the construction footprints such that they are not anticipated to be negatively impacted by the proposed works (see **Appendix A**, **Figure 4**).

The field visit indicated that the wooded area around Tower 41 has potential to provide roosting habitat for bat SAR. Since vegetation removal is required as part of the works associated with the raising of Tower 41, there is potential for impacts to bat SAR; however, consultation with the Ministry of Natural Resources and Forestry (MNRF) will be required to confirm whether additional surveys (e.g., acoustic monitoring and leaf-on searches) of the wooded area around Tower 41 are needed, prior to confirming any potential impacts to bat SAR. Any additional surveys or investigations associated with the works related to the raising of Tower 41 will be the responsibility of Hydro One. At this time, for the purposes of Addendum 1, no negative impacts to bat SAR are anticipated based on currently available information and following the implementation of appropriate mitigation measures outlined in **Appendix A**.

Portions of the construction footprints associated with Towers 41 and 42, as well as TPSS 2 are located within a restoration initiative called the “Meadoway”, which is led by Toronto and Region Conservation Authority (TRCA), City of Toronto and the W. Garfield Weston Foundation that will transform 16 kilometres (km) of hydro corridor from the Don River Ravine to the Rouge National Urban Park into urban greenspace and meadowland (TRCA, 2018). Consultation with the TRCA may be required if removal of restoration areas cannot be avoided.

Based on the detailed assessment of potential impacts (see **Appendix A**), the proposed relocation of TPSS 2 is not anticipated to have negative impacts on the natural environment provided that the identified avoidance and mitigation measures are implemented during construction, and additional surveys, agency consultation and procurement of required permits is completed during the Detailed Design Phase of the SSE.

Determination of potential impacts on the terrestrial and aquatic environment is based on the proposed construction footprints as shown on **Figure 1**. Should there be any design changes or additional design components added during the Detailed Design Phase of the SSE, the impact assessment is subject to change and additional field work, mitigation measures, monitoring, and permitting requirements may be necessary with respect to both the terrestrial and aquatic environment.

4.2 Archaeology

During the TPAP for the SSE, AECOM completed a Stage 1 Archaeological Assessment (AA) to document the geographic, archaeological and land use history of properties identified within the SSE Study Area in order to assess their potential to contain archaeological resources. The results of the Stage 1 AA (which were included as part of the SSE EPR) indicated that, while most of the lands within the existing SSE Study Area appeared to have been disturbed by past development, some of the Study Area still retained archaeological potential (AECOM, 2017). These areas of archaeological potential (as presented in the Stage 1 AA) included land within the Gatineau Hydro Corridor.

Additional field investigation was required to be completed prior to ground disturbance for all areas identified as having archaeological potential in the Stage 1 AA; therefore, a Stage 2 AA was completed within the Corridor in

support of the relocation of TPSS 2 and is presented in **Appendix B**[1]. Field investigations were conducted for TPSS 2 and Towers 41 and 42 on September 19 and 25, 2018, and additional site inspection photographs were taken on October 2, 2018. The proposed construction footprints assessed are shown on **Figure 1**.

The proposed construction footprints for TPSS 2 and Towers 41 and 42 (see **Figure 1**) consist of areas of visually assessed disturbed right of ways, and were therefore subject to test pit surveys at 5 and 10 m intervals as per *Section 2.1.2 Test Pit Survey* of the *Standards and Guidelines for Consultant Archaeologists* (2011). All of the construction footprint areas were found to be disturbed, and therefore test pitted at 10 m intervals, with the exception of the woodlot located east of McCowan Road (see **Appendix B**, **Section 9: Figure 15**). This area contained intact soil and was subject to test pit survey at 5 m intervals. Disturbed soil was compact yellow-brown-grey mottled soil with modern refuse. Intact soil was a medium brown silty loam overlying medium yellow-brown sandy subsoil. Test pits in the undisturbed area ranged in depth from 10-15 centimetres (cm).

The results of the assessment confirmed that the areas within the proposed construction footprints have either been disturbed or do not contain archaeological remains.

4.2.1 Summary of Potential Impacts and Mitigation

As no archaeological resources were recovered during the Stage 2 AA, the areas assessed are considered cleared of further archaeological concerns. As such, there are no potential negative impacts to archaeological resources as a result of the relocation of TPSS 2.

The Stage 2 AA Report has been submitted to the Ministry of Tourism, Culture and Sport for their review and acceptance into the provincial register.

5. Consultation

Comprehensive stakeholder and Indigenous community consultation took place during the TPAP for the SSE and is documented in the SSE EPR. Following the publication of the SSE EPR, additional consultation has taken place as a result of the proposed relocation of TPSS 2. The details of which, are provided in the subsections below.

As the proposed relocation of TPSS 2 was determined to be a “Not Significant” change, there are no consultation requirements during the TPAP addendum process, as per *O.Reg 231/08.* However, the TTC and the City chose to consult the immediate residential community and Indigenous communities engaged during the TPAP, as it is their view that these communities may have a vested interest in the relocation of TPSS 2 regardless of whether the change was deemed to be “Not Significant”.

5.1 Community Consultation

A series of community meetings were held with residents in the immediate vicinity of the proposed TPSS 2, specifically along Bellechasse Street and McCowan Road to discuss and solicit feedback related to the location and design of TPSS 2 as part of the SSE. These meetings were held in July 2017, August 2018 and December 2018 at the Scaborough Civic Centre from 6:30 pm to 8:30 pm.

The first community meeting was held during the TPAP, when TPSS 2 was proposed within the residential neighbourhood at 1 and 3 Bellechasse Street. At the second community meeting held on August 14, 2018 the residents were informed about the changes to the location of the TPSS 2 including a presentation of the new

[1] *Appendix B provides the Stage 2 AA for all areas within the SSE Study Area that intersect with the SSE construction footprint, including the footprint for TPSS 2 and associated footprints for Towers 41 and 42.*

location of TPSS 2 in the Hydro Corridor, maintenance and operation of the substation, as well as providing an overview of the construction impacts. TTC also responded to previous questions and comments raised during the July 2017 meeting. Additionally, the meeting was also intended to solicit comments from the community on the TPSS 2 building façade and landscaping options.

The final community meeting was held on December 6, 2018, to present the design concept being carried forward based on design development and community input gathered during previous meetings, the environmental work conducted during the summer period, future studies and investigations to be undertaken as part of detailed design for the TPSS 2, traffic staging, and other construction related impacts of concern to community residents.

5.2 Agency Consultation

The TTC continued consultation with key agencies following the TPAP to discuss items related to the design of the SSE, which included conversations to specifically address the relocation of TPSS 2 into the Hydro Corridor. These agencies included Hydro One, TRCA and MNRF; further details related to these consultations are provided below.

5.2.1 Hydro One

Following the submission of the EPR as part of the TPAP, TTC engaged Hydro One in September 2017 to discuss options for the relocation of TPSS 2. This was followed by further negotiation and discussion between TTC and Hydro One to reach an agreement for Hydro One to conduct a study to determine the feasibility of the relocation. This four month study was completed in March 2018. Following the review of this study by TTC in summer 2018, additional meetings were held between TTC and Hydro One to discuss the relocation options, which resulted in an agreement to proceed with an option that involved raising hydro towers 41 and 42 to allow for the placement of the TPSS at the location identified on Figure 1.

Engagement with Hydro One is ongoing and the TTC will continue to work closely with Hydro One throughout the detailed design and construction phases for TPSS 2.

5.2.2 Toronto and Region Conservation Authority

AECOM consulted with the TRCA on July 18, 2018 on behalf of TTC and the City to request additional information pertaining to natural heritage features and recent SAR records within 120 m of the Addendum 1 Study Area. TRCA replied to AECOM on August 10, 2018 providing additional information pertaining to flora and fauna records, including fish and SAR, and TRCA restoration activities within the Addendum 1 Study Area. Details of these discussions are documented in **Appendix A.**

The TTC also met with the TRCA on April 26, 2018 to undertake a page-turn review of the “30% design” plans which involved introducing the TRCA to the proposed relocation of TPSS 2. The TRCA has since provided comment on the 30% design plans, which included commentary on TPSS 2. These comments have been documented and are being addressed as part of the detailed design phase.

5.2.3 Ministry of Natural Resources and Forestry

AECOM consulted with the MNRF on July 16, 2018 on behalf of TTC and the City to request additional information pertaining to natural heritage features and recent SAR records within 120 m of the Addendum 1 Study Area. MNRF replied on July 18, 2018 confirming that the list of SAR records collected from secondary sources was sufficient, and did not provide additional records. Details of these discussions are documented in **Appendix A.**

5.3 Indigenous Community Consultation

In June 2017, during the TPAP for the SSE, the Study Team received a request from the Mississaugas of the New Credit First Nation (MNCFN) for a MNCFN Field Liaison Representative (FLR) to be present during Stage 2 archaeological work for the SSE. Following this request the Study Team was in discussion with the MNCFN to make arrangements for a MNCFN FLR to be present during the Stage 2 archaeological field work. Accommodating the request ultimately delayed the Stage 2 work and the Stage 2 AA was not completed during the TPAP. The Stage 2 AA was therefore included in the EPR as a future project commitment prior to the commencement of construction. The SSE EPR also indicated that a copy of all Archaeological Assessments for the Project would be made available to the MNCFN.

As a part of AECOM's agreement with TTC and the City, and in accordance with the draft technical bulletin entitled Engaging *Aboriginal Communities in Archaeology* (MTCS, 2011) the Indigenous community with the closest cultural affiliation, or with interest in the Project, were contracted to act as a FLR during the Stage 2 AA. The Stage 2 AA work was initiated by AECOM in 2017 and two representatives from the MNCFN, Blake Sault and Jazmin Sault participated as FLRs.

In 2018, the MNCFN were informed of additional Stage 2 archaeological field work being completed by AECOM for the relocation of TPSS 2 via letter and email on September 5, 2018. The MNCFN responded to the letter and requested that their FLRs be present. The Stage 2 field work for TPSS 2 was completed by AECOM on September 19 and 25, 2018, and Blake Sault participated as an FLR on behalf of MNCFN on September 19 only.

When finalized, the Stage 2 AA Report will be distributed to all Indigenous communities who were contacted during the SSE TPAP.

6. Statement of Significance

The assessment and evaluation as outlined in **Section 4** above, confirms that the relocation of TPSS 2 is considered to be "Not Significant". Following the application of appropriate mitigation measures, the identified change to the approved design does not negatively impact a matter of provincial importance that relates to the natural environment or has cultural heritage value or interest; or a constitutionally protected Indigenous or treaty right.

7. Addressing the Requirements of the Addendum Process

Table 1 summarizes the requirements of an EPR addendum under *O.Reg. 231/08* and Ontario's TPAP Guide (2014), pg. 11, along with corresponding sections herein where these requirements are addressed.

Table 1: TPAP EPR Addendum Requirements and Corresponding Addendum 1 Sections

TPAP Addendum Requirements	Addendum 1 Section Reference
A description of the change.	Section 3
The reasons for the change.	Section 1; Section 2
The proponent's assessment and evaluation of any negative impacts that the change might have on the environment.	Section 4; Appendix A; Appendix B
A description of any proposed measures for mitigating any negative impacts that the change might have on the environment.	Section 4; Appendix A; Appendix B
A statement of whether the proponent is of the opinion that the change is significant (or not), and the reasons for the opinion.	Section 2; Section 6

8. References

AECOM, 2017:
Scarborough Subway Extension Environmental Project Report. Prepared for City of Toronto and Toronto Transit Commission, August 2017.

AECOM, 2017:
Stage 1 Archaeological Assessment, Scarborough Subway Extension, City of Toronto / Toronto Transit Commission, Various Lots and Concessions, Geographic Township of Scarboro (now Scarborough), County of York (Now the City of Toronto), Ontario. PIF# P123-0274-2015.

Government of Ontario, 2014:
Ontario's Transit Project Assessment Process Guide.

Government of Ontario, 2015 (Consolidated):
Transit Projects and Metrolinx Undertakings, O.Reg. 231/08, s. 15.

MNRF, 2017:
Survey Protocol for Species at Risk Bats within Treed Habitats Little Brown Myotis, Northern Myotis & Tri-coloured Bat. MNRF Guelph District, April 2017.

MTCS, 2011:
Standards and Guidelines for Consultant Archaeologists. Ministry of Tourism, Culture and Sport.

TRCA, 2018:
The Meadoway: Creating an Active Greenspace Connection between Downtown Toronto and Rouge National Urban Park. Accessed on August 30, 2018 from: https://trca.ca/news/meadoway-greenspace-connection-downtown-toronto-rouge-park/

AECOM Imagine it. Delivered.

Appendix A

Natural Environment Memorandum

AECOM Imagine it. Delivered.

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To: Tessa Mackay (TTC)

cc: Anoushka Martil

Date: December 17, 2018
Project #: 60530166
From: Olga Hropach (AECOM)
Wendy Ott (AECOM)

Memorandum

Subject: **Scarborough Subway Extension Addendum #1 to the Environment Project Report – Natural Environment Memorandum for Traction Power Substation (TPSS) # 2**

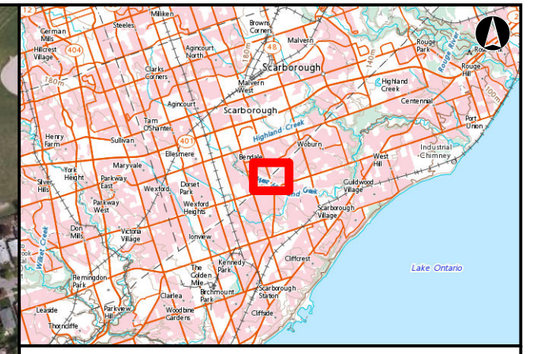
The proposed Scarborough Subway Extension includes the planned extension of the Bloor-Danforth Subway (Line 2), express from Kennedy Station to Scarborough Centre, and is intended to replace the existing Scarborough Rapid Transit (Line 3). An Environmental Project Report (EPR) was prepared in accordance with the Transit Project Assessment Process (TPAP), as outlined in the Ontario Regulation (O.Reg.) 231/08 under the *Environmental Assessment Act* for the Project.

The EPR was completed by AECOM in August 2017 and was granted a Notice to Proceed by the Ministry of Environment, Conservation and Parks (MECP) on October 30, 2017. Location of the TPSS 2 was identified in the residential neighbourhood at 1 and 3 Bellechasse in the EPR. Subsequent to the publication of the EPR, TTC and Hydro One discussed the potential for re-locating TPSS 2 within the Gatineau Hydro Corridor, east of McCowan Road and just south of the current location at 1 & 3 Bellechasse Street.

TTC is proceeding with re-locating TPSS 2 within the Gatineau Hydro Corridor and documenting this change as an Addendum to the EPR. **Figure 1** shows the proposed re-location of TPSS 2 and the locations of Towers 41 and 42.

This Natural Environment Memorandum has been prepared to summarize natural environment information for the relocation of TPSS 2 in support of the TPAP addendum. This Memorandum is intended to:

- Document the methods and results of a background review of secondary sources, agency consultation and site reconnaissance visit undertaken to supplement the natural environment existing conditions presented in the EPR for the Project;
- Provide an updated Species at Risk (SAR) Habitat Screening;
- Update the impact assessment and recommendations for mitigation based on the new existing conditions and location of TPSS#2; and,
- Identify anticipated additional species-specific field work and future Project permitting needs related to the new location of the TPSS#2.



Legend

- Watercourse
- Tower Base
- Approximate Construction Footprint
- Addendum #1 Study Area
- 120m Background Review Study Area
- City of Toronto's Natural Heritage System
- City of Toronto's Ravine and Natural Features Protected Areas
- TRCA Regulation Limit

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Scarborough Subway Extension Addendum to the Environment Project Report – Natural Environment Memorandum for Tractor Power Substation (TPSS) # 2

Policy Areas

Oct, 2018	1:4,475 * when printed 11"x17"	Datum: NAD 1983 UTM Zone 17N Source: MNRF, TTC, City of Toronto, TRCA
P#: 60530166		
AECOM		**Figure 1**

1. Proposed Design Change

The proposed re-location of TPSS 2 will be within the Gatineau Hydro Corridor, just south of the original location assessed in the EPR. In order to accommodate this re-location, the existing overhead Hydro One powerlines of the adjacent towers will need to be raised to provide adequate clearance of the TPSS 2 building, which will consist of a single-storey structure. Construction footprints associated with the construction of the TPSS 2 and proposed raising of Towers 41 and 42 are shown on **Figures 1 to 4**. The construction footprint includes all areas of disturbance that will be affected by construction activities such as vegetation removal and excavation activities. Note that the construction footprints are subject to change during detailed design and as such, the information and analysis provided herein are based on the construction footprints available at the time of preparation of this Natural Environment Memorandum.

1.1 Addendum #1 study area

The limits of the Addendum #1 study area are shown on **Figure 1** and are limited to within the Gatineau Hydro Corridor extending approximately 500 m from on either side of McCowan Road. The Addendum #1 study area also includes the approximate construction footprints for the TPSS 2 and the two powerline towers (41 and 42). A 120 m buffer was applied to the Addendum #1 study area for the purposes of the desktop background information review; in-field site reconnaissance was largely limited to within the Addendum #1 study area (i.e., the Gatineau Hydro Corridor) and within 50 m of Towers 41 and 42.

2. Methods

2.1 Background Information Review

The following sources were used to conduct the background information review:

- *Natural Heritage Report – Scarborough Subway Extension from Kennedy Station to Scarborough Centre* (LGL Limited, 2017);
- Land Information Ontario (LIO) base mapping data for fish community records and thermal regime information, Areas of Natural and Scientific Interest (ANSI), Woodlands, Wetlands and Provincial Parks (2017);
- Ministry of Natural Resources and Forestry (MNRF) Make-a-Map: Natural Heritage Areas Application (2018a);
- Fisheries and Oceans Canada (DFO) Aquatic Species at Risk (SAR) on-line mapping (2018);
- Ontario Freshwater Fishes Life History on-line database (Eakins, 2018);
- MNRF Natural Heritage Information Centre (NHIC) Rare Species Database (2018b);
- MNRF Significant Wildlife Habitat (SWH) Criteria Schedules for Ecoregion 7E (2015);
- Ontario Butterfly Atlas Online (OBA) (McNaughton et al., 2018);
- Ontario Breeding Bird Atlas (OBBA) Website (BSC et al., 2006);
- Ontario Reptile and Amphibian Atlas (Ontario Nature, 2018);
- Bat Conservation International (BCI) Species Profiles (2018);
- City of Toronto Official Plan (Consolidated June, 2015);
- City of Toronto Online Interactive Map (2018);
- Toronto and Region Conservation Authority (TRCA) Open Information & Data (2018a); and
- Aerial photography.

In addition, correspondence on behalf of TTC with the MNRF Aurora District and TRCA was initiated on July 16 and 18, 2018, respectively, to request additional information pertaining to natural heritage features and recent SAR records in or within 120 m of the Addendum #1 study area. MNRF replied on July 18, 2018 confirming the list of SAR records collected from secondary information was sufficient, and did not provide additional records. TRCA replied on August 10, 2018 providing additional information pertaining to flora and fauna records, including fish and SAR, and TRCA restoration activities within the Addendum #1 study area. Information received from both TRCA and MNRF have been incorporated into this memorandum.

2.2 Terrestrial Site Reconnaissance

AECOM Ecologists completed a site reconnaissance visit on July 19, 2018 to document existing conditions within the Addendum #1 study area. Terrestrial site reconnaissance investigations focused on the construction footprints of the TPSS 2 and both Towers 41 and 42. The site reconnaissance investigations included the following:

- Vegetation community classification and mapping, including documentation of dominant species associations, following the *Ecological Land Classification* (ELC) *Manual for Southern Ontario* (Lee *et al*., 1998) to Ecosite or Vegetation Type. ELC surveys were focused on naturally occurring areas within the West Highland Creek Branch valley, west of McCowan Road;
- Phase I (Bat Habitat Suitability Assessment) of the *Survey Protocol for Species at Risk Bats within Treed Habitats Little Brown Myotis, Northern Myotis and Tri-coloured Bat* (MNRF, 2017a);
- List of wildlife species recorded incidentally (e.g., species sighting, calls, tracks, scat, etc.);
- Search for bird nests on the structures of Towers 41 and 42; and,
- Location of any Species of Conservation Concern (SOCC), SAR or their habitats, as applicable. LGL Limited (2017) identified planted Kentucky coffee-tree (*Gymnocladus dioicus*) and naturally-occurring butternut (*Juglans nigra)* in the Addendum #1 study area; both species are protected under the *Endangered Species Act, 2007* (ESA). AECOM confirmed the locations of the SAR plants identified by LGL Limited (2017) and searched for any new locations of SAR plants within 50 m of the construction footprints of the towers and TPSS 2.

2.3 Significant Wildlife Habitat, Including Species of Conservation Concern

The *Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E* (MNRF, 2015) contains information and criteria for identifying SWH, which are defined as areas that have important ecological features and functions and support sustainable populations of plants, wildlife and other organisms within the 7E Ecoregion. The MNRF generally categorizes SWH into the following:

- Seasonal concentration areas;
- Rare vegetation communities or specialized habitats for wildlife;
- Habitats of SOCC; and,
- Animal movement corridors.

The *Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E* (MNRF, 2015) was used to identify any candidate or confirmed SWHs within the Addendum #1 study area based on results from the background review and/or field investigations. According to the Natural Heritage Reference Manual (MNRF, 2010), SOCC are defined as follows:

- Species with Provincial S-rank assigned by the NHIC as S1 (critically imperiled), S2 (imperiled) or S3 (vulnerable);

- Species listed as Special Concern under ESA; and,
- Species identified as nationally Endangered or Threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), which are not protected under the ESA.

A habitat assessment was completed for the SOCC records identified through the background review, which included comparing the SOCCs' habitat requirements to the habitat conditions present within the Addendum #1 study area. The potential for the species to occur was then determined through a probability of occurrence where by the following rankings were applied:

Low Probability:..... no suitable habitat for the species within 120 m of the Addendum #1 study area but there is a known species record in the general area and/or record for this species is considered to be historical (i.e., older than 20 years) and therefore unlikely that this species still persists in the area;

Moderate Probability:... Potentially suitable habitat identified within 120 m of the Addendum #1 study area, but no occurrence of the species incidentally observed through field reconnaissance although there is a known species record in the general area; and,

High Probability:..... Good quality habitat identified within 120 m of the Addendum #1 study area and known species record within 120 m of the Addendum #1 study area(either through current field assessment or background information).

Although those species that are listed as Special Concern on the Species at Risk in Ontario (SARO) list and those species with S-Ranks of S1 to S3 (i.e., SOCC) do not receive legal protection under the ESA, they may be afforded protection under the *Provincial Policy Statement* (2014), the *Migratory Bird Convention Act, 1994* (MBCA), *Ontario Fish and Wildlife Conservation Act,* 1997, and other planning documents.

2.4 Fish and Fish Habitat

AECOM Ecologists visited the site on July 19, 2018 conducted detailed fish habitat assessments to document the existing aquatic conditions within West Highland Creek from the bridge at McCowan Road to the inlet/outlet southwest of St. Andrews Road. Field reconnaissance focused on identifying and describing fish habitat features that may influence fish community composition. Data collection during field investigations included documentation of the following:

- Documentation of surrounding natural features and land uses (i.e., wetland, agriculture, etc.);
- Site dimensions, channel morphology, substrate composition and bank stability;
- Flow characteristics, including evidence of groundwater discharge;
- Instream cover (e.g., woody debris, undercut banks, boulders, vegetation), canopy cover, aquatic and riparian vegetation;
- Presence of physical barriers to fish passage;
- Disturbances and past habitat alterations (e.g., channelization, hardened banks, storm outlets); and,
- A photographic record of the site to document habitat conditions.

Documentation of these features was completed in order to identify any limiting, important/exceptional or critical habitat within the study reach such as spawning, nursery, feeding and migratory habitat. The identification of these habitat features is necessary in determining the proposed projects risk to fish and fish habitat. Sufficient

information was available within background information to characterize the fish community within the vicinity of the Project, and as such, primary collection of fish community data (i.e., fish sampling) was not conducted. These records were used to supplement the characterization of existing fish and fish habitat conditions. A photographic record for the site was documented during the field survey.

2.5 Species at Risk Habitat Screening

Species listed as Threatened or Endangered on the SARO list receive both individual and habitat protection under the ESA. The SAR screening included compiling a comprehensive list of all SAR that have occurrence records within or in the vicinity of the Addendum #1 study area through the background review as described in **Section 2.1**. A habitat screening and determination of probability of occurrence was completed following the methods described in the section above for SOCC.

3. Existing Conditions

3.1 Designated Natural Areas

According to the MNRF's Make-a-Map Natural Heritage Application Tool (MNRF, 2018a), there are no provincially or locally significant wetlands, unevaluated wetlands, environmentally sensitive areas, significant woodlands or areas of natural and scientific interest (ANSI) within 120 m of the Addendum #1 study area.

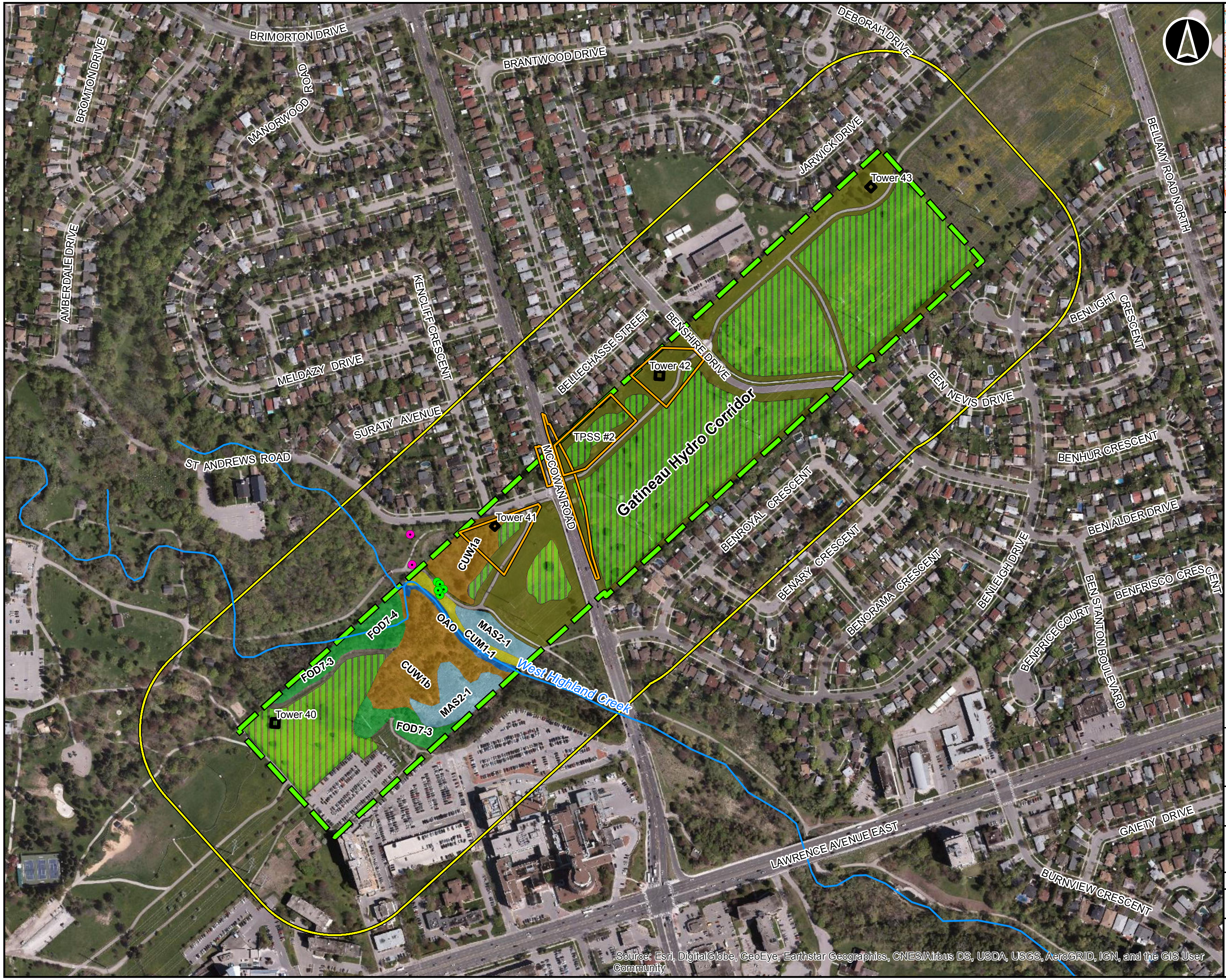
3.2 Policy Areas

According to the City of Toronto's Online Interactive Map (2018), portions of the Addendum #1 study area fall within the City of Toronto's Natural Heritage System (NHS) and Ravine and Natural Features Protected Areas (RNFP), as well as TRCA regulated areas associated with West Highland Creek. Policy areas are mapped on **Figure 1.**

3.3 Vegetation

LGL Limited completed ELC surveys in 2015 for the original Scarborough Subway Extension alignment and identified cultural meadows, cultural thickets and lowland deciduous forest within approximately 120 m on either side of McCowan Road within the Gatineau Hydro Corridor as described in the *Natural Heritage Report* (2017) as part of the EPR. AECOM either confirmed or refined LGL's delineation of ELC communities and delineated additional ELC communities within the Addendum #1 study area that extended beyond the area of investigation completed by LGL Limited. The delineated boundaries of these vegetation communities are mapped on **Figure 2.**

The Addendum #1 study area (i.e., the Gatineau Hydro Corridor) is part of a restoration initiative called the "Meadoway", which is led by TRCA, City of Toronto and the W. Garfied Weston Foundation that will transform 16 km of hydro corridor from the Don River Ravine to the Rouge National Urban Park into urban greenspace and meadowland (TRCA, 2018b). At the time of the site visit, AECOM noted several areas within the Addendum #1 study area have been planted as part of the Meadoway to create thickets and meadows. Based on the restoration plans provided by TRCA on August 10, 2018, there were several provincially or regionally rare prairie plant species that were planted as part of this initiative. Construction footprints of Towers 40 and 41, as well as TPSS 2 are located within the Meadoway Restoration Area. These planted vegetation communities were not classified using ELC as they were not naturally occurring.



Legend

- Kentucky Coffee Tree
- Suspected Naturally Occurring Butternuts
- Watercourse
- Tower Base
- Addendum #1 Study Area
- 120m Background Review Study Area
- Approximate Construction Footprint

ELC

- CUW1a – Mineral Cultural Woodland
- CUW1b – Mineral Cultural Woodland
- CUM1 – Mineral Cultural Meadow
- FOD7-3 – Fresh-moist Willow Lowland Deciduous Forest
- FOD7-4 – Fresh-moist Black Walnut Lowland Deciduous Forest
- MAS2-1 – Cattail Mineral Shallow Marsh
- OAO – Open Aquatic
- Meadoway Restoration Area
- Mowed

0 50 100 200 300
Metres

Scarborough Subway Extension Addendum to the Environment Project Report – Natural Environment Memorandum for Tractor Power Substation (TPSS) # 2

Ecological Land Classification

Oct, 2018	1:4,475 * when printed 11"x17"	Datum: NAD 1983 UTM Zone 17N Source: MNRF, TTC, City of Toronto, TRCA
P#: 60530166		

AECOM

Figure 2

There were a total of five naturally occurring, ELC vegetation communities identified by AECOM, including cultural woodland, cultural meadow, deciduous lowland forest and a cattail marsh. Brief descriptions of these vegetation communities are as follows:

- **Mineral Cultural Woodland (CUW1a)** – This cultural woodland was located on the east valley slope of the West Highland Creek Branch. The canopy was co-dominated by Manitoba maple (*Acer negundo*) and black walnut (*Juglans nigra*) in the canopy. The sub-canopy consisted of Manitoba maple with lesser amounts of green ash (Fraxinus pennsylvanica). The shrub layer consisted of common buckthorn (*Rhamnus cathartica*) and common elderberry (*Sambucus nigra)*. Garlic mustard (*Alliaria petiolata*) dominated the ground cover with lesser amounts of dog-strangling Vine (*Vincetoxicum rossicum*), wood avens (*Geum* urbanum), spotted jewelweed (*Impatiens capensis*), common burdock (*Arctium minus*) and tall goldenrod (*Solidago altissima*). Inclusions within this community included planted cultural thickets as part of the Meadoway restoration initiative along the southern edge that were dominated by ninebark (*Physocarpus opulifolius*) and a Fresh-moist Black Walnut Lowland Deciduous forest (FOD7-4) located at the bottom of the slope.

- **Mineral Cultural Woodland (CUW1b)** – This cultural woodland was located on the west valley slope of the West Highland Creek Branch. The canopy was largely dominated by black locust (*Robinia pseudoacacia*) with much lesser of eastern cottonwood (*Populus deltoides*) and Austrian pine (*Pinus nigra*). The shrub layer was dominated by black locust, tartarian honeysuckle (*Lonicera tatarica*), Morrow's honeysuckle (*Lonicera morrowii*) and common buckthorn. The ground cover was dominated by dog-strangling vine with lesser of Canada goldenrod (*Solidago Canadensis*), wood avens and red raspberry (*Rubus idaeus*). Inclusions noted on the edge and top of valley included a sumac mineral cultural thicket (CUT1-1) and a mineral cultural meadow (CUM1).

- **Cattail Mineral Shallow Marsh (MAS2-1)** – this marsh was dominated by hybrid cattail (*Typha glauca*) with some spotted Joe-Pye weed (*Eutrochium maculatum*) and purple loosestrife (*Lythrum salicaria*). Isolated and scattered trees in this community included silver maple (*Acer saccharinum*), black walnut, crack willow (*Salix x fragilis*), and balsam poplar (*Populus balsamifera*). This community also includes a red-osier mineral swamp thicket (SWT2-5), which was suspected to be planted as part of the Meadoway Restoration Area, located east of the West Highland Creek Branch.

- **Mineral Cultural Meadow (CUM1)** – this community was present along the east bank of West Highland Creek Branch and was dominated by grasses such as reed canary grass (*Phalaris arundinacea*), smooth brome (*Bromus inermis*) and timothy grass (*phleum pretense*), with lesser of tall goldenrod, asters (*symphyotrichum sp.*) and dog-strangling vine.

- **Fresh - Moist Willow Lowland Deciduous Forest (FOD7-3)** – The canopy of this community was dominated by crack willow with lesser of Norway maple (*Acer platinoides)*, black walnut and Siberian elm (*Ulmus pumila*). The sub-canopy was dominated by tartarian honeysuckle, Norway maple and riverbank grape (*Vitis riparia*). Common ground species included dog-strangling vine, tall goldenrod and early goldenrod (*solidago juncea*).

- **Fresh - Moist Black Walnut Lowland Deciduous Forest (FOD7-4)** – The canopy of this community was dominated by black walnut with lesser of crack willow and Manitoba maple. The sub-canopy was dominated by black walnut with some common buckthorn and green ash. Common ground species included grasses, tall goldenrod, blue vervain (*Verbena hastata*), common burdock, wood avens and red raspberry.

The following notes were also recorded pertaining to each of the Towers and the TPSS 2:

- **Tower 41** was located within the mineral cultural woodland (CUW1).
- **Towers 42** were located within mowed areas. Shrubs at the base included common buckthorn, black walnut, staghorn sumac, white mulberry (*Morus alba*) and Norway maple.
- **The TPSS 2** construction footprint encompasses a planted thicket as part of the Meadoway Restoration Area that was dominated by red-osier dogwood, staghorn sumac, common elderberry, meadowsweet (*Spirea alba*) and purple-flowering raspberry (*Rubus odouratus*).

3.3.1 Vascular Plant List

A comprehensive plant list for each identified vegetation community, including the Meadoway Restoration Areas, is provided in **Attachment 1.** A total of 121 plant species were recorded, of which 72 (60%) were native and 49 (40%) were non-native. Four provincially significant species were noted including: Tall Tickseed (*Coreopsis tripteris*), Cup-plant (*Silphium perfoliatum var. perfoliatum*), Kentucky coffee-tree and Butternut. Tall Tickseed and Cup-plant were planted as part of the Meadoway Restoration Area. As noted above, LGL Limited identified two plant SAR in the EPR, including a total of five butternuts assumed to be naturally occurring and one planted Kentucky coffee-tree. AECOM confirmed LGL Limited's findings in the field, with the exception of finding a total of two planted Kentucky coffee-trees (instead of one planted Kentucky coffee-tree as reported by LGL Limited), which were located along the manicured portion of the Gatineau Hydro Corridor Trail but outside of the Gatineau Hydro Corridor Segment. Locations of Kentucky Coffee-trees and Butternuts are mapped on **Figure 2** and further discussed in **Section 3.8.**

In addition, a total of five plant species considered to be regionally rare in Ecoregion 7E, Toronto and/or Greater Toronto Area (GTA) based on the *Distribution and Status of the Vascular Plants of the Greater Toronto Area* (Varga, 2000) were identified, including: eastern red cedar (*Juniperus virginiana*), cup-plant, ninebark (*Physocarpus opulifolius*), pasture rose (*Rosa Carolina*) and white sweet-meadow (*Spiraea alba*). With the exception of eastern red cedar, all of the regionally rare plants have been planted as part of the Meadoway Restoration Areas. Given that the regional status in *Varga, 2000* have not been updated in the last 18 years and that eastern red cedar is relatively common throughout Ontario, often abundant on roadsides or abandoned fields (MNRF, 2018), this species is no longer considered to be a regionally rare plant by AECOM.

3.4 Incidental Wildlife and Bird Nest Search

The following wildlife was incidentally recorded during the site reconnaissance visit:

- White-tailed Deer (*Odocoileus virgninianus*);
- Ground hog (*Mormota monax*);
- American Goldfinch (*Spinus stristis*);
- Red-winged Black Bird (*Agelaius phoeniceus*);
- Common Grackle (*Quiscalus quiscula*);
- American Robin (*Turdus migratorius*)[1];
- House Sparrow (*Passer domesticus*);
- European Starling (*Sturnus vulgaris*);
- Mourning Dove (*Zenaida macroura*);
- Monarch (*Danaus plexippus*);
- Black Swallowtail (*Papilio polyxenes*); and,
- Cabbage White (*Pieris rapae*).

All with the exception of the Monarch are considered to common and tolerant of urban disturbances. The Monarch is listed as Special Concern under the ESA and therefore considered to be a SOCC. Several Monarchs were observed flying over and foraging in the planted meadows. Towers 41 and 42 were inspected for any bird nests; however, none were found.

3.5 Significant Wildlife Habitat, Including Species of Conservation Concern

The Addendum #1 study area is comprised of natural areas associated with the West Highland Creek valley and restoration areas as part of the Meadoway that support breeding habitat for migratory birds protected under the MBCA, as well as other wildlife. In addition, the TRCA has installed wildlife habitat structures throughout the Addendum #1 study area south of the Gatineau Hydro Corridor trail, including bird boxes, brush piles, a snake hibernaculum and raptor poles; none of these wildlife habitat structures are located with the construction footprints of the Towers or TPSS.

Based on a review of the criteria from the *Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E* (MNRF, 2015), the following SWH were identified within the Addendum #1 study area:

- **Seasonal Concentration Areas:**
  - Candidate Bat Maternity Roosting Colony – the Fresh- Moist Lowland Deciduous Forests (i.e., FOD7-3 and FOD7-4) may support candidate Bat Maternity Roosting Colonies.
  - Candidate Reptile Hibernaculum - the artificial hibernaculum installed by TRCA may provide candidate reptile hibernaculum.
  - Candidate Migratory Butterfly Stopover Areas – the Gatineau Hydro Corridor, which is located within 5 km of the Ontario lakeshore, contains a combination of forests and restored meadows and thickets that provide suitable foraging habitat for butterflies and therefore is considered as candidate Migratory Butterfly Stopover Area.
- **Rare Vegetation Communities:**
  - Fresh - Moist Black Walnut Lowland Deciduous Forest (FOD7-4) is considered to be provincially rare in Ecoregion 7E.
- **Specialized Wildlife Habitat:**
  - Candidate Amphibian Breeding Habitat (woodland/wetland) – the Fresh-moist Lowland Deciduous Forests (i.e., FOD7-3 and FOD7-4) and Cattail Mineral Shallow Marsh (MAS2-1) could provide suitable breeding habitat.
- **Habitat for Species of Conservation Concern:**
  - Records of a total of nine SOCC were identified through the background review. Candidate habitats for the following SOCC that have medium or high probability of occurrence within 120 m of the Addendum #1 study area were identified through the habitat screening provided in **Attachment 2**:
    - Eastern Wood-pewee (*Contopus virens)* – Medium probability;
    - Wood Thrush (*Hylocichla mustelina)* – Medium probability;
    - Monarch – High probability (species was observed; refer to **Section 3.8**); and
    - Snapping Turtle (*Chelydra serpentine)* – Medium probability.

    The remaining SOCC were determined to have low probability of occurrence due to either lack of suitable habitat present or the species has not been recorded in the last 20 years such that the record was considered to be historical and the species was deemed unlikely to still persist in the area given the level of urbanization and development in recent decades.

3.6 Fish Habitat

West Highland Creek is a tributary of Highland Creek in the Lake Ontario drainage basin. The creek and its tributaries are entirely within the old City of Scarborough. A photographic log of the exiting aquatic habitat conditions is provided as **Attachment 3**.

Reach 1: West Highland Creek at the McCowan Road Bridge to 350 m Upstream

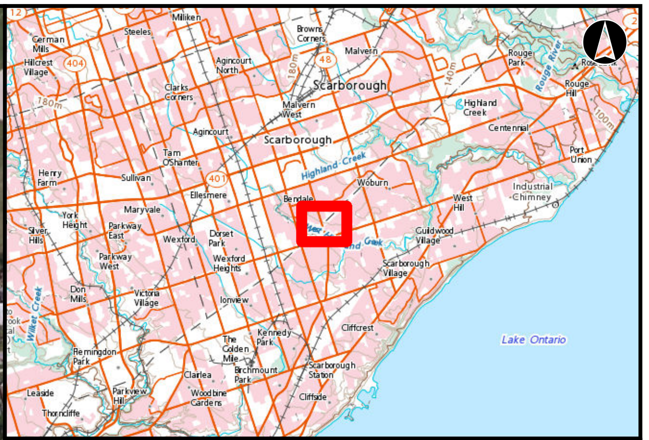
West Highland Creek at the McCowan Road Bridge is identified as a permanent slow flowing system. At the time of assessment, the mean wetted width was 8 m and the mean water depth was 0.6 m. Reach morphology was dominated by flats at the bridge and riffles immediately downstream, with riffle-pool sequences further upstream. Substrates were comprised predominately of cobble and silt with some sand and gravel. The banks were observed to be moderately unstable upstream and downstream of the bridge and generally of silt composition. At the bridge the right bank was comprised of gabion baskets while the left bank was interlocking brick. The bankfull width was estimated at 10 m while the bankfull height was 1.5 m. Exposed roots and undercutting was observed upstream of the bridge. Aquatic macrophytes were present within this reach, consisting of Eurasian Milfoil (*Myriophyllum spicatum*) and Duckweed (*Lemna minor*). Instream cover (30 % total cover) consisted of boulders (5%), instream vegetation (20%) and woody debris (5%). Canopy cover was moderate but sporadic in density throughout the reach (~60% cover). Sediment deposition was observed in areas. Young of year (YOY) cyprinids were observed within West Highland Creek downstream of the concrete step dam (shown on **Figure 3**). The concrete dam was 2.5 m wide and 0.5 m to 1.25 m high, acting as a fish passage barrier to non-salmonid species. No fish were observed on the upstream side of the dam at the time of the site visit.

Overall, it is likely that this reach provides forage, rearing and refuge habitat to a variety of warm/coolwater forage fish. Habitat conditions within the assessed reach were generally non-limiting throughout with no important or exceptional habitat observed. No specialized habitat (including critically limited spawning habitat) was identified. Based on agency correspondence no aquatic SAR was identified within West Highland Creek. A review of the DFO SAR mapping (2018) indicates that there are no fish or mussel SAR species protected under SARA identified within the Study Area.

Reach 2: West Highland Creek 350 m Upstream of McCowan Bridge to 750 m Upstream

Approximately 350 m upstream of the bridge at McCowan Road, West Highland Creek takes a sharp 90% bend to the southwest where it connects with seasonally intermittent tributary (dry at the time of assessment) north of main branch of west highland creek (shown on **Figure 3**). At the time of assessment, the mean wetted width through the main branch was 7 m and the mean water depth was 0.25 m. Reach morphology was dominated by riffles, pools and flats with minimal flow observed. Substrates were comprised primarily of cobble with sand and gravel. The banks were moderately unstable with exposed roots in areas and gabion baskets, some failing in areas. The bankfull width was estimated at 9 m and bankfull height at 2 m. Aquatic macrophytes were less abundant within this reach. Instream cover (20% total cover) consisted of in-stream vegetation (5%), cobble (10%) and woody debris (5%). Canopy cover was moderate to high (~70% closed). A concrete step dam with a vertical drop of 0.5 m to 1.25 m exists within this reach that likely acts as a barrier to non-salmonid fish species (see Attachment 3, Photos 1 and 2). No fish were observed in throughout this reach at the time of assessment.

Overall, habitat conditions within this reach are similar to that noted in Reach 1. It is likely that habitat conditions within this may reach provide direct fish habitat for suitable for foraging, rearing and refuge habitat for a mixed warm/cool water assemblage within the upper reaches of the Creek; however, this reach is not well connected with a downstream progression (i.e., to Reach 1) due to the concrete step dam (see **Attachment 3** Photos 7, 8 and 9. Habitat conditions within the assessed reach were non-limiting throughout with no important or exceptional habitat observed. Based on agency correspondence no aquatic SAR was identified within West Highland Creek. A review of the DFO SAR mapping (2018) indicates that there are no fish or mussel SAR species protected under SARA identified within the Study Area.



Legend

- Photo Location
- Flow Direction
- Reach Boundary
- Watercourse
- Surveyed Watercourse
- Tower Base
- Addendum #1 Study Area
- 120m Background Review Study Area
- Approximate Construction Footprint

0 50 100 200 300
Metres

Scarborough Subway Extension Addendum to the Environment Project Report – Natural Environment Memorandum for Tractor Power Substation (TPSS) # 2

Aquatic Existing Conditions

Oct, 2018	1:4,475 * when printed 11"x17"	Datum: NAD 1983 UTM Zone 17N Source: MNRF, TTC, City of Toronto, TRCA
P#: 60530166		
AECOM		**Figure 3**

Reach 3: West Highland Creek Upstream to Inlet/outlet (750 m to 850 m upstream of McCowan Road Bridge)

Within the assessed reach West Highland Creek narrowed to 2 m wide upstream to the inlet/outlet at the northern extent of the survey limits. At the time of assessment, the mean water depth was 0.10 m while the mean wetted width was 2 m. Reach morphology was comprised of riffles and runs. Substrate was dominated cobble with sand and gravel. The banks were moderately stable; however, broken gabion baskets were observed, likely leading to increased amounts of cobble in the channel. The bankfull width was 3.5 m and the bankfull height was 1.25 m. Instream cover (10% total cover) consisted of overhanging vegetation (5%) and woody debris (5%). The concrete inlet/outlet structure (1.2 m x 1.2 m) conveying West Highland Creek belowground is shown on **Figure 3** and in **Attachment 3**. No visual observations of fish use were documented within the assessed reach. Habitat conditions within this reach are of lesser quality than that noted in Reach 1 and Reach 2 and appear marginal to indirect. The inlet/outlet was slightly perched and likely precludes fish passage further upstream. No important or exceptional habitat was observed. Based on agency correspondence no aquatic SAR was identified within West Highland Creek. A review of the DFO SAR mapping (2018) indicates that there are no fish or mussel SAR species protected under SARA identified within the Study Area.

3.7 Fish Community

Based on a review of existing documentation, West Highland Creek is typical of a degraded urban watercourse and supports a warmwater fish community (LGL, 2016). Based on the TRCA data collected from 2002 to 2017 fish community structure within West Highland Creek is as shown in **Table 3-1**. The fish community consists of secure, common and widespread species representative of a generalist mixed warmwater to coolwater forage fish community intermediately tolerant to tolerant of environmental perturbation.

Table 3-1: West Highland Creek Fish Community (TRCA, 2016)

Common Name (Scientific Name)	Habitat	Thermal Preference[1]	Tolerance[1]	Spawning Months[1]
Blacknose dace (*Rhinichthys atratulus*)	Tends to inhabit headwaters, creeks, and small rivers with swiftly moving water. However, fry mature in slower moving portions of the habitats like shoals and pool margins.	Coolwater/ Warmwater	Intermediate	May to June
Bluntnose minnow (*Pimephales notatus*)	Lakes, rivers, ponds and streams, showing a preference for shallow, clear water with a sandy bottom. Their habitats range from headwater bogs, swamps, and springs to rivers, ponds, and lakes. Sometimes, up to a dozen species of minnows can be found in a single stream of moderate size.	Warmwater	Tolerant	May-July
Creek Chub (*Semotilus atromaculatus*)	Small and medium rivers and streams. Thriving in small stream environments, the creek chub gravitates toward areas of weeds to appear secure and avoid predation. Varying in environments containing a multitude of substrates, they have been documented over gravel, sand, silt, rubble, mud, boulders, clay, bedrock and detritus bottoms.	Warmwater	Tolerant	May to July
Fathead Minnow (*Pimephales promelas*)	Tolerant of turbid, low-oxygen water and can most commonly be found in small lakes, ponds, and wetlands. They can also be found in larger lakes, streams, and other habitats.	Warmwater	Tolerant	June to July

Table 3-1: West Highland Creek Fish Community (TRCA, 2016)

Common Name (Scientific Name)	Habitat	Thermal Preference[1]	Tolerance[1]	Spawning Months[1]
Longnose Dace (*Rhinichthys cataractae*)	Longnose dace occur in moderately cool water streams, rivers and lakes with temperatures up to 22 °C. Longnose dace are benthic and preferentially occupy rock and gravel substrate. During the day longnose dace hide under rocks. Longnose dace prefer shallow, fast-moving riffles in-streams and rivers and the turbulent, near-shore region of lakes.	Coolwater	Intermediate	May to August
White Sucker (*Catostomus commersonii*)	White suckers are found in small streams, rivers, and lakes in the Midwest and East Coast of the United States. The White sucker is also relatively tolerant of turbid and polluted waters.	Warmwater	Intermediate	April to May

3.8 Species at Risk Screening

A comprehensive list of all SAR records within the 120 m of the Addendum #1 study area was compiled based on the secondary information sources identified in **Section 2.1** and agency consultation and a SAR habitat screening was completed as described in **Section 2.5** and is provided in **Attachment 2.** A total of 13 records of SAR were identified through the background review; of these, the following eight SAR were deemed to have a medium or high probability of occurrence in the Addendum #1 study area based on the SAR habitat screening (refer to **Attachment 2**):

- Barn Swallow (*Hirundo rustica*) – medium probability;
- Chimney Swift (*Chaetura pelagica)* – medium probability;
- Eastern Small-footed Myotis *(Myotis leibii)* – medium probability;
- Little Brown Myotis *(Myotis lucifugus)* – medium probability;
- Northern Myotis *(Myotis septentrionalis)* – medium probability;
- Tri-coloured Bat (*Perimyotis subflavus)* – medium probability;
- Kentucky coffee-tree – high probability; and,
- Butternut – high Probability.

The remaining SAR were deemed to have a low probability of occurrence due to lack of habitat, or presence via a historical record. There were no records of aquatic SAR identified through the background review, or agency correspondence.

Barn Swallow and Chimney Swifts, both listed as threatened under the ESA, are known to build nests on man-made structures, with the latter nesting in suitable chimneys. These species have a medium probability of occurring in the Addendum #1 study area given the presence of residential homes that surround the Gatineau Hydro Corridor; however, no suitable buildings or structures were identified within the construction footprints of the Towers or TPSS 2.

Bat SAR, listed as Endangered under the ESA, also have the potential to occur within suitable habitats such as forested areas greater than 0.5 ha in size (e.g., FOD7-3, FOD7-4, CUW1a and CUW1b), where presence of suitable bat maternity roosting structures are confirmed. Additional surveys following the *Survey Protocol for Species at Risk Bats within Treed Habitats Little Brown Myotis, Northern Myotis and Tri-coloured Bat* (MNRF, 2017a) will be required where vegetation removal is proposed in suitable habitats.

Kentucky coffee-tree is listed as Threatened is protected under the ESA; two planted Kentucky coffee-trees were noted outside of the Gatineau Hydro Corridor Segment within a manicured portion (e.g., mowed lawns) of

the Gatineau Hydro Corridor trail (refer to **Figure 2** for locations). According to the Recovery Strategy (MNRF, 2017b), this species is frequently planted as an ornamental tree, often from non-native stock and it is suspected that the two identified specimens are likely from a non-native stock given that they are outside of the species' native range. Regardless, all individual trees are protected under the ESA; however, recovery efforts and application of critical habitats do not apply to planted individuals in landscaped settings (e.g., mowed lawns) as these habitat types are not considered to be critical habitat for the recovery of the species.

A total of five butternuts were identified along the Gatineau Hydro Corridor as shown on **Figure 2**. This species is listed as Endangered under the ESA. Only pure butternuts or those butternuts planted to satisfy compensation requirements under the ESA or Ontario Regulation (O.Reg.) 242/08 receive both species and habitat protection under the ESA, while cultivated and hybrid butternuts do not. These butternut trees had relatively healthy crowns (95-100%), ranged in size from 8 cm to 10.5 cm diameter of breast heights (DBH), and showed some evidence of Butternut Canker (*Ophiognomonia clavigignenti-juglandacearum*), a fungal disease threatening the species, in the form of a few sooty and open cankers. LGL Limited suspected these butternuts to be naturally occurring (2017). The MNRF was consulted regarding whether these butternuts are naturally occurring or planted as part of compensation efforts and whether information pertaining to the genetic purity of these trees was available. MNRF confirmed on July 18, 2018 that these butternuts were not planted as compensation; however, MNRF did not have further information on type of occurrence (e.g., naturally occurring or planted) or genetic purity. Therefore, for the purposes of this memorandum, AECOM assumes that these five butternuts are naturally occurring. These butternuts are located more than 50 m from the construction footprints as shown on **Figure 4**.

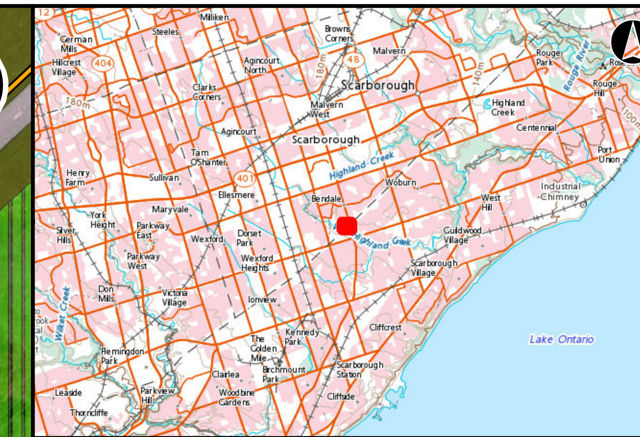
4. Impact Assessment

This section outlines the determination of whether the change may have a negative impact on a matter of provincial importance that relates to the natural environment. This determination was made for both terrestrial ecology features (e.g., designated natural areas, vegetation and vegetation communities, wildlife and wildlife habitat, and terrestrial SAR) and fisheries and aquatic habitat features (e.g., as it relates to aquatic SAR afforded protection under ESA) based on the existing conditions described in **Section 3**.

Table 4-1 below provides a summary of the determination of negative impacts, identified new potential effects (i.e., not previously addressed in the EPR) on the terrestrial and aquatic natural environment as a result of proposed design change, and recommends avoidance and mitigation measures, additional surveys, future commitments and required monitoring to avoid or minimize potential negative impacts.

Determination of potential impacts on the terrestrial and aquatic environment were based on the proposed construction footprint available at the time of preparation of this Memorandum and as shown on **Figures 1** to **4**. Should there be any design changes or additional design components developed through detailed design phases, the impacts assessment is subject to change and additional field work and mitigation measures and monitoring, and permitting requirements may be required with respect to both terrestrial and aquatic environments.

Based on the assessment of potential impacts, the proposed design change is not anticipated to have significant impacts on the natural environment provided that the identified avoidance and mitigation measures are implemented during construction and additional surveys, agency consultation and procurement of required permits is completed during detailed design. Of note, effects on bat SAR resulting from vegetation removal in the CUW1a for the proposed raising of Tower 41 are currently unknown at this time as species-specific surveys targeting bat SAR were not completed at this EA stage. For this reason, impacts on bat SAR have been deemed as not significant based on currently available information and implementation of appropriate mitigation measures; however, this is subject to change based on the results of the additional surveys following the *Survey Protocol for Species at Risk Bats within Treed habitats Little Brown Myotis, Northern Myotis and Tri-coloured Bat* (MNRF, 2017a), to be completed during detailed design.



Legend

- Suspected Naturally Occurring Butternuts
- Watercourse
- Tower Base
- Addendum #1 Study Area
- 120m Background Review Study Area
- 50m Buffer
- Approximate Construction Footprint

ELC

- CUW1a – Mineral Cultural Woodland
- CUW1b – Mineral Cultural Woodland
- CUM1 – Mineral Cultural Meadow
- FOD7-3 – Fresh-moist Willow Lowland Deciduous Forest
- FOD7-4 – Fresh-moist Black Walnut Lowland Deciduous Forest
- MAS2-1 – Cattail Mineral Shallow Marsh
- OAO – Open Aquatic
- Meadoway Restoration Area
- Mowed

0 5 10 20 30 40 50 60 70
Metres

Scarborough Subway Extension Addendum to the Environment Project Report – Natural Environment Memorandum for Tractor Power Substation (TPSS) # 2

Butternut Locations

Oct, 2018	1:947 * when printed 11"x17"	Datum: NAD 1983 UTM Zone 17N Source: MNRF, TTC, City of Toronto, TRCA
P#: 60530166		
AECOM		**Figure 4**

Map location: E:\Projects\60530166\900-CAD_GIS\920-929 (GIS-Graphics)\920-ENV\Design\01_Reports\ENV\MXD\60530166_Fig4_Butternuts.mxd
Date Saved: 10/22/2018 4:18:36 PM User Name: michael.w.collins

Table 4-1: Summary of Potential Effects, Mitigation Measures, Additional Pre-construction Surveys and Permitting Considerations for Traction Power Substation 2

Natural Features	Potential Effects Identified for TPSS 2	Mitigation Measures Identified for TPSS 2	Additional Pre-construction Surveys For TPSS 2 during Detailed Design	Permitting Considerations during Detailed Design for TPSS 2
Designated Natural Areas	▪ There were no ANSIs, PSWs or ESAs identified within the Addendum #1 study area.	▪ None required.	▪ Not required.	▪ Not required.
Policy Areas	▪ Vegetation removal and other associated above-ground construction work for the proposed raising of Tower 41 will impact the City of Toronto's NHS and RNFP, and is located within the TRCA's regulated limits.	▪ Additional mitigation measures identified below for soil, vegetation and vegetation communities apply and will mitigate effects on these policy areas.	▪ In accordance with the City of Toronto's *Ravine and Natural Feature Protection By-law* (Chapter 658 of the Municipal Code), a tree inventory documenting all trees of all diameters that will be impacted will be required during detailed design within 12 m of the construction footprint of Tower 41 where it overlaps with the RNFP area. ▪ Discussion with the City of Toronto and TRCA will occur during detailed design to determine permit requirements with respect to the City's NHS and RNFP, as well as TRCA's regulated limits.	▪ A permit under O.Reg. 166/06 will be required from the TRCA for development or site alteration for the proposed raising of Tower 41 within the regulated areas. ▪ Application under the City of Toronto's *Ravine and Natural Feature Protection By-law* to the City of Toronto for a permit will be required prior to undertaking any work that includes the injury or removal of a tree, or dumping fill or refuse, or altering the existing grade of land.
Soils	▪ Risk of water contamination as result of spills (e.g., grease, soils, and/or fuel) from equipment use. ▪ Increased sedimentation and erosion.	▪ An erosion and sediment control (ESC) plan, which complies with TRCA and City of Toronto guidelines and requirements. This ESC plan will need to be reviewed and approved by the TRCA prior to Project construction. ▪ Stockpiled materials or equipment will be stored within the construction footprint, but shall be kept at least 30 m away from the watercourse. ▪ Refuelling of equipment will occur at least 30 m away from the watercourse. ▪ Refuelling shall be done within refuelling stations lined with appropriate material to prevent seepage and fuel discharge. ▪ Exposed soils shall be stabilized and re-vegetated with suitable native species within the planting season or at the start of the next available planting season to reduce erosion.	Not required.	Not required.
Vegetation and Vegetation Communities	▪ Proposed raising of Towers 41 and 42 and construction of TPSS 2 are anticipated to remove approximately 0.46 ha of vegetation as per the following breakdown: – 0.15 ha of CUW1a – 0.31 ha of Meadoway Restoration Area. ▪ An additional area of 0.77 ha of the construction footprints will be limited to within the mowed areas. ▪ Accidental intrusion into adjacent vegetation. ▪ Other indirect potential effects may include the spread of invasive species from the construction footprint to new locations as result of clearing and grading, and movement of equipment during construction if not properly mitigated. ▪ Fresh-moist Black Walnut Lowland Deciduous Forest (FOD7-4) is considered to be provincially rare vegetation community but it is located outside of the construction footprints and therefore will not be impacted by the proposed construction work.	▪ Vegetation removal will be kept to a minimum and limited to within the construction footprint. ▪ Construction footprints associated with TPSS 2 and Towers 41 and 42 should avoid the Meadoway Restoration Area to the extent possible and be limited as much as possible to within existing trails, municipal right-of-way and mowed areas. ▪ Construction fencing and/or silt fencing, where appropriate, will be installed and maintained to clearly define the construction footprint and prevent accidental damage to vegetation, or intrusion to adjacent vegetated areas. – Any damaged trees will be pruned through the implementation of proper arboricultural techniques by a certified Arborist or Forester. – Monitoring of fencing will follow requirements of the ESC plan to be developed. ▪ Trees will be felled to avoid damaging other standing vegetation and away from any watercourse where it safe to do so. ▪ Hand clear (without grubbing) on steep slopes which do not require grading. ▪ All machinery, construction equipment and vehicles arriving on site should be in clean condition (e.g., free of fluid leaks, soils containing seeds of plant material from invasive species) and be inspected and washed in accordance with the Clean Equipment Protocol for Industry (Halloran et al., 2013) prior to arriving and leaving the construction site in order to prevent the spread of invasive species to other locations. ▪ Temporarily disturbed areas and exposed soils shall be stabilized and re-vegetated with suitable native species within the planting season or at the start of the next available planting season to reduce erosion. ▪ Discussions with TRCA will be required to determine if compensation and post-planting monitoring is required for the removal the Meadoway Restoration Area for construction of the TPSS 2 and proposed raising of Towers 41 and 42.	None required.	None required

Table 4-1: Summary of Potential Effects, Mitigation Measures, Additional Pre-construction Surveys and Permitting Considerations for Traction Power Substation 2

Natural Features	Potential Effects Identified for TPSS 2	Mitigation Measures Identified for TPSS 2	Additional Pre-construction Surveys For TPSS 2 during Detailed Design	Permitting Considerations during Detailed Design for TPSS 2

Ornamental Trees and Shrubs	▪ Removal of private and City-owned trees may be required for the construction of the TPSS 2 and associated raising of Towers 41 and 42.
	▪ Above-ground construction work for the proposed raising of Tower 41 is anticipated to removal vegetation within the City of Toronto's RNFP area.
		▪ A tree inventory will be undertaken during detail design to document impacts to trees in accordance with the City of Toronto Urban Forestry requirements. In addition, a Tree Preservation Plan and will be prepared to document tree protection and mitigation measures that follow the City of Toronto Tree Protection Policy and Specifications for Construction Near Trees Guidelines (2013). Tree protection measures as specified in the Tree Preservation Plan will be adhered to during construction and will include but not limited to the following:
		  ▪ Creation of a tree protection zone (TPZ), which is an area around a tree or group of trees wherein no grading, excavation or restoration-related activities are to occur without Arborist supervision.
		  ▪ The TPZ should outline any additional specifications for the contractor that ensures the proper maintenance of existing trees. Should the limits of the proposed activity areas change, a Certified Arborist will be retained to review trees with TPZs intersecting new activity area limits in order to determine whether trees should be recommended for removal or preservation.
			▪ In accordance with the City of Toronto's *Ravine and Natural Feature Protection By-law* (Chapter 658 of the Municipal Code), a tree inventory documenting all trees of all diameters that will be impacted will be required during detailed design within 12 m of the construction footprint of Tower 41 where it overlaps with the RNFP policy area. A tree inventory, outside of the RNFP policy area, of any city or private-owned trees that may be removed will also be undertaken within 6 m of the construction footprint. Results of this additional tree inventory will be incorporated into the Tree Preservation Plan. A Replanting/Landscape Plan will also be required for any tree removal within the RNFP policy area.	▪ Application under the City of Toronto's *Ravine and Natural Feature Protection By-law* to the City of Toronto for a permit will be required prior to undertaking any work that includes the injury or removal of a tree, or dumping fill or refuse, or altering the existing grade of land.
				▪ The following permits from the City of Toronto in accordance with the *City of Toronto Tree Protection Policy and* Specifications *for Construction Near Trees Guidelines* (2013) will be required if removing private or city owned trees:
				  – Permit to Remove Healthy City-owned tree
				  – Permit to Injure or Destroy Trees on Private Property

Wildlife and Wildlife Habitat	▪ Required vegetation removal will remove wildlife habitat and potentially displace wildlife; however, less than 0.5 ha of vegetation will be removed and as such potential effect is considered to be minimal. ▪ Although effects to common and urban adapted wildlife are anticipated to be minimal, there is potential for wildlife to enter the construction area and be incidentally injured or killed.	▪ Additional mitigation measures for vegetation removal from above in this column apply and will minimize loss of wildlife habitat. ▪ Prior to commencement of daily works, the Environmental Monitor will ensure that there are no wildlife in the construction area as wildlife can move into an area at any given time. ▪ Any wildlife incidentally encountered during vegetation clearing or subsequent construction activities will not be knowingly harmed and will be allowed to exit the site on their own, via safe routes. ▪ In the event that the wildlife does not move or is injured, the Environmental Monitor/Qualified Biologist will be contacted. Construction staff should not attempt to capture or handle any encountered wildlife unless it is in imminent danger and cannot wait for rescue/relocation by an individual qualified in the safe handling of wildlife.	▪ None required.	▪ None required.

Migratory Birds	▪ Impacts to migratory birds protected under the MBCA that may be nesting in the vegetation (e.g., trees, shrubs and ground) within the construction footprints associated with TPSS 2 and Towers 41 and 42.	▪ Vegetation removal (including vegetation at the bases of Towers 41 and 42) should be scheduled to occur outside of the overall bird nesting season of April 1 to August 31 to avoid contravention of the MBCA. If this is not possible and vegetation must be removed during the overall bird nesting season, nest and nesting activity searches will be conducted in areas defined as simple habitat by a qualified Biologist prior to vegetation removal. In accordance with the definitions within the MBCA, simple habitats within the Addendum #1 study area are limited to mowed areas and Tower structures. The CUW1a and the Meadoway Restoration Area are considered to be complex habitats, wherein nesting surveys will not be effective.
		  – If an active nest or confirmed nesting activity of a migratory bird is observed, regardless of the timing window recommended, a species-specific buffer area following Environment and Canada Climate Change (ECCC) guidelines will be applied to the nest or confirmed nesting activity wherein no vegetation removal will be permitted until the young have fledged from the nest. The radius of the buffer will depend on species, level of disturbance and landscape context (ECCC, 2016), which will be confirmed by a qualified Biologist, but will protect a minimum of 10 m around the nest or nesting activity.
		  – Vegetation removal within the assigned protection buffer around active nest or confirmed nesting activity of a migratory bird will not be permitted under the young have fledged from the nest as confirmed by a qualified Biologist.
		▪ If construction activities occur during the nesting window (April 1 to August 31), bird exclusion methods such as covering up any potentially suitable nesting locations on machinery, equipment and stockpiled materials in addition to other types of exclusion methods will be implemented to prevent migratory birds from accessing and building nests in the constructions site. If a nest is found in the construction site, all work in the immediate vicinity must stop and a Qualified Biologist be contacted to determine appropriate avoidance measures in order to avoid contravention of the MBCA.
			▪ None required.	▪ None required if mitigation measures are implemented.

Table 4-1: Summary of Potential Effects, Mitigation Measures, Additional Pre-construction Surveys and Permitting Considerations for Traction Power Substation 2

Natural Features	Potential Effects Identified for TPSS 2	Mitigation Measures Identified for TPSS 2	Additional Pre-construction Surveys For TPSS 2 during Detailed Design	Permitting Considerations during Detailed Design for TPSS 2
Significant Wildlife Habitat	▪ Several candidate SWH were identified within the Addendum #1 study area, including the following: – Candidate Bat Maternity Roosting Colony (FOD7-3 and FOD7-4) – Candidate Reptile Hibernaculum – Candidate Migratory Butterfly Stopover Areas – Confirmed significant vegetation community (FOD7-4) – Candidate Amphibian Breeding Habitat (FOD7-3, FOD7-4 and MAS2-1) ▪ Candidate habitat for the following SOCC: – Eastern Wood-pewee – Wood Thrush – Monarch – Snapping Turtle ▪ All SWH, except for Candidate Migratory Butterfly Stopover Area and candidate habitats for Eastern Wood-pewee and Monarch, are either located outside of the construction footprints or do not have habitat within the construction footprint and therefore not anticipated to be affected. The CUW1a community is likely too small to provide nesting habitat for Wood Thrush, and habitat for Snapping Turtle is limited to West Highland Creek, which is located outside of the construction footprint and not anticipated to be affected. ▪ Vegetation removal within the CUW1a for the proposed raising of Tower 41 may affect candidate habitat for Eastern Wood-pewee, and vegetation removal within the Meadoway Restoration Area may affect Candidate Migratory Butterfly Stopover Area and candidate habitat for Monarch. However, this will be minimized provided appropriate mitigation measures are implemented.	▪ Additional mitigation measures identified below for soil, vegetation and vegetation communities, migratory birds and wildlife and wildlife habitat apply and will mitigate effects on SWH. ▪ Native flowering plants, including Common Milkweed, should be planted in temporarily disturbed areas and incorporated into Landscape Plans.	▪ None required.	▪ None Required.
Species at Risk	▪ The following SAR were identified to have a medium to high probability of occurrence within the Addendum #1 study area: – Barn Swallow – Chimney Swift – Bat SAR – Kentucky coffee-tree – Butternut ▪ Identified Kentucky coffee-trees and butternuts are located more than 50 m from the construction footprints; as such, no impacts to plant SAR are anticipated. ▪ Barn Swallow and Chimney Swifts may fly over the Addendum #1 study area but no suitable buildings or structures were identified within the construction footprints, as such, no impacts to the species or their habitats are anticipated. Foraging habitats for these species are not limited in the general area. ▪ Removal of trees within the CUW1a for the proposed raising of Tower 41 may affect potential maternity roosting habitat for bat SAR. ▪ No impacts to aquatic SAR as there are no in-water works anticipated.	▪ If suitable roosting trees are identified through additional surveys, then identified suitable roosting trees for bat SAR will be avoided to the extent possible. However, should these suitable roosting trees be unavoidable and habitat use by bat SAR is confirmed through additional pre-construction surveys, ongoing consultation with MNRF shall be required by Project Co. to determine the necessary level of permitting under the Endangered Species Act (ESA). The following mitigation and avoidance measures are also anticipated to be required and will be confirmed by Project Co. through the MNRF consultation process: ▪ Removal of suitable roosting trees should occur outside of the bat roosting season of March 31 to October 1, and strictly cannot occur during the bat maternity period of June 1st through July 31st.	▪ Additional species-specific surveys following the *Survey Protocol for Species at Risk Bats within Treed habitats Little Brown Myotis, Northern Myotis and Tri-coloured Bat* (MNRF, 2017a) within CUW1a where vegetation removal is required for Tower 41. At minimum, leaf-off surveys will be required to identify suitable roosting trees. Consultation with the MNRF will be required to confirm whether additional surveys (e.g., acoustic monitoring and leaf-on surveys) are needed to confirm presence/absence of bat SAR use of the identified suitable roosting trees or to confirm presence of leaf clusters for Tri-coloured Bat.	▪ If bat SAR are confirmed to be using the trees as roosting habitat through pre-construction surveys and removal of these trees cannot be avoided, ongoing consultation with MNRF will be required to determine the necessary level of permitting under the ESA.
Aquatic Ecosystem	▪ There are unlikely impacts to the watercourse West Highland Creek. ▪ The watercourse supports direct fish habitat. However, all tower construction and areas of impact are expected to be greater than 30 from the watercourse, therefore, no serious harm to fish or fish habitat is anticipated.	▪ No work shall occur within 30 m of the West Highland Creek. ▪ Erosion and sediment control measures shall be applied between the work area and the watercourse to prevent deleterious substances from entering the creek. ▪ No machinery shall come within 30 m of the watercourse. ▪ No refuelling of machinery within 30 m of the watercourse. ▪ No fording of the watercourse shall take place.	▪ A DFO Self-Assessment will be completed to determine if serious harm can be avoided to fish and fish habitat. It is likely that serious harm will be avoided provided appropriate mitigation measures are implemented.	▪ None Required

5. Limitations of this Memorandum

The observations and results obtained during the site reconnaissance visit are representative of the conditions encountered during the 2018 field surveys only. Many of the species surveyed are migratory and may occur within the Addendum #1 study area during some years and not others. Habitat (vegetation communities, SWH, etc.) also changes over time and may increase or decrease in suitability for SAR or other wildlife. AECOM has used its best professional judgement to interpret the survey results and provide accurate conclusions based on the construction footprints available at the time of finalization of this Memorandum.

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AECOM Imagine it. Delivered.

Attachment 1

2018 Vascular Plant List within the Addendum #1 Study Area

Attachment 1: 2018 Vascular Plant List within the Addendum #1 Study Area

BOTANICAL NAME		COMMON NAME	Coefficient of Conservatism	Wetness Index	Weediness Index	Provincial Status	OMNR Status	Global Status	Local Status Toronto	Local Status GTA	Local Status Site District 7E-4	Local Status TRCA	Vegetation Communities:						
													CUW1a	CUW1b	FOD7-3	FOD7-4	CUM1	MAS2-1	Meadoway
PTERIDOPHYTES		**FERNS & ALLIES**										L4							
Equisetaceae		**Horsetail Family**										L+?							
Equisetum	*arvense*	Field Horsetail	0	0		S5		G5	X	X	X	L+						x	
GYMNOSPERMS		**CONIFERS**																	
Juniperus	*virginiana*	Eastern Red Cedar	4	3		S5		G5	R1	U	R8						x		
Thuja	*occidentalis*	Eastern White Cedar	4	-3		S5		G5	X	X	X	L4		x			x	x	
Pinaceae		**Pine Family**																	
Picea	*glauca*	White Spruce	6	3		S5		G5	X+	X	X+	L5	x			x			
Pinus	*nigra*	Austrian Pine		-5	-1	SNA		GNR		X		L+		x					
Pinus	*strobus*	Eastern White Pine	4	3		S5		G5	X	X	X		x	x					
DICOTYLEDONS		**DICOTS**										L2							
Aceraceae		**Maple Family**																	
Acer	*negundo*	Manitoba Maple	0	-2		S5		G5	X	X	X	L3	x	x	x	x	x		
Acer	*platanoides*	Norway Maple		5	-3	SNA		GNR	X	X	X	L1	x		x				P
Acer	*saccharinum*	Silver Maple	5	-3		S5		G5	X	X	X	L+	P		x		x	x	
Anacardiaceae		**Sumac or Cashew Family**																	
Rhus	*typhina*	Staghorn Sumac	1	5		S5		G5	X	X	X	L2	P	x					P
Apiaceae		**Carrot or Parsley Family**																	
Daucus	*carota*	Wild Carrot		5	-2	SNA		GNR	X	X	X		x				x		x
Asclepiadaceae		**Milkweed Family**																	
Asclepias	*syriaca*	Common Milkweed	0	5		S5		G5	X	X	X	L4	x				x	x	x
Vincetoxicum	*rossicum*	Dog-strangling Vine		5	-2	SNA		GNR	X	X	X		x	x	x	x			x
Asteraceae		**Composite or Aster Family**																	
Arctium	*minus*	Common Burdock		5	-2	SNA		GNR					x	x	x	x	x		
Symphyotrichum	*cordifolium*	Common Blue Wood Aster	5	5		S5		G5				L3				x			
Symphyotrichum	*lanceolatum*	White Panicled Aster	3	-3		S5		G5T5				LX	x						
Symphyotrichum	*species*	Aster species	0														x		
Symphyotrichum	*lateriflorum*	Calico Aster	3	-2		S5		G5	X	X	X	L2				x			
Symphyotrichum	*novae-angliae*	New England Aster	2	-3		S5		G5				L+						x	
Cichorium	*intybus*	Chicory		5	-1	SNA		GNR	X	X	X	L+	x				x		
Cirsium	*arvense*	Canada Thistle		3	-1	SNA		GNR	X	X	X	L4	x						x
Coreopsis	*tripteris*	Tall Tickseed	9	0		S2		G5											P
Echinacea	*purpurea*	Eastern Purple Coneflower	10	5		SNA		G4											P
Erigeron	*philadelphicus ssp. philadelphicus*	Philadelphia Fleabane	1	-3		S5		G5	X	X	X	L5							P
Eutrochium	*maculatum*	Spotted Joe-pye-weed	3	-5		S5		G5T5	X	X	X							x	
Helianthus	*giganteus*	Giant Sunflower	6	-3		S5		G5											P
Heliopsis	*helianthoides*	Sweet Ox-eye	3	5		S5		G5	X	X	X								P
Inula	*helenium*	Elecampane		5	-2	SNA		GNR							x				
Rudbeckia	*hirta*	Black-eyed Susan	0	3		SU		G5T4T5	X	X	X								P
Silphium	*perfoliatum var. perfoliatum*	Cup-plant	9	-2		S2		G5	R4	R	R4	L4							P
Solidago	*altissima*	Tall Goldenrod	1	3		S5		GNR	X	X	X		x		x	x			x
Solidago	*canadensis*	Canada Goldenrod	1	3		S5		G5	X	X	X		x	x	x	x			
Solidago	*juncea*	Early Goldenrod	3	5		S5		G5	U	U	U				x				
Sonchus	*arvensis ssp. arvensis*	Field Sow-thistle		1	-1	SNA		GNRTNR	X	X	X	L3	x				x	x	
Tanacetum	*vulgare*	Common Tansy		5	-1	SNA		GNR	X	X	X			x			x		
Taraxacum	*officinale*	Common Dandelion	0			SNA		G5											x
Balsaminaceae		**Touch-me-not Family**																	
Impatiens	*capensis*	Jewelweed	4	-3		S5		G5	X	X	X		x		x			x	
Impatiens	*glandulifera*	Himalayan Balsam		-3	-2	SNA		GNR	X	X	X								
Boraginaceae		**Borage Family**										L+							
Echium	*vulgare*	Viper's Bugloss		5	-2	SNA		GNR	X	X	X								x
Brassicaceae		**Mustard Family**							X	X	X								
Alliaria	*petiolata*	Garlic Mustard		0	-3	SNA		GNR	X	X	X		x	x		x			x
Barbarea	*vulgaris*	Garden Yellowrocket		0	-1	SNA		GNR				L+?							x
Hesperis	*matronalis*	Dame's Rocket		5	-3	SNA		G4G5	X	X	X	L5	x						
Caprifoliaceae		**Honeysuckle Family**										L+							
Lonicera	*morrowii*	Morrow's Honeysuckle		5	-1	SNA		GNR	X	X	X			x			x		
Lonicera	*tatarica*	Tartarian Honeysuckle		3	-3	SNA		GNR	X	X	X	L+	x	x	x	x			
Sambucus	*nigra ssp. canadensis*	Common Elderberry	5	-2		S5		G5T5	U	X	X		x						P
Sambucus	*racemosa*	Red-berried Elderberry	5	2		S5		G5	X	X	X	L+							P
Viburnum	*acerifolium*	Maple-leaved Viburnum	6	5		S5		G5	X	X	X		P						
Viburnum	*lentago*	Nannyberry	4	-1		S5		G5	X	X	X	L+							P
Celastraceae		**Staff-tree Family**																	
Euonymus	*europaea*	European Spindle Tree		5	-1	SNA		GNR	X	X	X	L3			x				
Chenopodiaceae		**Goosefoot Family**										L+							
Chenopodium	*album var. album*	Lamb's Quarters		1	-1	SNA		G5	X	X	X	L+							x

Attachment 1: 2018 Vascular Plant List within the Addendum #1 Study Area

BOTANICAL NAME		COMMON NAME	Coefficient of Conservatism	Wetness Index	Weediness Index	Provincial Status	OMNR Status	Global Status	Local Status Toronto	Local Status GTA	Local Status Site District 7E-4	Local Status TRCA	Vegetation Communities:						
													CUW1a	CUW1b	FOD7-3	FOD7-4	CUM1	MAS2-1	Meadoway
Convolvulaceae		**Morning-glory Family**																	
Convolvulus	*arvensis*	Field Bindweed		5	-1	SNA		GNR	X	X	X	L2		x					
Cornaceae		**Dogwood Family**																	
Cornus	*racemosa*	Gray Dogwood	2	-2		S5		G5?	X	X	X								P
Cornus	*sericea*	Red-osier Dogwood	2	-3		S5		G5	X	X	X	L+	x					P	P
Cucurbitaceae		**Gourd Family**										L1							
Echinocystis	*lobata*	Wild Cucumber	3	-2		S5		G5	X	X	X		x		x				
Dipsacaceae		**Teasel Family**																	
Dipsacus	*fullonum*	Fuller's Teasel		5	-1	SNA		GNR	X	X	X	L4							x
Fabaceae		**Pea Family**																	
Desmodium	*canadense*	Canadian Tick-trefoil	5	1		S4		G5	X	U	X					x			
Gymnocladus	*dioicus*	Kentucky Coffee-tree	6	5		S2	THR	G5					P						
Lotus	*corniculatus*	Bird's-foot Trefoil		1	-2	SNA		GNR	X	X	X			x				x	x
Melilotus	*alba*	White Sweet-clover		3	-3	SNA		G5	X	X	X								x
Robinia	*pseudo-acacia*	Black Locust		4	-3	SNA		G5	X	X	X		P	x					x
Trifolium	*pratense*	Red Clover		2	-2	SNA		GNR	X	X	X								x
Vicia	*cracca*	Cow Vetch		5	-1	SNA		GNR	X	X	X	L+					x		
Guttiferae		**St. John's-wort Family**																	
Hypericum	*perforatum*	Common St. John's-wort		5	-3	SNA		GNR	X	X	X	L+	x	x					x
Hippocastanaceae		**Buckeye Family**										L2							
Aesculus	*hippocastanum*	Horse Chestnut		5	-1	SNA		GNR	X	X	X	LX	P						
Juglandaceae		**Walnut Family**										L5							
Juglans	*cinerea*	Butternut	6	2		S3?		G4	X	X	X	L+	x						
Juglans	*nigra*	Black Walnut	5	3		S4		G5	X	X	X	L5	x	x	x	x	x		
Lamiaceae		**Mint Family**										L+							
Leonurus	*cardiaca ssp. cardiaca*	Common Motherwort		5	-2	SNA		GNR	X	X	X		x		x				
Monarda	*fistulosa*	Wild Bergamot	6	3		S5		G5T5?	X	X	X								P
Prunella	*vulgaris ssp. vulgaris*	Common Heal-all		0	-1	SNA		G5TU	X	X	X				x				
Lythraceae		**Loosestrife Family**																	
Lythrum	*salicaria*	Purple Loosestrife		-5	-3	SNA		G5	X	X	X							x	
Moraceae		**Mulberry Family**										L4							
Morus	*alba*	White Mulberry		0	-3	SNA		GNR	X	X	X				x				x
Oleaceae		**Olive Family**										L5							
Fraxinus	*pennsylvanica*	Green Ash	3	-3		S4		G5	X	X	X		x	x	x	x			
Onagraceae		**Evening-primrose Family**																	
Circaea	*canadensis*	Canada Enchanter's Nightshade	3	3		S5		G5T5	X	X	X		x			x			
Epilobium	*parviflorum*	Small-flowered Willow-herb		3	-1	SNA		GNR	X	X	X							x	
Oenothera	*biennis*	Common Evening-primrose	0	3		S5		G5	U	U	U		x						
Oxalidaceae		**Wood Sorrel Family**																	
Oxalis	*stricta*	Common Yellow Oxalis	0	3		S5		G5	X	X	X					x			
Plantaginaceae		**Plantain Family**										L+							
Plantago	*major*	Common Plantain		-1	-1	S5		G5	X	X	X						x		
Polygonaceae		**Smartweed Family**																	
Persicaria	*maculosa*	Lady's-thumb		-3	-1	SE5		G?	X	X	X	L3							x
Rumex	*crispus*	Curly-leaf Dock		-1	-2	SNA		GNR	X	X	X		x						x
Primulaceae		**Primrose Family**																	
Lysimachia	*ciliata*	Fringed Loosestrife	4	-3		S5		G5	X	X	X	L3			x				
Ranunculaceae		**Buttercup Family**										L+							
Anemone	*canadensis*	Canada Anemone	3	-3		S5		G5	X	X	X						x		
Ranunculus	*acris*	Tall Buttercup		-2	-2	SNA		G5	X	X	X				x	x			
Rhamnaceae		**Buckthorn Family**										L3							
Rhamnus	*cathartica*	Common Buckthorn		3	-3	SNA		GNR	X	X	X		x	x		x			x
Rosaceae		**Rose Family**																	
Amelanchier	*laevis*	Smooth Juneberry	5	5		S5		G4G5Q	U	U	U								P
Amelanchier	*sanguinea*	Roundleaf Juneberry	7	5		S5?		G5	U	U	U				x				
Crataegus	*monogyna*	Single-seed Hawthorn		5	-1	SNA		G5	X	X	X			x					
Geum	*urbanum*	Wood Avens		5	-1	SNA		G5	X	X	X	L2	x	x		x			x
Physocarpus	*opulifolius*	Ninebark	5	-2		S5		G5	R6	R	R7		P						
Prunus	*serotina*	Black Cherry	3	3		S5		G5	X	X	X		x						
Prunus	*virginiana*	Choke Cherry	2	1		S5		G5	X	X	X		x	x	x				
Rosa	*carolina*	Pasture Rose	6	4		S4		GNR	R	R	R4		P						P
Rosa	*multiflora*	Multiflora Rose		3	-3	SNA		GNR	X	X	X				x				
Rubus	*idaeus*	American Red Raspberry	0	-2		SNA		G5T5		X	X		x	x		x	x	x	
Rubus	*odoratus*	Purple Flowering Raspberry	3	5		S5		G5	X	X	X								P
Spiraea	*alba*	White Meadow-sweet	3	-4		S5		G5	R1	X	R6							P	P
Rubiaceae		**Madder Family**																	

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BOTANICAL NAME		COMMON NAME	Coefficient of Conservatism	Wetness Index	Weediness Index	Provincial Status	OMNR Status	Global Status	Local Status Toronto	Local Status GTA	Local Status Site District 7E-4	Local Status TRCA	Vegetation Communities:						
													CUW1a	CUW1b	FOD7-3	FOD7-4	CUM1	MAS2-1	Meadoway
Galium	*aparine*	Cleavers	4	3		S5		G5	U	U	U				x	x			
Galium	*asprellum*	Rough Bedstraw	6	-5		S5		G5	U	U	U		x						
Salicaceae		**Willow Family**										L+							
Populus	*balsamifera ssp. balsamifera*	Balsam Poplar	4	-3		S5		G5	X	X	X	L3						x	
Populus	*deltoides ssp. deltoides*	Eastern Cottonwood	4	-1		S5		G5T5	X	X	X	LX		x					
Populus	*tremuloides*	Trembling Aspen	2	0		S5		G5	X	X	X		x						
Salix	*eriocephala*	Missouri River Willow	4	-3		S5		G5	X	X	X							P	
Salix X	*fragilis*	Crack Willow		-1	-3	SNA		GNR	X	X	X	L3			x	x		x	
Scrophulariaceae		**Figwort Family**										L+							
Linaria	*vulgaris*	Butter-and-eggs		5	-1	SNA		GNR	X	X	X		x						x
Solanaceae		**Nightshade Family**																	
Solanum	*dulcamara*	Bittersweet Nightshade		0	-2	SNA		GNR	X	X	X						x		
Tiliaceae		**Linden Family**																	
Tilia	*americana*	American Basswood	4	3		S5		G5	X	X	X	L3			x				
Ulmaceae		**Elm Family**																	
Ulmus	*americana*	American Elm	3	-2		S5		G5?	X	X	X		x						
Ulmus	*pumila*	Siberian Elm		5	-1	SNA		GNR	X	X	X	LX			x	x			
Urticaceae		**Nettle Family**										L+							
Urtica	*dioica ssp. gracilis*	California Nettle	2	-1		S5		G5T5	X	X	X	L4	x						
Verbenaceae		**Vervain Family**										LX							
Verbena	*hastata*	Blue Vervain	4	-4		S5		G5	X	X	X					x	x		
Vitaceae		**Grape Family**																	
Parthenocissus	*inserta*	Thicket-creeper	3	3		S5		G5	X	X	X		x						
Vitis	*riparia*	Riverbank Grape	0	-2		S5		G5	X	X	X		x	x	x	x			x
MONOCOTYLEDONS		**MONOCOTS**										L+							
Cyperaceae		**Sedge Family**										L3							
Carex	*vulpinoidea*	Fox Sedge	3	-5		S5		G5	X	X	X							x	
Scirpus	*atrovirens*	Green Bulrush	3	-5		S5		G5?	X	X	X	L4						x	
Juncaceae		**Rush Family**																	
Juncus	*tenuis*	Path Rush	0	0		S5		G5	X	X	X							x	
Poaceae		**Grass Family**										L+							
Bromus	*inermis ssp. inermis*	Smooth Brome		5	-3	SNA		G5TNR	X	X	X		x	x	x	x	x		x
Dactylis	*glomerata*	Orchard Grass		3	-1	SNA		GNR	X	X	X				x		x		
Elymus	*repens*	Quack Grass		3	-3	SNA		GNR	X	X	X	L5							x
Phalaris	*arundinacea*	Reed Canary Grass	0	-4		S5		G5	X	X	X		x	x	x	x	x		
Phleum	*pratense*	Timothy		3	-1	SNA		GNR	X	X	X	L5	x	x			x		x
Poa	*pratensis ssp. pratensis*	Kentucky Blue Grass	0	1		S5		G5T	X	X	X						x	x	
Typhaceae		**Cattail Family**																	
Typha X	*glauca*	Hybrid Cattail	3	-5		SNA		GNA	X	X	X							x	

FLORISTIC SUMMARY & ASSESSMENT

Species Diversity			
Total Species:		**121**	
Native Species:		**72**	59.50%
Exotic Species		**49**	40.50%
Total Taxa in Region (List Region, Source)		10000	
% Regional Taxa Recorded		1.21%	
Regionally Significant Species		enter manually	
S1-S3 Species		3	
S4 Species		4	
S5 Species		58	
Co-efficient of Conservatism and Floral Quality Index			
Co-efficient of Conservatism (CC) (average)		**3.31**	
CC 0 to 3	*lowest sensitivity*	40	55.56%
CC 4 to 6	*moderate sensitivity*	28	38.89%
CC 7 to 8	*high sensitivity*	1	1.39%
CC 9 to 10	*highest sensitivity*	3	4.17%
Floral Quality Index (FQI)		**28.05**	
Presence of Weedy & Invasive Species			
mean weediness		**-1.82**	
weediness = -1	*low potential invasiveness*	23	46.94%
weediness = -2	*moderate potential invasiveness*	12	24.49%
weediness = -3	*high potential invasiveness*	14	28.57%
Presence of Wetland Species			
average wetness value		**1.15**	
upland		33	27.27%
facultative upland		29	23.97%

Attachment 1: 2018 Vascular Plant List within the Addendum #1 Study Area

facultative	21	17.36%
facultative wetland	29	23.97%
obligate wetland	7	5.79%

EXPLANATION OF TERMINOLOGY *(See the following pages for addition detailed information on terms.)*
Botanical and Common Name: From Newmaster et. al, 1998. Species requiring confirmation noted (cf).
Co-efficient of Conservatism: This value, ranging from 0 (low) to 10 (high), is based on a species tolerance of disturbance and fidelity to a specific habitat integrity.
Wetness Index: This value, ranging from -5 (obligate wetland) to 5 (upland) provides the probability of a species occurring in wetland or upland habitats.
Weediness Index: This value, ranging from -1 (low) to -3 (high) quantifies the potential invasiveness of non-native plants. In combination with the percentage of non-native plants, it can be used as an indicator of disturbance.
Provincial Status: Provincial ranks are used by the NHIC to set protection priorities for rare species and natural communities. These ranks are not legal designations. S4 and S5 species are generally uncommon to common in the province. Species ranked S1-S3 are considered to be rare in Ontario.
Local Status:
X: native species present (collection-based) and all exotic species
R: native species locally rare (number of stations): Durham (<10 stations), GTA (<40 stations), Site District 6E7 (<20 stations)
U: native species locally uncommon Durham (11-20 stations), GTA (41-80 stations), Site District 6E7 (21-40 stations)
Note: study area in Site District 6E13
Record Type
X – observed naturally occurring
P – planted
DETAILED EXPLANATION OF TERMS
Floral Quality Index and Coefficient of Conservatism Values
Vegetation species and community sensitivity was assessed through the application of coefficient of conservatism values (CC), assigned to each native species in southern Ontario (Oldham, et. al, 1995). The value of CC, ranging from 0 (low) to 10 (high), is based on a species tolerance of disturbance and fidelity to specific habitat integrity. The occurrence of species with a CC of 9 or 10 can be good indicators of undisturbed conditions such as mature forests, fens or bogs.
General habitat values associated with the CC values are:
0-3: species found in a wide variety of communities, including disturbed sites
4-6: species associated with a specific community, but tolerate moderate disturbance
7-8: species associated with a community in an advanced successional stage, tolerant of minor disturbances
9-10: species with a high degree of fidelity to a narrow range of synecological parameters
The floristic quality of an area is reflected in the mean value of CC. For example, an old field or grazed woodlot would tend have a low mean CC; these habitats are dominated by opportunistic species that occur in a wide range of site conditions and are tolerant of disturbance. A bog, prairie or intact forest would have a higher value, reflecting the specific habitat requirements of many of the species and a generally undisturbed condition. The following provides an example of interpretation of CC values:
mean CC value / % spp CC >8 / Condition of the Landscape
5 / 27 / intact
3.5 / 19 / slightly degraded
1.3 / 2 / severely degraded
The FQI accounts for the species diversity of the area by equating the number of native species with the mean CC value. The FQI is generally used for comparing natural areas. The CC value and FQI of the study area were calculated for the entire study area.
Weediness Index
The sensitivity of natural areas can be assessed through application of the Weediness Index. The Weediness Index quantifies the potential invasiveness of non-native plants, and, in combination with the percentage of non-native plants can be used as an indicator of disturbance. Values (ranging from 1- to -3) have been assigned to most non-native species based on the potential impact each species can have in natural areas:
-1: little or no impact on natural areas (most non-native plants are in this category)
-2: occasional impacts on natural areas, generally infrequent or localized
-3: major potential impacts on natural areas
Wetness Index
All plants in southern Ontario have been assigned a wetland category, based on the designations developed for use by the United States Fish & Wildlife Service. Plants are designated into the following categories:
OBL (Obligate Wetland): occurs almost always in wetlands under natural conditions (estimated >99% probability)
FACW (Facultative Wetland): usually occurs in wetlands, but occasionally found in non-wetlands (estimated 67-99% probability)
FAC (Facultative): equally likely to occur in wetlands or non-wetlands (estimated 34-66% probability)
FACU (Facultative Upland): occasionally occurs in wetlands, but usually occurs in non-wetlands (estimated 1-33% probability)
UPL (Upland): occurs almost never in wetlands under natural conditions (estimated <1% probability)
Further refinement of the Facultative categories are denoted by a “+” or “-” to express exaggerated tendencies for those species. The “+” denotes a greater estimated probability occurring in wetlands than species in the general indicator category, but a lesser probability than species occurring in the next higher category. The "-" denotes a lesser estimated probability of occurring in wetlands than species in the general indicator category, but a greater probability than species occurring in the next lower general category.
Each wetland category has been assigned a numerical value to facilitate the quantification of the wetness index. The wetland categories and their corresponding values are as follows:
OBL : -5
FACW+: -4
FACW: -3
FACW-: -2
FAC+: -1
FAC: 0
FAC-: 1
FACU+: 2
FACU: 3
FACU-: 4
UPL: 5
Provincial Status
Provincial ranks are used by the NHIC to set protection priorities for rare species and natural communities. These rankings are based on the total number of extant Ontario populations and the degree to which they are potentially or actively threatened with destruction. The ranks are:
S1: Critically Imperiled—Critically imperiled in the nation or state/province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state/province
S2: Imperiled—Imperiled in the nation or state/province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the nation or state/province
S3: Vulnerable—Vulnerable in the nation or state/province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation
S4: Apparently Secure—Uncommon but not rare; some cause for long-term concern due to declines or other factors.
S5:Secure—Common, widespread, and abundant in the nation or state/province
SH: Possibly Extirpated (Historical)—Species or community occurred historically in the nation or state/province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20-40 years. A species or community could become NH or SH without such a 20-40 year delay if the only known occurrences in a nation or state/province were destroyed or if it had been extensively and unsuccessfully looked for. The NH or SH rank is reserved for species or communities for which some effort has been made to relocate occurrences, rather than simply using this status for all elements not known from verified extant occurrences
SNR Unranked—Nation or state/province conservation status not yet assessed
SX: Presumed Extirpated—Species or community is believed to be extirpated from the nation or state/province. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered

Attachment 1: 2018 Vascular Plant List within the Addendum #1 Study Area

SNA Not Applicable —A conservation status rank is not applicable because the species is not a suitable target for conservation activities.
SU: Unrankable—Currently unrankable due to lack of information or due to substantially conflicting information about status or trends
Rank ranges, e.g. S2S3, indicate that the rank is either S2 or S3, but that current information is insufficient to differentiate.
S#S# Range Rank —A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).

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Attachment 2

Species of Conservation Concern and Species at Risk Habitat Screening

Attachment 2: Species of Conservation Concern and Species at Risk Habitat Screening

Taxon	Common Name	Scientific Name	S-rank[1]	ESA Status[2]	Year Last Observed	Source	Preferred Habitat	Probability of Occurrence in Project Area
Species of Conservation Concern (Special Concern, S1-S3)								
Bird	Common Nighthawk	*Chordeiles minor*	S4B	SC	2001-2005	OBBA	Traditional Common Nighthawk habitat consists of open areas with little to no ground vegetation, such as logged or burned-over areas, forest clearings, rock barrens, peat bogs, lakeshores, and mine tailings. Although the species also nests in cultivated fields, orchards, urban parks, buildings with gravel flat roofs, mine tailings and along gravel roads and railways, they tend to occupy natural sites. This species can typically be associated with the following ELC communities: SD, BB, RB, CUM, BO, FOM, FOC and FOD with openings with little vegetation.	Low - there were no suitable breeding areas within the study area.
Bird	Eastern Wood-Pewee	*Contopus virens*	S4B	SC	2001-2005	OBBA	The Eastern Wood-Pewee can be found in every type of wooded community in eastern North America. The size of the forest does not appear to be an important factor in habitat selection as this species has been found in both small fragmented forests and larger forest tracks. 4 This species can typically be associated with the following ELC communities: FOC, FOM, FOD, SWD, SWM and CUW.	Medium – forested communities (FOD7-3, FOD7-4, CUW1a and CUW1b) associated within the Highland Creek valley may support breeding habitat for this species.
Bird	Peregrine Falcon	*Falco peregrinus*	S3B	SC	2001-2005	OBBA	Peregrine Falcons usually nest on tall, steep cliff ledges close to large bodies of water. Although most people associate Peregrine Falcons with rugged wilderness, some of these birds have adapted well to city life. Urban peregrines raise their young on ledges of tall buildings, even in busy downtown areas. Cities offer peregrines a good year-round supply of pigeons and starlings to feed on. This species can be associated with the following ELC communities: CLO.	Low – there were no tall sky scrapers to provide nesting habitat for this species.
Bird	Wood Thrush	*Hylocichla mustelina*	S4B	SC	2001-2005	OBBA	The Wood Thrush can typically be found in the interior and along the edges of well-developed upland deciduous and mixed forests. Key elements of these forests include trees that are greater than 16 m in height, high variety of deciduous tree species, moderate subcanopy and shrub density, shade, fairly open forest floor, moist soils and decaying leaf litter. Wood Thrush is more likely to occur in larger forests but may also nest in 1 ha fragments and semi-wooded residential areas and parks. Smaller habitat fragments have lower fecundity when compared to larger fragments. This species can typically be associated with the following ELC communities: FOD and FOM that are greater than 1 ha in size.	Medium – forested communities (FOD7-3, FOD7-4 and CUW1b) associated within the Highland Creek valley may support breeding habitat for this species.
Insect	Monarch	*Danaus plexippus*	S2N,S4B	SC	2017	OBA	Throughout their life cycle, Monarchs use three different types of habitat. Only the caterpillars feed on milkweed plants and are confined to meadows and open areas where milkweed grows. Adult butterflies can be found in more diverse habitats where they feed on nectar from a variety of wildflowers. Monarchs spend the winter in Oyamel Fir forests found in central Mexico. This species can typically be associated with the following ELC communities: AI, TP and CUM where milkweed plants are present.	High – the Meadoway restoration meadow areas provide suitable breeding and foraging habitat for this species. Monarchs were also observed foraging in these restoration areas in the study area.
Insect	Painted Skimmer	*Libellula semifasciata*	S2	-	1908 (historical)	NHIC	This species can found in marshy, forest seepages, ponds and slow streams.	Low – although suitable habitat in the form of Highland Creek and forested riparian areas were present; this species is unlikely to still occur in this area given that it was last seen more than 20 years ago and therefore considered to be a historical record.
Insect	Swamp Darner	*Epiaeschna heros*	S2S3	-	1941 (historical)	NHIC	This species can found in heavily wooded ponds, streams and ox-bows including ephemeral pools and ponds.	Low – although suitable habitat in the form of Highland Creek and forested riparian areas were present; this species is unlikely to still occur in this area given that it was last seen more than 20 years ago and therefore considered to be a historical record.
Turtle	Eastern Musk Turtle	*Sternotherus odoratus*	S3	SC	2003	ORAA	Eastern Musk Turtles are found in ponds, lakes, marshes and rivers that are generally slow-moving have abundant emergent vegetation and muddy bottoms that they burrow into for winter hibernation. Nesting habitat is variable, but it must be close to the water and exposed to direct sunlight. Nesting females dig shallow excavations in soil, decaying vegetation and rotting wood or lay eggs in muskrat lodges, on the open ground or in rock crevices. This species can typically be associated with the following ELC communities: MAS, OAO, SAS, SAM and SAF. Nesting habitat can be any upland areas adjacent these area that are exposed to direct sunlight.	Low – the reach of Highland Creek did not have abundant emergent vegetation and was general shallow such that it is unlikely to provide suitable habitat for this species.
Turtle	Snapping Turtle	*Chelydra serpentina*	S3	SC	2016	ORAA	Snapping Turtles spend most of their lives in water. They prefer shallow waters so they can hide under the soft mud and leaf litter, with only their noses exposed to the surface to breathe. During the nesting season, from early to mid summer, females travel overland in search of a suitable nesting site, usually gravelly or sandy areas along streams. Snapping Turtles often take advantage of man-made structures for nest sites, including roads (especially gravel shoulders), dams and aggregate pits. This species can typically be associated with the following ELC communities: OAO, SA near gravelly or sandy areas.	Medium – Highland Creek may act as a suitable movement corridor and suitable nesting habitats may be present along the creek.
Species at Risk (Threatened, Endangered, Extirpated)								
Bird	Bank Swallow	*Riparia riparia*	S4B	THR	2001-2005	OBBA	Bank swallows nest in burrows in natural and human-made settings where there are vertical faces in silt and sand deposits. Many nests are on banks of rivers and lakes, but they are also found in active sand and gravel pits or former ones where the banks remain suitable. The birds breed in colonies ranging from several to a few thousand pairs.	Low – there were no suitable banks along Highland Creek to provide nesting habitat for this species.
Bird	Barn Swallow	*Hirundo rustica*	S4B	THR	2001-2005	OBBA	Barn Swallows often live in close association with humans, building their cup-shaped mud nests almost exclusively on human-made structures such as open barns, under bridges and in culverts. The species is attracted to open structures that include ledges where they can build their nests, which are often re-used from year to year. They prefer unpainted, rough-cut wood, since the mud does not adhere as well to smooth surfaces. This species can typically be associated with the following ELC communities: TPO, CUM1, MAM, MAS, OAO, SAS1, SAM1, SAF1; containing or adjacent structures that are suitable for nesting.	Medium – residential buildings surrounding the Gatineau Hydro Corridor may support nesting habitat for this species; however, no buildings were identified within the construction disturbance areas.
Bird	Bobolink	*Dolichonyx oryzivorus*	S4B	THR	2001-2005	OBBA	Historically, Bobolinks lived in North American tallgrass prairie and other open meadows. With the clearing of native prairies, Bobolinks moved to living in hayfields. Bobolinks often build their small nests on the ground in dense grasses. Both parents usually tend to their young, sometimes with a third Bobolink helping. This specie prefers hayfields, meadows and pastures that are greater than 5 ha in size. This species can typically be associated with the following ELC communities: TPO, TPS, CUM1 and MAM2.	Low – although there were a series of small meadows present (0.5-3 ha), they are fragmented by roads and pedestrian trails and surrounded by residential homes. Furthermore, there is a high forb cover relative to grasses such that it would not be suitable habitat species.
Bird	Chimney Swift	*Chaetura pelagica*	S4B,S4N	THR	2001-2005	OBBA	Before European settlement Chimney Swifts mainly nested on cave walls and in hollow trees or tree cavities in old growth forests. Today, they are more likely to be found in and around urban settlements where they nest and roost (rest or sleep) in chimneys and other manmade structures. They also tend to stay close to water as this is where the flying insects they eat congregate. Foraging habitat for this species can be associated with the following ELC codes: TPO, CUM1, MAM, MAS, OAO, SAS1, SAM1, SAF1 containing or adjacent structures with suitable nesting habitat (i.e. chimneys).	Medium – residential buildings that have suitable chimneys surrounding the Gatineau Hydro Corridor may support nesting habitat for this species; however, no buildings with chimneys were identified within the construction disturbance areas.

Attachment 2: Species of Conservation Concern and Species at Risk Habitat Screening

Taxon	Common Name	Scientific Name	S-rank[1]	ESA Status[2]	Year Last Observed	Source	Preferred Habitat	Probability of Occurrence in Project Area
Bird	Eastern Meadowlark	*Sturnella magna*	S4B	THR	2001-2005	OBBA	Eastern Meadowlarks breed primarily in moderately tall grasslands, such as pastures and hayfields, but are also found in alfalfa fields, weedy borders of croplands, roadsides, orchards, airports, shrubby overgrown fields, or other open areas. Small trees, shrubs or fence posts are used as elevated song perches. This specie prefers hayfields, meadows and pastures that are greater than 5 ha in size. This species can typically be associated with the following ELC communities: TPO, TPS, CUM1, CUS, and MAM2 with elevated song perches.	Low – although there were a series of small meadows present (0.5-3 ha), they are fragmented by roads and pedestrian trails and surrounded by residential homes. Furthermore, there is a high forb cover relative to grasses such that it would not be suitable habitat species.
Insect	American Burying Beetle	*Nicrophorus americanus*	SH	EXP	1896	NHIC	American burying beetles prefer undisturbed deciduous forest, but have been found in many kinds of habitat. They seem to have three requirements – soil in which they can dig a chamber for their eggs and larvae, enough carcasses for food, and few enough competitors for these carcasses.	Low – this species is unlikely to occur in the study area given this species was last seen in the area more than 20 years ago and is considered to be a historical record.
Mammal	Eastern Small-footed Myotis	*Myotis leibii*	S2S3	END	-	BCI	In the spring and summer, eastern small-footed bats will roost in a variety of habitats, including in or under rocks, in rock outcrops, in buildings, under bridges, or in caves, mines, or hollow trees. These bats often change their roosting locations every day. At night, they hunt for insects to eat, including beetles, mosquitos, moths, and flies. In the winter, these bats hibernate, most often in caves and abandoned mines. They seem to choose colder and drier sites than similar bats and will return to the same spot each year.	Medium – forested areas greater than 0.5 ha (e.g., FOD7-3, FOD7-4, CUW1a and CUW1b) may provide suitable roosting habitat for this species.
Mammal	Little Brown Myotis	*Myotis lucifugus*	S4	END	-	BCI	Bats are nocturnal. During the day they roost in trees and buildings. They often select attics, abandoned buildings and barns for summer colonies where they can raise their young. Bats can squeeze through very tiny spaces (as small as six millimetres across) and this is how they access many roosting areas. Little brown bats hibernate from October or November to March or April, most often in caves or abandoned mines that are humid and remain above freezing. This species can typically be associated with any community where suitable roosting (i.e. cavity trees, houses, abandoned buildings, barns, etc.) habitat is available.	Medium – forested areas greater than 0.5 ha (e.g., FOD7-3, FOD7-4, CUW1a and CUW1b) may provide suitable roosting habitat for this species.
Mammal	Northern Myotis	*Myotis septentrionalis*	S3	END	-	BCI	Northern long-eared bats are associated with boreal forests, choosing to roost under loose bark and in the cavities of trees. These bats hibernate from October or November to March or April, most often in caves or abandoned mines. This species can typically be associated with the following ELC communities: FOC, FOM, FOD, SWC, SWM and SWD where suitable roosting (i.e. cavity trees and trees with loose bark) habitat is available.	Medium – forested areas greater than 0.5 ha (e.g., FOD7-3, FOD7-4, CUW1a and CUW1b) may provide suitable roosting habitat for this species.
Mammal	Tricolored Bat	*Perimyotis subflavus*	S3?	END	-	BCI	In Ontario, the Tri-colored Bat lives in forested habitats, forming day roosts and maternity colonies in older forest within foliage or in high tree cavities, occasionally also in barns or other structures. This species forages over water and along streams in forests. At the close of the summer season, this species congregate at a location to swarm, usually near caves, mines or underground locations where they will winter; it has a strong fidelity to its winter hibernation sites. This bat overwinters in caves, typically individually instead of as a group.	Medium – forested areas greater than 0.5 ha (e.g., FOD7-3, FOD7-4, CUW1a and CUW1b) may provide suitable roosting habitat for this species.
Plant	Butternut	*Juglans cinerea*	S2	END	2018	AECOM; LGL Limited	In Ontario, Butternut usually grows alone or in small groups in deciduous forests. It prefers moist, well-drained soil and is often found along streams. It is also found on well-drained gravel sites and rarely on dry rocky soil. This species does not do well in the shade, and often grows in sunny openings and near forest edges. This species can typically be associated with the following ELC communities: FOD and mature hedgerows; Soil: dry rocky or moist (4, 5, 6) to fresh (2, 3).	High – forested riparian areas along Highland Creek can provide suitable habitat for this species. A total of five Butternuts were recorded along the pedestrian trail and are assumed to be naturally occurring.
Plant	Kentucky Coffee Tree	*Gymnocladus dioicus*	S2	THR	2018	AECOM; LGL Limited	Kentucky Coffee-tree is found in a variety of habitats, but grows best on moist rich soil. Consequently, it is often found in floodplains, though it will tolerate shallow rocky or sandy soils. It is shade-intolerant, and therefore grows along the edges of woodlot or relies on canopy openings in forests and woodlots. In Canada, it is only found in southwest Ontario (southwest of Brantford) where it was documented at 20 locations in 2000. This species can typically be associated with the following ELC communities: FOD typically on moist rich soils along forest edges or in forest openings.	High – two planted Kentucky Coffee trees were found in a manicured landscape outside the Gatineau Hydro Corridor Segment. The study area is generally located beyond the geographic range of known native and extant populations occurring in natural areas; therefore, it is assumed these trees are likely not from a native stock.
Turtle	Blanding's Turtle	*Emydoidea blandingii*	S3	THR	2016	ORAA	Blanding's Turtles live in shallow water, usually in large wetlands and shallow lakes with lots of water plants. It is not unusual, though, to find them hundreds of metres from the nearest water body, especially while they are searching for a mate or traveling to a nesting site. Blanding's Turtles hibernate in the mud at the bottom of permanent water bodies from late October until the end of April. This species can typically be associated with the following ELC communities: SWT2, SWT3, SWD, SWM, MAS2, SAS1, SAM1, where open water is present.	Low – Highland Creek did not have a lot of water plants present and is not deep enough to provide suitable habitat for this species.

[1] ***S-rank:*** *The natural heritage provincial ranking system (provincial S-rank) is used by the MNRF NHIC to set protection priorities for rare species and natural communities.* The following status definitions were taken from NatureServe Explorer's (2015) National and Subnational Conservation Status Definitions available at http://explorer.natureserve.org/nsranks.htm:

SX - Presumed Extirpated—Species or community is believed to be extirpated from the province. Not located despite intensive searches of historical sites and other appropriate habitat, and virtually no likelihood that it will be rediscovered.
SH- Possibly Extirpated (Historical)—Species or community occurred historically in the province, and there is some possibility that it may be rediscovered. Its presence may not have been verified in the past 20-40 years. A species or community could become SH without such a 20-40 year delay if the only known occurrences in a province were destroyed or if it had been extensively and unsuccessfully looked for.
S1 - Critically Imperiled—Critically imperiled in the province because of extreme rarity (often 5 or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the province.
S2-Imperiled—Imperiled in the province because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the province.
S3 - Vulnerable—Vulnerable in the province due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
S4 - Apparently Secure—Uncommon but not rare; some cause for long-term concern due to declines or other factors.
S5 - Secure—Common, widespread, and abundant in the nation or state/province.
SNR - Unranked—Province conservation status not yet assessed.
SU - Unrankable—Currently unrankable due to lack of information or due to substantially conflicting information about status or trends.
SNA - Not Applicable —A conservation status rank is not applicable because the species is not a suitable target for conservation activities.
S#S# - Range Rank —A numeric range rank (e.g., S2S3) is used to indicate any range of uncertainty about the status of the species or community. Ranges cannot skip more than one rank (e.g., SU is used rather than S1S4).

Breeding Status Qualifiers
B - Breeding—Conservation status refers to the breeding population of the species in the province.
N - Nonbreeding—Conservation status refers to the non-breeding population of the species in the province.
M - Migrant—Migrant species occurring regularly on migration at particular staging areas or concentration spots where the species might warrant conservation attention. Conservation status refers to the aggregating transient population of the species in the province.
Note: A breeding status is only used for species that have distinct breeding and/or non-breeding populations in the province. A breeding-status S-rank can be coupled with its complementary non-breeding-status S-rank if the species also winters in the province, and/or a migrant-status S-rank if the species occurs regularly on migration at particular staging areas or concentration spots where the species might warrant conservation attention. The two (or rarely, three) status ranks are separated by a comma (e.g., "S2B,S3N" or "SHN,S4B,S1M").

Other Qualifiers
? -Inexact or Uncertain—Denotes inexact or uncertain numeric rank. (The ? qualifies the character immediately preceding it in the S-rank.)

Attachment 2: Species of Conservation Concern and Species at Risk Habitat Screening

[2] ***ESA Status:*** *The Endangered Species Act 2007 (ESA) protects species listed as Threatened and Endangered on the Species at Risk in Ontario (SARO) List on provincial and private land. The Minister lists species on the SARO list based on recommendations from the Committee on the Status of Species at Risk in Ontario (COSSARO), which evaluates the conservation status of species occurring in Ontario. The following are the categories of at risk:*
END *(Endangered) – A species facing imminent extinction or extirpation in Ontario.*
THR *(Threatened) – Any native species that, on the basis of the best available scientific evidence, is at risk of becoming endangered throughout all or a large portion of its Ontario range if the limiting factors are not reversed.*
SC *(Special Concern) – A species that may become threatened or endangered due to a combination of biological characteristics and identified threats.*
NAR *(Not at Risk) – A species that has been evaluated and found to be not at risk.*
Note: *species with "-" represent those that were not evaluated by COSSARO.*

[3] Presence of suitable habitats were determined based on species' habitat preferences taken form the following sources:

1) Ontario Ministry of Natural Resources and Forestry (MNRF), 2018b: Species at Risk in Ontario. Accessed May 2018 from: https://www.ontario.ca/environment-and-energy/species-risk-ontario-list
2) Abbott, J.C. 2006-2018. OdonataCentral: An online resource for the distribution and identification of Odonata. Available at https://www.odonatacentral.org/index.php/PageAction.get/name/Copyright (Accessed: August 31, 2018).

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Attachment 3

Aquatic Habitat Photo Log

Attachment 3: Aquatic Habitat Photo Log

Photograph 1 ↑ Reach 1
West Highland Creek, looking upstream
at the McCowan Road bridge

Photograph 2 ↑ Reach 1
West Highland Creek, looking towards the interlocking
brick bank at the McCowan Road bridge

Photograph 3 ↑ Reach 1
Gabion baskets under McCowan Road bridge, right bank

Photograph 4 ↑ Reach 1
West Highland Creek, left bank, looking
upstream of McCowan Road bridge

Attachment 3: Aquatic Habitat Photo Log

Photograph 5 ↑ Reach 1
Cobble substrate, looking towards the left bank upstream of the McCowan Road bridge

Photograph 6 ↑ Reach 1
Riffle, pool sequence, looking upstream

Photograph 7 ↑ Reach 1
Concrete step dam, looking towards the right bank (east)

Photograph 8 ↑ Reach 1
Concrete step dam, looking downstream towards the McCowan Road bridge

Attachment 3: Aquatic Habitat Photo Log

Photograph 9 ↑ Reach 1
Concrete step dam, looking upstream towards Legion Road

Photograph 10 ↑ Reach 2
West Highland Creek tributary dry, looking north

Photograph 11 ↑ Reach 2
West Highland Creek, looking upstream after meander to the southwest

Photograph 12 ↑ Reach 2
Gabion baskets along the left bank, looking upstream

Attachment 3: Aquatic Habitat Photo Log

Photograph 13 ↑ Reach 2
Gabion baskets failing along the left bank, looking upstream

Photograph 14 ↑ Reach 2
Gabion baskets failing along the left bank, looking southwest

Photograph 15 ↑ Reach 2
Gabion baskets along the left bank with increased cobble in the channel, looking downstream

Photograph 16 ↑ Reach 2
Gabion baskets along the left bank with increased cobble in the channel, looking upstream

Attachment 3: Aquatic Habitat Photo Log

Photograph 17 ↑ Reach 3
West Highland Creek narrows downstream of inlet/outlet, looking downstream

Photograph 18 ↑ Reach 3
West Highland Creek, right bank immediately downstream of inlet/outlet, looking east

Photograph 19 ↑ Reach 3
Inlet/outlet northern extent of survey, looking upstream

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Appendix B

Stage 2 Archaeological Assessment

City of Toronto and Toronto Transit Commission

Stage 2 Archaeological Assessment
Scarborough Subway Extension

Lot 23, Concession D, Lot 23, Concession I, and Lot 23 Concession II,
Geographic Township of Scarboro, County of York, Now City of Toronto, Ontario

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Related PIF: P123-0274-2015

November 29, 2018

Original Report

Project Number: 60347313

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0	yes	City of Toronto
0	yes	MTCS
0	No	AECOM

Revision History

Revision #	Date	Revised By:	Revision Description

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- has not been updated since the date of issuance of the Report and its accuracy is limited to the time period and circumstances in which it was collected, processed, made or issued;
- must be read as a whole and sections thereof should not be read out of such context;
- was prepared for the specific purposes described in the Report and the Agreement; and
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Project Archaeologist

Executive Summary

AECOM was retained by the City of Toronto (the City) and Toronto Transit Commission (TTC) to conduct a Stage 2 Archaeological Assessment (AA) for the proposed Scarborough Subway Extension in the Geographic Township of Scarboro (now Scarborough), County of York (now the City of Toronto), Ontario The proposed Scarborough Subway Extension includes the planned extension of the Bloor-Danforth Subway (Line 2), express from Kennedy Station to Scarborough Centre, and is intended to replace the existing Scarborough Rapid Transit (Line 3). An Environmental Project Report (EPR) was prepared in accordance with the Transit Project Assessment Process (TPAP), as outlined in the Ontario Regulation (O. Reg.) 231/08 under the *Environmental Assessment Act* for the Project.

AECOM completed the Stage 1 AA documented the geographic, archaeological and land use history of properties identified within the study area in order to assess their potential to contain archaeological resources. No optional property inspection was undertaken due to the snow-covered ground conditions at the time of the assessment. Instead, detailed mapping, satellite imagery and recommendations made in the *Master Plan of Archaeological Resources for the City of Toronto* (ASI 2011) were used in order to evaluate the study area's archaeological potential. The results of the Stage 1 AA indicated that, while most of the lands within the existing study area appeared to have been disturbed by past development, some of the study area still retained archaeological potential (AECOM 2017). This was based on the presence of historic homesteads, the proximity of historic transportation routes, certain physiographic features and previously registered archaeological sites within the study area.

Areas that were not visually assessed as deeply disturbed were subject to test pit survey as per *Section 2.1.2 Test Pit Survey* of the *Standards and Guidelines for Consultant Archaeologists* (2011). Test pits were completed on a 5 metre (m) grid where topsoil was intact and 10 m intervals when disturbance was encountered. The results of the assessment confirmed most of the study areas have been disturbed by previous construction. No archaeological resources were recovered during the test pit survey. One location, comprised of 23 and 25 Durrington Crescent, did not grant permission to enter (PTE) and therefore no Stage 2 AA could be completed.

Given the results of this assessment, AECOM makes the following recommendations:

1. Those properties for which PTE has not been obtained at 23 and 25 Durrington Crescent (marked in red in **Section 9: Figure 16**) will require Stage 2 AA prior to any construction within the Scarborough Subway Extension study area.

2. The Stage 2 assessment of the remaining properties determined that there are no significant archaeological resources present on these lands. Therefore, these areas are considered clear of further archaeological concern.

Project Personnel

Project Manager	Charlton Carscallen, M.A.
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Acknowledgements

Proponent Contact	Toronto Transit Commission
Approval Authority	Toronto Transit Commission

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Statement of Aboriginal Engagement

1. Project Context

1.1 Development Context

AECOM was retained by the City of Toronto (the City) and the Toronto Transit Commission (TTC) to conduct a Stage 2 Archaeological Assessment (AA) for the lands to be impacted by the Scarborough Subway Extension in the City of Toronto. The study areas are located in the historic Township of Scarboro, Lot 23, Concession D, Lot 23, Concession 1, and Lot 23, Concession 2 in the County of York. The proposed Scarborough Subway Extension includes the planned extension of the Bloor-Danforth Subway (Line 2), express from Kennedy Station to Scarborough Centre, and is intended to replace the existing Scarborough Rapid Transit (Line 3). An Environmental Project Report (EPR) was prepared in accordance with the Transit Project Assessment Process (TPAP), as outlined in the Ontario Regulation (O.Reg.) 231/08 under the *Environmental Assessment Act* for the Project. The objective of this assessment is to determine whether archaeological resources are present within the study areas.

The Stage 1 AA was completed in 2015 and involved background research to describe the geography, land use history, previous archaeological fieldwork and current conditions of the lands within the study areas in order to evaluate their archaeological potential and to support recommendations for the Stage 2 survey for all or parts of these parcels (AECOM 2017a). At the time of the Stage 1, the preferred corridor had not been selected. While a field review was not conducted within the study area due to snow cover preventing ground visibility, satellite imagery, aerial photographs, thematic and historic maps, past archaeological reports recommendations made in the *Master Plan of Archaeological Resources for the City of Toronto* (ASI 2011) were analyzed in order to evaluate the archaeological potential of the study areas for the Scarborough Subway Extension. The Stage 1 assessment concluded that once a preferred corridor was selected it should be subject to Stage 2 assessment in areas deemed to have archaeological potential.

In 2017, following the publishing of the SSE EPR, AECOM was retained to complete the Stage 2 AA. Although most of the proposed corridor has been previously disturbed by road / building construction, several areas with archaeological potential were to be impacted. AECOM completed this portion of the Stage 2 AA on July 26, August 4, and September 9, 2017.

In 2018 some of the proposed EEB construction footprints changed slightly and TPSS #2 was relocated into the Hyrdo Corridor so additional Stage 2 was needed for the Scarborough Subway Extension study areas. The areas subject to Stage 2 assessment consist of proposed locations for emergency exit buildings (EEB), and a traction power substation (TPSS). This work was completed between September 19 and 25, 2018. In the portion of the study areas comprised of 23 and 25 Durrington Crescent (EEB #6) PTE was not granted and therefore no Stage 2 AA could be completed at this time.

This Stage 2 AA was completed under the project direction of Charlton Carscallen [Licence #P088] and archaeological licence of Glenn Kearsley [licence #P123] (AECOM). Work was completed in accordance with the provisions of the *Ontario Heritage Act* (2005) and with the Ontario's Ministry of Tourism, Culture and Sport's (MTCS) *Standards and Guidelines for Consultant Archaeologists* (2011). Permission to access the properties was granted by TTC and the property owners. No limits were placed on this access. This report provides the results of the Stage 2 AA and provides recommendations.

As a part of AECOM's agreement with the City of Toronto and Toronto Transit Commission in accordance with the draft technical bulletin entitled *Engaging Aboriginal Communities in Archaeology* (MTCS 2011b) the Indigenous communities with the closest cultural affiliation, or with interest in the project, were contracted to act as Field Liaison Representatives during the Stage 2 AA. Monitoring was conducted for the fieldwork by Mississauga New Credit First Nation via monitor Blake Sault and Jazmin Sault.

1.1.1 Objectives

The Stage 2 AA has been conducted to meet the requirements of the MTCS's *Standards and Guidelines for Consultant Archaeologists* (2011). The Stage 2 provides an overview of archaeological resources on the study areas and determines whether any of the resources might be archaeological in nature with cultural heritage value and/or interest. The objectives of the Stage 2 AA are:

- To document all archaeological resources on the subject properties;
- To determine whether the subject properties contain archaeological resources requiring further assessment; and
- To recommend appropriate Stage 3 assessment strategies for archaeological sites identified.

1.2 Historical Context

Years of archaeological research and assessments in southern Ontario have resulted in a well-developed understanding of the historic use of land in the County of York from the earliest First Nation people to the more recent Euro-Canadian settlers and farmers. **Table 1** provides a breakdown of the cultural and temporal history of past occupations in the County of York.

Table 1: Cultural Chronology for County of York

Archaeological Period	Characteristics	Time Period	Comments
Early Paleo	Fluted Points	9000-8400 BC	Arctic tundra and spruce parkland, caribou hunters
Late Paleo	Holcombe, Hi-Lo and Lanceolate Points	8400-8000 BC	Slight reduction in territory size
Early Archaic	Notched and Bifurcate base Points	8000-6000 BC	Growing populations
Middle Archaic	Stemmed and Brewerton Points, Laurentian Development	6000-2500 BC	Increasing regionalization
Late Archaic	Narrow Point	2000-1800 BC	Environment similar to present
	Broad Point	1800-1500 BC	Large lithic tools
	Small Point	1500-1100 BC	Introduction of bow
Terminal Archaic	Hind Points, Glacial Kame Complex	1100-950 BC	Earliest true cemeteries
Early Woodland	Meadowood Points	950-400 BC	Introduction of pottery
Middle Woodland	Dentate/Psuedo-scallop Ceramics	400 BC – AD 500	Increased sedentism
Transition from Middle to Late Woodland	Princess Point	AD 550-900	Introduction of corn horticulture
Late Woodland	Early Ontario Iroquoian	AD 900-1300	Agricultural villages
	Middle Ontario Iroquoian	AD 1300-1400	Increased longhouse sizes
	Late Ontario Iroquoian	AD 1400-1650	Warring nations and displacement
Contact Period	Various Algonkian and Iroquoian Groups	AD 1600-1875	Early written records and treaties
Historic	French and English Euro-Canadian	AD 1749-present	European settlement

Notes: Taken from Ellis and Ferris (1990)

The following sections provide a detailed summary of the archaeological cultures that have settled in the vicinity of the study areas. As Chapman and Putnam (1984) illustrate, the modern physiography of southern Ontario is largely a product of events of the last major glacial stage and the landscape is a complex mosaic of features and deposits produced during the last series of glacial retreats and advances prior to the withdrawal of the continental glaciers from the area. Southwestern Ontario was finally ice free by 12,500 years ago. With continuing ice retreat and lake regressions the land area of southern Ontario progressively increased while barriers to the influx of plants, animals, and people steadily diminished (Karrow and Warner 1990). The lands within the County of York have been extensively utilized by pre-contact First Nation people who began occupying southwestern Ontario as the glaciers receded from the land, as early as 11,000 BC.

1.2.1 Pre-Contact First Nation Settlement

The Paleo Period

In this area the first human settlement can be traced back to 11,000 BC; these earliest well-documented groups are referred to as Paleo which literally means old or ancient. During the Paleo period, people were non-agriculturalists who depended on hunting and gathering of wild food stuffs, they moved their encampments on a regular basis to be in the locations where these resources naturally became available and the size of the groups occupying any particular location would vary depending on the nature and size of the available food resources (Ellis and Deller 1990). The picture that has emerged for the early and late Paleo is of groups at low population densities who were residentially mobile and made use of large territories during annual cycles of resource exploitation (Ellis and Deller 1990).

The Archaic Period

The next major cultural period following the Paleo is termed the Archaic, which is broken temporally into the Early, Middle, and Late Archaic periods. There is much debate on how the term Archaic is employed; general practice bases the designation off assemblage content as there are marked differences in artifact suites from the preceding Paleo and subsequent Woodland periods. As Ellis *et al.* (1990) note, from an artifact and site characteristic perspective the Archaic is simply used to refer to non-Paleo manifestations that pre-date the introduction of ceramics. Ellis *et al.* (1990) stress that Archaic groups can be distinguished from earlier groups based on site characteristics and artifact content.

Early Archaic sites have been reported throughout much of southwestern Ontario and extend as far north as the Lake Huron Basin region and as far east as Rice Lake (Deller *et al.* 1986). A lack of excavated assemblages from southern Ontario has limited understandings and inferences regarding the nature of stone tool kits in the Early Archaic and tool forms other than points are poorly known in Ontario; however, at least three major temporal horizons can be recognized and can be distinguished based on projectile point form (Ellis *et al.* 1990). These horizons are referred to as Side-Notched (*ca.* 8,000-7,700 BC), Corner-Notched (*ca.* 7,700-6,900 BC), and Bifurcated (*ca.* 6,900-6,000 BC) (Ellis *et al.* 1990). Additional details on each of these horizons and the temporal changes to tool types can be found in Ellis *et al*. (1990).

The Middle Archaic period (6,000-2,500 BC), like the Early Archaic, is relatively unknown in southern Ontario. Ellis *et al.* (1990) suggest that artifact traits that have come to be considered as characteristic of the Archaic period as a whole, first appear in the Middle Archaic. These traits include fully ground and polished stone tools, specific tool types including banner stones and net-sinkers, and the use of local and/or non-chert type materials for lithic tool manufacture (Ellis *et al.*. 1990).

The Late Archaic begins around approximately 2,000 BC and ends with the beginning of ceramics and the Meadowood Phase at roughly 950 BC. Much more is known about this period than the Early and Middle Archaic and

a number of Late Archaic sites are known. Sites appear to be more common than earlier periods, suggesting some degree of population increase. True cemeteries appear and have allowed for the analysis of band size, biological relationships, social organization, and health. Narrow and Small point traditions appear as well as tool recycling wherein points were modified into drills, knives, end scrapers, and other tools (Ellis *et al..* 1990). Other tools including serrated flakes used for sawing or shredding, spokeshaves, and retouched flakes manufactured into perforators, gravers, micro-perforators, or piercers. Tools on coarse-grained rocks such as sandstone and quartz become common and include hammerstones, net-sinkers, anvils, and cobble spalls. Depending on preservation, several Late Archaic sites include bone and/or antler artifacts which likely represent fishing toolkits and ornamentation. These artifacts include bone harpoons, barbs or hooks, notched projectile points, and awls. Bone ornaments recovered have included tubular bone beads and drilled mammal canine pendants (Ellis *et al.* 1990).

Throughout the Early to Late Archaic periods the natural environment warmed and vegetation changed from closed conifer-dominated vegetation cover, to the mixed coniferous and deciduous forest in the north and deciduous vegetation in the south we see in Ontario today (Ellis *et al.* 1900). During the Archaic period there are indications of increasing populations and decreasing size of territories exploited during annual rounds; fewer moves of residential camps throughout the year and longer occupations at seasonal campsites; continuous use of certain locations on a seasonal basis over many years; increasing attention to ritual associated with the deceased; and, long range exchange and trade systems for the purpose of obtaining valued and geographically localized resources (Ellis *et al.* 1990).

The Woodland Period

The Early Woodland period is distinguished from the Archaic period primarily by the addition of ceramic technology, which provides a useful demarcation point for archaeologists but is expected to have made less difference in the lives of people during the Early Woodland. The settlement and subsistence patterns during the Early Woodland Period show much continuity with the earlier Archaic with seasonal camps occupied to exploit specific natural resources (Spence *et al.* 1990).

During the Middle Woodland well-defined territories containing several key environmental zones were exploited over the yearly subsistence cycle. Large sites with structures and substantial middens appear in the Middle Woodland associated with spring macro-band occupations focussed on utilizing fish resources and created by consistent returns to the same site (Spence *et al.* 1990). Groups would come together into large macro-bands during the spring-summer at lakeshore or marshland areas to take advantage of spawning fish; in the fall inland sand plains and river valleys were occupied for deer and nut harvesting and groups split into small micro-bands for winter survival (Spence *et al.* 1990). This is a departure from earlier Woodland times when macro-band aggregation is thought to have taken place in the winter (Ellis *et al.* 1988; Granger 1978).

The period between the Middle and Late Woodland was both technically and socially transitional for the ethnically diverse populations of southern Ontario and these developments formed the basis for the emergence of settled villages and agriculturally based lifestyles (Fox 1990). The first agricultural villages in southwestern Ontario date to the 10th century AD. Unlike the riverine base camps of the Middle Woodland period, these sites are located in the uplands, on well-drained sandy soils. The Late Woodland period is often sub-divided into the Early (900-1300 AD), Middle (1300-1400 AD), and Late Iroquoian (1400-1650 AD) periods.

Early Ontario Iroquoian (900-1300 AD) villages tended to be small settlements with nearby camps and hamlets that served as temporary spaces for hunting game and gathering resources outside of the villages. Corn may have been introduced into southwestern Ontario from the American Midwest as early as 600 AD; however, it did not become a dietary staple until at least three to four hundred years later. Small amounts of corn appear to have been a dietary component at this time; however, archaeological evidence suggests that its role was not as a dietary staple at this time and was supplemental in nature. Village sites dating between 900 and 1300 AD, share many attributes with the historically reported Iroquoian sites, including the presence of longhouses and sometimes palisades. However, these

early longhouses were actually not all that large, averaging only 12.4 metres (m) in length. It is also quite common to find the outlines of overlapping house structures, suggesting that these villages were occupied long enough to necessitate re-building. The Jesuits reported that the Huron moved their villages once every 10-15 years, when the nearby soils had been depleted by farming and conveniently collected firewood grew scarce. It's likely that Early Ontario Iroquoians occupied their villages for considerably longer, as they relied less heavily on corn than did later groups, and since their villages were much smaller, there was less demand on nearby resources.

The Middle Ontario Iroquoian period (1300-1400 AD) witnessed several interesting developments in terms of settlement patterns and artifact assemblages. Changes in ceramic styles have been carefully documented, allowing the placement of sites in the first or second half of this 100-year period and widespread similarities in ceramic and smoking pipe styles suggest increasing levels of inter-community communication and integration. Village size, which previously averaged approximately 0.6 hectares (ha) in extent during the Early Ontario Iroquoian period, grew significantly to between one and two ha. The Middle Iroquoian not only marks the emergence of fully developed horticulture, including the cultivation of corn, beans, and squash, but also the development of complex community political systems. House lengths also change dramatically, more than doubling to an average of 30 m in length. A number of hypotheses have been put forward to explain this radical increase in longhouse length. The simplest possibility is that increased house length is the result of a gradual, natural increase in population. Other possible explanations involve changes in economic and socio-political organization. One suggestion is that during the Middle Ontario Iroquoian period small villages were amalgamating to form larger communities for mutual defense. If this was the case, the more successful military leaders may have been able to absorb some of the smaller family groups into their households, thereby requiring longer structures. This hypothesis draws support from the fact that some sites had up to seven rows of palisades, indicating at least an occasional need for strong defensive measures. There are, however, other Middle Ontario Iroquoian villages which had no palisades present.

By the beginning of the fourteenth century, most Iroquoian people inhabited large and often fortified villages throughout southern Ontario as a result of an increasing reliance on horticulture. Larger village sites were often cleared to accommodate the cultivation of corn, beans, and squash. Between 1400 and 1450 AD house length continued to grow, reaching an average length of 62 m. However, after 1450 AD, house lengths began to decrease, with houses from 1500-1580 AD averaging only 30 m in length. The reason house lengths decrease after 1450 AD is poorly understood, but it is believed that drastically shorter houses documented on historic period sites may be partially attributed to population reductions associated with the introduction of European diseases.

1.2.2 Post-Contact Period Settlement

The post-contact occupation of southern Ontario was heavily influenced by the dispersal of Iroquoian speaking peoples, such as the Huron-Wendat, Petun and Neutral by the New York State Confederacy of Iroquois, followed by the arrival of Algonkian speaking groups from northern Ontario. The Ojibwa of southern Ontario date from about 1701 and occupied the territory between Lakes Huron, Erie and Ontario (Schmalz 1991). This is also the period in which the Mississaugas are known to have moved into southern Ontario and the Great Lakes watersheds (Konrad 1981) while at the same time the members of the Three Fires Confederacy, the Chippewa, Ottawa and Potawatomi were immigrating from Ohio and Michigan (Feest and Feest 1978). As European settlers encroached on their territory the nature of Indigenous population distribution, settlement size and material culture changed. Despite these changes it is possible to correlate historically recorded villages with archaeological manifestations and the similarity of those sites to more ancient sites reveals an antiquity to documented cultural expressions that confirms a long historical continuity to systems of ideology and thought (Ferris 1009).
It is important to note that, when discussing the historical documentation of the movement of Indigenous people, what has been documented by early European explorers and settlers represents only a very small snap-shot in time. Where Indigenous groups were residing during European exploration and settlement is restricted to only a very short period of time and does not reflect previous and subsequent movements of these groups. This brief history

does not reflect the full picture of the pre- or post-contact period occupation of Indigenous groups or cultures. As such, relying on historic documentation in regards to Indigenous occupation and movement across the landscape can lead to misinterpretation. For example, historic documentation of the movement of Indigenous groups into an area may suggest to the reader that these groups had not occupied the area previously; however, this is not the case. It is clear from Indigenous oral histories and the archaeological record that pre-contact Indigenous populations were extremely mobile and not tied to any one specific area. Over the vast period of time prior to the arrival of Europeans, Indigenous groups, language families, and cultures were fluid across the landscape.

The study areas fall under the Johnson-Butler Purchase and Williams Treaties. The Johnson-Butler Purchase, entered into in 1788 by the representatives of the Crown and certain Anishinaabe peoples, covers the north shore of Lake Ontario, beginning at the eastern boundary of the Toronto Purchase and continuing east to the Bay of Quinte, where it meets the Crawford Purchase (Ontario Government 2018). The Williams Treaties were signed on October 31 and November 15, 1923 by seven Anishinaabe First Nations and representatives of the Crown and covered the area between Lake Ontario and Lake Nipissing.

1.2.3 Euro-Canadian Settlement

The study areas are located in the City of Toronto, within historic Lot 23, Concession D, Lot 23, Concession I, and Lot 23, Concession II in the Township of Scarboro, County of York. Making up the eastern portion of Toronto, Scarboro was named by Elizabeth Simcoe after the English town of the same name. It is presently bordered on the east by Pickering and the Rouge River, to the south by Lake Ontario, to the north by Steeles Avenue and to the west by Victoria Park Avenue.

When originally surveyed by Augustus Jones in 1793, the Townships of Pickering, Scarboro and York were respectively named Edinburgh, Glasgow and Dublin (Boyle 1896:26). The Township of Scarboro's concessions were laid out east to west, rather than the more frequently encountered north to south. Some of the early Euro-Canadian settlers included United Empire Loyalists. The Canada Company purchased several hundred acres, the Legislature was granted 155.399 ha (384 acres), and King's College purchased approximately 809.3713 ha (2000 acres). In the early 1800s the Township consisted mostly of scattered villages. The Township of Scarboro was declared a borough when it joined the Municipality of Metropolitan Toronto (now the City of Toronto) in 1954. It was declared a city in 1983, due to its rapid growth and large population size.

Several historic roads are found within Scarborough and include Danforth and Kingston Roads. These early transportation routes followed established Aboriginal trails along the higher ground bordering Lake Ontario. Danforth Road (which runs north-south through the central section of the Scarborough Subway Extension study areas) was completed in this part of the County in 1799, originally contracted to Mr. Danforth from York to the Bay of Quinte (Boyle 1896:112). Kingston Road, initially Kingston Street, was first built in 1800, connecting Kingston and York. It follows the north shore of Lake Ontario and is southeast of the Scarborough Subway Extension study areas.

With the clearing of land for farming and the vast variety and quantity of lumber materials, the lumber industry thrived in this area. As a result, saw mills began to emerge as early as 1804 and eventually dozens could be found along the Highland Creek and the Rouge River. This continued until the depletion of the forests in the area. Grist and Flour-mills were also found along the watercourses, but a flood in 1850 carried away the last of the old dams (Briggs 1896:131). Other common trades found in the township included blacksmiths, wagon makers, shoemakers, and ship builders. Several 19th century churches, cemeteries and school houses can found be in the immediate vicinity of the study areas. The population of the Township was 89 in 1802, with a total of 477 inhabitants by 1820, and 3,821 by 1850.

One historic village falls within the project area. The 1878 map shows the Benlomond Post Office as being on Lot 23, Concession I. A community had already been in existence since the early 19th Century but it was given the name of Benlomond in 1878 when the post office opened in William Forfar's General Store. In 1819 the Thomson family has donated land to have St. Andrew's Church constructed. The brick church, built in 1848 still stands today and its cemetery contains some of the areas earliest settlers. There was also a frame library built nearby in 1832. The name of the settlement was changed to Bendale in 1881, and the post office closed in 1913. The name Bendale has survived in three schools, a library, a church, a senior citizens apartment and the present communities of Bendale and Bendale North within the City of Scarborough (Scarborough Historical Society).

Study Areas Specific Land Use

Both illustrated historic atlases as well as textual documentary sources were consulted when researching the history of the Township of Scarboro and compiling the specific land use history for the study areas. Due to the fact that the 1851 census for Scarborough did not survive, additional sources were drawn upon when compiling the land use history for lots and concessions in these areas. *The Township of Scarboro, 1796-1896* by William Briggs (1896), and *History of Toronto and County of York Ontario*; *Containing an Outline of the History of the Dominion of Canada, A history of the City of Toronto and the County of York, with the Townships, Towns, Villages, Churches, Schools, General and Local Statistics, Biographical Sketches Etc.* (Mercer and Pelham 1885) were both examined to gain a broader picture of the land use history of this County in the 19th Century. Briggs describes Scarboro Township in the 1890s in the following way,

> *"The area now embraced by Scarboro Township was undoubtedly a desirable one for the Indian. The lake-shore cliffs formed an admirable defence against attack from the south, so that enemies from that quarter must needs have approached the villages by a circuitous route; there could not be better soil for their extremely simple method of cultivation; extensive forests of magnificent pine, with here and there clumps and ranges of hard-wood trees in great variety, afford ideal places of domicile; small fruits were plentiful, and numerous streams supplied fish of different kinds in abundance, while game, we may presume, was not difficult to procure" (1896: 22-23).*

Presently, Scarborough is part of the City of Toronto in the Greater Toronto Area. The landscape consists primarily of residential areas, commercial areas, busy streets and highways. There are some areas of vegetation, primarily around Highland Creek and its tributaries.

Table 2, below, illustrates the land use history of each lot in the study areas for York County, according to these 19th Century sources. The Historic County Atlas from the 1878 and the Tremaine Map from 1860 indicate that the study areas were largely used for agricultural purposes at that time. Documentary sources corroborate that farming and lumber extraction / saw mills were the professions of the majority of inhabitants in the Township of Scarboro from the time of settlement of the area in the early 19th into the 20th Century (Miles & Co. 1878 and Census of Canada 1861, 1871).

Table 2: Information from Historic Mapping for Scarborough Township

CONCESSION	LOT	1811 Map	1851 Map	1860 Map	1878 Atlas Map	NOTES
D	23	David Robertson	David Robertson	J. Torrance South ½	John Young South ½	
					James Chester North ½	1878 – 1 structure, orchard and Benlomond Post Office on property
I	23	Andrew Thomson	Andrew Thomson	Joseph A. Thomson South ½	Joseph Thomson	1860 – structure on property

CONCESSION	LOT	1811 Map	1851 Map	1860 Map	1878 Atlas Map	NOTES
						1878 – structure, orchard and Presbyterian church on property
				William A Thomson North ½	Franklin Scott	1860 – two structures and a church on property 1878 – structure on property
II	23	Valentine Fisher	Valentine Fisher	George Scott	F&J Scott	1860 - structure on property

Census information was gathered every 10 years beginning in 1851. Census records for Scarborough Township did not survive for 1851. Presently census information is available from 1861 to 1911. Information for individuals may change from census to census, depending on the individual giving the information to the Enumerator.

One of the inhabitants of the study areas is a member of the Thomson family. The Thomson family was the very first family to settle and clear land in the area in 1796 and did so by following the Aboriginal trail which subsequently opened as Danforth Road (Briggs 1896: 28). David Thomson was a stone mason and brought his wife Mary Glendinning (another prominent name in the settlement history of the area), and four children with him to settle Lot 24, Concession I. The patent was taken out on this property in May 17th, 1802.

Table 3: Information from the Canadian Census

Name	Census	Information
J. Torrance	1861	Occupation: Farmer Background: Scottish Religion: Church of Scotland Age: 30
	1871	Occupation: Farmer Background: Scottish Religion: Canadian Presbyterian Age: 40
James Chester	1891	Occupation: Farmer Religion: Presbyterian Age: 49 Marital Status: Married
	1901	Occupation: Farmer Religion: Church of Scotland Date of Birth: December 1, 1841 Marital Status: Married Able to speak French
Joseph Thomson	1871	Occupation: Farmer Background: Scottish Religion: Presbyterian Age: 35
	1891	Occupation: Farmer Background: Scottish Religion: Canadian Presbyterian Age: 56 Marital Status: Widow Can read and write
	1901	Occupation: Retired Farmer Background: Scottish

Name	Census	Information
		Religion: Canadian Presbyterian Date of Birth: March 23, 1834. Marital Status: Widow
William Thomson	1871	Occupation: Farmer Background: Scottish Religion: Presbyterian Age: 39
Francis Scott	1881	Occupation: Farmer Background: Scottish Religion: Presbyterian Age: 49 Marital Status: Married
	1891	Occupation: Farmer Background: Scottish Religion: Canadian Presbyterian Age: 58
John Scott	1881	Occupation: Farmer Background: Scottish Religion: Canadian Presbyterian Age: 39
	1891	Occupation: Farmer Background: Scottish Religion: Canadian Presbyterian Age: 48 Can read and write

1.3 Archaeological Context

1.3.1 Reports with Relevant Background Information

To inform the current Stage 2 archaeological assessment and further establish the archaeological context of the study areas, a search of the OASD was conducted by AECOM to determine if any previous archeological work has been completed within the current study areas or within 50 m of the study areas boundaries. **Table 4** lists reports regarding previous archaeological work relevant to the study areas.

Table 4: Archaeological Reports with Relevant Background Information

Year	Title	Author	PIF Number
2017	*Stage 1 Archaeological Assessment, Scarborough Subway Extension, City of Toronto/Toronto Transit Commission, Various Lots and Concessions, Geographic Township of Scarboro (now Scarborough), County of York (Now the City of Toronto), Ontario. Transit Project Assessment Process*	AECOM	P123-0274-2015

Aside from the Stage 1 AA completed by AECOM in 2017, to the best of our knowledge there are no other reports concerning archaeological work conducted within or in close proximity (i.e. within 50 m) of the study areas; however, it should be noted that the MTCS does not maintain a database of all properties that have had past archaeological

investigations and searches of the MTCS' public register do not always result in a complete listing of all archaeological work conducted in a given area. In consequence, in some cases the only way a consulting archaeologist will know that a past assessment has been conducted in a given area is if they have personal knowledge of it, or if the assessment resulted in the discovery and registration of one or more archaeological sites.

Archaeological Management Plans

A review of the archaeological potential mapping from the Master Plan of Archaeological Resources for the City of Toronto, Interim Report (ASI 2004) suggests that most of the study areas did not have archaeological potential. Areas that were marked as having potential include the area at the intersection of Danforth and McCowan Roads, the area south of West Highland Creek and north of Lawrence Avenue, the areas north and south of the Gatineau Hydro Corridor Trail at McCowan Road, and the northwest corner of McCowan Road and Corporate Drive.

Municipal Registers of Heritage Properties

While there are no registered heritage properties within any of the study areas, the Springfield Farm House, built in 1840 by James A. Thomson, is found just west of the property at McCowan Road and the Gatineau Hydro Corridor Trail.

Heritage Plaques and Historic Places

There is a plaque for the Springfield Farm House from 1979 in front of the home. No other plaques are found in any of the Scarborough Subway Extension study areas.

1.3.2 Natural Environment

The Scarborough Subway Extension study areas are located in the South Slope physiographic region of southern Ontario. The South Slope itself extends from the Niagara Escarpment to the Trent River, between Lake Ontario and the Oak Ridges Moraine (Chapman and Putnam 1984: 172). This physiographic region is underlain by carbonate rich Palaeozoic rock with a variety of overlying glacial deposits. In the study areas, the slope is smoothed, faintly drumlinized, and intersected by tributaries to the Humber, Rouge and Don Rivers (Chapman and Putman 1984).

A number of South Slope soil types are well-suited to agricultural use. Generally, soils vary in an east-west direction according to till content. Clay and shale content in soils increases moving west from the Regional Municipality of Durham. In the study areas, soils include a small amount of black and grey shales and are slightly acidic. Scarborough's Woburn loam is considered the best agricultural soil in the South Slope region and prior to urbanization this area was farmland (Chapman and Putman 1984).

Potable water is the single most important resource necessary for any extended human occupation or settlement. Since water sources have remained relatively stable in south-central Ontario after the Pleistocene era, proximity to water can be regarded as a useful index for the evaluation of archaeological site potential. Indeed, distance from water has been one of the most commonly used variables for predictive modeling of site location. The proximity to Lake Ontario provided a solid transportation network which attracted early settlement and Aboriginal peoples. East and West Highland Creeks are found in close proximity to the study areas as well.

During the 19th and 20th century, rapid deforestation resulted in significant land clearance across Scarborough and over time, the once diverse forest life and wide range of tree species and natural resources would have also been depleted as agricultural and modern residential and commercial development continued. As a result of continuing urban development, this part of southern Ontario is almost completely deforested today.

The Scarborough Subway Extension study areas consist primarily of commercially and privately-owned lands separated by present-day and historic roadways as well as the major 401 series Highway that travels through the Greater Toronto Area (GTA). The Scarborough Subway Extension study areas are primarily an urban setting east of the densely populated Toronto core within the GTA along major roads. Agriculture appears to be the primary activity historically as the soil conditions were ideal for growing and sustaining crops, which has likely continued, albeit at a larger scale, from the advent of initial Euro-Canadian settlement in the 1800s. Now, however the primary activity is industry and commercial/residential livelihood as most of the study areas are built up and developed.

Based on the background research into the archaeological and land use history and its physiographic characteristics, the study areas were deemed to have potential for containing archaeological resources in areas that have not already been disturbed. The presence of 19th century Euro-Canadian industry in combination with the immediate access to potable water from East and West Highland Creeks indicates that human occupancy could and would have been ideal in the study areas.

1.3.3 Known Archaeological Sites

In Ontario, information concerning archaeological sites is stored in the Ontario Archaeological Sites Database (OASD) maintained by the MTCS. This database contains archaeological registered sites within the Borden system. Under the Borden system, Canada has been divided into grid blocks based on longitude and latitude. A Borden block is approximately 13 kilometres (km) east to west, and approximately 18.5 km north to south. Each Borden block is referred to by a four letter designation and sites located within the block are numbered sequentially as they are found. The study areas are situated within the *AkGt* Borden block. Due to the spread out nature of the study areas, a 1km radius was established around each location to ascertain if there were any archaeological sites nearby.

Table 5: Registered Archaeological Sites within 1 km of the Study Areas

Borden #	Site Name	Cultural Affiliation	Site Type	Research	Development Status
AkGt-5	Tabor Hill Ossuary	Woodland; Aboriginal	Burial	Churcher and Kenyon (1960)	Unknown
AkGt-12	Wallace	Unknown	Unknown	Unknown (1896)	Unknown
AkGt-20	Thompson	Late Woodland, Uren	Village	William Fox (1977)	No further work required

Information concerning specific site locations is protected by provincial policy, and is not fully subject to the *Freedom of Information Act*. The release of such information in the past has led to looting or various forms of illegally conducted site destruction. Confidentiality extends to all media capable of conveying location, including maps, drawings, or textual descriptions of a site location. The MTCS will provide information concerning site location to the party or an agent of the party holding title to a property, or to a licensed archaeologist with relevant cultural resource management interests.

1.3.4 Determination of Archaeological Potential

Archaeological potential is established by determining the likelihood that archaeological resources may be present on a subject property. Criteria commonly used by the MTCS (2011) to determine areas of archaeological potential include:

- Proximity to previously identified archaeological sites;
- Distance to various types of water sources;
- Soil texture and drainage;
- Glacial geomorphology, elevated topography and the general topographic variability of the area;
- Resource areas including food or medicinal plants, scarce raw materials and early Euro-Canadian industry;
- Areas of early Euro-Canadian settlement and early transportation routes;
- Properties listed on municipal register of properties designated under the *Ontario Heritage Act*;
- Properties that local histories or informants have identified with possible archaeological sites, historical events, activities or occupants; and
- Historic landmarks or sites.

Distance to modern or ancient water sources is generally accepted as the most important element for past human settlement patterns and when considered alone may result in a determination of archaeological potential. In addition, any combination of two or more of the criteria listed above, such as well drained soils or topographic variability, may indicate archaeological potential.

Certain features indicate that archaeological potential has been removed, such as land that has been subject to extensive and intensive deep land alterations that have severely damaged the integrity of any archaeological resources. This includes landscaping that involves grading below the topsoil level, building footprints, quarrying and sewage and infrastructure development (MTCS 2011).

2. Field Methods

AECOM conducted the Stage 2 AA of the Scarborough Subway Extension study areas on July 26, 2017, August 4, 2017 and September 9, 2017, and September 19 and 25, 2018 under the field direction of Alexandra Mullan [R1006], Joseph Cull [R1061] and Melissa Wallace [R496]. The study areas consist of proposed locations for emergency exit buildings (EEB) and a traction power substation (TPSS) (**Table 6**). It should be noted that the construction limits are larger than the EEB or TPSS footprints but are primarily located within the disturbed right of way (**Figures 12-18**).

Table 6: Location of the Scarborough Subway Extension Study Areas

Emergency Exit Building/Traction Power Substation	Location
EEB 3	1340-1360 Danforth Road, west and east side of Pringdale Ravine
EEB 4	Bendale Library, 1515 Danforth Road
EEB 5	Scarborough and Rouge Hospital, 3030-3050 Lawrence Avenue East, Temporary Parking – Gatineau Hydro Corridor
TPSS 2	Gatineau Hydro Corridor, 1 Bellechasse Street
EEB 6	23 and 25 Durrington Crescent (**NO Permission to Enter (PTE)**)
EEB 7	1072 McCowan Road
EEB 8	530 Progress Avenue, La-Z-Boy (Oxford Properties), Scarborough Town Centre

As per *Section 2.1 Standard 3* of *the Standards and Guidelines for Consultant Archaeologists* (MTCS 2011), the assessment took place when weather and lighting conditions permitted good visibility of ground conditions (**Table 7**).

Ground visibility was excellent. In keeping with *Section 2.1.2 Test Pit Survey* in the *Standards and Guidelines for Consultant Archaeologists* (MTCS 2011) test pits were at least 30 centimetres (cm) in diameter and dug 5 cm into subsoil. All soil was screened through 6 millimetre (mm) mesh and investigated for artifacts. Under *Section 2.1.8 Property Survey to Confirm Previous Disturbance* in the *Standards and Guidelines for Consultant Archaeologists* (MTCS 2011) a combination of visual inspection and test pitting was completed to confirm disturbance. All other areas were subject to test pit survey at 5 m intervals when intact topsoil was encountered. All test pits were backfilled to grade upon completion.

Table 7: Weather Conditions encountered during the Stage 2 Assessment

Date	Weather Conditions	Temperature
July 26, 2017	Sunny	26°C
August 4, 2017	Sunny	26°C
September 9, 2017	Sunny	16˚C
September 19, 2018	Sunny	16˚C
September 25, 2018	Overcast and rain	20°C

EEB 3 / 1340-1360 Danforth Road

The areas subject to Stage 2 test pit survey were found northeast of 1360 Danforth Road on either side of the Pringdale Ravine, and east of 1350 Danforth Road (**Section 9: Figure 12**). Visual inspection of this area suggested it was disturbed and as such test pitting was completed on a 10 m grid to confirm the disturbance. Test pit survey confirmed that this area is disturbed and does not contain any archaeological resources. Soil consisted of medium brown sandy loam mottled with medium yellow brown sand, with gravel and modern refuse inclusions. All other areas for EEB 3 were visually assessed as deeply disturbed and therefore not subject to test pit survey.

EEB 4 / 1515 Danforth Avenue

The area subject to Stage 2 test pit survey was located north of the Bendale Library, primarily manicured lawn (**Section 9: Figure 13)**. Test pits were initially excavated on a 5 m grid, were at least 30 cm in diameter and dug 5 cm into subsoil. Test pit survey showed that the area was disturbed, and test pits were moved to 10 m intervals. Disturbed test pits contained mottled light brown sandy loam with gravel inclusions. This area did not contain any archaeological resources. The remaining portion of the study area for the proposed EEB 4 were visually assessed as disturbed.

EEB 5 / 3030-3050 Lawrence Avenue

Two portions of this study area were subject to test pit survey. Northeast of the Scarborough hospital and within the Gatineau Hydro Corridor, the area for the proposed temporary parking lot was subject to test pit survey at 5 m and 10 m intervals, as disturbance was encountered at the western and southern edges of the study area (**Section 9: Figure 14**). This area is a 'no mow area' which is a part of a meadow restoration project. Intact topsoil was a dark red-brown silty-sand, overlying a yellow-brown silty-sand subsoil, and test pits ranged in depth from 20-45 cm. Disturbed test pits contained mottled medium brown soils and gravel fill.

Northeast of the Scarborough Hospital, south of the West Highland Creek, a portion of the study area was subject to test pit survey. Visual inspection of this area showed at least four sewer entrance covers which suggested it was disturbed, so test pitting was initiated on a 10 m grid to confirm the disturbance. The area closest to the parking lot and McCowan Road was disturbed with mottled medium brown soils and gravel fill. The northern edge was intact

and test pits were placed on a 5 m grid. Intact topsoil was a dark red-brown silty-sand, overlying a yellow-brown silty-sand subsoil, and test pits ranged in depth from 20-40 cm.

The remaining portions of the proposed EEB 5 study area were visually assessed as deeply disturbed.

EEB 6 / 23 and 25 Durrington Crescent

As noted, the properties at 23 and 25 Durrington Crescent were not subject to Stage 2 AA as PTE could not be obtained. The remaining portions of the study area for EEB 6 are primarily within the disturbed roadway and were visually assessed as disturbed (**Section 9: Figure 16**).

EEB 7 / 1072 McCowan Road

The area subject to Stage 2 test pit survey was approximately 25 m by 20 m in size (**Section 9: Figure 17**). Test pits were excavated on a 5 m grid. All soil was screened through 6 mm mesh and investigated for artifacts. No archaeological resources were found during the Stage 2 test pit survey. Topsoil was a dark brown sandy loam, overlying a light yellow-brown sand, and test pits ranged in depth from 10-20 cm. The remaining area required for the proposed EEB 7 was visually assessed as disturbed.

EEB 8 / 530 Progress Avenue

Visual inspection of this area suggested it was disturbed and so test pitting was completed on a 10 m grid to confirm the disturbance only in the area north of the Scarborough Town Centre (**Section 9: Figure 18**). The area around the La-Z-Boy Store includes manicured lawns with many modern utilities throughout. Test pit survey confirmed that this area is disturbed and does not contain any archaeological resources. Soil was mottled brown fill with gravel inclusions. All other portions of the EEB 8 study area were visually assessed as deeply disturbed and not subject to test pit survey.

TPSS 2 / 1 Bellechasse Street

The proposed TPSS 2 study area consists of areas of visually assessed disturbed right of ways, and three areas within the Gatineau Hydro Corridor which were subject to test pit survey at 5 and 10 m intervals. All of the Gatineau Hydro Corridor sections were disturbed, and test pitted at 10 m intervals, with the exception of the woodlot located east of McCowan Road (**Section 9: Figure 15**). This area contained intact soil and was subject to test pit survey at 5 m intervals. Disturbed soil was compact yellow-brown-grey mottled soil with modern refuse. Intact soil was a medium brown silty loam overlying medium yellow-brown sandy subsoil. Test pits in the undisturbed area ranged in depth from 10-15 cm.

The survey results of the Stage 2 assessment for the Scarborough Subway Extension can be found in **Table 8**, and **Section 9: Figures 12-18**. The study areas conditions were photo-documented in **Section 8**.

Table 8: Results of the Stage 2 Archaeological Assessment

Survey Method	Hectares	%
Test pitted at 10 m intervals to confirm disturbance	1.76	13.54
Visually assessed, disturbed	10.29	78.13
Tested at 5 m intervals	0.67	5.18
No permission to enter	0.05	0.40
Low and wet	0.09	0.67
Sloped	0.14	1.08

Survey Method	Hectares	%
Grand Total	13.01	100.00

3. Record of Finds

This Stage 2 Archaeological Assessment was conducted by employing the methods outlined in Section 2 of this report. **Table 9** provides a listing of the documentary record generated by the Stage 2 fieldwork and indicates the location of each document type. Any maps that show actual archaeological locations and all UTM coordinates recorded during the assessment are provided in the supplementary documentation to this report.

Table 9: Inventory of Documentary Record

Document Type	Quantity	Location	Additional Comments
Field Notes	8 pages	AECOM London Office	In original field folder and stored digitally in project file
Hand Drawn Maps	6	AECOM London Office	In original field folder and stored digitally in project file
Proponent Maps	1	AECOM London Office	Hard copy and digital copy in project file
Digital Photographs	26	AECOM London Office	Stored digitally in project file

4. Analysis and Conclusions

AECOM was retained by the City of Toronto and the Toronto Transit Commission to conduct a Stage 2 Archaeological Assessment for the lands to be impacted by the Scarborough Subway Extension. proposed Scarborough Subway Extension includes the planned extension of the Bloor-Danforth Subway (Line 2), express from Kennedy Station to Scarborough Centre, and is intended to replace the existing Scarborough Rapid Transit (Line 3). An Environmental Project Report (EPR) was prepared in accordance with the Transit Project Assessment Process (TPAP), as outlined in the Ontario Regulation (O.Reg.) 231/08 under the *Environmental Assessment Act* for the Project. The study areas are located in the historic Township of Scarboro, Lot 23, Concession D, Lot 23, Concession 1, and Lot 23, Concession 2 in the County of York. The objective of this assessment is to determine whether archaeological resources are present within the study areas.

The results of the assessment indicate that the study areas subject to Stage 2 survey or visual assessment were either disturbed or did not contain archaeological remains. These areas should be considered cleared of further archaeological concerns. A portion of the study area for proposed EEB 6 at 23 and 25 Durrington Crescent did not have PTE and therefore a Stage 2 AA could not be completed at this time.

5. Recommendations

The Ministry of Tourism, Culture and Sport is asked to accept this report into the Ontario Public Register of Archaeological Reports thereby concurring with the recommendations presented herein. As further archaeological assessment is required, archaeological concerns for the Scarborough Subway Extension study areas in the City of Toronto, Ontario have not been fully addressed.

1. Those properties for which PTE has not been obtained at 23 and 25 Durrington Crescent (marked in red in **Section 9: Figure 16**) will require Stage 2 AA prior to any construction within the Scarborough Subway Extension study areas.

2. The Stage 2 assessment of the remaining properties determined that there are no significant archaeological resources present on these lands. Therefore, these areas are considered clear of further archaeological concern.

Please note that this archaeological assessment report has been written to meet the requirements of the MTCS's *Standards and Guidelines for Consultant Archaeologists* (Ontario Government 2011); however, properties that are subject to archaeological assessment are not considered cleared for ground disturbance activities until the associated report has been reviewed and accepted by the MTCS. In order to maintain compliance with the MTCS and the *Ontario Heritage Act* (1990), no ground disturbing activities are to occur until the proponent and approval authority receive a formal letter from the MTCS stating that the recommendations provided herein are compliant and that the report has been accepted into the MTCS' register of archaeological reports.

6. Advice on Compliance with Legislation

This report is submitted to the Ontario Minister of Tourism, Culture and Sport as a condition of licensing in accordance with Part VI of the *Ontario Heritage Act*, R.S.O. 1990, c 0.18. The report is reviewed to ensure that it complies with the standards and guidelines that are issued by the Minister, and that the archaeological fieldwork and report recommendations ensure the conservation, protection and preservation of the cultural heritage of Ontario. When all matters relating to archaeological sites within the project area of a development proposal have been addressed to the satisfaction of the Ministry of Tourism, Culture and Sport, a letter will be issued by the ministry stating that there are no further concerns with regard to alterations to archaeological sites by the proposed development.

It is an offence under Sections 48 and 69 of the *Ontario Heritage Act* for any party other than a licensed archaeologist to make any alteration to a known archaeological site or to remove any artifact or other physical evidence of past human use or activity from the site, until such time as a licensed archaeologist has completed fieldwork on the site, submitted a report to the Minister stating that the site has no further cultural heritage value or interest, and the report has been filed in the Ontario Public Register of Archaeology Reports referred to in Section 65.1 of the *Ontario Heritage Act*.

Should previously undocumented archaeological resources be discovered, they may be a new archaeological site and therefore subject to Section 48(1) of the *Ontario Heritage Act*. The proponent or person discovering the archaeological resources must cease alteration of the site immediately and engage a licensed consultant archaeologist to carry out archaeological fieldwork, in compliance with Section 48(1) of the *Ontario Heritage Act*.

Archaeological sites recommended for further archaeological fieldwork or protection remain subject to section 48 (1) of the *Ontario Heritage Act* and may not be altered, or have artifacts removed from them, except by a person holding an archaeological license.

The *Funeral, Burial and Cremation Services Act*, 2002, S.O. 2002, c.33 (when proclaimed in force in 2012) require that any person discovering human remains must notify the police or coroner and the Registrar of Cemeteries at the Ontario Ministry of Government and Consumer Services.

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8. Images

EEB 8 / 530 Progress Avenue

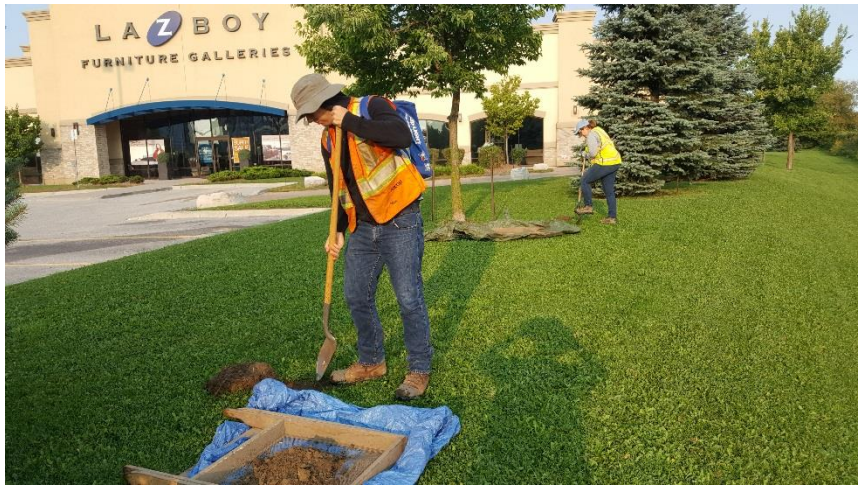


Photo 1: Crew at work conducing Stage 2 Test pit survey at 530 Progress Avenue; view east

Photo 2: Typical disturbed test Pit at 530 Progress Avenue, facing down.

Photo 3: Overview of the study area at 530 Progress Avenue, Scarborough Town Centre, showing disturbance from commercial buildings; view south

EEB 7 / 1072 McCowan Road

Photo 4: Typical test pit from 1072 McCowan Road, showing intact topsoil overlying subsoil; view down

Photo 5: Overview of the area subject to test pit survey at 1072 McCowan Road; view northeast

TPSS 2 / 1 Bellechasse Street

Photo 6: Overview of the disturbance within the Gatineau Hydro Corridor, west of McCowan Road; view southwest

Photo 7: View of the permanently low and wet area within the Gatineau Hydro Corridor, west of McCowan Road; view north

Photo 8: Severe slope and disturbance encountered within the Gatineau Hydro Corridor, west of McCowan Road; view south

Photo 9: Typical disturbed test pit within the Gatineau Hydro Corridor, west of McCowan Road; view down

Photo 10: Crew at work test pitting the disturbed area within the Gatineau Hydro Corridor, west of Benshire Drive; view northeast

Photo 11: Crew at work test pitting within the Gatineau Hydro Corridor, east of McCowan Road for TPSS 2; view northeast

Photo 12: Typical disturbed test unit within the Gatineau Hydro Corridor, east of McCowan Road for TPSS 2; view down

Photo 13: Area subject to test pitting at 5m intervals within the Gatineau Hydro Corridor, east of McCowan Road for TPSS 2; view north

Photo 14: Typical undisturbed test pit within the Gatineau Hydro Corridor, east of McCowan Road for TPSS 2; view down

Photo 15: Overview of the study area east of McCowan Road; view southeast

Photo 16: Crew at work test pitting at 10m intervals to confirm disturbance along the eastern side of McCowan Road; view west

EEB 5 / 3030-3050 Lawrence Ave E

Photo 17: Overview of the proposed temporary parking area northwest of the Scarborough Hospital, consisting of a planted meadow; view northeast

Photo 18: Signage for the meadow, indicating that it could not be ploughed; view northeast

Photo 19: Overview of the area subject to test pitting at 10m intervals to confirm disturbance south of the meadow; view northeast

Photo 20: Crew at work test pitting at 5m intervals within the meadow; view east

Photo 21: Typical test pit in the undisturbed portion of the meadow; view down

Photo 22: Crew at work test pitting at 5m intervals; view north

Photo 23: Disturbance from modern utilities; view east-southeast

Photo 24: Typical disturbed test pit south of the intact area; view down

EEB 4 / Bendale Library, 1515 Danforth Rd

Photo 25: Visible modern utilities north of the library in the manicured lawn; view north

Photo 26: Overview of the area subject to test pit survey at 10m intervals to confirm disturbance; view north

Photo 27: Typical disturbed test pit with soil mottling and gravel inclusions; view down

EEB 3 / 1340-1360 Danforth Road, West and East of Pringdale Ravine

Photo 28: Overview of the study area at 1360 Danforth Road; view south

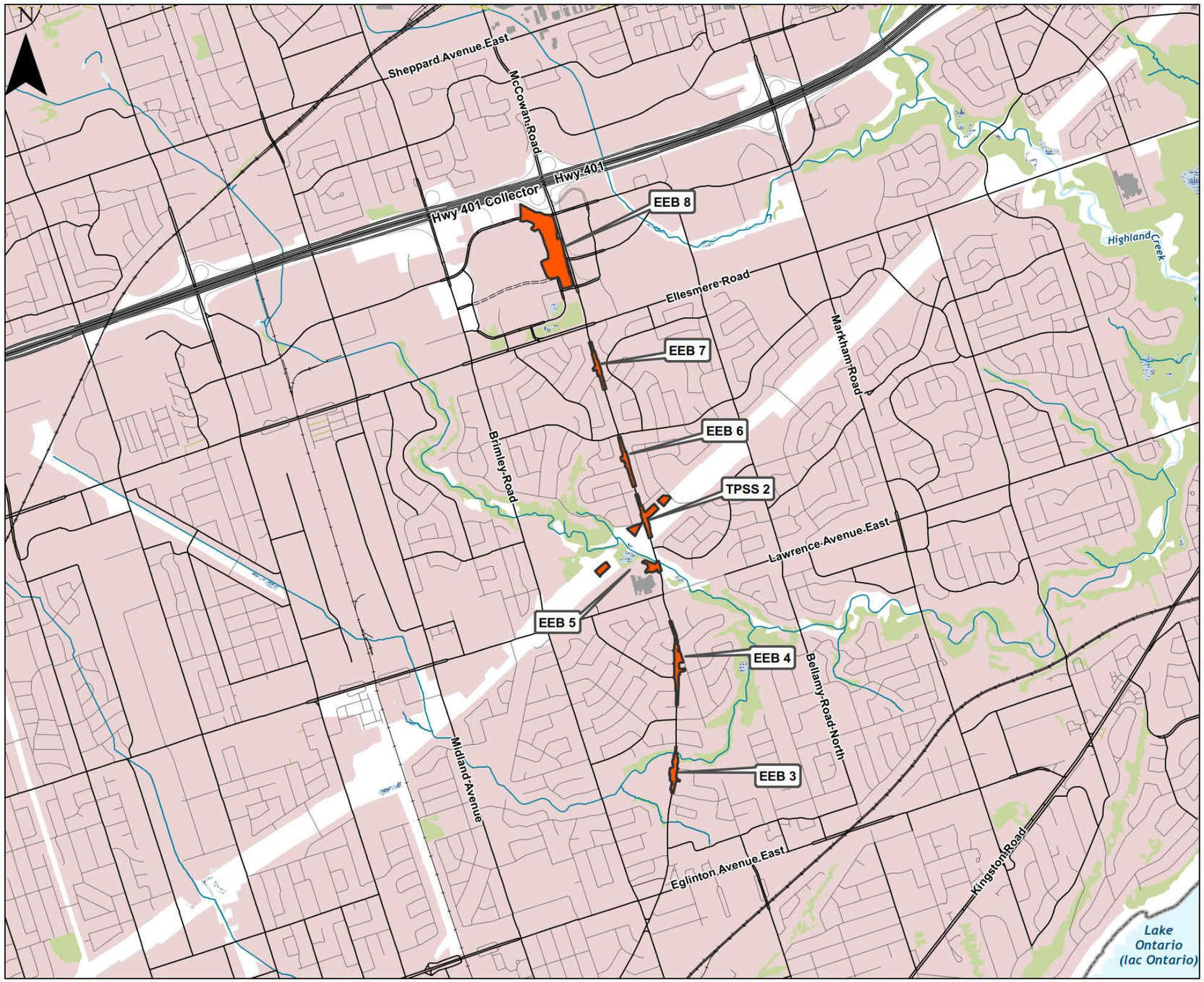
Photo 29: Typical test pit found in the manicured lawn area east of 1360 Danforth Road showing mottling and gravel inclusions; view down

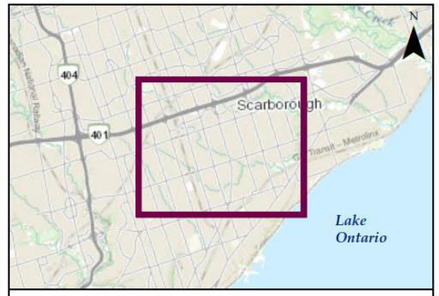
Photo 30: Overview of the study area on the eastern side of Danforth Road; view north

Photo 31: Typical disturbed test pit in the area east of Danforth Road; view down

9. Figures

All figures pertaining to the Stage 2 archaeological assessment for the Scarborough Subway Extension in the City of Toronto, Ontario are provided on the following pages.





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Study Area

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Meters

Scarborough Subway Extension
Stage 2 Archaeological Assessment

Site Location

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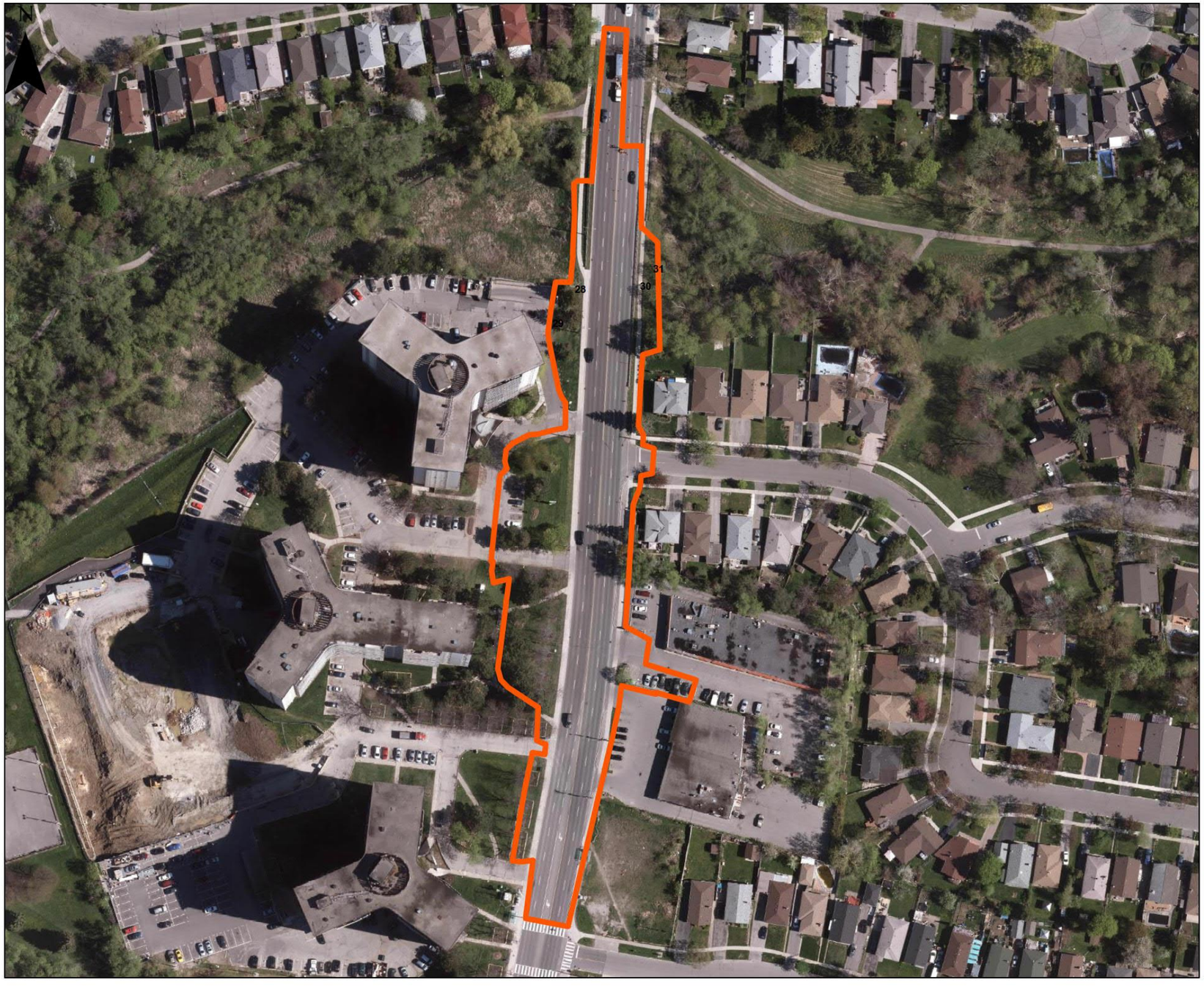
Figure 1: Location of the Scarborough Subway Extension Study Areas



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Study Area

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Meters

Scarborough Subway Extension
Stage 2 Archaeological Assessment

Study Area EEB 3

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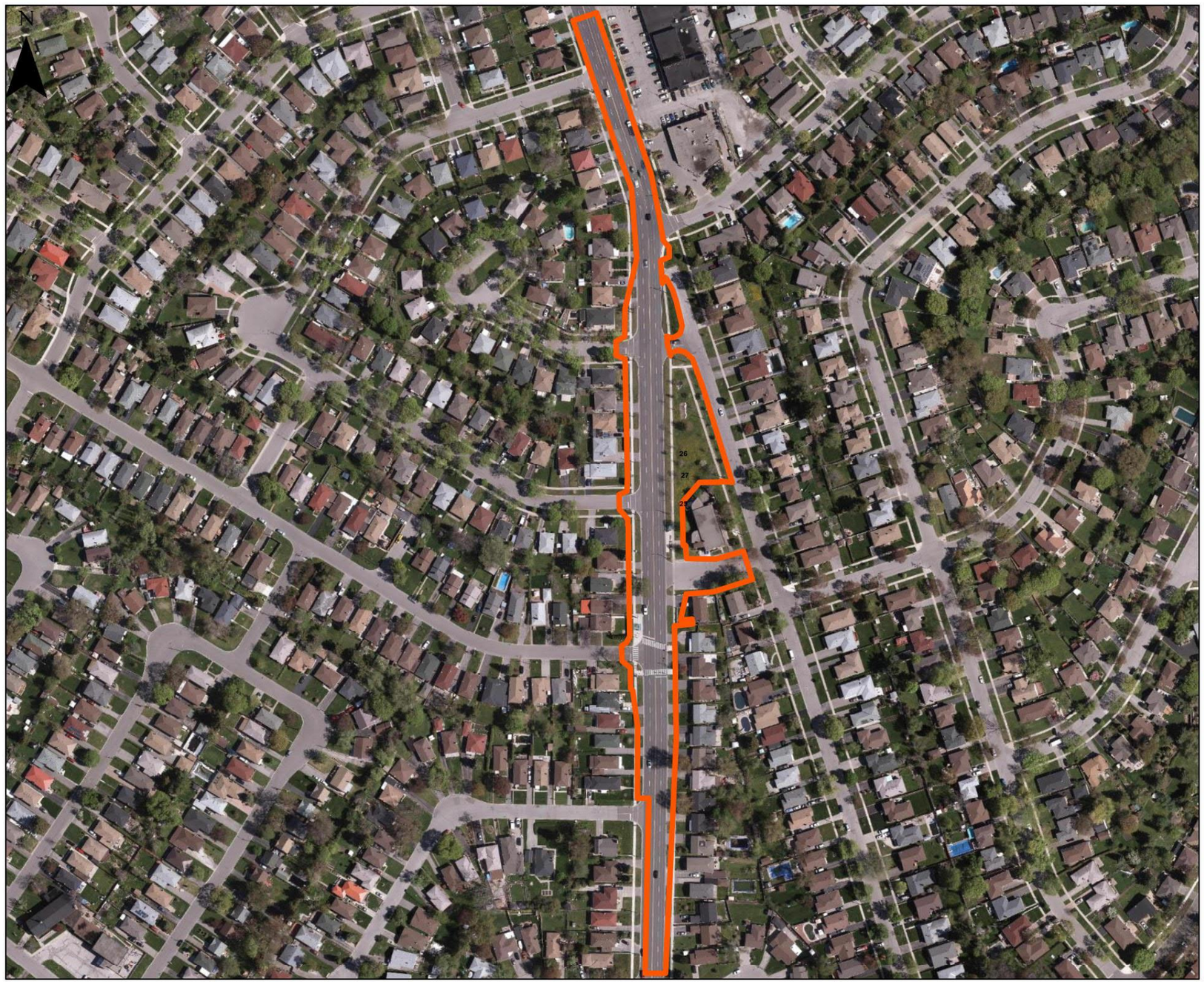
Figure 2: EEB 3 Study Area in Detail



Legend

Study Area

0 25 50 100 150

Meters

Scarborough Subway Extension
Stage 2 Archaeological Assessment

Study Area EEB 4

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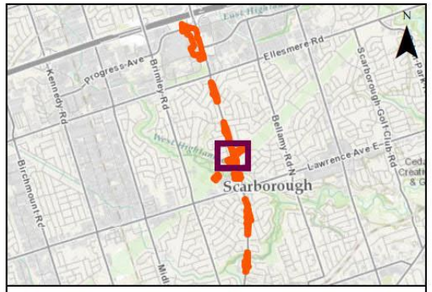
Figure 3: EEB 4 Study Area in Detail

Figure 4: EEB 5 Study Area in Detail



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Study Area

0 12.5 25 50 75

Meters

Scarborough Subway Extension
Stage 2 Archaeological Assessment

Study Area TPSS 2

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AECOM		**Figure 2-4**

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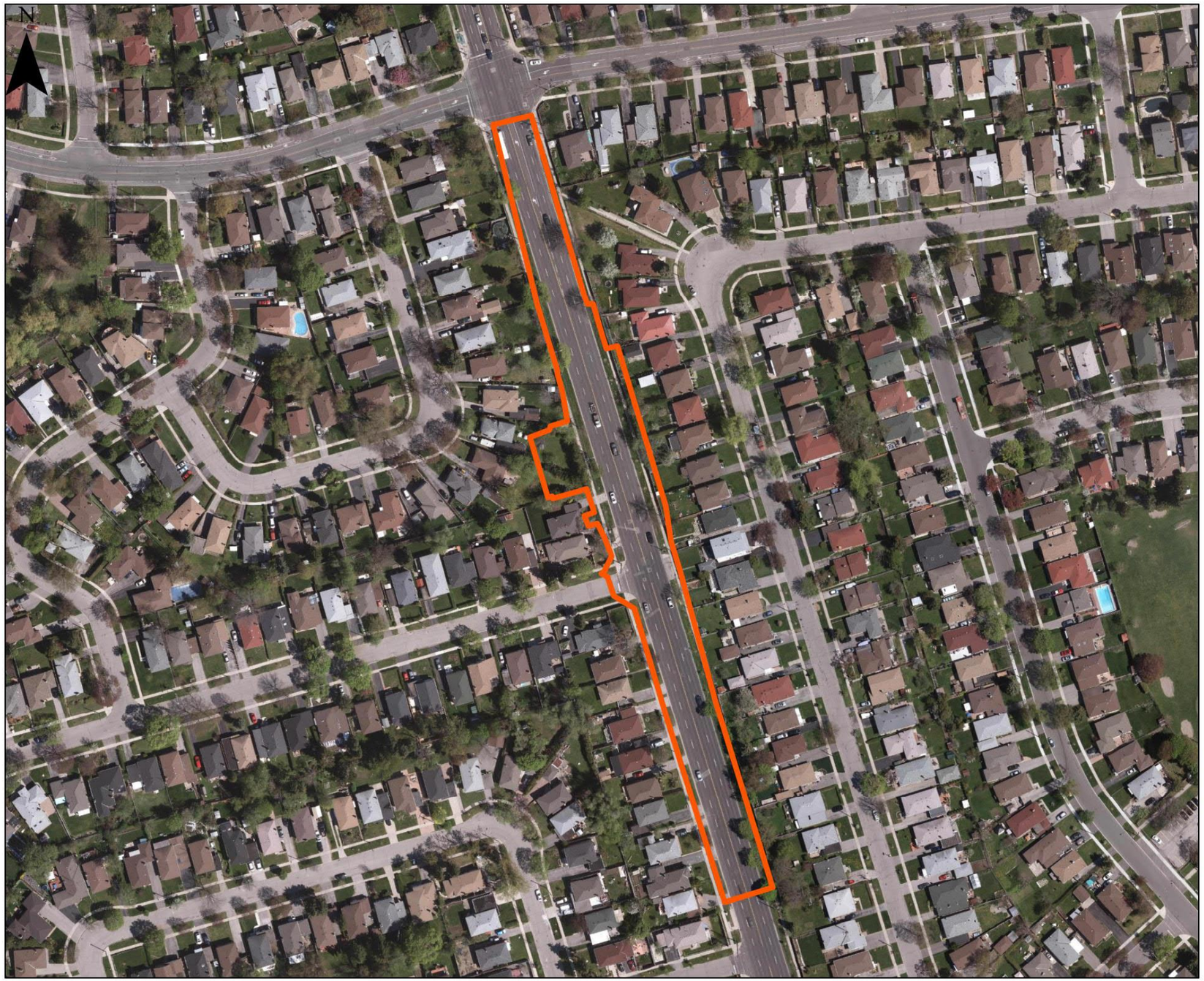
Figure 5: TPSS 2 Study Area in Detail



Legend

Study Area

0 12.5 25 50 75

Meters

Scarborough Subway Extension
Stage 2 Archaeological Assessment

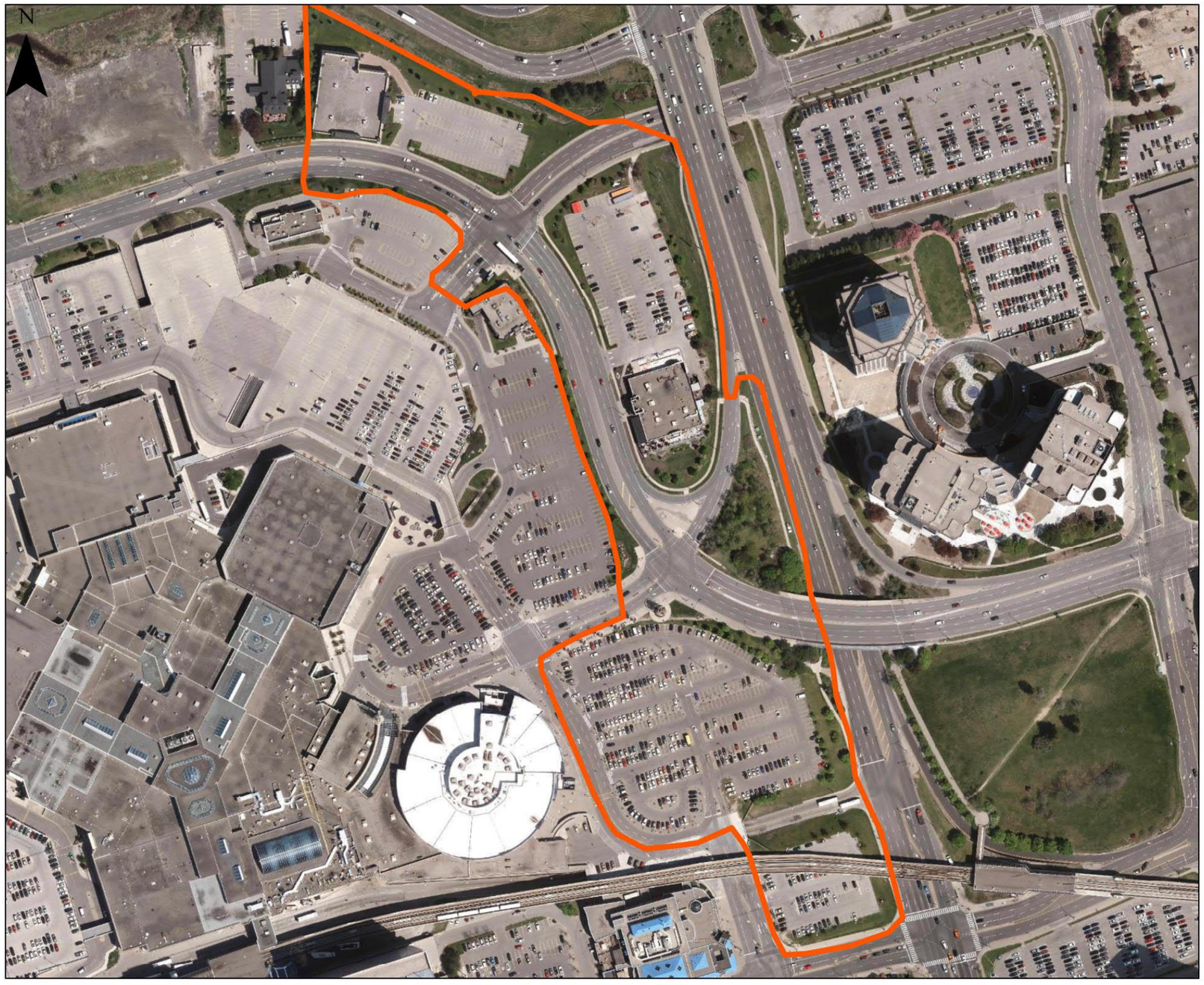
Study Area EEB 6

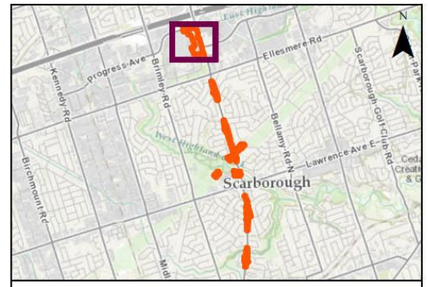
Oct 2018	1:1,600	Datum: NAD 1983 UTM Zone 17N
AECOM		**Figure 2-5**

Map Saved: C:\Users\Andrew.Clyde\Desktop\ArcProjects\60503198_Scarborough TTCExtension\Stage2\60503198_Stage2StudyArea_Fig2-5_EEB6.mxd
Date Saved: 10/29/2018 12:26:56 PM

Figure 6: EEB 6 Study Area in Detail

Figure 7: EEB 7 Study Area in Detail





Legend

Study Area

0 25 50 100 150

Meters

Scarborough Subway Extension
Stage 2 Archaeological Assessment

Study Area EEB 8

Oct 2018	1:2,200	Datum: NAD 1983 UTM Zone 17N
AECOM		**Figure 2-7**

Map location: C:\Users\Stephanie.Chuter\Desktop\ArcProjects\60503169_Scarborough\TTC\Extension\Stage2\60503169_Stage2SubArea_Fig2-7_EEB8.mxd
Date Saved: 10/23/2018 12:56:14 PM

Figure 8: EEB 8 Study Area in Detail

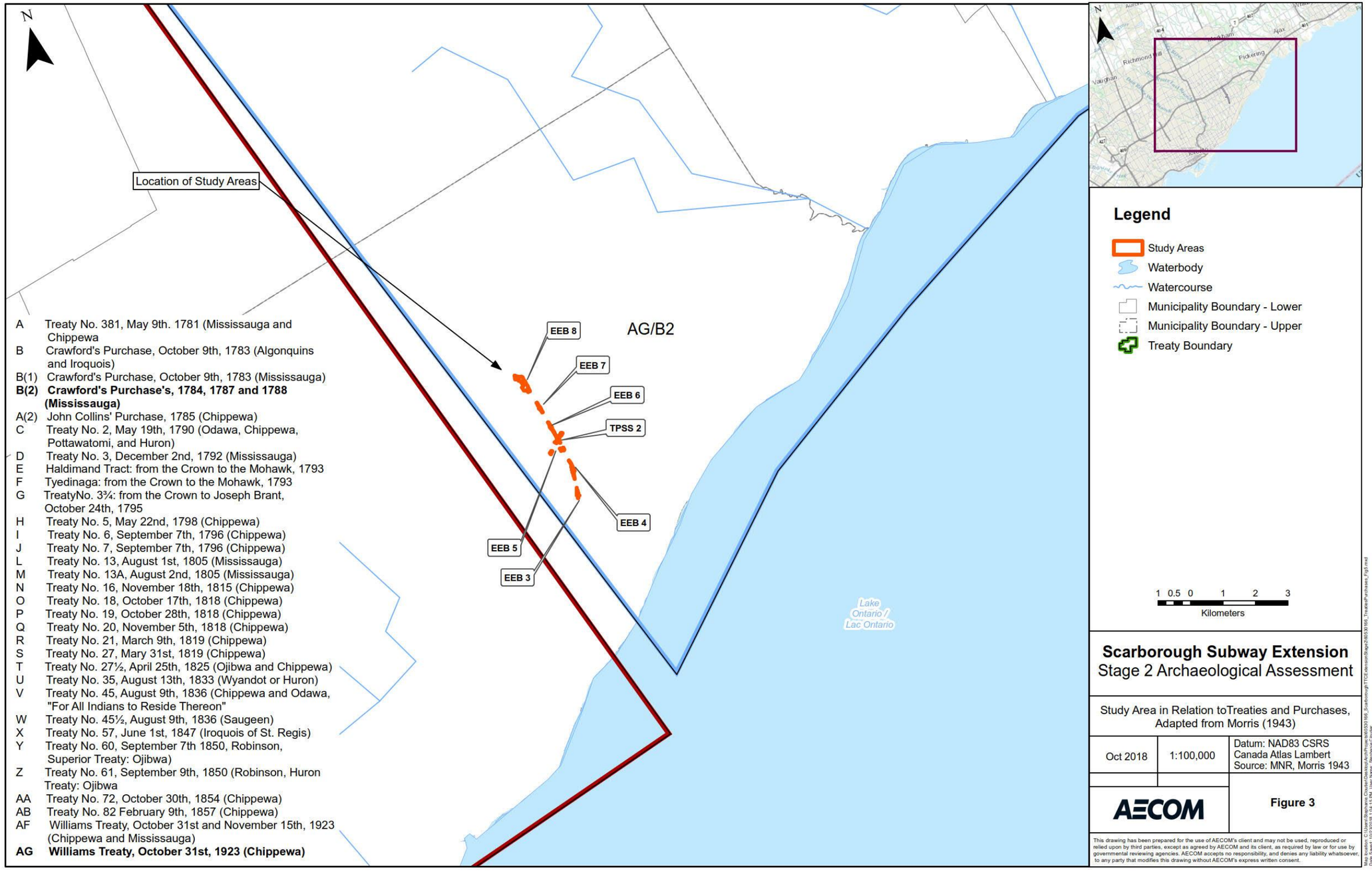


Figure 9: Treaties and Purchases, adapted from Morris 1943

Figure 10: Portion of 1860 Tremaine Map in Relation to the Scarborough Subway Extension Study Areas

Figure 11: Portion of the 1878 Historical Atlas Map in Relation to the Scarborough Subway Extension Study Areas

Legend

- Study Area
- Test pitted at 10m intervals - Disturbed
- Visually Assessed -
- Photo Location - Ground shot
- Photo Location

0 12.5 25 50 75
Meters

Scarborough Subway Extension
Stage 2 Archaeological Assessment

Study Area EEB 3
Stage 2 Results and Photo Locations

Oct 2018	1:1,300	Datum: NAD 1983 UTM Zone 17N
AECOM		**Figure 6-1**

Map location: C:\Users\Stephane.Chartier\Desktop\ArcMProjects\605X\Mxd_Scarborough\TTC\Extension\Stage2\605X Mxd_StageResults_Fig6-1_EEB3.mxd
Date Saved: 10/23/2018 11:58:56 AM

Figure 12: Results of the Stage 2 AA at the EEB 3 Study Area with Photo Locations

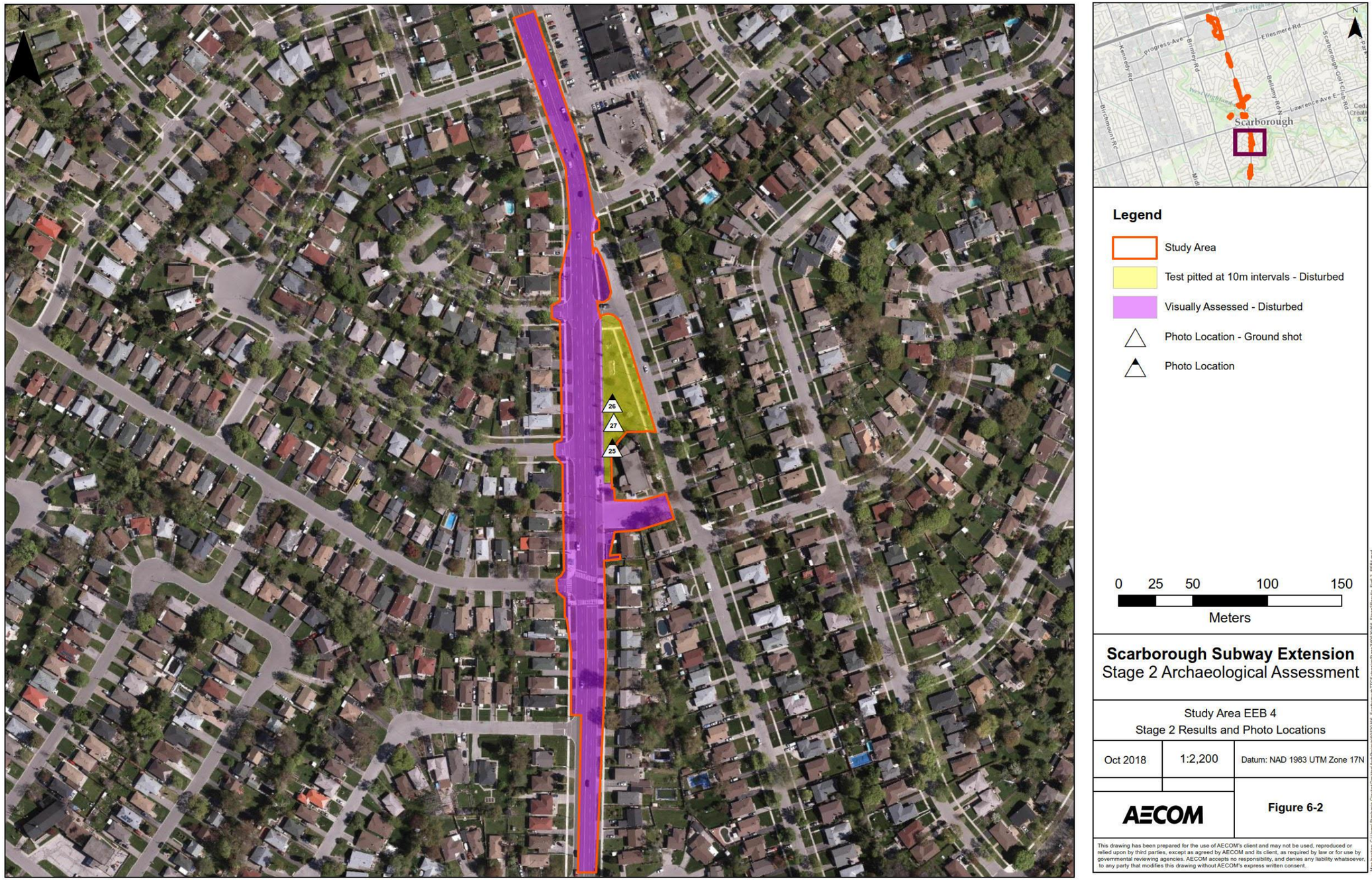
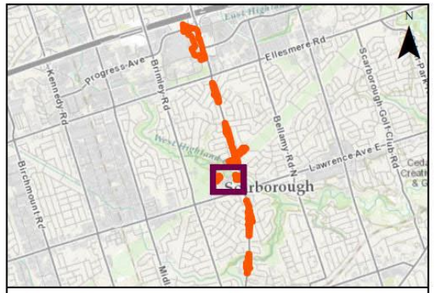


Figure 13: Results of the Stage 2 AA at the EEB 4 Study Area with Photo Locations



Legend

- Study Area
- Test pitted at 5m intervals
- Test pitted at 10m intervals - Disturbed
- Visually Assessed - Disturbed
- Photo Location - Ground shot
- Photo Location

0 12.5 25 50 75
Meters

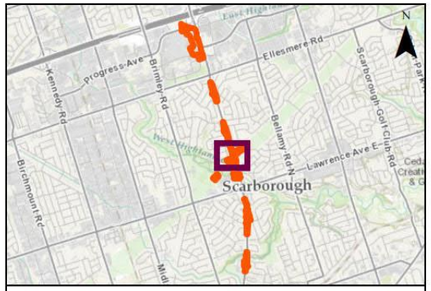
Scarborough Subway Extension
Stage 2 Archaeological Assessment

Study Area EEB 5
Stage 2 Results and Photo Locations

Oct 2018	1:1,500	Datum: NAD 1983 UTM Zone 17N
AECOM		**Figure 6-3**

Map location: C:\Users\Stephanie.Cloutier\Desktop\ArcProjects\60503168_Scarborough TTC\Extension\Stage2\60530168_Stage2Results_Fig6-3_EEB5.mxd
Date Saved: 10/22/2018 12:12:49 PM

Figure 14: Results of the Stage 2 AA at the EEB 5 Study Area with Photo Locations



Legend

- Study Area
- Test pitted at 5m intervals
- Test pitted at 10m intervals - Disturbed
- Low and wet - No archaeological potential
- Sloped - No archaeological potential
- Visually Assessed - Disturbed
- Photo Location - Ground shot
- Photo Location

0 12.5 25 50 75
Meters

Scarborough Subway Extension
Stage 2 Archaeological Assessment

Study Area TPSS 2
Stage 2 Results and Photo Locations

Oct 2018	1:1,500	Datum: NAD 1983 UTM Zone 17N
AECOM		**Figure 6-4**

Map Saved: C:\Users\tfrederick\Desktop\Archive\Projects\60553019\6_Scarborough TTC Extension\Stage2\60553019_Stage2Results_Fig04-4_TPSS2.mxd
Date Saved: 10/22/2018 12:24:48 PM

Figure 15: Results of the Stage 2 AA at the TPSS 2 Study Area with Photo Locations

Legend

- Study Area
- No Permission to Enter - Stage 2 Archaeological Assessment required
- Visually Assessed -

0 12.5 25 50 75
Meters

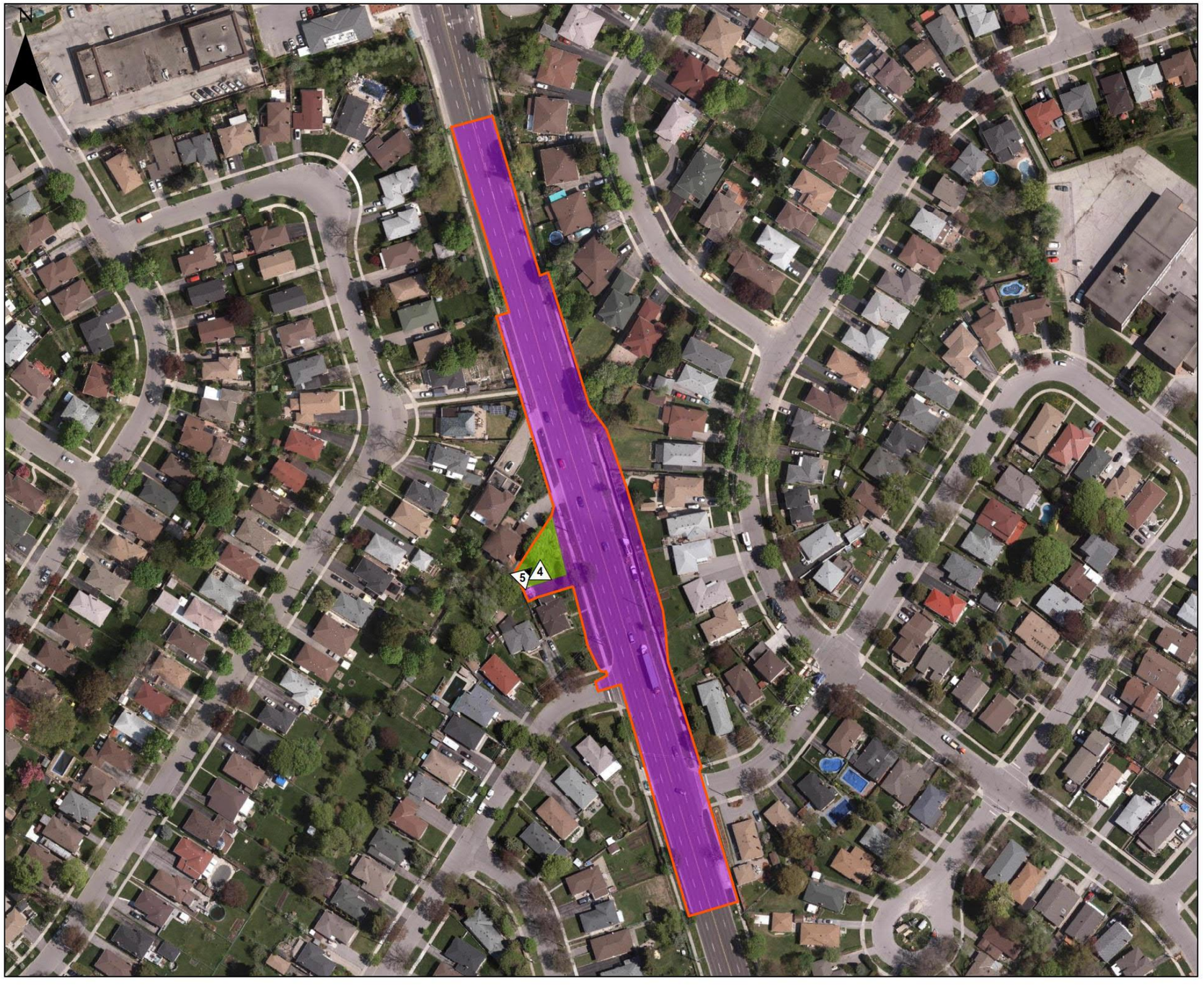
Scarborough Subway Extension
Stage 2 Archaeological Assessment

Study Areas EEB 6
Stage 2 Results and Photo Locations

Oct 2018	1:1,600	Datum: NAD 1983 UTM Zone 17N
AECOM		Figure 6-5

Map Location: C:\Users\Raghavan.Chokkalingam\Desktop\ArcGIS Projects\60503168_Scarborough TTC\Extension\Maps\60503168_ShapeNetwork_Fig6-5_EEB6.mxd
Date Saved: 10/23/2018 12:38:07 PM

Figure 16: Results of the Stage 2 AA at the EEB 6 Study Area with Photo Locations



Legend

- Study Area
- Test pitted at 5m intervals
- Visually Assessed - Disturbed
- Photo Location - Ground shot
- Photo Location

0 12.5 25 50 75
Meters

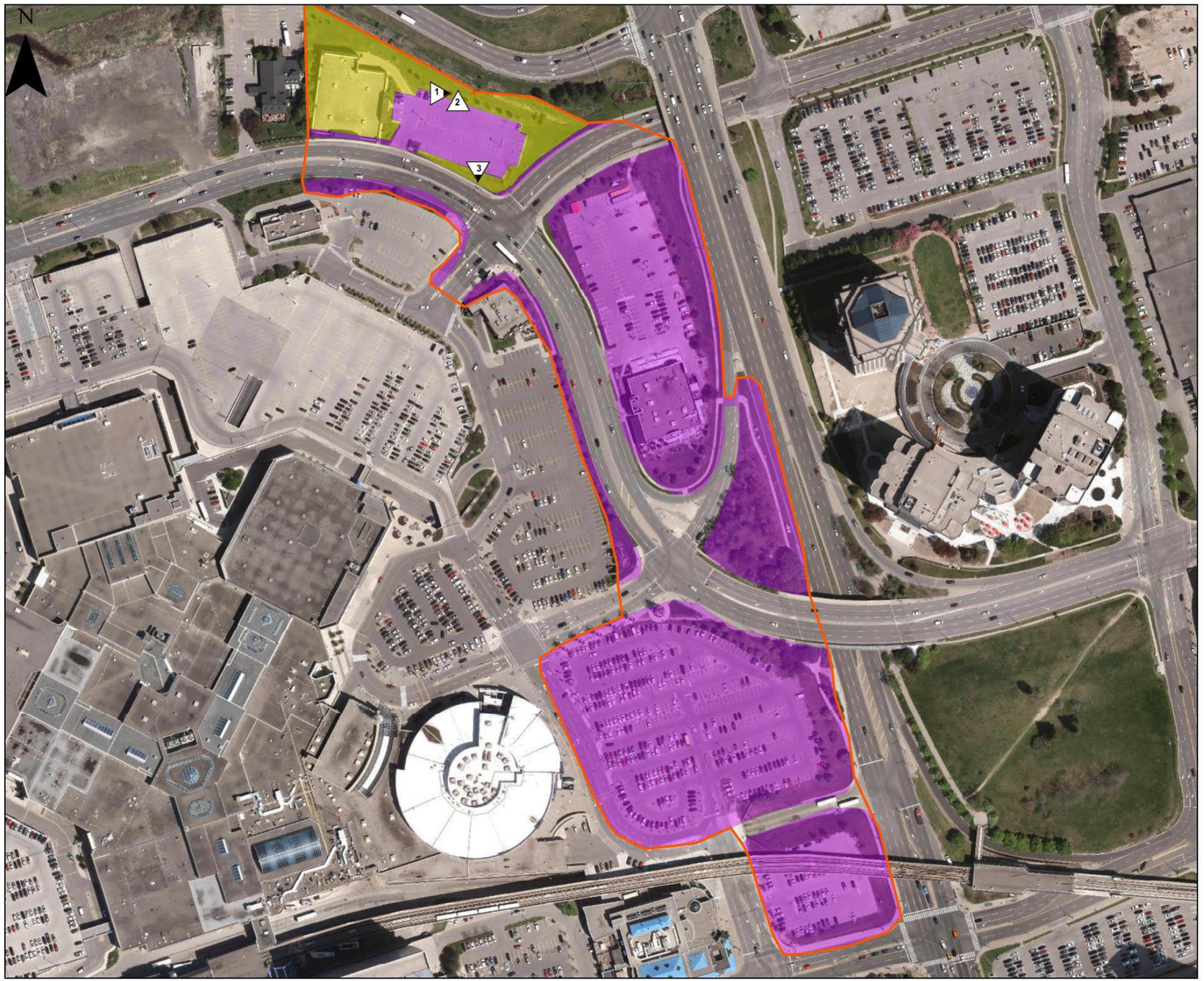
Scarborough Subway Extension
Stage 2 Archaeological Assessment

Study Areas EEB 7
Stage 2 Results and Photo Locations

Oct 2018	1:1,500	Datum: NAD 1983 UTM Zone 17N
AECOM		**Figure 6-6**

Map Location: C:\Users\Stephanie.Chouinard\Desktop\Arch\Projects\60539166_ScarboroughTTC\Extension\Stage2\60539166_StageResults_Fig6-6_EEB7.mxd
Date Saved: 10/25/2018 11:40:21 AM

Figure 17: Results of the Stage 2 AA at the EEB 7 Study Area with Photo Locations



Legend

- Study Area
- Test pitted at 10m intervals - Disturbed
- Visually Assessed - Disturbed
- Photo Location - Ground shot
- Photo Location

0 25 50 100 150
Meters

Scarborough Subway Extension
Stage 2 Archaeological Assessment

Study Areas EEB 8
Stage 2 Results and Photo Locations

Oct 2018	1:2,200	Datum: NAD 1983 UTM Zone 17N
AECOM		**Figure 6-7**

Map Location: C:\Users\Stephanie.Chuter\Desktop\Arch\Projects\60333166_Scarborough TTC\Extension\Stage2\60333166_Stage2Results_Fig6-7_EEB8.mxd
Date Saved: 10/26/2018 11:41:07 AM

Figure 18: Results of the Stage 2 AA at the EEB 8 Study Area with Photo Locations

About AECOM

AECOM (NYSE: ACM) is built to deliver a better world. We design, build, finance and operate infrastructure assets for governments, businesses and organizations in more than 150 countries.

As a fully integrated firm, we connect knowledge and experience across our global network of experts to help clients solve their most complex challenges.

From high-performance buildings and infrastructure, to resilient communities and environments, to stable and secure nations, our work is transformative, differentiated and vital. A Fortune 500 firm, AECOM companies had revenue of approximately US$19 billion during the 12 months ended June 30, 2015.

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City of Toronto and Toronto Transit Commission
Aboriginal Engagement
Stage 2 Archaeological Assessment
Scarborough Subway Extension

Lot 23, Concession D, Lot 23, Concession I, and Lot 23 Concession II,
Geographic Township of Scarboro, County of York, Now City of Toronto, Ontario

Licensee: Glenn Kearsley
License: P123
PIF Number: **P123-0403-2018, P123-0364-2017**
Related PIFs: P123-0274-2015

Prepared by:

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905 780 5964 tel
905 780 8693 fax

November 29, 2018
Original Report

Project Number: 60347313

STATEMENT OF ABORIGINAL ENGAGEMENT

The Stage 2 archaeological assessment (AA) for the proposed Scarborough Subway Extension in the Geographic Township of Scarboro (now Scarborough), County of York (now the City of Toronto), Ontario has involved consultation with and participation by Indigenous communities whose traditional and treaty territories are affected by the study area. The study area falls within the ancestral homeland of the Mississaugas of the New Credit First Nation.

As a part of AECOM's agreement with the City of Toronto and Toronto Transit Commission in accordance with the draft technical bulletin entitled *Engaging Aboriginal Communities in Archaeology* (MTCS 2011b) the Indigenous communities with the closest cultural affiliation, or with interest in the project, were contracted to act as Field Liaison Representatives during the Stage 2 AA. Monitoring was conducted for the fieldwork by Mississaugas of the New Credit First Nation via monitors Blake Sault and Jazmin Sault.

The process for reporting the results of engagement to the Mississaugas of the New Credit First Nation included daily updates provided by the respective monitors and email communications by Glenn Kearsley.