Municipal Class Environmental Assessment Study: Malton Flood Mitigation Study – Etude Drive to Justine Drive

Project File Report

City of Mississauga

60520028

February 2024

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AECOM: 2015-04-13

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Revision History

Revision Number	Date	Revised By	Revision Description
-	September 22, 2023	-	Draft Project File submitted to City
1	October 12, 2023	SZ	Draft Project File for agency circulation
2	February 16, 2024	SZ	Final Project File for 30-day review

Executive Summary

Introduction and Background

The City of Mississauga (the City), through its consultant AECOM Canada Ltd (AECOM), has completed a Schedule B Municipal Class Environmental Assessment study to develop a flood mitigation plan for the general area between Etude Drive and Justine Drive in the Malton community.

Previously, a flood study (Matrix Solutions Inc., 2018) for the larger Malton community, was completed by the Toronto and Region Conservation Authority, which investigated flooding across the entire community and highlighted this area and others for potential flood mitigation efforts. Based on that study's findings, the City identified this area, between Etude Drive and south of Justine Drive, as a high-priority site and accordingly initiated this flood study including engineering design.

The purpose of the project is to mitigate urban flooding risks to people, property, and infrastructure for this study area. The study has identified and evaluated various alternative solutions, including the preliminary preferred solution to help mitigate flooding.

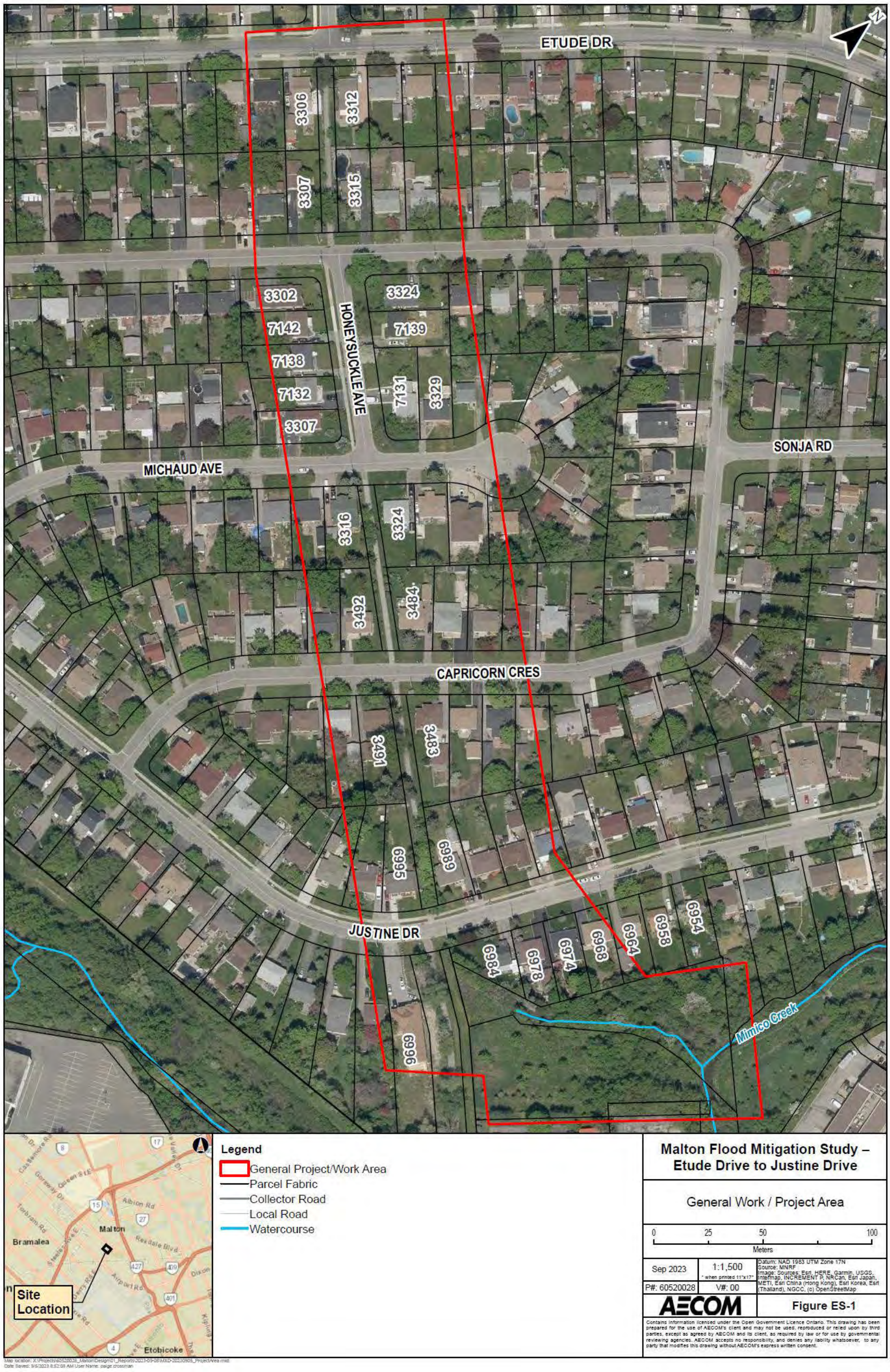
The study has been undertaken in accordance with the planning and design process for Schedule 'B' projects, as outlined in the "Municipal Class Environmental Assessment" document (October 2000, amended in 2015), which is approved under the *Ontario Environmental Assessment Act*.

Study Area

The general work and project area between Etude Drive and Justine Drive in Malton is comprised of mostly single detached residential properties. The area includes Mimico Creek and has been subject to urban flooding during storm events, including the rainstorm that occurred on July 8, 2013, which affected a number of homes in the neighbourhood.

Refer to **Figure ES-1** for the general work/project area based on the area identified to be further investigated through the 2018 Matrix Solutions Inc. Flood Study. The general work/project area encompasses the pedestrian walkway from Etude Drive to Capricorn Crescent, Honeysuckle Drive, and the pedestrian pathway from Michaud Avenue to Justine Drive. The general work/project area also includes portions of Derry Greenway Park.

Figure ES-1: General Work/ Project Area



Phase 1: Problem or Opportunity Statement

Phase 1 of the Municipal Class Environmental Assessment planning process requires the City to first document factors leading to the conclusion that the improvement is needed, and to develop a clear statement of the identified problems and opportunities to be investigated.

Problem

- The general area between Etude Drive and Justine Drive in Malton has been subject to urban flooding during storm events, including the rainstorm that occurred on July 8, 2013, which affected a number of homes in the neighbourhood.
- Previously, a flood study for the larger Malton community, led by the Toronto and Region Conservation Authority, was undertaken which investigated flooding across the entire community and highlighted this area, among others, for potential flood mitigation efforts. Based on that study's findings, the City identified the general area between Etude Drive and south of Justine Drive, as a high-priority site to help mitigate flooding.

Opportunity

- Complete the Schedule B Municipal Class Environmental Assessment planning process to mitigate urban flooding risks to people, property and infrastructure within the Malton community.

Phase 2: Alternative Solutions

The evaluation of alternatives included a two-step evaluation process. A long list of solutions was screened as the initial step of the evaluation process. All possible alternatives to reduce or eliminate flooding were explored, including source point measures, conveyance measures and storage measures.

A short list of five alternatives, as delineated in **Figure ES-2** were carried forward for more detailed evaluation as the second step in the evaluation process. The alternatives are summarized as follows:

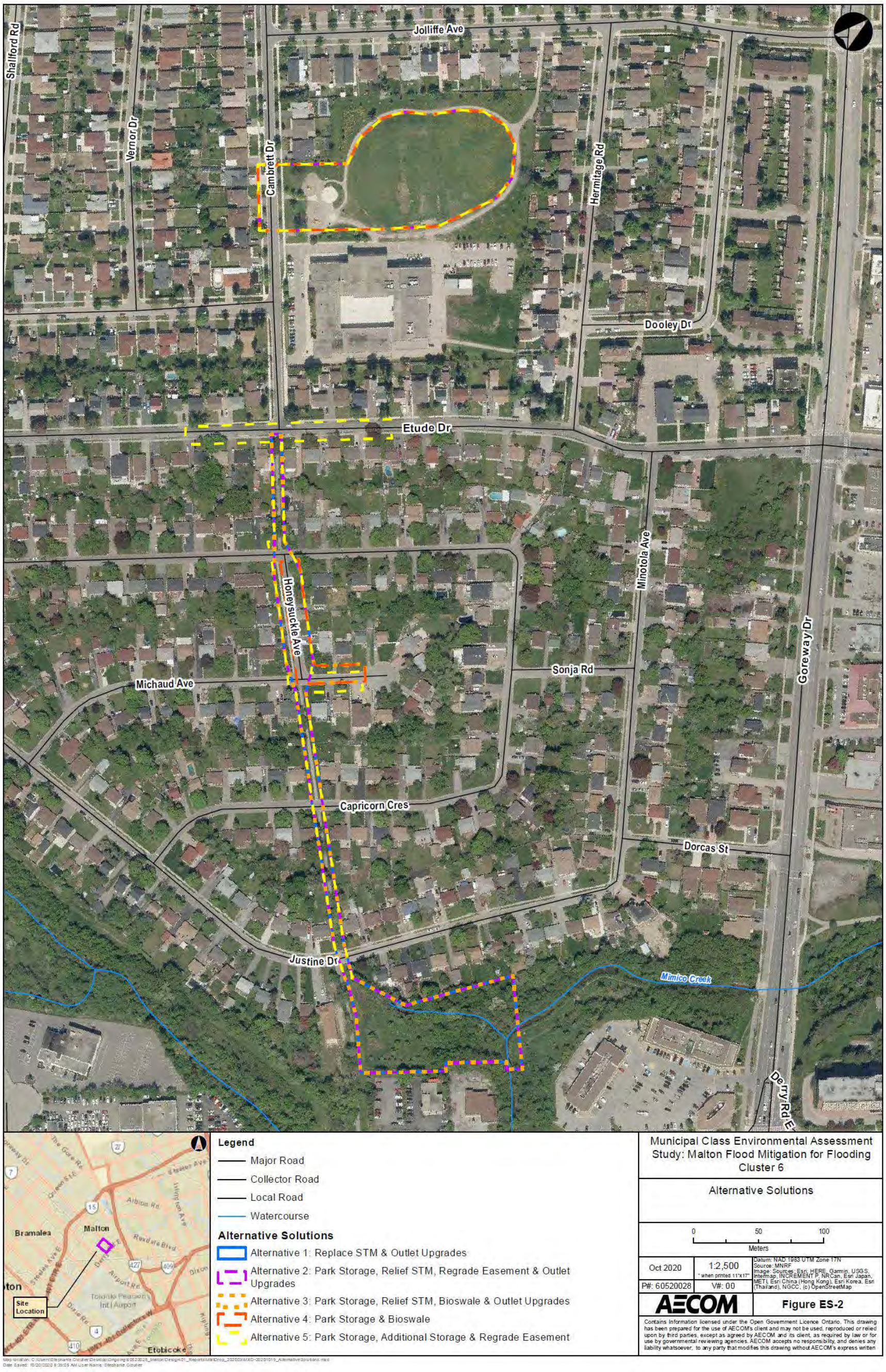
- **Alternative 1:** involves replacing the existing 1,650 millimetre storm sewer beneath the pedestrian walkway and within existing City property with a new box storm sewer from Etude Drive to the Mimico Creek outfall channel in Derry Greenway Park, regrading the walkway to a proper overland flow path and completing a new outlet upgrade at the outlet channel south of Justine Drive. Additional inlets would also be required.

- **Alternative 2:** involves constructing 12,000 metres cubed of underground storage in Ridgewood Park open space area, installation of a new 1,050 millimetre relief sewer beneath the pedestrian walkway and within existing City property from Etude Drive to the Mimico Creek outfall channel in Derry Greenway Park, regrading of the pedestrian walkway to a proper overland flow path and completing a new outlet upgrade upstream of the outlet channel south of Justine Drive. Additional inlets would be required.
- **Alternative 3:** involves constructing 12,000 metres cubed of underground storage in the Ridgewood Park open space area, installation of a new 1,050 millimetre diameter relief sewer beneath the pedestrian walkway and within existing City property from Etude Drive to the Mimico Creek outfall channel in Derry Greenway Park, and completing a new outlet upgrade upstream of the outlet channel south of Justine Drive. Additional inlets would also be required as well as a 0.15 metres deep bioswale providing 115 metres cubed of storage beneath Honeysuckle Avenue and Michaud Avenue.
- **Alternative 4:** involves constructing 12,000 metres cubed underground storage in the Ridgewood Park open space area and a 0.15 metres deep bioswale with 180 metres cubed storage beneath at Honeysuckle Avenue and Michaud Avenue.
- **Alternative 5**: involves constructing 12,000 metres cubed underground storage in the Ridgewood Park open space area along with additional inlets and storage in the right-of-way along Etude, Honeysuckle Avenue and Michaud Avenue, and regrading of the pedestrian walkway, within the existing City property from Etude Drive to Mimico Creek.

Criteria were developed to evaluate the alternative flood mitigation solutions based on the following factors: technical environment, natural environment, socio-economic environment, climate change, cultural heritage environment and cost. Refer to **Section 6.3** for the detailed evaluation.

Based on the evaluation, **Alternative 1 was identified as the preferred flood mitigation solution** as it significantly reduces the potential impacts of flooding to properties in this specific area, minimizes impacts to public parks, and has a lower overall cost when compared to the other alternatives. All homes would be eliminated from being impacted by flooding along the City's pedestrian walkway during a 100-year storm event. However, the proposed solution is not intended to address the flooding issue resulted from the regulatory storm which is Hurricane Hazel storm.

Figure ES-2: Alternative Solutions



Storm Sewer and Pedestrian Walkway

The preferred flood mitigation solution requires complete re-construction of the pedestrian walkway and relocation of the chain-link fence to the City's property line, which extends beyond the existing chain-link fence. Relocation of the chain link fence is required to allow construction of the box storm sewer and provide the City to access and maintain these lands and infrastructure going forward. This means that objects illegally encroaching on City property, such as fences, trees, shrubs, etc. will be removed prior to construction. It is intended that removals would be at the City's expense understanding these encroachments may have been placed by past homeowners.

There will be significant improvements to the walkway itself including a more formal and modernized multi-use trail. Safety and accessibility improvements will also be incorporated through different aspects of the walkway such as improved lighting, updated signage, new bollards at road crossings, better sightlines and more. Certain design aspects will help to deter loitering and litter such as avoiding walkway benches and upgraded lighting. There will also be regrading of the walkway for an overland flow route to safely convey runoff during larger storm events. Refer to **Figure ES-3** for a rendering of the existing and proposed condition of this project component.

Outlet Upgrades

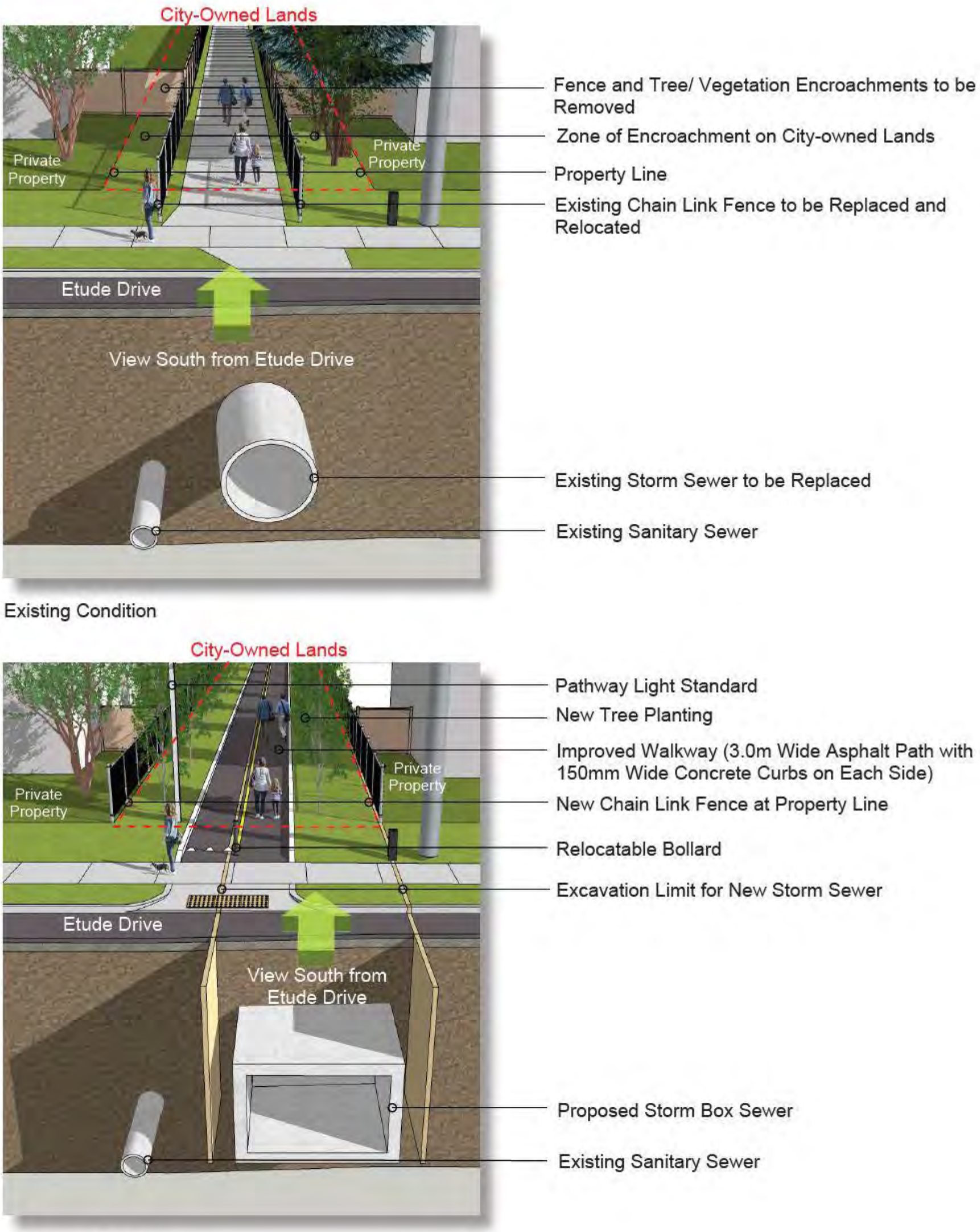
The preferred solution includes a new, larger outlet structure and channel realignment south of Justine Drive upstream of Mimico Creek in Derry Greenway Park. The channel design will dissipate flows to minimize downstream erosion. The proposed channel upgrades are not anticipated to cause flooding downstream along Mimico Creek.

The existing outfall will remain in-place while the new outfall is installed beside it which will lessen construction impacts and disturbances in the area. Efforts will be made to avoid impacting trees and vegetation in the construction footprint area with new plantings for those that end up requiring removal.

In addition, the existing gabion basket retaining wall on the north side of the outlet channel will be reinforced.

Refer to **Figure ES-4** for the conceptual figure of the outlet upgrades.

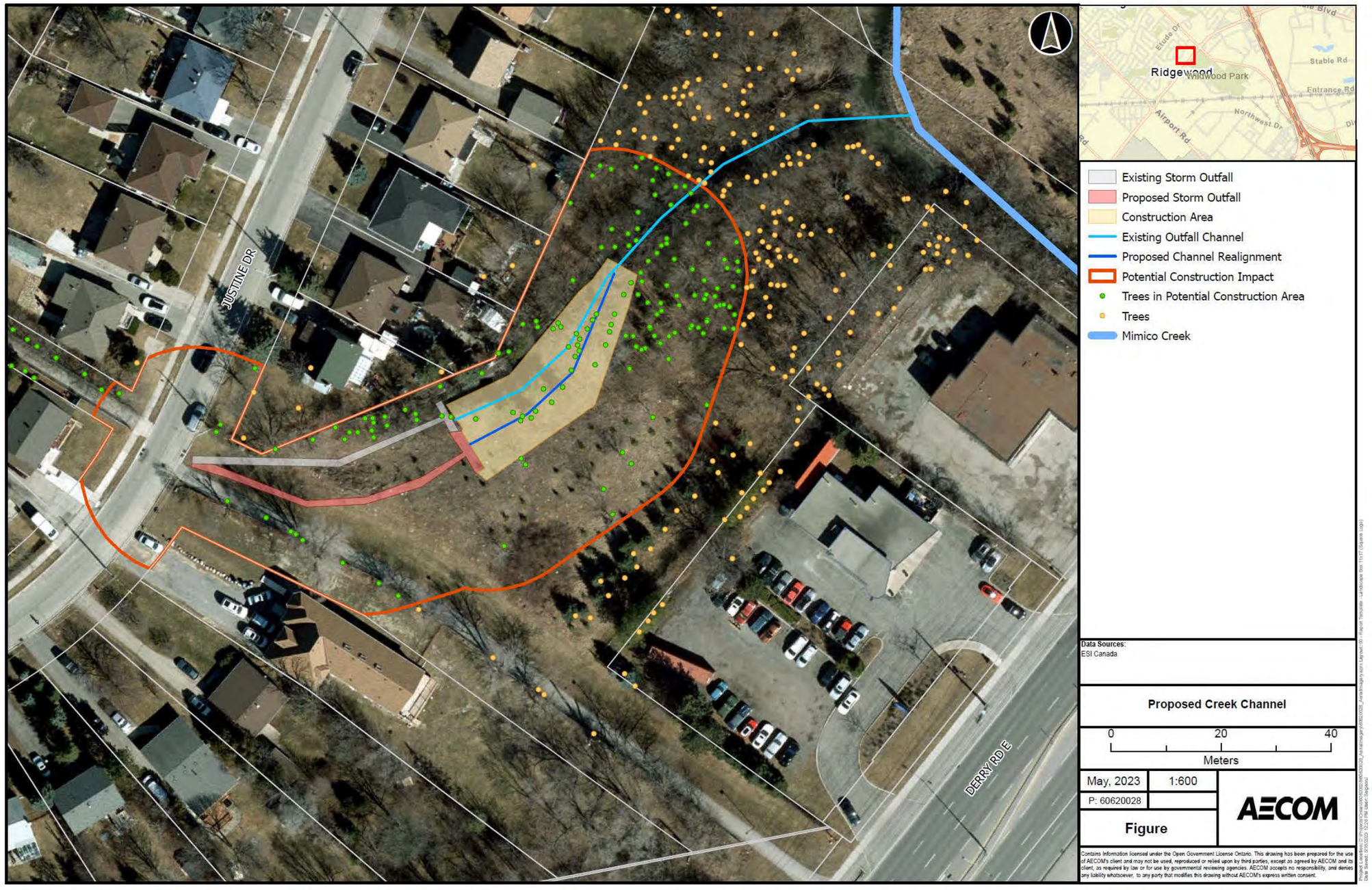
Figure ES-3: Conceptual Renderings – Storm Sewer



Existing Condition

Proposed Condition

Figure ES-4: Proposed Creek Channel – New Outlet Upgrade



Potential Impacts and Proposed Mitigation and Compensation Measures

Impacts related to construction of the new box culvert, new upgraded outlet structure and channel will be largely limited to the duration and location of construction.

Based on the preferred flood mitigation strategy, construction is expected to have varied effects on the environment and community. Efforts to minimize impacts such as noise and vibration will be made by implementing standard construction and best management practices.

The pedestrian walkway area, including lands extending beyond the walkways chain-link fence, are City-owned lands and many illegal encroachments exist in this area such as trees, gardens, fences, etc. Encroachments would be removed along the pedestrian walkway area, at the City's expense, and not reinstated. Efforts will be made to keep existing trees where possible and new trees/vegetation will be planted for those removed.

The City will continue to engage with affected property owners prior to construction regarding the removal of encroachments. General project information and updates will be provided through the City's website.

Proposed mitigation measures will be further developed during the preliminary and detailed design phases by means of further studies and permit applications, where applicable.

Communications and Consultation Overview

The following summarizes the engagement activities undertaken to obtain feedback and thereby inform the decision-making process in selecting the preferred Malton flood mitigation strategy:

- Development of a contact list at the onset of the study that was regularly updated.
- Distribution of notifications to residents, key review agencies, stakeholders, Indigenous communities and interested members of the public.
- Distribution of letters to residents outlining the specific potential impacts to City-owned lands adjacent to their property beside the pedestrian walkway, within the road boulevard or beside the outlet structure and channel.
- Posting of key information to the City's website.

- Posting a narrated Public Information Centre video to the City's website to provide residents in the Malton community, stakeholders, key review agencies, and Indigenous communities an opportunity to learn about the project and provide feedback.
- Engagement with key review agencies, including meeting with Toronto and Region Conservation Authority staff.

Conclusions

This Project File covers the process required to ensure that the preferred flood mitigation solution complies with the *Environmental Assessment Act*. The Municipal Class Environmental Assessment planning process has not identified any significant environmental concerns that cannot be addressed by incorporating best management practices and established mitigation measures during construction.

The proposed works described in **Section 7** involves:

- Replacing the existing storm sewer with a larger box storm sewer beneath the pedestrian walkway and Honeysuckle Avenue within the existing City property, from Etude Drive to the outfall channel and associated restoration.
- Regrading of the walkway for the creation of an overland flow route to safely convey runoff during larger storm events.
- New upgraded outfall south of Justine Drive at the outfall channel in Derry Greenway Park that flows into Mimico Creek. The existing outfall will remain in-place while the new outfall is installed beside it, which will lessen construction impacts and disturbances in the area. The existing gabion basket retaining wall on the north side of the outlet channel will also be reinforced.

The implementation of the preferred flood mitigation solution would eliminate all homes from being impacted by flooding along the City's pedestrian walkway during a 100-year storm event.

A preliminary evaluation of potential effects indicates varied environmental impacts that can be addressed by recommended mitigation and compensation measures as identified in **Section 8**. The key impact to the community will be the removal of encroachments along the pedestrian walkway area as discussed under the potential impacts.

Subject to receiving Municipal Class Environmental Assessment clearance, the City will complete and finalize the preliminary and detailed design and proceed to construction as soon as 2024, subject to the City's capital budget process and receiving all necessary approvals.

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1. Introduction

1.1 Background

The City of Mississauga (the City), through its consultant AECOM Canada Ltd (AECOM), has completed a Schedule B Municipal Class Environmental Assessment study to develop a flood mitigation plan for the general area between Etude Drive and Justine Drive in the Malton community.

Previously, a flood study (Matrix Solutions Inc. 2018) for the larger Malton community, was completed by the Toronto and Region Conservation Authority, which investigated flooding across the entire community and highlighted this area and others for potential flood mitigation efforts. Based on that study's findings, the City identified this area, between Etude Drive and south of Justine Drive, as a high-priority site and initiated this flood study.

The purpose of the project is to mitigate urban flooding risks to people, property and infrastructure for this study area. The study has identified and evaluated various alternative solutions, including the preliminary preferred solution to help mitigate flooding.

The study has been undertaken in accordance with the planning and design process for Schedule 'B' projects, as outlined in the "Municipal Class Environmental Assessment" document (October 2000, amended in 2015), which is approved under the *Ontario Environmental Assessment Act*.

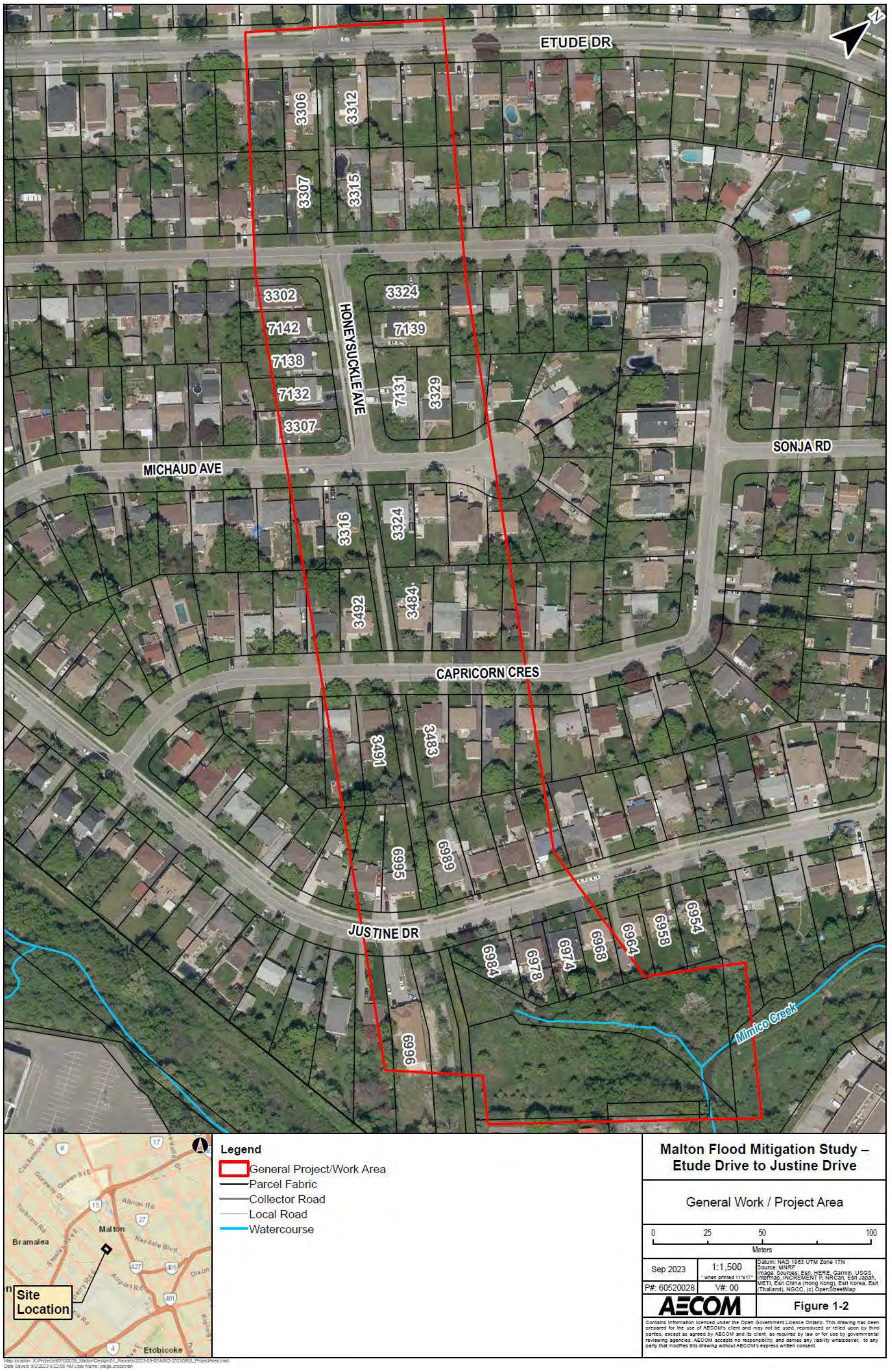
1.2 Study Area

The general work and project area between Etude Drive and Justine Drive in Malton is comprised of mostly single detached residential properties. The area includes Mimico Creek and has been subject to urban flooding during storm events, including the rainstorm that occurred on July 8, 2013 which affected a number of homes in the neighbourhood.

Refer to **Figure 1-1** for an overview of the larger Study Area and **Figure 1-2** for the general work/project area based on the area identified to be further investigated through the Matrix Solutions Inc. Flood Study. The general work/project area encompasses the pedestrian walkway from Etude Drive to Capricorn Crescent, Honeysuckle Avenue, and the pedestrian pathway from Michaud Avenue to Justine Drive. The general work/project area also includes portions of Derry Greenway Park.

Figure 1-1: Study Area

Figure 1-2: General Work/ Project Area



2. Municipal Class Environmental Assessment Planning Process

2.1 Overview

All municipalities in Ontario are subject to the provisions of the Ontario *Environmental Assessment Act* and its requirements to prepare an Environmental Assessment for applicable public works projects. The Ontario Municipal Engineers Association "Municipal Class Environmental Assessment" manual (October 2000, as amended in 2007, 2011,2015, and 2023) provides municipalities with a phased planning procedure, to plan and undertake all municipal sewage, water, stormwater management and transportation projects that occur frequently, are usually limited in scale and have a predictable range of environmental impacts and applicable mitigation measures. This study has been undertaken in accordance with the 2015 "Municipal Class Environmental Assessment" manual as it was initiated prior to the release of the amended Municipal Class Environmental Assessment manual in March 2023.

In Ontario, infrastructure projects are subject to the Municipal Class Environmental Assessment process and must follow a series of mandatory steps as outlined in the Municipal Class Environmental Assessment manual. The Municipal Class Environmental Assessment manual consists of five phases and the application of the phases depends on the Municipal Class Environmental Assessment Schedule that applies to a project. The phases are summarized below:

- **Phase 1 – Problem or Opportunity:** Identify the problems or opportunities to be addressed and the needs and justification.
- **Phase 2 – Alternative Solutions:** Identify alternative solutions to the problems or opportunities by taking into consideration the existing environment, and establish the preferred solution considering public and agency review and input.
- **Phase 3 – Alternative Design Concepts for the Preferred Solution:** Examine alternative methods of implementing the preferred solution based upon the existing environment, public and agency input, anticipated environmental effects and methods of minimizing negative effects and maximizing positive effects.
- **Phase 4 – Environmental Study Report:** Document in an Environmental Study Report, a summary of the rationale, planning, design and consultation process for the project as established through Phases 1 to 3 above and make such documentation available for scrutiny by review agencies and the public.

- **Phase 5 – Implementation:** Complete contract drawings and documents, proceed to construction and operation, and monitor construction for adherence to environmental provisions and commitments. Also, where special conditions dictate, monitor the operation of the completed facilities.

Phases 1, 2 and 5 of the Municipal Class Environmental Assessment process apply to this project as it falls under the Schedule B project category. The Municipal Class Environmental Assessment process ensures that all projects are carried out with effectiveness, efficiency and fairness. The process serves as a mechanism for understanding economic, social and environmental concerns while implementing improvements to municipal infrastructure.

2.2 Project Planning Schedules

The Municipal Class Environmental Assessment as per the 2015 Municipal Engineers Association “Municipal Class Environmental Assessment” manual defines four types of projects and the processes required for each (referred to as Schedule A, A+, B, or C). The selection of the appropriate schedule is dependent on the anticipated level of environmental impact, and for some projects, the anticipated construction costs. Projects are categorized according to their environmental significance and their effects on the surrounding environment. This study is categorized as a schedule B planning activity. The following describes the Municipal Class Environmental Assessment planning schedules in accordance with the 2015 Municipal Engineers Association “Municipal Class Environmental Assessment” manual:

- **Schedule A:** Projects are limited in scale, have minimal adverse environmental effects and include a number of municipal maintenance and operational activities. These projects are pre-approved and may proceed to implementation without following the full Municipal Class Environmental Assessment planning process.
- **Schedule A+:** The purpose of Schedule A+ is to ensure appropriate public notification for certain projects that are pre-approved under the Municipal Class Environmental Assessment. It is appropriate to inform the public of municipal infrastructure project(s) being constructed or implemented in their area.
- **Schedule B:** Projects have the potential for some adverse environmental effects. The proponent is required to undertake a screening process (Phases 1 and 2), involving mandatory contact with directly affected public and with relevant review agencies to ensure that they are aware of the project and that their concerns are addressed. If there are no outstanding concerns,

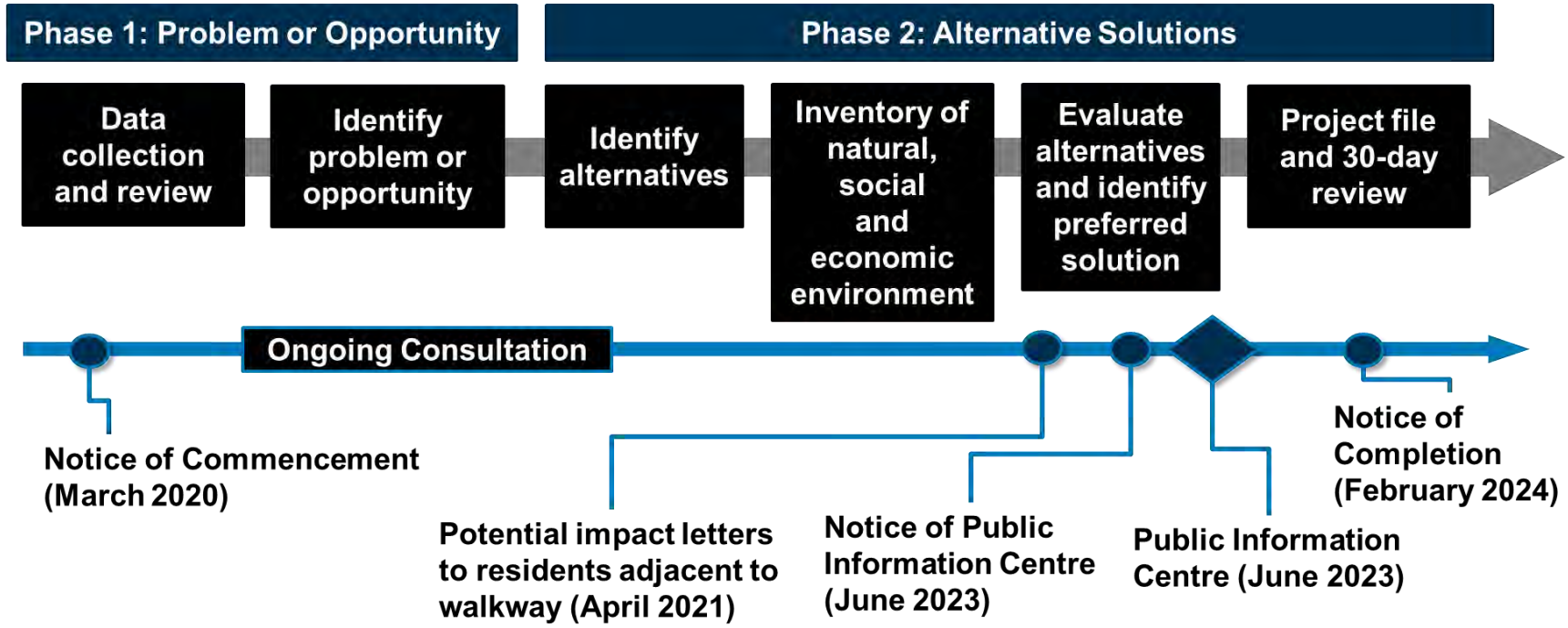
then the proponent may proceed to implementation. At the end of Phase 2, a Project File documenting the planning process followed through Phases 1 and 2 shall be finalized and made available for public and agency review. However, if a concern is raised related to aboriginal and treaty rights which cannot be resolved, a Section 16 Order may be requested and considered by the Minister of the Environment, Conservation and Parks.

- **Schedule C:** Projects have the potential for significant adverse environmental effects and must proceed under the full planning and documentation (Phases 1 to 4) procedures specified in the Municipal Class Environmental Assessment manual. Schedule C projects require that an Environmental Study Report be prepared and filed for review by the public and review agencies. If concerns related to aboriginal and treaty rights are raised that cannot be resolved then a Section 16 Order may be requested.

2.2.1 Flood Mitigation Planning Schedule

As per the Ontario Municipal Engineers Association Municipal Class Environmental Assessment manual (October 2000, as amended in 2007, 2011 and 2015), establishing, extending or enlarging a sewage collection system and all works necessary to connect the system to an existing sewage outlet where such facilities are not in an existing road allowance or an existing utility corridor is a Schedule B activity. As this study involved screening of alternative solutions that require storm sewer infrastructure outside the existing road allowance, Phases 1 and 2 of the Municipal Class Environmental Assessment planning process as described above (**Section 2.1**) apply to this study. **Figure 2-1** provides a general overview of the Environmental Assessment planning process undertaken.

Figure 2-1: Overview of Schedule B Environmental Assessment Planning Process



2.3 Communications and Consultation Overview

A key priority of community engagement has been to encourage the participation of residents along the City's pedestrian walkway, as well as other stakeholders, key review agencies, Indigenous communities and the Malton community. The following summarizes the key activities undertaken:

- Development of a contact list at the onset of the study that was regularly updated.
- Distribution of notifications to residents, key review agencies, stakeholders, Indigenous communities and interested members of the public.
- Distribution of letters to residents outlining the specific potential impacts to City-owned lands adjacent to their property beside the pedestrian walkway, within the road boulevard or beside the outlet structure and channel.
- Posting of key information to the City's website.
- Posting a narrated Public Information Centre video to the City's website to provide residents in the Malton community, stakeholders, key review agencies, and Indigenous communities an opportunity to learn about the project and provide feedback.
- Engagement with key review agencies, including meeting with Toronto and Region Conservation Authority staff.

All comments received were considered and addressed to the extent possible by the Study Team. Refer to **Section 10** for the overview of consultation completed for Phases 1 and 2 of this Municipal Class Environmental Assessment study.

3. Existing Conditions

3.1 Technical Environment

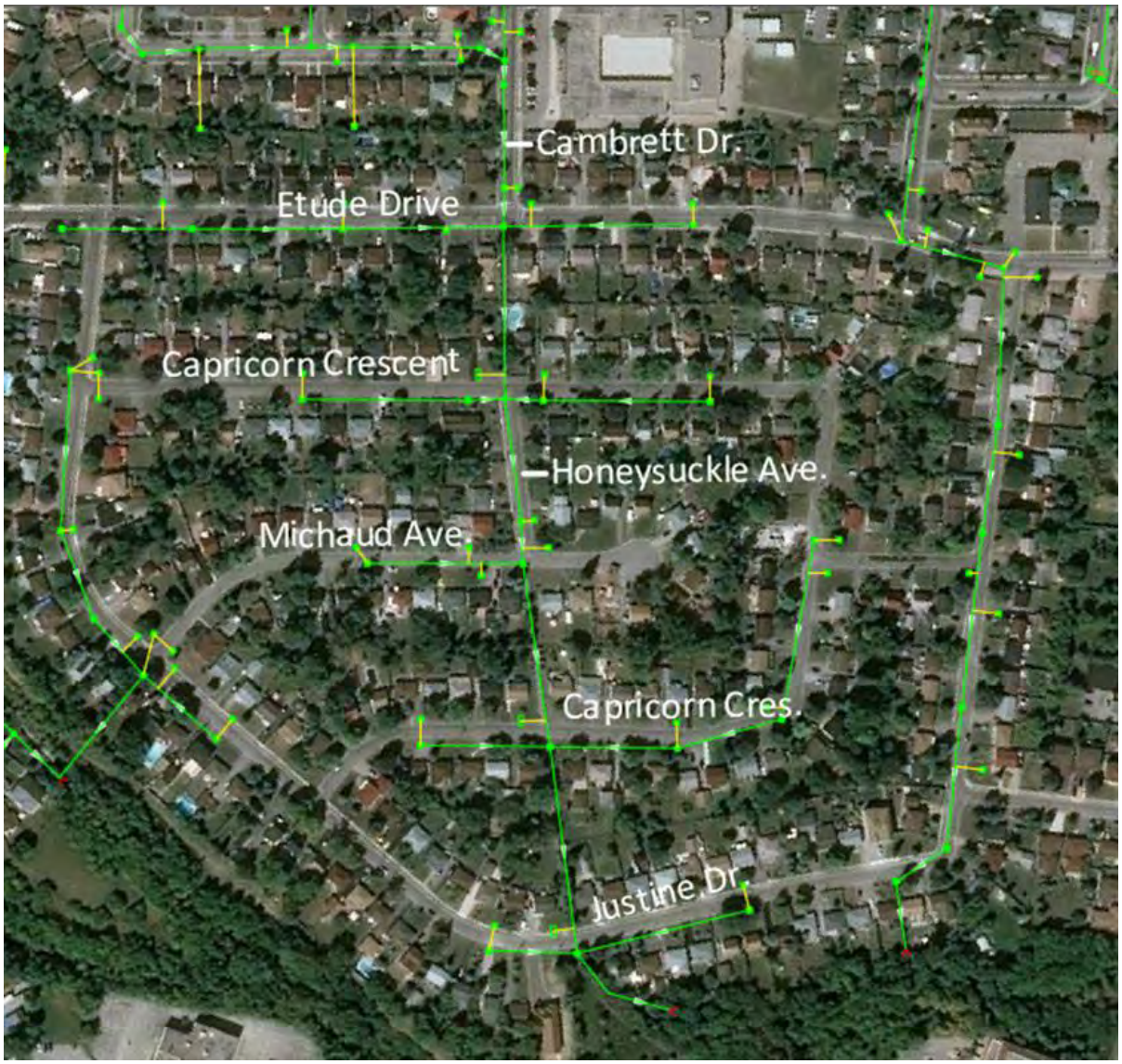
3.1.1 Storm Sewer Network

Minor flows within the Study Area are conveyed by a storm sewer network that mirrors the major system, with a 1,650 millimetre diameter trunk storm sewer beneath the Study Area which outlets just south of Justine Drive to Mimico Creek. Engineering plan and profile drawings were obtained from the City to determine the details of the minor system. A plan of the storm sewers within the Study Area is shown below in **Figure 3-1**.

The existing storm system is undersized as the trunk sewer is only able to convey the 2-year storm flow.

Refer to **Appendix A (Stormwater Management Report – Conceptual Design)** and **Appendix B (Flood Mitigation Preliminary Design Report)** for an overview of existing conditions within the general work/project area.

Figure 3-1: Existing Storm Sewers



3.1.2 Outlet Structure South of Justine Drive Upstream of Mimico Creek

The existing outlet structure consists of a concrete headwall with the 1,600 millimetre diameter storm trunk sewer. The trunk sewer discharges into a small channel that conveys runoff from the Malton neighbourhood to Mimico Creek. The channel has vertical gabion basket walls at the outlet structure, and farther downstream the channel transitions to a more natural cross-section. Below are photos of the outlet structure and channel.

Figure 3-2: Existing Outlet Structure and Channel

3.1.3 Utilities

Utilities within the general project/work area include:

- A Region of Peel sanitary sewer within the City owned property (pedestrian walkway easement) slightly off set and below the existing 1,650 millimetre storm sewer.
- Region of Peel local watermain and associated service connections to the residences within the Study Area.
- Enbridge natural gas supply and associated service connections to the residences within the Study Area.
- Various service provider communication cables and associated service connections to the residences within the Study Area.
- Alectra electrical wires and associated service connections to the residences within the Study Area.

3.2 Transportation

3.2.1 Road Network

The road network within the general project/work area includes several local roads, including, among others, Honeysuckle Avenue, Michaud Avenue, Capricorn Crescent and Justine Drive.

Etude Drive is designated as a Minor Collector Road as per the City's Official Plan (Office Consolidation March 3, 2023).

3.2.2 Transit Network

The City of Mississauga MiWay services run across Mississauga on weekdays and weekends. The following transit routes service the larger Study Area: 11, 16,18, 24, 30, and 107. Route 24 services the general work/project area along Etude Drive.

3.2.3 Cycling Network

Pursuant to the City's Cycling Master Plan (2018), Etude Drive is a signed route and the pedestrian walkway from Etude Drive to Capricorn Crescent, Honeysuckle Drive, and the pedestrian walkway from Michaud Avenue to Justine Drive is identified as a connecting trail.

3.2.4 Pedestrian Network

In terms of the pedestrian network, there are sidewalks on several roads within the Study Area. In the Pedestrian Master Plan (2021), the pedestrian walkway from Etude Drive to Capricorn Crescent, Honeysuckle Drive, and the pedestrian walkway from Michaud Avenue to Justine Drive is identified as an engineered walkway.

There is an existing pedestrian trail south of Justine Drive though Derry Greenway Park that connects to a multi-use trail. Ridgewood Park along Cambrett Drive in the Study Area also contains existing pedestrian trails.

3.3 Stormwater Management

The general project/work area encompasses the pedestrian walkway from Etude Drive to Capricorn Crescent, Honeysuckle Avenue, and the pedestrian walkway from Michaud Avenue to Justine Drive, as well as a section between Justine Drive and the outfall channel to the south. This City-owned land is situated at the topographical low point of the subdivision, receiving major and minor flows from the north, east and west, discharging to Mimico Creek downstream. However, as-built drawings show that this walkway was not designed as an overland flow route, with a cross-section not able to properly convey flow.

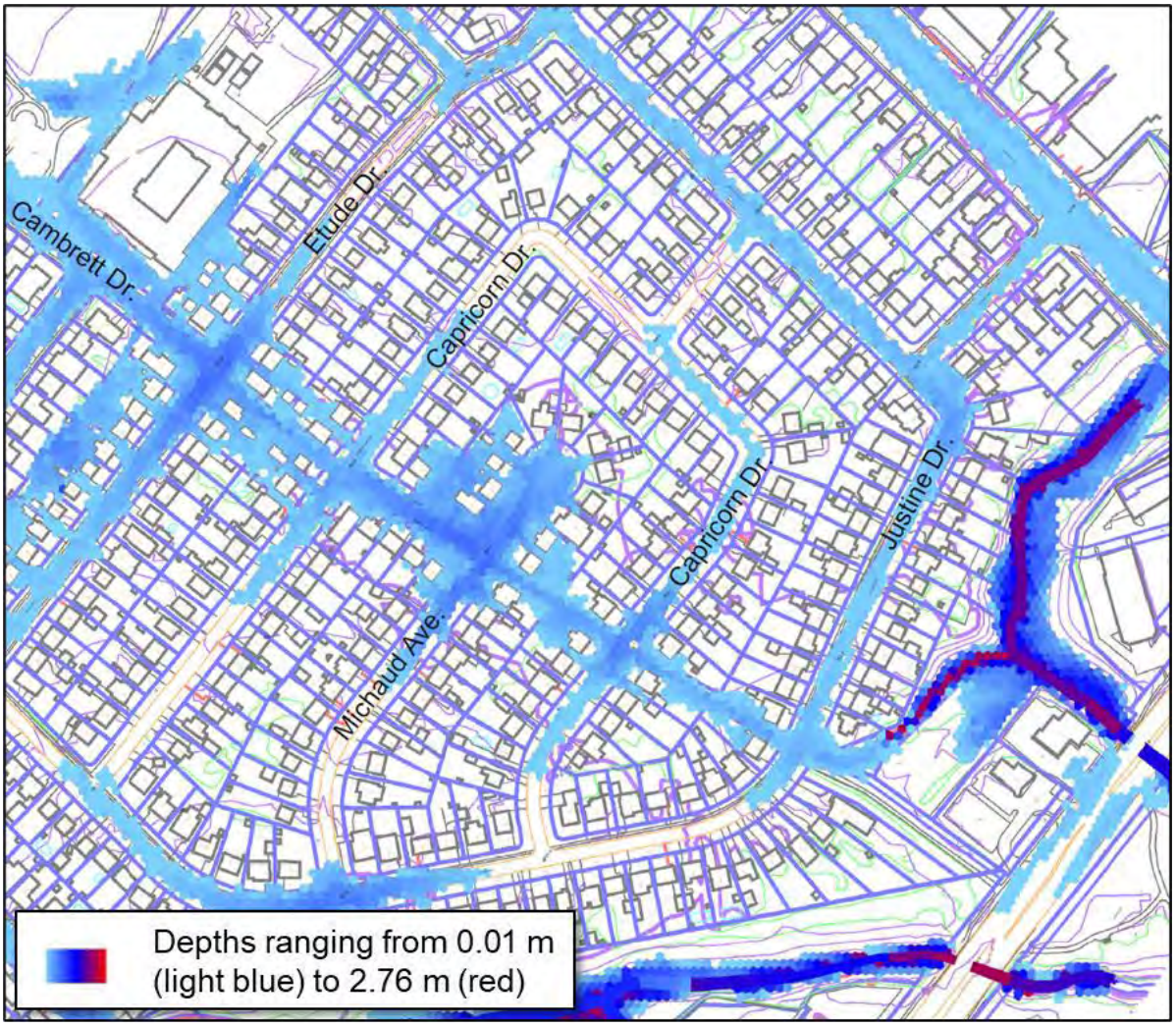
The Matrix PCSWMM model was truncated to eliminate any areas not relevant to this Malton Flood Study. The existing storm sewer network throughout the Study Area and upstream was added to the model, as referenced from as-built drawings and City data. Subcatchments and rain gauges were adjusted to include the minor system, and storm sewer inlets were added connecting the minor system to the overland surface.

The existing conditions model was run for all storm events and the major and minor systems through the Study Area were analysed. It was found that the existing minor system is not quite able to capture and convey the 2-year event.

During a 2-year storm the model results show that two houses would be impacted by flooding and the trunk storm sewer would be surcharged, indicating that the current major system has less than a 2-year capacity.

During a 100-year event the minor system would surcharge and spill, and overland flow would spread to houses adjacent to the pedestrian walkway easement. The model results (**Figure 3-3**) show that during a 100-year event 38 houses would be impacted.

Figure 3-3: Results of 100-year storm event



The capacity of the existing major and minor systems as compared to the 100-year flowrate (required capacity) was determined. The combined capacity of the existing

major and minor system is approximately 8.2 metres cubed per second, and the peak flowrate of a 100-year event is 16.6 metres cubed per second. This indicates that an additional 8.4 metres cubed per second capacity is required to properly convey the existing 100-year flows from the Study Area, or other measures, likely in combination, be applied to alleviate the flooding.

Refer to **Appendix A** for the complete **Stormwater Management Report** and **Appendix B** for the **Flood Mitigation Preliminary Design Report**.

3.4 Natural Environment

A review of secondary sources was completed in addition to field investigations to confirm existing conditions. Hereafter summarizes the existing natural environment conditions. Refer to **Appendix C** for the complete Natural Environment Report.

3.4.1 Designated Natural Areas and Policy Areas

According to the Ministry of Natural Resources and Forestry's Make-a-Map Natural Heritage Application Tool, there are no Area of Natural and Scientific Interest, provincially, locally significant or unevaluated wetlands within the Study Area; however, the valley lands associated with Mimico Creek are considered Significant Valleyland by the City as per the City's Official Plan (2023).

The Study Area also falls partially within the Significant Natural Areas and Natural Green Spaces of the City of Mississauga's Natural Heritage System and consists of Greenlands, Mixed Use, and Residential Low Density I Land Use Designations.

Furthermore, the Study Area falls within the limits of Ontario Regulation 166/06 Toronto and Region Conservation Authority: Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses.

3.4.2 Aquatic Ecology

3.4.2.1 Aquatic Background Information

The Study Area falls within the Mimico Creek Watershed and includes the storm drain outlet channel and a reach of the main branch of Mimico Creek. According to the Mimico Creek Watershed Report Card (Toronto and Region Conservation Authority, 2018), the watershed has the lowest proportion of natural cover in the Toronto and Region Conservation Authority jurisdiction and has chronic surface water quality impairments, particularly elevated chloride concentrations. Ministry of Natural Resources and Forestry (2020) Aquatic Resource Area data indicate that the reach of Mimico Creek within the Study Area has a warmwater thermal regime. The warmwater

thermal regime classification was confirmed for both Mimico Creek and the storm drain outlet channel by Toronto and Region Conservation Authority (O. Obembe, personal communication, September 28, 2020). Fish community data (Ministry of Natural Resources and Forestry, 2020) associated with the reach of Mimico Creek within the Study Area are presented in **Table 3-1**. Fish species documented at the nearest Toronto and Region Conservation Authority monitoring station (MM005WM) to the Study Area from 2002 to 2014 have also been incorporated (Toronto and Region Conservation Authority, 2020). No aquatic Species at Risk were identified as present or potentially present within the Study Area from open background data sources. A response from Ministry of Natural Resources and Forestry to the information request letter did not identify any additional or missing aquatic Species at Risk data.

3.4.2.2 Aquatic Existing Conditions

The storm drain outlet channel and location of works associated with Alternatives 1, 2 and 3, identified on **Figure 3-4** was assessed from the outlet structure south of Justine Drive to the confluence with Mimico Creek. The storm drain outlet channel was a permanent watercourse channelized for the first approximately 30 metres from the outlet becoming more naturalized for the remaining approximately 70 metres downstream toward the confluence with the main branch of Mimico Creek. The banks and streambed of the outlet channel were armoured by Gabion baskets in the channelized reach. In the unarmoured reach, the substrates consisted of sand, silt, gravel, and clay, in order of abundance. The wetted width of the channel ranged from 3.0 to 4.0 metres with a mean of 3.5 metres and the wetted depth ranged from 0.35 to 0.65 metres with a mean of 0.4 metres. The bankfull width ranged from 4.0 to 4.5 metres and the bankfull depth from 0.5 to 0.9 metres. Both the left and right upstream banks (i.e. facing upstream) were moderately unstable with scouring observed the full length of the assessed reach downstream of the Gabion basket armouring. Substantial undercutting (0.4 to 0.5 metres) of the left upstream bank was observed immediately downstream of the Gabion baskets and substantial slope failure was observed on the right upstream bank at the last meander bend upstream of the confluence with Mimico Creek. Multiple leaning or fallen trees were observed, providing further evidence of bank instability. The channel morphology was predominantly (95%) slow flowing flat with sparse pools (5%) associated with in-water trees and the scour pool at the end of the Gabion baskets. In-stream cover was sparse, limited to woody debris, cobble from the Gabion baskets, and the one undercut bank. No impediments to fish movement were observed within the outlet channel downstream of the outlet structure, which had an open connection to Mimico Creek downstream; however, a large debris jam was observed in Mimico Creek approximately 15 metres downstream of the confluence. No fish were observed in either the outlet channel or Mimico Creek at the time of assessment.

Table 3-1: Mimico Creek Fish Community Data

Common Name	*Scientific Name*	S-Rank (Note 1)	SARA (Note 2)	ESA (Note 3)	Source
Blacknose Dace	*Rhinichthys atratulus*	S5	Not at Risk	Not at Risk	Ministry of Natural Resources and Forestry
Bluntnose Minnow	*Pimephales notatus*	S5	Not at Risk	Not at Risk	Ministry of Natural Resources and Forestry
Brook Stickleback	*Culaea inconstans*	S5	Not at Risk	Not at Risk	Ministry of Natural Resources and Forestry, Toronto and Region Conservation Authority
Common Shiner	*Luxilus cornutus*	S5	Not at Risk	Not at Risk	Ministry of Natural Resources and Forestry
Creek Chub	*Semotilus atromaculatus*	S5	Not at Risk	Not at Risk	Ministry of Natural Resources and Forestry, Toronto and Region Conservation Authority
Fathead Minnow	*Pimephales promelas*	S5	Not at Risk	Not at Risk	Ministry of Natural Resources and Forestry, Toronto and Region Conservation Authority
Mottled Sculpin	*Cottus bairdii*	S5	Not at Risk	Not at Risk	Ministry of Natural Resources and Forestry
White sucker	*Catostomus commersonii*	S5	Not at Risk	Not at Risk	Ministry of Natural Resources and Forestry, Toronto and Region Conservation Authority

Note 1. **S-rank:** The natural heritage provincial ranking system (provincial S-rank) is used by the Ministry of Natural Resources and Forestry NHIC. National and Subnational Conservation Status Definitions available at http://explorer.natureserve.org/nsranks.htm:
S5 - Secure—Common, widespread, and abundant in the nation or state/province.

Note 2. **SARA Status:** The following are definitions of the SARA status rankings assigned to each species in the table above:

Not at Risk: These species have either been assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as Not at Risk or there is not enough data to assess the status ranking of the species and therefore these are not listed on Schedule 1 nor do they receive protection under SARA.

Source: Government of Canada, 2009: Frequently Asked Questions: What are the SARA schedules? Accessed on January 2017. Available: http://www.dfo-mpo.gc.ca/species-especes/faq/faq-eng.htm

Note 3. **ESA Status:** Not at Risk – A species that has been evaluated and found to be not at risk.

Figure 3-4: Ecological Investigations

3.4.3 Vegetation Communities

Field investigations were completed by an AECOM Ecologist on October 28, 2020. Vegetation communities within the Study Area were assessed and classified into Ecological Land Classification units as per Lee *et al.* (1998) using a combination of aerial photography interpretation and field investigations. This system provides a standard for comparing similar communities across Ontario. This protocol classifies vegetation communities through the completion of a multilayer (canopy, sub-canopy, ground cover) vegetation inventory. A summary of disturbance factors, community conditions, plant species list and representative photographs were also recorded for each vegetation patch (refer to **Appendix C**).

With the exception of the natural area surrounding the existing outlet and associated channel to Mimico Creek south of Justine Drive, the Study Area lacked any natural vegetation communities and was limited to residential homes, mowed lawn at the Ridgewood Park and street trees planted within the manicured road right-of-way and private properties. A total of two vegetation communities were identified within 120 metres of the existing outfall to Mimico Creek (henceforth referred to as the Outlet Study Area) and are described below.

Dry-Moist Old Field Meadow Type (CUM1-1): This cultural meadow community was located along the southeast banks of the Mimico Creek. This community was dominated by smooth brome (*Bromus inermis*), Virginia wildrye (*Elymus virginicus*), Canada goldenrod (*Solidago canadensis*) and late goldenrod (*Solidago altissima*). Other herbaceous species observed included wild parsnip (*Pastinaca sativa*), Canada thistle (*Cirsium arvense*), garlic mustard *(Alliaria petiolata*), purple loosestrife (*Lythrum salicaria*), Kentucky bluegrass (*Poa pratensis*) and big bluestem (*Andropogon gerardi*). Trees and shrubs were scattered across the community and included species such as Freeman's maple (*Acer x freemanii*), white spruce (*Picea glauca*), eastern white cedar (*Thuja occidentalis*), Manitoba maple (*Acer negundo*), cottony willow (*Salix eriocephala*), multiflora rose (*Rosa multiflora*), Bebb's willow (*Salix bebbiana*) and red-osier dogwood (*Cornus sericea*).

Fresh-Moist Lowland Deciduous Forest Ecosite (FOD7): This forest community was located along the banks of the stormwater outlet channel and Mimico Creek. The community was dominated by Freeman's maple, Norway maple (*acer platanoides*), Manitoba maple and hybrid crack willow (*Salix x rubens*). The sub-canopy was dominated by common buckthorn (*Rhamnus cathartica*), eastern white cedar, European black alder (*Alnus glutinosa*), black cherry (*Prunus serotine*) and staghorn sumac (*Rhus typhina*). Species within the shrub layer included common buckthorn, English hawthorn (*Crataegus monogyna*), *staghorn* sumac and Morrow's Honeysuckle (*Lonicera*

morrowii). Abundant species observed in the ground cover layer included common buckthorn, wood avens (*Geum urbanum*), lesser periwinkle (*Vinca minor*) and Virginia wildrye.

No Species at Risk or Species of Conservation Concern plant species were recorded. Ecological Land Classification community delineations are displayed on **Figure 3-4.** No vegetation communities were present within the footprint for the potential underground storage at Ridgewood Park and are not included in **Figure 3-4**.

3.4.4 Significant Wildlife Habitat

A Significant Wildlife Habitat screening exercise was conducted using the Ecoregion 7E criteria schedules (Ministry of Natural Resources and Forestry 2015) to determine the presence of candidate Significant Wildlife Habitat in the Study Area. Species listed as Special Concern (SC) under the provincial Endangered Species Act, with a provincial S-Rank of S1 to S3, or species that are listed as Endangered (END) or Threatened (THR) by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) are referred to as species of conservation concern (SOCC; Ministry of Natural Resources and Forestry 2000). Habitat for these species is considered Significant Wildlife Habitat and is afforded protection under the Provincial Policy Statement (2020). The Significant Wildlife Habitat Technical Guide (SWHTG; MRNF 2000) divides wildlife habitat into four categories:

- Seasonal Concentration Areas
- Rare Vegetation Communities or Specialized Habitats for Wildlife
- Habitats of Species of Conservation Concern
- Animal Movement Corridors

Field investigations identified three candidate Significant Wildlife Habitat types within the outlet Study Area; Bat Maternity Colonies, Marsh Breeding Bird Habitat and Special Concern and Rare Wildlife Species. Existing conditions did not meet criteria for SWH in Ridgewood Park. Details on the identified candidate Significant Wildlife Habitat are presented below and the Significant Wildlife Habitat screening document is provided in Appendix B of the **Natural Environment Report (Appendix C)**. A full list of species of conservation concern and their probability of occurrence within the Study Area is provided in **Table 3-2**.

3.4.5 Candidate Significant Wildlife Habitat

Marsh Breeding Bird Habitat – The cultural meadow community found within the boundaries of the Outlet Study Area may provide suitable breeding bird habitat for Green Heron (*Butorides virescens)*. According to the Ministry of Natural Resources and Forestry (2015) habitat for Green Heron includes the boundaries of sluggish streams, ponds and marshes sheltered by shrubs and trees and as such communities such as cultural meadows adjacent to suitable watercourses should be considered candidate Significant Wildlife Habitat. The suitable cultural meadow within the Study Area is located on the opposite bank of the outlet channels confluence with Mimico Creek and is not expected to be impacted by the proposed works.

Bat Maternity Colonies – The majority of trees within the Outlet Study Area were found to be unsuitable habitat for bats as they were too small and lacked suitable cavities for roosting. However, large trees capable of providing suitable roosting habitat for Species at Risk bats such as crack willow and Freeman's maple are present within the FOD7 community. As no suitable cavities for roosting were observed, leaf-off surveys for bat habitat were not conducted during field investigations. As such, the FOD7 community remains candidate habitat for bat maternity colonies. Candidate habitat also exists along both the east and west branches of Mimico Creek and Paul Coffey Park to the south.

Special Concern / Rare Wildlife Species – Candidate habitat for Special Concern species exists within Mimico Creek and the vegetation communities found within the Study Area. The FOD7 community provides candidate habitat for eastern Wood-pewee (*Contopus virens*) and Wood Thrush (*Hylocichla mustelina*), the CUM1-1 community provides candidate habitat for Monarch (*Danaus plexippus*) and Mimico Creek provides candidate habitat for Snapping Turtle (*Chelydra serpentine*). The outlet channel does not provide overwintering habitat for Snapping Turtle; however, this species may travel up the naturalized portion of the channel and into the adjacent parkland in search of potential nesting spots, although this is unlikely as well. All species are listed as Special Concern under the *Endangered Species Act*. As species specific surveys were not conducted during field investigations the FOD7 community, CUM1-1 community and Mimico Creek all remain candidate habitat for Special Concern / Rare Wildlife Species.

Table 3-2: Species of Conservation Concern Habitat Screening

Taxon	Common Name	Scientific Name	S-Rank[1]	COSEWIC[2]	SARA Schedule 1[3]	ESA[4]	Last Year Observed	Historical Record	Source	Probability of Occurrence within the Outlet Study Area
Birds	Barn Swallow*	*Hirundo rustica*	S5B	THR	THR	THR	2014	No	eBird, OBBA	**Low** – Both bridges located along Derry Road East may provide suitable nesting habitat. However, both structures are outside of the proposed alternatives and are not expected to be impacted by the proposed works.
Birds	Common Nighthawk	*Chordeiles minor*	S4B	SC	THR	SC	2016	No	OBBA	**Low** – Deciduous forest is present within the Study Area; however, the understory was covered in dense vegetation.
Birds	Eastern Wood-Pewee	*Contopus virens*	S4B	SC	SC	SC	2020	No	OBBA	**Medium** – forests may provide suitable breeding habitat.
Birds	Grasshopper Sparrow	*Ammodramus savannarum*	S4B	SC	SC	SC	2014	No	OBBA	**Low** – no suitable hayfields, pastures or grasslands present.
Birds	Purple Martin	*Progne subis*	S3S4B	-	-	-	2001-2005	No	OBBA	**Low** – forests and artificial next boxes within the Study Area, if present, may provide suitable breeding habitat. No roosting habitat was observed within the Outlet Study Area.
Birds	Wood Thrush	*Hylocichla mustelina*	S4B	THR	THR	SC	2020	No	OBBA	**Medium** – forests may provide suitable breeding habitat.
Insect	Monarch	*Danaus plexippus*	S2N, S4B	END	SC	SC	2019	No	OBA	**Medium** – A cultural meadow with common milkweed (*Asclepias syriaca*) is present within the Study Area.
Turtle	Snapping Turtle	*Chelydra serpentina*	S4	SC	SC	SC	2019	No	ORAA	**Medium** – Mimico Creek may provide suitable habitat. Snapping Turtle may travel up the naturalized potion of the outlet channel in search for nesting sites in the parkland.

Note 1. ***S-rank:*** *The natural heritage provincial ranking system (provincial S-rank) is used by the* Ministry of Natural Resources and Forestry *NHIC.* National and Subnational Conservation Status Definitions available at http://explorer.natureserve.org/nsranks.htm:

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.

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.

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").

Note 2. ***OSEWIC Status:*** *COSEWIC (Committee on the Status of Endangered Wildlife in Canada) assigns a federal status ranking for all species that it assesses. Rankings include:*

THR *(Threatened) - A species likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.*

SC *(Special Concern) - A species of special concern because of characteristics that make it particularly sensitive to human activities or natural events, but does not include an extirpated, endangered or threatened species.*

Note 3. ***SARA Status****:* *The following are definitions of the SARA status rankings assigned to each species in the table above:*

THR (Schedule 1) *– These species are listed as Threatened under Schedule 1 of SARA and receive species and habitat protection under SARA, as well as recovery strategies and action plans.*

SC (Schedule 1) *– These species are listed as Special Concern under Schedule 1 of SARA and receive management initiatives under SARA to prevent them from becoming endangered and threatened.*

Note 4. ***ESA Status:*** ***SC*** *(Special Concern) – A species that may become threatened or endangered due to a combination of biological characteristics and identified threats.*

Note: * Barn Swallow was down-listed from Threatened to Special Concern under the Endangered Species Act, 2007 on January 25, 2023 and no longer receives the individual and habitat protection provided under Sections 9 and 10 of the Act; however, this species is now considered to be a Species of Conservation Concern and still receives protection under the Migratory Birds Convention Act, 1994, Provincial Policy Statement and Mississauga Official Plan (2023).

3.4.6 Species at Risk

A Species at Risk habitat assessment was undertaken for the eight Species at Risk records identified during the background review process to determine if suitable habitat for these species was potentially present within the Study Area. For the purpose of this report, Species at Risk are defined as those species listed as Threatened, Endangered or Extirpated and receive individual and habitat protections under Sections 9 and 10 of the provincial Endangered Species Act. This assessment was initially based on the characterization of vegetation communities using aerial photo interpretation and was further refined using the terrestrial existing conditions and Ecological Land Classification communities observed during field investigations. The Species at Risk habitat assessment is provided in Appendix C of the **Natural Environment Report (Appendix C)** and includes habitat preferences and a description of potentially suitable habitat within the Study Area. A summary of the habitat assessment is provided in **Table 3-3**.

Candidate habitat for five Species at Risk was identified in the Outlet Study Area, including: Little Brown Myotis (*Myotis lucifugus*), Northern Myotis (*Myotis septentrionalis*), Eastern Small-footed Myotis (*Myotis leibii*),Tricolored Bat (*Perimyotis subflavus*), and Chimney Swift. Potential bat Species at Risk habitat exists as large crack willow and Freeman's maple trees capable of providing suitable habitat for roosting are found a within the FOD7 community. Candidate habitat for Chimney Swift also exists within the entire Study Area in the form of anthropogenic structures such as uncapped chimneys on buildings. Species at Risk presence/absence surveys were not completed and therefore, the probability of occurrence for the above identified Species at Risk was considered as medium based on presence of potentially suitable habitat. Further investigations may be required once the final design is available to determine if there will be an impact on potential Species at Risk bat habitat.

Table 3-3: Species at Risk Habitat Screening

Taxon	Common Name	Scientific Name	S-Rank[1]	COSEWIC	SARA Schedule 1	ESA[4]	Last Year Observed	Historical Record	Source	Probability of Occurrence within the Outlet Study Area
Birds	Bank Swallow	*Riparia*	S4B	THR	THR	THR	2001-2005	No	OBBA	**Low** – Suitable nesting habitat was not observed.
Birds	Bobolink	*Dolichonyx oryzivorus*	S4B	THR	THR	THR	2001-2005	No	OBBA	**Low** – no suitable hayfields, pastures or grasslands present.
Birds	Chimney Swift	*Chaetura pelagica*	S4B,S4N	THR	THR	THR	2001-2005	No	OBBA	**Medium** – buildings with uncapped chimneys, if any, may provide suitable roosting/nesting habitat.
Birds	Eastern Meadowlark	*Sturnella magna*	S4B	THR	THR	THR	2001-2005	No	OBBA	**Low** – no suitable hayfields, pastures or grasslands present.
Mammal	Eastern Small-footed Myotis	*Myotis leibii*	S2S3	-	-	END	Not available	No	BCI	**Medium** – buildings and forest (FOD7) may provide suitable roosting habitat.
Mammal	Little Brown Myotis	*Myotis lucifugus*	S3	END	END	END	Not available	No	BCI	**Medium** – buildings and forest (FOD7) may provide suitable roosting habitat.
Mammal	Northern Myotis	*Myotis septentrionalis*	S3	END	END	END	Not available	No	BCI	**Medium** – forest (FOD7)may provide suitable roosting habitat.
Mammal	Tricolored Bat	*Perimyotis subflavus*	S3?	END	END	END	Not available	No	BCI	**Medium** – forest (FOD7)may provide suitable roosting habitat.

Note 1: ***S-rank:*** *The natural heritage provincial ranking system (provincial S-rank) is used by the* Ministry of Natural Resources and Forestry *NHIC.* National and Subnational Conservation Status Definitions available at http://explorer.natureserve.org/nsranks.htm:

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.
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.
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").

Note 2: ***COSEWIC Status:*** *COSEWIC (Committee on the Status of Endangered Wildlife in Canada) assigns a federal status ranking for all species that it assesses. Rankings include:*

THR *(Threatened) - A species likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.*
SC *(Special Concern) - A* species *of special concern because of characteristics that make it particularly sensitive to human activities or natural events, but does not include an extirpated, endangered or threatened species.*
[3]SARA Status*: The following are definitions of the SARA status rankings assigned to each species in the table above:*
END (Schedule 1) *– These* species *are listed as Endangered under Schedule 1 of SARA and receive species and habitat protection under SARA, as well as recovery strategies and action plans.*
THR (Schedule 1) *– These* species *are listed as Threatened under Schedule 1 of SARA and receive species and habitat protection under SARA, as well as recovery strategies and action plans.*

Note 4: ***ESA Status:*** ***THR*** *(Threatened) - A species that is at* risk *of becoming endangered in Ontario if limiting factors are not reversed.*
END *(Endangered) - Endangered - a* species *facing imminent extinction or extirpation in Ontario which is a candidate for regulation under Ontario's Endangered Species Act.*

3.5 Tree Inventory

In anticipation of tree injuries and removals required to facilitate and support the Project, AECOM completed a tree inventory for the Preliminary Tree Inventory Study Area to assess the general health and structure of the onsite trees.

The Preliminary Tree Inventory Study Area is defined as the Project's Impact Area, based on the Project's Preliminary Design, as well as a 6 metre or 10 metre Buffer Area from the Impact Area to include additional trees that may be affected by the construction of the alternative solutions (**Figure 6-1**).

A total of 649 trees were inventoried and assessed within Preliminary Tree Inventory Study Area. **Table 3-4** provides a detailed summary of the total number of trees within each of the Project's alternatives and their relevant location category within that Project alternative.

Table 3-4: Summary of Tree Locations within Each Project Alternative

Project Alternative Number	Trees within Project Alternative Study Area	Trees within Project Alternative Impact Area	Trees within Project Alternative Buffer Area	Trees Outside Project Alternative Study Area	Trees Outside Preliminary Tree Inventory Study Area	Total Number of Trees
1	490	370	120	144	15	649
2	544	410	134	91	14	649
3	545	412	133	90	14	649
4	67	44	23	540	2	649
5	44	3	34	27	0	649

All trees surveyed as part of the tree inventory and assessment were found within an urban/natural environment and consisted of small, medium and large trees with Diameter at Breast Height measurements ranging from 1 centimetre to 50 centimetres; the average Diameter at Breast Height was 16 centimetres. **Table 3-5** provides a summary of the overall condition of the trees ranging from a rating of good to dead.

Table 3-5: Summary of Tree Condition

Tree Condition	Total Number of Trees
Good	242
Fair	333
Poor	33
Dead	39
Hazard	2
Total	649

Refer to **Section 0** for the preliminary tree impact analysis associated with each alternative and **Section 8** for the tree removal, preservation and maintenance recommendations for the preferred solution.

The tree inventory will be updated based on the final construction impact area during detail design. Refer to **Appendix D** for the complete **Arborist Report and Tree Preservation Plan**.

3.6 Fluvial Geomorphology

A fluvial geomorphology assessment has been undertaken to document fluvial geomorphological conditions along existing watercourses in the vicinity of the existing outlet that is proposed to be upgraded to convey flood waters within the study area. Fluvial geomorphic field work was completed along the Tributary of East Mimico Creek and East Mimico Creek itself as a consideration for potential outlet discharge. Specifically, the scope of work included:

- Background Review
- Delineation of Fluvial Geomorphological Reaches
- Reach-Scale Geomorphological Characterization
- Field Reconnaissance and Geomorphological Assessment
- Review of the PCSWMM 2D Modelling Outputs with Regards to Fluvial Geomorphological Processes

Refer to **Appendix E** for the **Fluvial Geomorphology Report**.

3.6.1 Reach Delineation and Characterization

Reaches can be defined as lengths of channel that display similar physical characteristics and have a setting that remains nearly constant along their length. Reaches display relative homogeneity in channel form, functions and process. Reaches are influenced by similar controlling (discharge and slope) and modifying factors (vegetation) to which the channel has become adjusted or will become adjusted to in the future. Reach breaks within the Study Area were first delineated through a desktop assessment of tributary locations, channel gradient, geology, valley setting, sinuosity, and riparian vegetation using Geographic Information System layers. The reaches were subsequently confirmed in the field.

The location of the reach breaks within the Study Area are shown in **Figure 3-5** and the reaches are further described below.

Reach EMC-1

Reach EMC-1 of the main branch of East Mimico Creek begins approximately 100 metres upstream of Goreway Drive and flows downstream approximately 200 metres downstream to the confluence with the main outfall channel located to the south of Justine Drive. The surrounding riparian vegetation consisted of herbaceous vegetation and mature trees and shrubs. The bed sediment was composed of fine materials (silt, sand, clay) as well as gravel and cobbles. The reach exhibited defined riffle pool morphology. It was noted that channel restoration work had been completed and there was vegetated rip-rap present.

The bankfull width was approximately 8 to 10 metres and the bankfull depth was approximately 1.5 to 1.7 metres. On the day of assessment, the wetted width was approximately 6 to 8 metres and the wetted depth was approximately 0.30 metres. The channel gradient was classified as low to moderate.

Reach EMC-2

Reach EMC-2 begins at the confluence with the outfall channel and the Main Branch of East Mimico Creek and then flows approximately 200 metres downstream of Derry Road East where it ends at a confluence with the small tributary of East Mimico Creek. The surrounding riparian vegetation consisted of herbaceous vegetation, small shrubs, and mature trees. The bed sediment consisted of fine material (silt, clay, sand) to small cobble sized materials. The reach exhibited well defined riffle pool morphology and was confined along the right bank. The channel restoration work continued into Reach EMC-2.

The bankfull width was approximately 6 to 8 metres and the bankfull depth was approximately 1 to 1.6 metres. The wetted width on the day of assessment was approximately 4 to 7 metres and the wetted depth on the day of assessment was approximately 0.40 metres. The channel gradient was classified as low to moderate.

EMCT-1

EMCT-1 begins at Lancaster Avenue and continues approximately 485 metres downstream to the confluence with the Tributary of East Mimico Creek. The channel is lined with concrete and is approximately 4.5 metres wide and 0.70 metres deep. In channel vegetation was observed within the concrete lined channel as well as overgrown mature trees and some trash, likely impacting the flow conveyance within the channel. At the end of the concrete channel there are steps leading into the naturalized channel, the total height is approximately 2 metres. At the transition point between the concrete and the natural channel there is an outfall approximately 1.70 metres diameter. There are gabion baskets lining the right bank with missing stone at the bottom. Further downstream there was bank erosion noted in the form of exposed roots and the channel

becomes confined within a valley with no access to the floodplain. The bed substate begins to transition to small boulders and there are multiple channel spanning debris jams. A concrete weir structure also exists just upstream of the reach break with an approximate 0.25 metres drop on the downstream side.

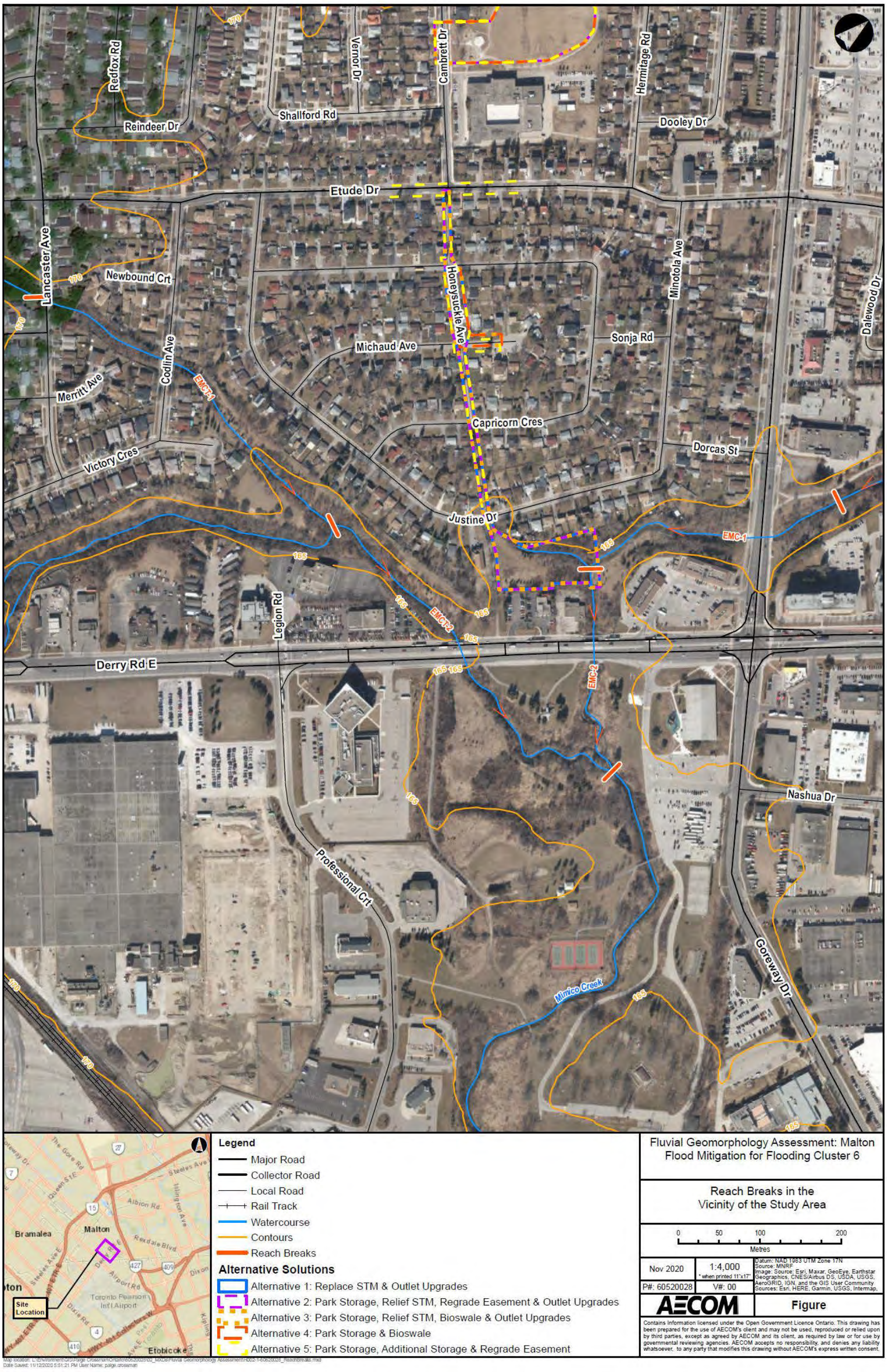
No bed morphology was noted along the channel, however fine sediment (including silt and sand) has begun to deposit on top of the concrete (approximately 0.11 metres). The gradient of the channel was classified as moderate and the channel has been straightened.

EMCT-2

EMCT-2 begins at the confluence with the Tributary of East Mimico Creek and ends approximately 450 metres downstream at the confluence with Reach EMC-2 along East Mimico Creek. Gabion baskets continue along the left bank for approximately 100 metres of the upstream reach boundary, the gabion is in poor condition with the bottom layer broken and vegetation growing within the gabion. Bank instability was noted through out the reach in the form of undercutting and bank slumping. The channel was confined along the left bank and had limited access to the floodplain along the right bank. Multiple woody debris jams were also noted throughout the reach. At the Derry Road crossing, the gabion was also undercut and there was deposition of cobble along both banks. It is likely that the reach had been straightened upstream of Derry Road.

The bankfull width was approximately 8.3 metres and the bankfull depth was approximately 1.1 metres. On the day of assessment, the wetted width was 7.2 metres and the wetted depth was approximately 0.19 metres. The gradient of the channel was classified as moderate and the bed substrate consisted of fine materials (clay, silt, sand) to boulder sized materials. The riparian vegetation consisted of herbaceous vegetation, shrubs and mature trees.

Figure 3-5: Reach Breaks



Map location: L:\Environment\GIS\Paige Crossman\Ontario\60520028\02_MXDs\Fluvial Geomorphology Assessment\H002-1-60520028_ReachBreaks.mxd
Date Saved: 11/12/2020 5:51:21 PM User Name: paige.crossman

3.6.2 Rapid Geomorphic Assessment

A Rapid Geomorphic Assessment was completed to assess reaches EMC-1, EMC-2 and EMCT-2. A Rapid Geomorphic Assessment could not be completed within Reach EMCT-1 because the channel was lined with concrete, therefore there was no channel morphology noted within the channel.

Reaches EMC-1 and EMC-2 were classified as transitional with a stability index of 0.25 and 0.34 respectively. This indicates that channel morphology is within a range of variance for streams of similar hydrographic characteristics, but the evidence of instability is frequent within throughout the reach. Reach EMC-1 was classified as In Adjustment by GHD in 2016 prior to bank restoration work being completed. Reach EMCT-2 was classified as transitional or moderately stressed with a stability index of 0.33.

3.6.3 Review of Hydraulic Modelling

For the preferred solution, hydraulic analysis showed that the impacts on water surface elevations and velocities were concentrated where the outfall channel meets the creek tributary and just downstream. Downstream of the confluence there are some slight increases in water level (1 to 3 centimetres) and velocity impacts at the outfall channel are noted but dissipate downstream.

Review of the hydraulic model output for the 100-year return flow event show that there is no discernable impact (increase or decrease) to sediment entrainment or transport as a result of the proposed increase in flows from the outlet into East Mimico Creek.

3.7 Geotechnical Characteristics

A comprehensive geotechnical investigation is being completed that includes a hydrogeological assessment and sampling for environmental quality to support the design requirements, as well as construction needs (e.g., dewatering quantities). Information resulting from this work that impacts the recommended preliminary preferred solution will be incorporated into the recommendation as the Project proceeds through preliminary and detailed design phases.

3.8 Socio-Economic Environment

Residential land use surrounds the northwest side of the study area along Justine Drive and further beyond Goreway Drive towards the north east. There are also commercial properties that run along Derry Road east to the south of the Study Area.

Two parks associated with the proposed alternative solutions include Derry Greenway Park located south of Justine Drive and Ridgewood Park, which is located adjacent to Ridgewood Public School on Cambrett Drive.

3.9 Cultural Heritage Environment

The following describes the cultural heritage resources related to the alternative solutions presented in **Section 6.1**. Cultural heritage resources include archaeological resources, built heritage resources and cultural heritage landscapes.

3.9.1 Archaeological Resources

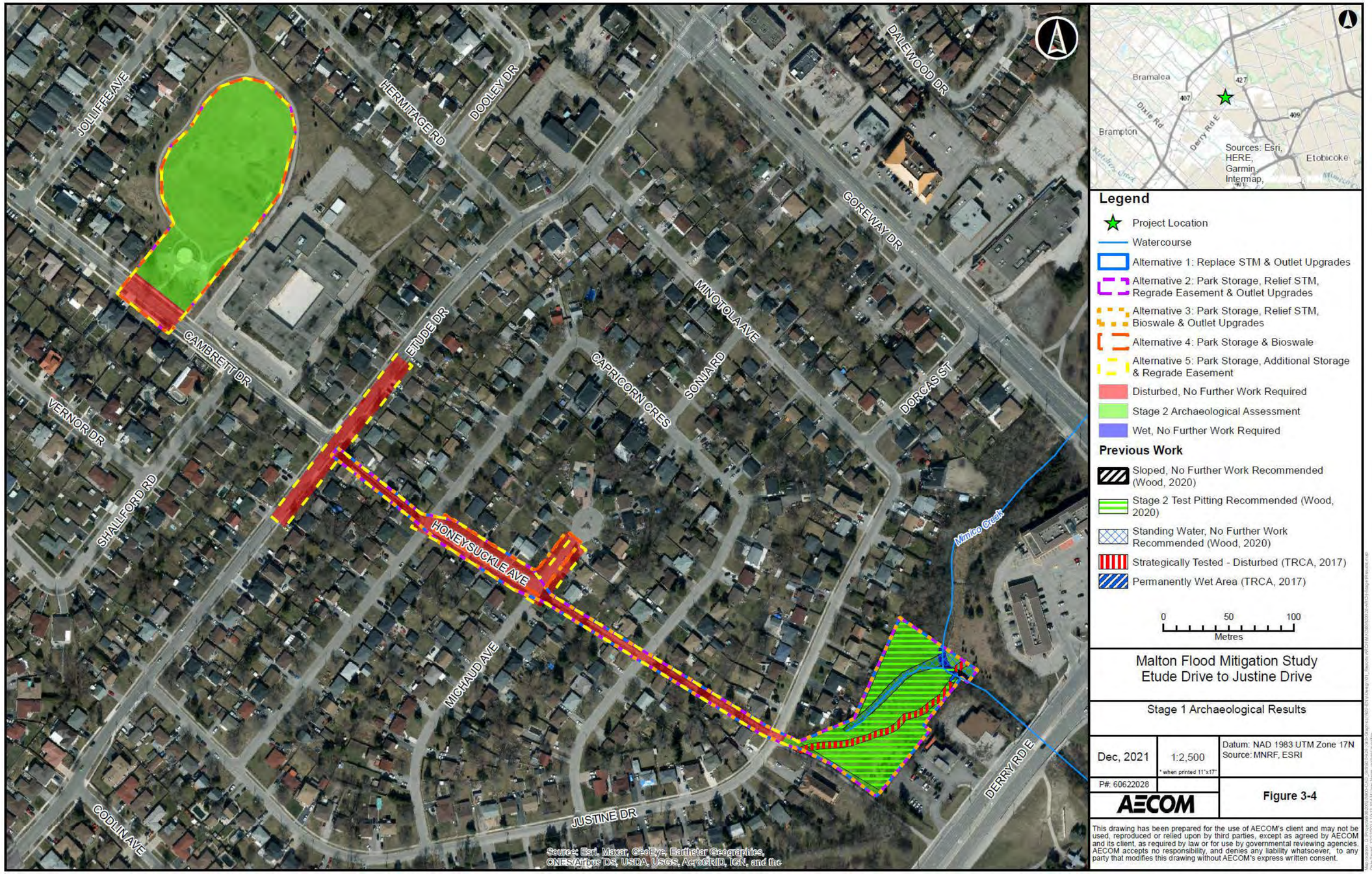
A Stage 1 Archaeological Assessment (Project Information Form number P123-0462-2020) has been completed by AECOM to evaluate the archaeological potential within the Study Area related to the alternative solutions as presented in **Section 6.1**.

The **Stage 1 Archaeological Assessment Report (Appendix F)** details the rationale, methods and results of the Stage 1 Archaeological Assessment. The Stage 1 Archaeological Assessment was completed by using background research to describe the geography, land use history, previous archaeological fieldwork and current conditions of the Study Area to determine its archaeological potential. In addition, satellite imagery and thematic and historic maps were analyzed. The results of the Stage 1 assessment indicates that while much of the Study Area does not contain further archaeological potential due to residential and commercial development which has deeply disturbed portions of the Study Area, there are sections of the Study Area that are not obviously disturbed and will therefore require a Stage 2 archaeological assessment.

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

- The areas marked in solid and hatched green in **Figure 3-6** require a Stage 2 archaeological assessment. The Stage 2 assessment should be completed in accordance with Section 2.1 Property Survey of the Standards and Guidelines for Consultant Archaeologists (Ontario Government 2011).
- Areas marked in solid and cross hatched blue are permanently low and wet and no further work is required (**Figure 3-6**).
- Areas marked in solid and hatched red have been determined to be deeply disturbed and no further archaeological assessment is required.

Figure 3-6: Stage 1 Archaeological Assessment Results



3.9.2 Built Heritage Resources and Cultural Heritage Landscapes

A desktop review screening for cultural heritage resources (**Appendix G**) was completed to identify built heritage resources and/or cultural heritage landscapes within and/or adjacent to the alternative solutions within the Study Area. The Ministry of Citizenship and Multiculturalism Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes was used to complete the desktop cultural heritage screening to help determine whether this Municipal Class Environmental Assessment project may impact cultural heritage resources.

Based on the review of the City of Mississauga's Heritage Register for Mississauga (June 2020), there are no previously identified cultural heritage resources within or adjacent to alternative solutions as described in **Section 6.1**. In addition, there are no historical features within the vicinity of the alternative solutions shown on the 1859 or 1877 historical maps that are still extant within or adjacent to the alternative solutions.

4. Policy Context

4.1 Provincial Policy Statement

The Provincial Policy Statement provides provincial policy direction on matters related to land use planning and development that affect communities, such as ensuring the appropriate infrastructure is available to accommodate current and future needs. The current Provincial Policy Statement came into effect on May 1, 2020, replacing the 2014 Provincial Policy Statement, and applies to planning decisions made on or after that date.

Relevance to this study: The key sections of policies applicable to this study are as follows:

- 1.1 Managing and Directing Land Use to Achieve Efficient and Resilient Development and Land Use Patterns
- 1.2 Coordination
- 1.6 Infrastructure and Public Service Facilities
- 2.1 Natural Heritage
- 2.6 Cultural Heritage and Archaeology
- 3.0 Protecting Public Health and Safety

Pursuant to Policy 1.2.1, this study is consistent with the Provincial Policy Statement through the implementation of a coordinated, integrated and comprehensive approach to dealing with infrastructure.

4.2 A Place to Grow: Growth Plan for the Greater Golden Horseshoe

The Growth Plan for the Greater Golden Horseshoe (Office Consolidation 2020) was established by the Ontario government to provide a framework for municipalities to implement Ontario's vision for stronger communities and growth management throughout the region. The goal of the Growth Plan for the Greater Golden Horseshoe is to focus growth in compact development patterns, offer a variety of housing options, and mixed-use development within 'Urban Growth Centres'. The Plan sets out minimum density targets for jobs and residents per hectare in 'Urban Growth Centres'.

The infrastructure framework in the Growth Plan requires that an integrated approach to land use planning, infrastructure investments, and environmental protection is undertaken to achieve the outcomes of the Plan.

Relevance to this study: The Study Area is situated within the Built-Up Area of the Greater Golden Horseshoe Growth Plan Area. The polices in the Growth Plan were considered in the development of alternative flood mitigation solutions.

4.3 Peel Region Official Plan

The Region of Peel Official Plan (April 2022 Consolidation) is a long-term plan for managing Peel's growth and development.

The Government of Ontario recently announced that Peel Region will be dissolved and the City of Mississauga will become an independent city by 2025.

Relevance to this study: The Peel Region Official Plan was considered in the screening of alternatives. The Study Area is within the Urban System (Official Plan Schedule E-1) and partially falls within the Greenlands System Overlay (Official Plan Schedule C-2).

4.4 City of Mississauga Official Plan

The City of Mississauga Official Plan (Office Consolidation March 3, 2023) guides how the City will grow and develop to 2031, including policy framework to address transportation, housing, culture and heritage, the environment, and the economy.

Relevance to this study: The Official Plan was considered in the screening of alternatives. The Study Area is located within the Neighbourhood designation within the City Structure (Official Plan Schedule 1) and within the Malton Neighbourhood (Official Plan Schedule 9). Chapter 16 (Neighbourhoods) of the Official Plan details the policies for the Malton Neighbourhood. The subject area is shown in **The Study** Area falls partially within the Significant Natural Areas and Natural Green Spaces of the City of Mississauga’s Natural Heritage System (Official Plan Schedule 3). As per Section 11.2, flood control and piped services and related facilities for stormwater are permitted in all land use designations, except Greenlands and Parkway Belt West unless specifically allowed.

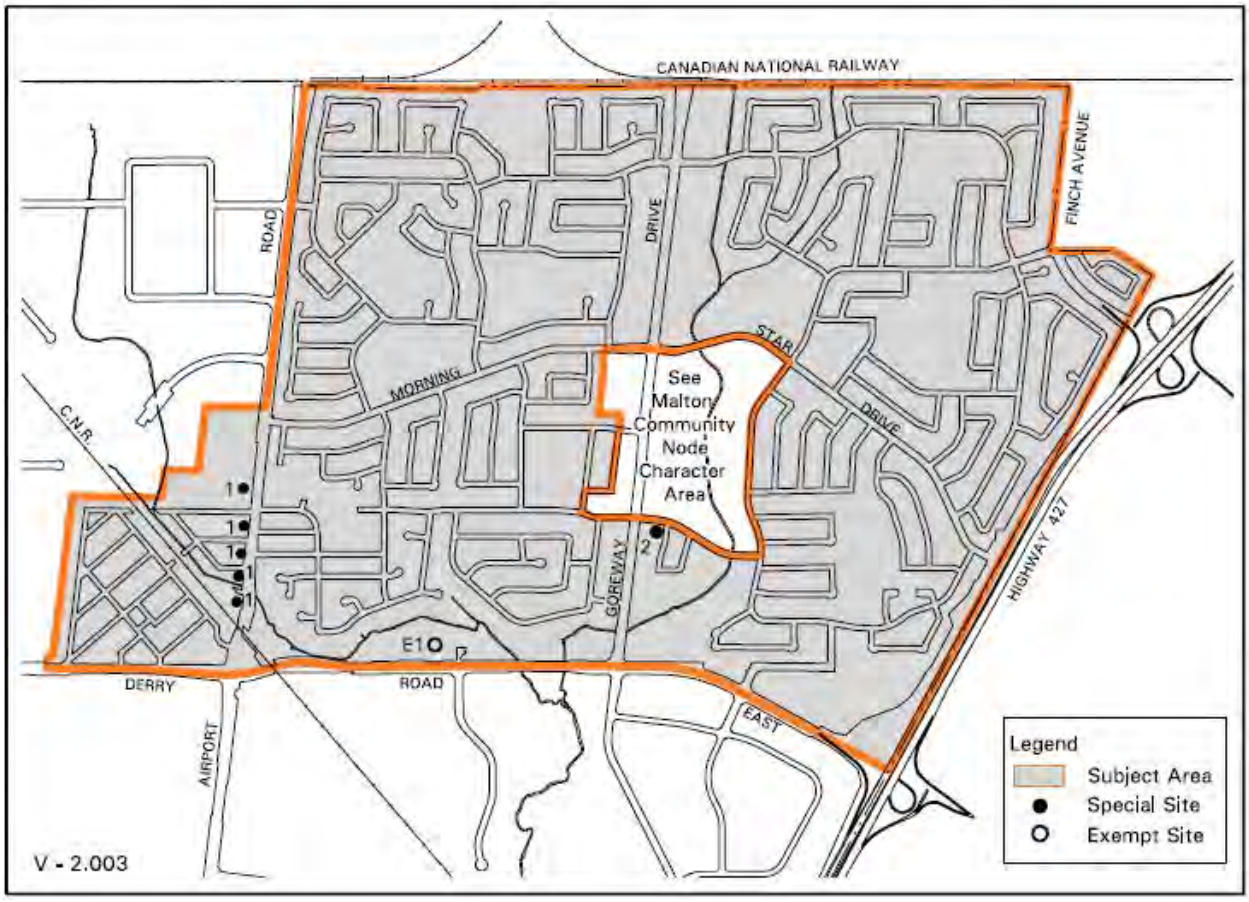
Figure 4-1**.**

As per Schedule 10, the Land Use designations associated with the alternative solutions include Greenlands, Mixed Use, and Residential Low Density I Land Use

Designations. There is also a public school (Ridgewood Public School) where several alternatives have been screened for underground storage in Ridgewood Park.

The Study Area falls partially within the Significant Natural Areas and Natural Green Spaces of the City of Mississauga's Natural Heritage System (Official Plan Schedule 3). As per Section 11.2, flood control and piped services and related facilities for stormwater are permitted in all land use designations, except Greenlands and Parkway Belt West unless specifically allowed.

Figure 4-1: Malton Neighbourhood (City of Mississauga Official Plan, 2023)



The valleylands associated with Mimico Creek within the Study Area are considered Significant Valleyland by the City. Section 6.3.12 of the City of Mississauga Official Plan defines Significant Natural Areas as areas that meet at least one of several criteria, which includes all valleylands associated with the main branches, major tributaries, and other tributaries and watercourse corridors of four watercourses, including Mimico Creek. In accordance with Section 6.3.27 of the City of Mississauga Official Plan, development and site alteration are not permitted in a Significant Natural Area unless all

alternatives have been considered and any negative impacts avoided. If a negative impact cannot be avoided, mitigation through restoration and enhancement will be required. Alternatives have been considered and screened with mitigation measures proposed in the **Natural Environment Report (Appendix C)** and summarized in **Section 8** of this report.

4.5 Toronto and Region Conservation Authority Requirements

Toronto and Region Conservation Authority is authorized by the Development, Interference with Wetlands and Alterations to Shorelines and Watercourse Regulation (Ontario Regulation 166/06 also known as the “Generic Regulation”). These Regulations, passed under the Conservation Authorities Act, regulate natural and hazardous areas such as areas within and adjacent to rivers or stream valleys, areas that are subject to the hazards of flooding and erosion, and areas within and adjacent to wetlands areas.

Development or site alteration within Toronto and Region Conservation Authority’s regulation limits require consultation with Toronto and Region Conservation Authority and may require a permit application under Ontario Regulation 166/06.

Relevance to this study: The Study Area falls within the limits of Ontario Regulation 166/06 Toronto and Region Conservation Authority: Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses. Toronto and Region Conservation Authority has been engaged in support of this environmental assessment and will be engaged during the design phase to confirm permitting requirements.

4.6 Credit Valley-Toronto and Region – Central Lake Ontario Source Protection Region

Section A.2.10.6 of the 2015 Municipal Class Environmental Assessment manual directs proponents, including the City, to consider Source Water Protection in the context of the *Clean Water Act*, 2006. Projects proposed within a Source Water Protection vulnerable area are required to consider policies in the applicable Source Protection Plan including their impact with respect to the project. A watershed-based Source Protection Plan contains policies to reduce existing and future threats to drinking water in order to safeguard human health through addressing activities that have the potential to impact municipal drinking water systems.

The Study Area is located in the Toronto and Region Source Protection Area. The applicable source protection plan for the Study Area is called the Approved Source Protection Plan: Credit Valley-Toronto and Region-Central Lake Ontario Source Protection Region (Approved February 23, 2022).

Relevance to this study: There are no vulnerable areas associated with the alternative solutions.

5. Phase 1: Problem or Opportunity Statement

Phase 1 of the five-phase Municipal Class Environmental Assessment planning process requires the proponent of an undertaking (i.e., the City) to first document factors leading to the conclusion that the improvement is needed, and to develop a clear statement of the identified problems or opportunities to be addressed. As such, the problem or opportunity statement is the main starting point in the undertaking of a Municipal Class Environmental Assessment and becomes the central theme and integrating element of the Project. It also assists in setting the scope of a Municipal Class Environmental Assessment study.

The following problem or opportunity statement has been developed for this Municipal Class Environmental Assessment study:

Problem

- The general area between Etude Drive and Justine Drive in Malton has been subject to urban flooding during storm events, including the rainstorm that occurred on July 8, 2013, which affected a number of homes in the neighbourhood.
- Previously, a flood study for the larger Malton community, led by the Toronto and Region Conservation Authority, was undertaken which investigated flooding across the entire community and highlighted this area, among others, for potential flood mitigation efforts. Based on that study's findings, the City identified the general area between Etude Drive and south of Justine Drive, as a high-priority site to help mitigate flooding.

Opportunity

- Complete the Schedule B Municipal Class Environmental Assessment planning process to mitigate urban flooding risks to people, property and infrastructure within the Malton community.

6. Phase 2: Alternative Solutions

6.1 Flood Mitigation Alternatives

The evaluation of alternatives included a two-step evaluation process. A long list of solutions was screened as the initial step of the evaluation process. All possible alternatives to reduce or eliminate flooding were explored, including source point measures, conveyance measures and storage measures. A long list of eleven possible measures were evaluated against the following criteria:

- Constructability / proximity to problem area
- Complexity of obtaining permits and approvals
- Natural environment (tree and vegetation removal and/or damage)
- Socio-economic impacts (disruption to community, including travelling public)
- Potential construction cost

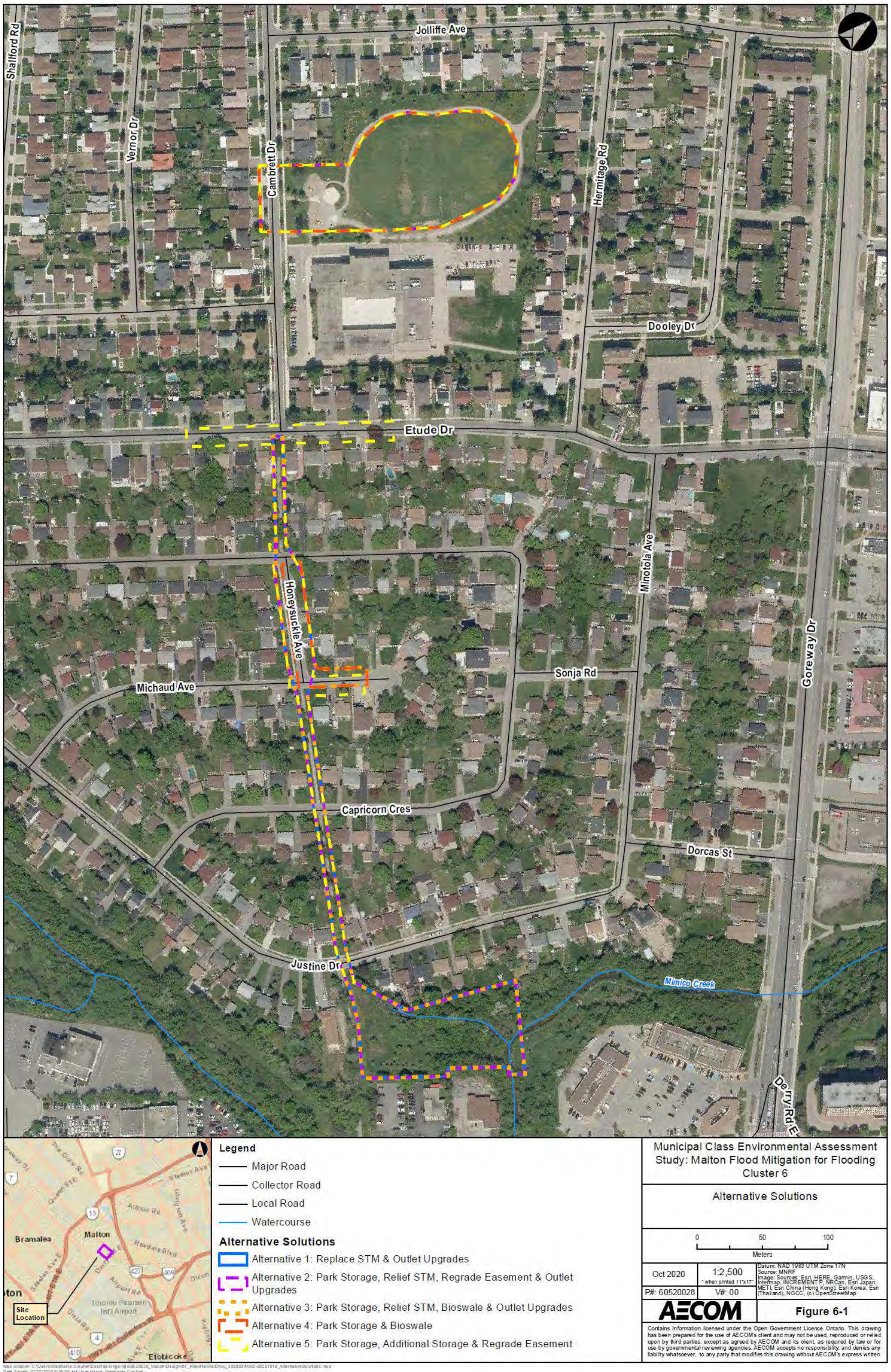
Refer to the **Stormwater Management Report (Appendix A)** for the long list of alternatives. Alternatives located on private property were screened out. A short list of five alternatives, as delineated in **Figure 6-1** were carried forward for more detailed evaluation as the second step in the two-part evaluation screening process.

Alternative 1: involves replacing the existing 1,650 millimetre storm sewer beneath the pedestrian walkway and within existing City property with a new box storm sewer from Etude Drive to the Mimico Creek outfall channel in Derry Greenway Park, regrading the walkway to a proper overland flow path and completing a new outlet upgrade at the outlet channel south of Justine Drive. Additional inlets would also be required.

Alternative 2: involves constructing 12,000 metres cubed of underground storage in Ridgewood Park open space area, installation of a new 1,050 millimetre relief sewer beneath the pedestrian walkway and within existing City property from Etude Drive to the Mimico Creek outfall channel in Derry Greenway Park, regrading of the pedestrian walkway to a proper overland flow path and completing a new outlet upgrade upstream of the outlet channel south of Justine Drive. Additional inlets would be required.

Alternative 3: involves constructing 12,000 metres cubed of underground storage in the Ridgewood Park open space area, installation of a new 1,050 millimetre diameter relief sewer beneath the pedestrian walkway and within existing City property from Etude Drive to the Mimico Creek outfall channel in Derry Greenway Park, and completing a new outlet upgrade upstream of the outlet channel south of Justine Drive. Additional inlets would also be required as well as a 0.15 metres deep bioswale providing 115 metres cubed of storage beneath Honeysuckle Avenue and Michaud Avenue.

Figure 6-1: Flood Mitigation Alternatives



Alternative 4: involves constructing 12,000 metres cubed underground storage in the Ridgewood Park open space area and a 0.15 metres deep bioswale with 180 metres cubed storage beneath at Honeysuckle Avenue and Michaud Avenue.

Alternative 5: involves constructing 12,000 metres cubed underground storage in the Ridgewood Park open space area along with additional inlets and storage in the right-of-way along Etude, Honeysuckle Avenue and Michaud Avenue, and regrading of the pedestrian walkway, within the existing City property from Etude Drive to Mimico Creek.

6.2 Short List Evaluation Criteria and Methodology

To identify the recommended preferred flood mitigation strategy the criteria listed in **Table 6-1** have been developed to evaluate the five short list alternative solutions carried forward for detailed evaluation.

Table 6-1: Evaluation Criteria

Category	Criteria
Technical Environment	■ Constructability ■ Access ■ Traffic impacts during construction, including expected lane, walkway and sidewalk closures ■ Potential impacts to property and infrastructure
Natural Environment	■ Potential for flooding mitigation ■ Potential effects on terrestrial habitat and species ■ Potential effects on aquatic habitat and species ■ Potential effects on Species at Risk and their habitat ■ Potential number of tree removals ■ Potential effects on surface and groundwater ■ Potential to encounter soil and water contamination ■ Potential effects on fluvial characteristics of the existing watercourse ■ Anticipated environmental permitting and approval considerations
Socio-Economic Environment	■ Disruption to residences, institutions, businesses, and recreational facilities during construction (noise, air, vibration, access)
Climate Change	■ Potential for greenhouse gas emission reduction measures ■ Vulnerability of project/ infrastructure to climate change effects
Cultural Heritage Environment	■ Potential effects on archaeological resources and areas of archaeological potential ■ Potential effects on built heritage resources and cultural heritage landscapes
Cost	■ Cost of construction (high level estimate) ■ Cost of operations and maintenance

A comparative evaluation has been completed for the alternative solutions using the above noted criteria and were rated based on their potential constraints relative to the other alternatives as follows:

- High Constraints (Less Preferred)
- Medium Constraints (Moderately Preferred)
- Low Constraints (More Preferred)

6.3 Evaluation of Short List Flood Mitigation Alternatives

Table 6-2 details the comparative evaluation of the five flood mitigation alternatives based on the footprints shown in **Figure 6-1**. The evaluation has been informed through documentation of existing conditions and consideration of feedback from potentially affected and interested agencies and stakeholders.

Table 6-2: Evaluation of Flood Mitigation Alternatives

Category	Criteria	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Technical Environment	Constructability	■ Narrow work area with close proximity to residences with encroachments along the City's pedestrian walkway ■ Potential conflicts with existing infrastructure	■ Narrow work area with close proximity to residences with encroachments along the City's pedestrian walkway ■ Infiltration potential beneath Ridgewood Park	■ Narrow work area with close proximity to residences with encroachments along the City's pedestrian walkway ■ Infiltration potential beneath Ridgewood Park	■ Narrow work area with close proximity to residences ■ Infiltration potential beneath Ridgewood Park	■ Narrow work area with close proximity to residences with encroachments along the City's pedestrian walkway ■ Infiltration potential beneath Ridgewood Park
Technical Environment	Access	■ Direct access to site work via public right-of-way and City owned walkway and Derry Greenway Park	■ Direct access to works via public right-of-way and City owned walkway, Ridgewood Park and Derry Greenway Park	■ Direct access to works via public right-of-way and City owned walkway, Ridgewood Park and Derry Greenway Park	■ Direct access to works via public right-of-way and City owned walkway, and Ridgewood Park	■ Direct access to works via public right-of-way and City owned walkway, and Ridgewood Park
Technical Environment	Traffic impacts during construction, including expected lane, walkway and sidewalk closures	■ Temporary closure of the City's pedestrian walkway during construction	■ Temporary closure of the City's pedestrian walkway during construction ■ Multi-year closure of Ridgewood Park for construction of underground storage	■ Temporary closure of the City's pedestrian walkway during construction ■ Multi-year closure of Ridgewood Park for construction of underground storage	■ Temporary lane closure along Honeysuckle Avenue and Michaud Avenue during construction ■ Multi-year closure of Ridgewood Park for construction of underground storage	■ Temporary closure of the City's walkway and along Honeysuckle Avenue and Michaud Avenue during construction ■ Multi-year closure of Ridgewood Park for construction of underground storage
Technical Environment	Potential impacts to property and infrastructure	■ No houses estimated to be impacted by flooding during 100-yr flood	■ 10 houses estimated to be impacted by flooding during 100-yr flood	■ 13 houses estimated to be impacted by flooding during 100-yr flood	■ 14 houses estimated to be impacted by flooding during 100-yr flood	■ 6 houses estimated to be impacted by flooding during 100-yr flood
Technical Environment	Evaluation Ranking	Low Constraints (More Preferred)	High Constraints (Less Preferred)	High Constraints (Less Preferred)	High Constraints (Less Preferred)	Medium Constraints (Moderately Preferred)
Natural Environment	Potential for flood mitigation	■ Significant flood reduction ■ Results in an estimated 7.8 metres cubed per second additional conveyance	■ No significant improvement ■ Results in an estimated 0.4 metres cubed per second additional conveyance	■ Underground storage would fit within path, flow at outfall shouldn't be much greater than existing, water quality benefits from bioswale, infiltration potential beneath Ridgewood Park ■ No significant improvement ■ Results in minimal additional conveyance	■ Without the relief sewer this solution would be more cost effective and less disruptive, water quality benefits from bioswale. infiltration potential beneath field ■ No significant improvement ■ Results in an estimated 1,950 metres cubed additional storage	■ Construction would be limited to the Ridgewood field and Etude Drive, Honeysuckle Avenue and Michaud Avenue, virtually no increase of flow at outfall. infiltration potential beneath field. ■ Slight improvement ■ Results in an estimated 200 metres cubed additional storage

Category	Criteria	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Natural Environment	Potential effects on terrestrial habitat and species	■ Removal of vegetation within the Outlet Study Area may affect candidate bat maternity habitat if suitable cavity trees are to be removed within the FOD7 community during the all-inclusive bat active season (March 15 – November 30) ■ MBCA protected migratory birds and SOCC birds may be affected if vegetation removal is completed during the breeding bird window (April 1 to August 31) ■ Travelling Snapping Turtle may be injured if construction occurs during the active turtle window (April 1 to October 30)	■ Removal of vegetation within the Outlet Study Area may affect candidate bat maternity habitat if suitable cavity trees are to be removed within the FOD7 community during the all-inclusive bat active season (March 15 – November 30) ■ MBCA protected migratory birds and SOCC birds may be affected if vegetation removal is completed during the breeding bird window (April 1 to August 31) ■ Travelling Snapping Turtle may be injured if construction occurs during the active turtle window (April 1 to October 30)	■ Removal of vegetation within the Outlet Study Area may affect candidate bat maternity habitat if suitable cavity trees are to be removed within the FOD7 community during the all-inclusive bat active season (March 15 – November 30) ■ MBCA protected migratory birds and SOCC birds may be affected if vegetation removal is completed during the breeding bird window (April 1 to August 31) ■ Travelling Snapping Turtle may be injured if construction occurs during the active turtle window (April 1 to October 30)	■ Minimal potential effects on terrestrial environment as this alternative is limited to mowed lawns and road right of ways ■ MBCA protected migratory birds may be affected if street tree removal is completed during the breeding bird window (April 1 to August 31)	■ Minimal potential effects on terrestrial environment as this alternative is limited to mowed lawns and road right of ways ■ MBCA protected migratory birds may be affected if street tree removal is completed during the breeding bird window (April 1 to August 31) ■
Natural Environment	Potential effects on aquatic habitat and species	■ In-water works associated with the construction of a new outfall and channel, and downstream tie-in with the existing outfall channel have the potential to result in the death of fish or harmful alteration, disruption or destruction (HADD) of fish habitat if mitigation measures including timing windows are not followed (no work March 15 – July 15) ■ In-water works associated with repairs to the existing outfall structure and channel have the potential to result in the death of fish or HADD of fish habitat if mitigation measures including timing windows are not followed (no work March 15 – July 15). ■ Repairs to the existing outfall structure and channel may reduce further habitat degradation by reducing potential erosion and subsequent sediment transport into Mimico Creek. ■ Repairs to the existing outfall channel provides opportunity to naturalize this reach and improve overall fish habitat quality	■ In-water works associated with the construction of a new outfall and channel, and downstream tie-in with the existing outfall channel have the potential to result in the death of fish or HADD of fish habitat if mitigation measures including timing windows are not followed (no work March 15 – July 15) ■ In-water works associated with repairs to the existing outfall structure and channel have the potential to result in the death of fish or HADD of fish habitat if mitigation measures including timing windows are not followed (no work March 15 – July 15). ■ Repairs to the existing outfall structure and channel may reduce further habitat degradation by reducing potential erosion and subsequent sediment transport into Mimico Creek.	■ In-water works associated with the construction of a new outfall and channel, and downstream tie-in with the existing outfall channel have the potential to result in the death of fish or HADD of fish habitat if mitigation measures including timing windows are not followed (no work March 15 – July 15) ■ In-water works associated with repairs to the existing outfall structure and channel have the potential to result in the death of fish or HADD of fish habitat if mitigation measures including timing windows are not followed (no work March 15 – July 15). ■ Repairs to the existing outfall structure and channel may reduce further habitat degradation by reducing potential erosion and subsequent sediment transport into Mimico Creek.	■ Not applicable; no impacts to the watercourse	■ Not applicable; no impacts to the watercourse

Category	Criteria	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Natural Environment (continued)	Potential effects on aquatic habitat and species (continued)	■ Replacement of the storm sewer from Etude Drive to Mimico Creek offers the greatest potential for inclusion of water quality protection measures (e.g. oil grit separators, catch basin shields) ■ Construction of a new outlet channel could create new fish habitat if naturalized	■ Repairs to the existing outfall channel provides opportunity to naturalize this reach and improve overall fish habitat quality ■ Construction of a new outlet channel could create new fish habitat if naturalized	■ Repairs to the existing outfall channel provides opportunity to naturalize this reach and improve overall fish habitat quality ■ Construction of a new outlet channel could create new fish habitat if naturalized	■ -	■ -
Natural Environment	Potential effects on Species at Risk and Species at Risk habitat	■ If removal of suitable cavity trees occurs during the all-inclusive bat active season (March 15 – November 30), bat SAR may be affected ■ No impacts to Chimney Swifts are anticipated as there are no buildings demolitions	■ If removal of suitable cavity trees occurs during the all-inclusive bat active season (March 15 – November 30), bat SAR may be affected ■ No impacts to Chimney Swifts are anticipated as there are no buildings demolitions	■ If removal of suitable cavity trees occurs during the all-inclusive bat active season (March 15 – November 30), bat SAR may be affected ■ No impacts to Chimney Swifts are anticipated as there are no buildings demolitions	■ No anticipated impacts to SAR	■ No anticipated impacts to SAR
Natural Environment	Potential number of tree removals	■ Based on the preliminary tree inventory, 402 trees are recommended for removal. 377 of these trees are City-owned. ■ Of the 402 trees, a total of 74 are recommended for removal as they are in dead/poor or hazardous condition and are considered a risk. A total of 41 trees are recommended for injury with protection, with 17 being recommended for injury and 24 for minor injury. A further 55 trees have been recommended to have protection placed around them, due to their TPZs being within the Buffer Area or within 2 metres of the Buffer Area. The remaining 151 trees are recommended to be retained ■ The above tree removals are based on the larger Alternative 1 Study Area boundary and does not represent the final construction footprint	■ Based on the preliminary tree inventory, 445 trees are recommended for removal. 420 of these trees are City-owned. ■ Of the 445 trees, 74 are recommended for removal as they are in poor/dead or hazardous condition and are considered a risk. A total of 45 trees are recommended for injury with protection, with 18 being recommended for injury and 27 for minor injury. A further 87 trees have been recommended to have protection placed around them, due to their TPZs being within the Buffer Area or within 2 metres of the Buffer Area. The remaining 72 trees are recommended to be retained ■ The above tree removals are based on the larger Alternative 2 Study Area boundary and does not represent the final construction footprint	■ Based on the preliminary tree inventory, 446 trees are recommended for removal. 421 of these trees are City-owned. ■ Of the 446 trees, a total of 74 are recommended for removal as they are in poor/dead or hazardous conditions and are considered a risk. A total of 41 trees are recommended for injury with protection, with 17 being recommended for injury and 24 for minor injury. A further 91 trees have been recommended to have protection placed around them, due to their TPZs being within the Buffer Area or within 2 metres of the Buffer Area. The remaining 71 trees are recommended to be retained ■ The above tree removals are based on the larger Alternative 3 Study Area boundary and does not represent the final construction footprint	■ Based on the preliminary tree inventory, 120 trees are recommended for removal. 47 of these trees are City-owned. ■ Of the 120 trees, a total of 74 are recommended for removal as they are in poor/dead or hazardous conditions and are considered a risk. A total of 6 trees are recommended for injury with protection, with 2 being recommended for injury and 4 for minor injury. A further 45 trees have been recommended to have protection placed around them, due to their TPZs being within the Buffer Area or within 2 metres of the Buffer Area. The remaining 478 trees are recommended to be retained ■ The above tree removals are based on the larger Alternative 4 Study Area boundary and does not represent the final construction footprint.	■ Based on the preliminary tree inventory, 172 trees are recommended for removal. 103 of these trees are City-owned. ■ Of the 172 trees, a total of 74 are recommended for removal as they are in poor/dead or hazardous conditions and are considered a risk. A total of 21 trees are recommended for injury with protection, with 8 being recommended for injury and 13 for minor injury. A further 64 trees have been recommended to have protection placed around them, due to their TPZs being within the Buffer Area or within 2 metres of the Buffer Area. The remaining 392 trees are recommended to be retained ■ The above tree removals are based on the larger Alternative 5 Study Area boundary and does not represent the final construction footprint

Category	Criteria	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Natural Environment	Potential to encounter soil and water contamination	■ Potential to encounter soil and water contamination ■ Works in or near water carry risk of water contamination via spills from machinery (e.g. refuelling, hydraulic leaks)	■ Potential to encounter soil and water contamination ■ Works in or near water carry risk of water contamination via spills from machinery (e.g. refuelling, hydraulic leaks)	■ Potential to encounter soil and water contamination ■ Works in or near water carry risk of water contamination via spills from machinery (e.g. refuelling, hydraulic leaks)	■ Potential to encounter soil and water contamination ■ No works in or near water	■ Potential to encounter soil and water contamination ■ No works in or near water
Natural Environment	Potential effects on surface and groundwater	■ Increased risk of erosion due to site grading and use of machinery may result in sediment transport into Mimico Creek ■ There are no vulnerable source water protection areas associated with Alternative 1 ■ Potential for dewatering during construction	■ Increased risk of erosion due to site grading and use of machinery may result in sediment transport into Mimico Creek ■ There are no vulnerable source water protection areas associated with Alternative 2. ■ Potential for dewatering during construction	■ Increased risk of erosion due to site grading and use of machinery may result in sediment transport into Mimico Creek ■ There are no vulnerable source water protection areas associated with Alternative 3 ■ Potential for dewatering during construction	■ None anticipated. ■ There are no vulnerable source water protection areas associated with Alternative 4. ■ Potential for dewatering during construction	■ None anticipated. ■ There are no vulnerable source water protection areas associated with Alternative 5. ■ Potential for dewatering during construction
Natural Environment	Potential effects on fluvial characteristics of the existing watercourse	■ The implications for sediment entrainment and transport downstream of the outlet, including East Mimico Creek should be considered. The watercourses form and function are influenced by channel flow and the sediment regime. Changes to the amount of flow and/or frequency of flow have the potential to impact entrainment and transport of sediment. ■ Proposed alteration could impact bed and bank stability, and flow energy dissipation. ■ Downstream of the confluence there are some slight increases in water level (1 to 3 centimetres) and velocity impacts at the outfall channel are noted but dissipate downstream. ■ There is no discernable impact (increase or decrease) to sediment entrainment or transport as a result of the proposed increase in flows from the outlet into East Mimico Creek.	■ The implications for sediment entrainment and transport downstream of the outlet, including East Mimico Creek should be considered. The watercourses form and function are influenced by channel flow and the sediment regime. Changes to the amount of flow and/or frequency of flow have the potential to impact entrainment and transport of sediment. ■ Proposed alteration could impact bed and bank stability, and flow energy dissipation.	■ The implications for sediment entrainment and transport downstream of the outlet, including East Mimico Creek should be considered. The watercourses form and function are influenced by channel flow and the sediment regime. Changes to the amount of flow and/or frequency of flow have the potential to impact entrainment and transport of sediment. ■ Proposed alteration could impact bed and bank stability, and flow energy dissipation.	■ Not applicable; no impacts to the watercourse	■ Not applicable; no impacts to the watercourse

Category	Criteria	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Natural Environment	Anticipated environmental permitting and approval considerations	■ A permit will be required from Toronto and Region Conservation Authority under Ontario Regulation 166/06 Toronto and Region Conservation Authority: Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses ■ Submission of a Fisheries and Oceans Canada Request for Review detailing the proposed in-water work and outlet channel alteration is recommended; Fisheries and Oceans Canada will determine whether issuance of an Authorization is required based upon the Request for Review ■ Fisheries Act Authorization may be required due to in-water work and alteration of fish habitat. This will be confirmed during detailed design ■ A License to Collect Fish for Scientific Purposes under the *Fish and Wildlife Conservation Act* (1997) Ontario Regulation 261/05 will be required for conducting a fish salvage in advance of any in-water work ■ Contravention of the Migratory Birds Convention Act (1994) is not anticipated provided any vegetation removal occurs outside of the breeding bird season (April 1 to August 31) and there are no potential cavity trees removed in the FOD7 community for Pileated Woodpecker (*Dryocopus pileatus*)	■ A permit will be required from Toronto and Region Conservation Authority under Ontario Regulation 166/06 Toronto and Region Conservation Authority: Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses ■ Submission of a Fisheries and Oceans Canada Request for Review detailing the proposed in-water work and outlet channel alteration is recommended; Fisheries and Oceans Canada will determine whether issuance of an Authorization is required based upon the Request for Review ■ Fisheries Act Authorization may be required due to in-water work and alteration of fish habitat. This will be confirmed during detailed design ■ A License to Collect Fish for Scientific Purposes under the *Fish and Wildlife Conservation Act* (1997) Ontario Regulation 261/05 will be required for conducting a fish salvage in advance of any in-water work ■ Contravention of the Migratory Birds Convention Act (1994) is not anticipated provided any vegetation removal occurs outside of the breeding bird season (April 1 to August 31) and there are no potential cavity trees removed in the FOD7 community for Pileated Woodpecker (*Dryocopus pileatus*)	■ A permit will be required from Toronto and Region Conservation Authority under Ontario Regulation 166/06 Toronto and Region Conservation Authority: Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses ■ Submission of a Fisheries and Oceans Canada Request for Review detailing the proposed in-water work and outlet channel alteration is recommended; Fisheries and Oceans Canada will determine whether issuance of an Authorization is required based upon the Request for Review ■ Fisheries Act Authorization may be required due to in-water work and alteration of fish habitat. This will be confirmed during detailed design ■ A License to Collect Fish for Scientific Purposes under the *Fish and Wildlife Conservation Act* (1997) Ontario Regulation 261/05 will be required for conducting a fish salvage in advance of any in-water work ■ Contravention of the Migratory Birds Convention Act (1994) is not anticipated provided any vegetation removal occurs outside of the breeding bird season (April 1 to August 31) and there are no potential cavity trees removed in the FOD7 community for Pileated Woodpecker (*Dryocopus pileatus*)	■ A permit may be required from Toronto and Region Conservation Authority under Ontario Regulation 166/06 Toronto and Region Conservation Authority: Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses ■ Contravention of the Migratory Birds Convention Act (1994) is not anticipated provided any vegetation removal occurs outside of the breeding bird season (April 1 to August 31)	■ A permit may be required from Toronto and Region Conservation Authority under Ontario Regulation 166/06 Toronto and Region Conservation Authority: Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses ■ Contravention of the Migratory Birds Convention Act (1994) is not anticipated provided any vegetation removal occurs outside of the breeding bird season (April 1 to August 31)

Category	Criteria	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Natural Environment (continued)	Anticipated environmental permitting and approval considerations (continued)	■ It is not anticipated that authorization under the ESA would be required for bat SAR if minimal suitable cavity trees are removed outside of the all inclusive bat window (March 15 to November 30)	■ It is not anticipated that authorization under the ESA would be required for bat SAR if minimal suitable cavity trees are removed outside of the all inclusive bat window (March 15 to November 30)	■ It is not anticipated that authorization under the ESA would be required for bat SAR if minimal suitable cavity trees are removed outside of the all inclusive bat window (March 15 to November 30)	■ -	■ -
Natural Environment	Evaluation Ranking	Medium Constraints (Moderately Preferred)	High Constraints (Less Preferred)	High Constraints (Less Preferred)	Low Constraints (More Preferred)	Low Constraints (More Preferred)
Socio-Economic Environment	Disruption to residences, institutions, businesses, and recreational facilities during construction (noise, air, vibration, access)	■ Temporary disruption during construction to property owners along the current City-owned walkway, Derry Greenway Park users and to the travelling public ■ No impacts to Ridgewood Park associated with Alternative 1	■ Temporary disruption during construction to property owners along the current City-owned walkway, Ridgewood Park and Derry Greenway Park users and to the travelling public	■ Temporary disruption during construction to property owners along the current City-owned walkway, Ridgewood Park and Derry Greenway Park users and to the travelling public	■ Temporary disruption during construction to property owners along Michaud Avenue and Honeysuckle Avenue, Ridgewood Park users and to the travelling public ■ No impacts to Derry Greenway Park associated with Alternative 4	■ Temporary disruption during construction to property owners along long Michaud Avenue and Honeysuckle Avenue, the current City-owned walkway, Ridgewood Park users and to the travelling public ■ No impacts to Derry Greenway Park associated with Alternative 5
Socio-Economic Environment	Evaluation Ranking	Medium Constraints (Moderately Preferred)	High Constraints (Less Preferred)	High Constraints (Less Preferred)	Medium Constraints (Moderately Preferred)	Medium Constraints (Moderately Preferred)
Climate Change	Potential for greenhouse gas emission reduction measures	■ Improvements to the City's walkway will promote pedestrian walkability within the Malton Community	■ Improvements to the City's walkway will promote pedestrian walkability within the Malton Community ■ Higher greenhouse gas emissions related to more construction materials and longer construction duration for underground storage in Ridgewood Park	■ Improvements to the City's walkway will promote pedestrian walkability within the Malton Community ■ Higher greenhouse gas emissions related to more construction materials and longer construction duration for underground storage in Ridgewood Park	■ Improvements to the City's walkway will promote pedestrian walkability within the Malton Community ■ Higher greenhouse gas emissions related to more construction materials and longer construction duration for underground storage in Ridgewood Park	■ Improvements to the City's walkway will promote pedestrian walkability within the Malton Community ■ Higher greenhouse gas emissions related to more construction materials and longer construction duration for underground storage in Ridgewood Park
Climate Change	Vulnerability of project/ infrastructure to climate change effects	■ Additional stormwater capacity will be incorporated within the storm sewer system to accommodate additional flows during extreme storm events	■ Additional stormwater storage capacity will be incorporated within the storm sewer system to accommodate additional flows during extreme storm events	■ Additional stormwater storage capacity will be incorporated within the storm sewer system to accommodate additional flows during extreme storm events	■ Additional stormwater storage capacity will be incorporated within the storm sewer system to accommodate additional flows during extreme storm events	■ Additional stormwater storage capacity will be incorporated within the storm sewer system to accommodate additional flows during extreme storm events
Climate Change	Evaluation Ranking	Low Constraints (More Preferred)	Medium Constraints (Moderately Preferred)	Medium Constraints (Moderately Preferred)	Medium Constraints (Moderately Preferred)	Medium Constraints (Moderately Preferred)

Category	Criteria	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Cultural Heritage Environment	Potential effects on archaeological resources and areas of archaeological potential	■ Stage 2 Archaeological Assessment is required (and further assessments, if recommended)	■ Stage 2 Archaeological Assessment is required (and further assessments, if recommended)	■ Stage 2 Archaeological Assessment is required (and further assessments, if recommended)	■ Stage 2 Archaeological Assessment is required (and further assessments, if recommended)	■ Stage 2 Archaeological Assessment is required (and further assessments, if recommended)
Cultural Heritage Environment	Potential effects on built heritage resources and cultural heritage landscapes	■ No direct or indirect impact to built heritage resources or cultural heritage landscapes (no further cultural heritage work is required)	■ No direct or indirect impact to built heritage resources or cultural heritage landscapes (no further cultural heritage work is required)	■ No direct or indirect impact to built heritage resources or cultural heritage landscapes (no further cultural heritage work is required)	■ No direct or indirect impact to built heritage resources or cultural heritage landscapes (no further cultural heritage work is required)	■ No direct or indirect impact to built heritage resources or cultural heritage landscapes (no further cultural heritage work is required)
Cultural Heritage Environment	Evaluation Ranking	Medium Constraints (Moderately Preferred)	Medium Constraints (Moderately Preferred)	Medium Constraints (Moderately Preferred)	Medium Constraints (Moderately Preferred)	Medium Constraints (Moderately Preferred)
Cost	Cost of construction (high level estimate based on 100-year design)	■ $8M	■ $9.4M	■ $9.5M	■ $7.3M	■ $16.5M
Cost	Cost of operation / maintenance	■ Lowest cost alternative to operate /maintain	■ Similar costs to Alternatives 3, 4 and 5 to operate /maintain	■ Similar costs to Alternatives 2, 4 and 5 to operate /maintain	■ Similar costs to Alternatives 2, 3, and 5 to operate /maintain	■ Similar costs to Alternatives 2, 3, and 4 to operate /maintain
Cost	Evaluation Ranking	Low Constraints (More Preferred)	Medium Constraints (Moderately Preferred)	Medium Constraints (Moderately Preferred)	Low Constraints (More Preferred)	High Constraints (Less Preferred)
Overall	**Preferred Solution?**	**Yes**	**No**	**No**	**No**	**No**

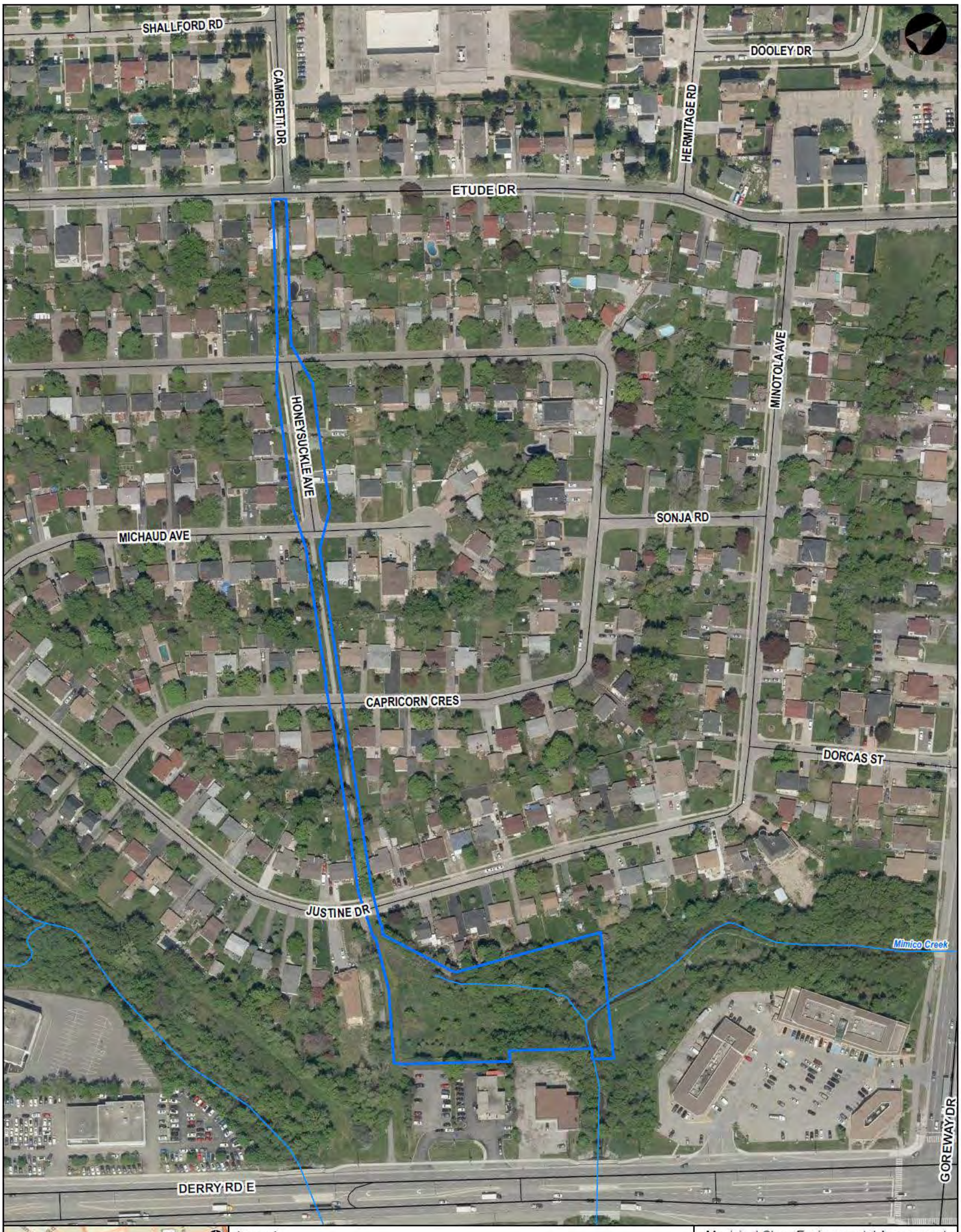
6.4 Preferred Solution – Alternative 1

Based on the evaluation, Alternative 1 (**Figure 6-2**) was identified as the preferred flood mitigation solution. This involves replacing the existing storm sewer with a larger box storm sewer beneath the pedestrian walkway and Honeysuckle Avenue within the existing City property, from Etude Drive to the outfall channel and associated restoration. There will also be regrading of the walkway for the creation of an overland flow route to safely convey runoff during larger storm events. Additional inlets would also be required.

The preliminary preferred solution also includes new outfall upgrade and associated channel realignment south of Justine Drive at the outfall channel in Derry Greenway Park that flows into Mimico Creek. The existing outlet headwall will be expanded to accommodate the box culvert and the channel will be expanded and rebuilt. The existing gabion basket retaining wall on the north side of the outlet channel will be reinforced. This solution significantly reduces the potential impacts of flooding to properties in this specific area, minimizes impacts to public parks, lower potential climate change effects, and has a lower overall cost when compared to the other alternatives. Overall, the implementation of the preferred solution would eliminate all homes from being impacted along the walkway during a 100-year storm event.

However, the proposed solution is not intended to address the flooding issue resulted from the regulatory storm which is Hurricane Hazel storm.

Figure 6-2: Preferred Solution – Alternative 1



Map location: X:\Projects\60520028_Malton\Design\01_Reports\2023-09-05\MXD-20230905_PreferredSolution.mxd
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7. Preferred Undertaking – Project Description

7.1 Design Considerations

7.1.1 Storm Sewer and Pedestrian Walkway

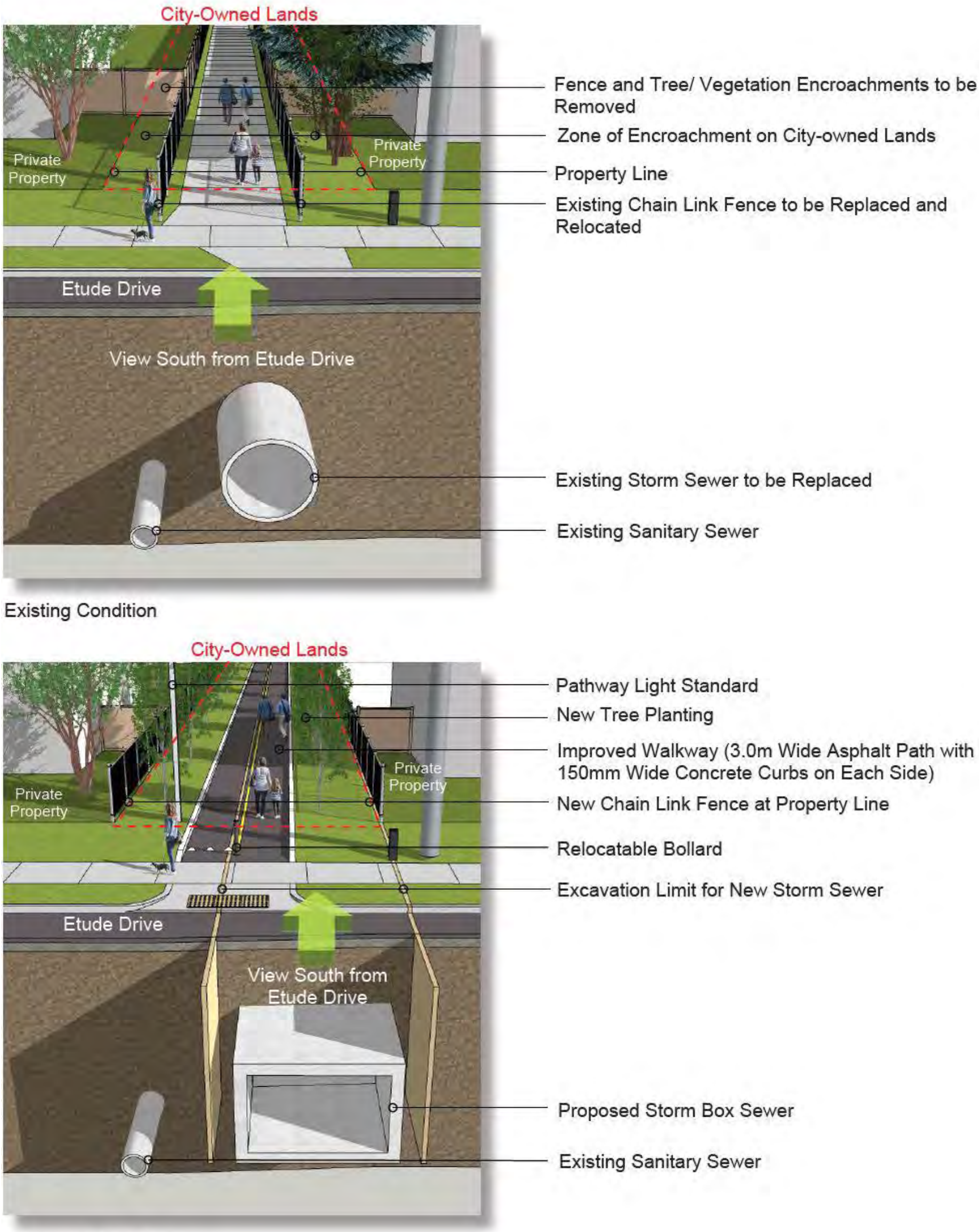
Figure 7-1 details the conceptual renderings of the existing and proposed condition for the storm sewer along the pedestrian walkway. The existing storm sewer will be replaced with a larger new box storm sewer beneath the pedestrian walkway and within the existing municipal property from Etude Drive to Mimico Creek. This will convey more storm flow away from road right of ways and private property to significantly reduce flooding in the area.

Complete re-construction of the pedestrian walkway and relocation of the chain-link fence to the City's property line, which extends beyond the existing chain-link fence, will be undertaken to allow construction of the box storm sewer and allow the City to access and maintain these lands and infrastructure going forward. This means that objects illegally encroaching on City property, such as fences, trees, shrubs, etc. will be removed prior to construction. It is intended that removals would be at the City's expense understanding these encroachments may have been placed by past homeowners.

Best efforts will be made to keep existing trees wherever possible, both along the walkway and within Derry Greenway Park, and new trees and vegetation will be planted for those removed.

There will also be significant improvements to the walkway itself including a more formal and modernized multi-use trail. Safety and accessibility improvements will also be incorporated through different aspects of the walkway such as improved lighting, updated signage, new bollards at road crossings, better sightlines and more. Certain design aspects will help to deter loitering and litter such as avoiding walkway benches and upgraded lighting.

Figure 7-1: Conceptual Renderings – Storm Sewer



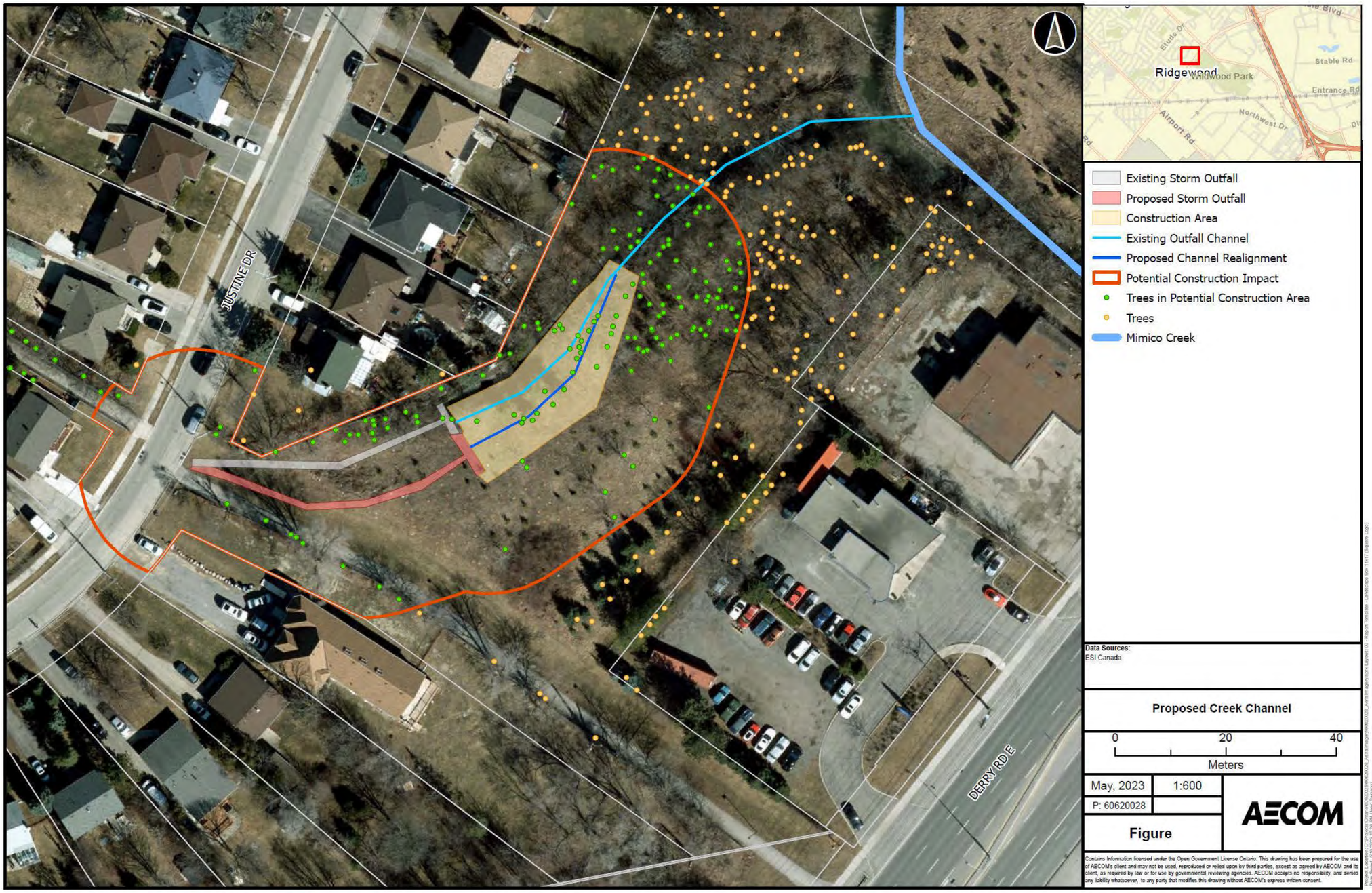
7.1.2 Outlet Upgrades

The preferred solution includes a new, larger outlet structure and channel realignment south of Justine Drive upstream of Mimico Creek in Derry Greenway Park as shown in **Figure 7-2**. The channel design will dissipate flows to minimize downstream erosion. The proposed channel upgrades are not anticipated to cause flooding downstream along Mimico Creek.

The existing outfall will remain in-place while the new outfall is installed beside it, which will lessen construction impacts and disturbances in the area. Efforts will be made to avoid impacting trees and vegetation in the park with new plantings for those that end up requiring removal.

In addition, the existing gabion basket retaining wall on the north side of the outlet channel will be reinforced.

Figure 7-2: Proposed Creek Channel – New Outlet Upgrade



7.1.3 Property and Easement Requirements

There are no property takings associated with the preferred flood mitigation strategy. The pedestrian walkway area, including lands extending beyond the walkways chain-link fence, are City-owned lands and many encroachments exist in this easement such as trees, gardens, sheds, fences, etc. A visual survey was completed (**Figure 7-3**) that shows the encroachments that will be reviewed and confirmed prior to construction through a legal survey.

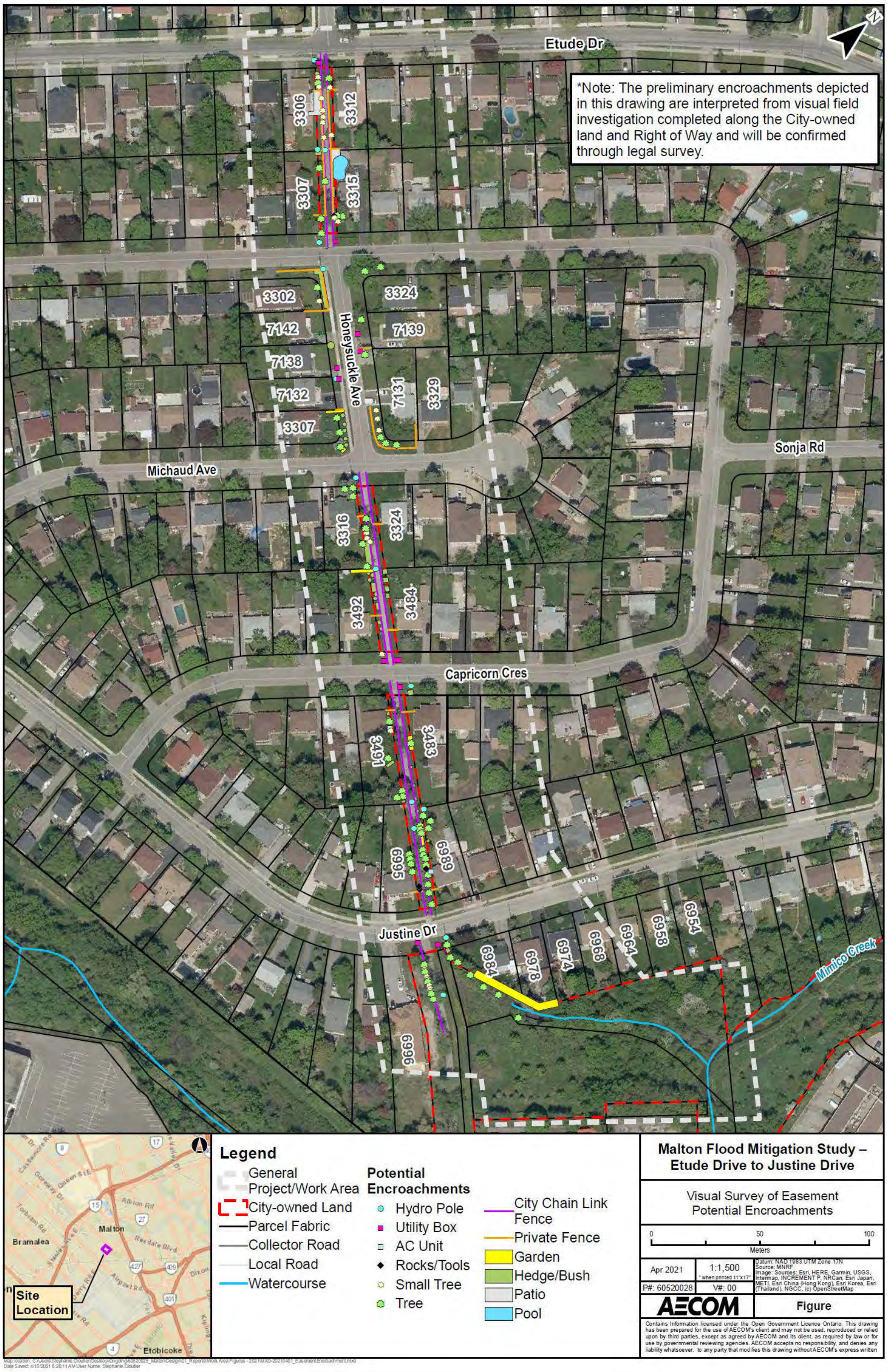
The chain-link fence would be relocated to the City's property line to facilitate the construction of the box storm sewer and allow access and maintenance of these lands and infrastructure.

There may be select locations where access to private properties is required to remove encroachments and adjust the grading around the relocated chain-link fence. This will be reviewed and confirmed during the design phase of the Project.

Encroachments would be permanently removed and not reinstated at the City's expense, unless otherwise agreed upon by the City. This will be completed in order to construct the box culvert within the limits of the City's pedestrian walkway.

Efforts will be made to keep existing trees where possible and new trees/vegetation will be planted for those removed. Refer to **Section 8** for more details on the proposed mitigation measures.

Figure 7-3: Visual Survey of Easement – Potential Encroachments



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7.1.4 Climate Change Considerations

Climate change considerations for the proposed flood mitigation solution include ensuring that the works are designed and built to include resiliency to more extreme storm events. Availability of adequate stormwater storage capacity and conveyance will be incorporated within the storm sewer system to accommodate additional flows during extreme storm events.

In addition, climate mitigation includes reduction of carbon emissions both during and after construction. Considerations include avoiding the idling of construction equipment, and ensure equipment is in good working order to reduce inefficiencies in the operation of the equipment.

Improvements to the City's walkway will also provide enhanced accessibility for the Malton Community and improve overland drainage which reduces localized flooding.

7.2 Cost Estimate

The preliminary estimated cost for the preferred flood mitigation solution is $8.0M in 2023 dollars. The preliminary cost estimate will be reviewed and updated during detailed design.

7.3 Permits and Approvals

The anticipated permits and approvals required prior to construction are summarized in **Table 7-1**. Permitting requirements will be confirmed during the preliminary and detailed design phase of the Project and where required, will require additional consultation with the applicable regulatory agencies.

Table 7-1: Anticipated Permits and Approvals

Permits and Approvals	Timing
■ A Permit to Take Water under the Ontario Water Resources Act (OWRA) may be required. A Permit to Take Water is required for any water takings that exceed 50,000 Litres per day, except for certain water taking activities that have been prescribed by the Water Taking EASR Regulation – Ontario Regulation 63/16. These prescribed water-taking activities require registration in the Environmental Activity and Sector Registry (EASR) instead of a Permit to Take Water.	Detailed Design
■ The preferred flood mitigation solution falls within Toronto and Region Conservation Authority. A permit will be required from Toronto and Region Conservation Authority under Ontario Regulation 166/06 Toronto and Region Conservation Authority: Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses. ■ An area of the Project is within Toronto and Region Conservation Authority regulated area and, therefore, these guidelines for tree data collection and tree compensation apply to this area of the project.	Detailed Design
■ The City is exempt from acquiring tree removal permits under the Private Tree Protection By-Law and the Encroachment By-Law.	Not applicable
■ Submission of a Fisheries and Oceans Canada Request for Review detailing the proposed in-water work is recommended; Fisheries and Oceans Canada will determine whether an Authorization is required based upon the Request for Review. ■ Fisheries Act Authorization may be required due to in-water work and alteration of fish habitat. This will be confirmed during detailed design.	Detailed Design
■ Contravention of the Migratory Birds Convention Act (1994) is not anticipated provided any vegetation removal occurs outside of the breeding bird season (April 1 to August 31). ■ In the unlikely event that a potential nest cavity tree suspected to be used by Pileated Woodpecker (listed on Schedule 1 of the Act) is identified for removal during leaf-off surveys, the nest must be registered on the abandoned nest registry and a permit to remove the nest cavity tree before the designated wait time of three years has passed may be required.	Detailed Design
■ Candidate habitat for Species at Risk bats exists within the Outfall Study Area. Authorization under the ESA for bat SAR is not anticipated provided that limited number of potential cavity trees are removed such the remaining treed habitat continue to provide and function as bat roosting habitat and tree removal occurs outside of the all-inclusive bat active season of March 15 to November 30.	Detailed Design
■ A License to Collect Fish for Scientific Purposes under Ontario Regulation 261/05 will be required for conducting a fish salvage in advance of any in-water work.	Detailed Design
■ There are no permits to be obtained under the Provincial Policy Statement (2020); however, mitigation measures and best management practices will reduce the risk of impacts to Fish and SOCC Habitat and the Significant Valleyland.	Detailed Design

■ The recommended Stage 2 archaeological assessment (and further assessments, as required) should be completed as early as possible during detailed design and prior to any ground disturbing activities.
■ Archaeological concerns have not been addressed until reports have been entered into the Ontario Public Register of Archaeological Reports where those reports recommend that:
  ■ the archaeological assessment of the project area is complete and;
  ■ all archaeological sites identified by the assessment are either of no further cultural heritage value or interest (as per Section 48(3) of the Ontario Heritage Act) or that mitigation of impacts has been accomplished through excavation or an avoidance and protection strategy.
	Detailed Design

■ Parks Access Permit will be required from the City as work is being completed in Derry Greenway Park.	Prior to Commencement of Work
■ A permit will be required for tree removals as per the City's Public Tree Removal By-law.	Detailed Design

7.4 Preliminary Project Schedule

If no issues are raised during the Municipal Class Environmental Assessment phase, the City intends to proceed to complete and finalize the preliminary design and detailed design phases in 2024 and construction may start as soon as 2024, subject to the City's capital budget process and receiving all necessary approvals.

7.5 Additional Studies and Commitments

The following additional commitments and future work should be completed during the preliminary and detailed design phases of the Project:

- Complete a legal survey for the pedestrian walkway and City owned land to confirm and address the encroachments.
- Complete the Stage 2 archaeological assessment (and further assessments, as required) and engage the Indigenous Communities that confirmed their interest in participating.
- Obtain fluvial geomorphic input during the preliminary and detailed design stage for the design of the proposed outfall channel.
- Review and update the tree inventory as needed for the preferred solution based on the detailed design construction footprint.
- Prior to the installation of the proposed works that will alter flow inputs to the outfall channel and East Mimico Creek, a hydraulic analysis should be developed in order to predict proposed velocities compared to existing conditions for various flow conditions. This can be used to assess whether current bed and bank materials will be susceptible to erosion and/or depositional processes due to changes in velocity.
- If trees are proposed to be removed within the FOD7 community, leaf-off cavity tree searches for bat Species at Risk and woodpecker suitable habitat should be completed prior to the start of construction.
- Submission of a Fisheries and Oceans Canada Request for Review based on the aquatic existing conditions field investigations detailing the proposed works and potential effects of the proposed works on fish and fish habitat. Based upon their assessment of the Request for Review, Fisheries and Oceans Canada will determine whether a Fisheries Act Authorization is required for the Project.

- City to consider future opportunities to add rest stops near entries/exits of the Multi-use Pathway to support accessibility and design for all ages and abilities.

In addition to the above, the following identifies the commitments specifically for Toronto and Region Conservation Authority that will be carried forward to be addressed during detailed design:

- Confirm Toronto and Region Conservation Authority permit application requirements under Ontario Regulation 166/06 and compensation requirements related to tree removals.
- Ensure coordination with the Mimico Creek Erosion Control Schedule B Municipal Class Environmental Assessment Study related to impacts to Mimico Creek arising from alternative solutions out-letting into Mimico Creek East Branch just north of Derry Road.
- For works at the watercourse and the channel design, the design will be reviewed by a fluvial geomorphologist and geotechnical engineers.
- Toronto and Region Conservation Authority staff to provide comments on geotechnical studies, as well as future detail designs and plans.
- For the preferred solution, Toronto and Region Conservation Authority recommended that natural channel design options be implemented for the in-water channel reconstruction works and that options be explored to replace the existing failing gabion baskets with alternative bioengineered bank restoration approaches suitable for the natural area, including, but not limited to, soil wraps, log-crib baskets, root wads, and vegetated rock buttresses.
- Review and update the number of tree removals for the preferred solution and explore options to avoid, minimize, and mitigate these impacts. There are potential planting opportunities available in the area close to the project location.
- Develop a detailed Erosion and Sediment Control Plan.

8. Anticipated Environmental Effects and Mitigation Measures

Potential effects related to construction of the preferred flood mitigation solution, including box culvert, upgraded outlet structure and channel, as described in **Section 7,** will be largely limited to the duration and location of construction. Construction is expected to have varied environmental and community impacts. By incorporating proper best management practices and construction techniques, adverse construction related effects can be minimized. In order to address potential effects, the following approach was taken:

- **Avoidance:** The first priority is to prevent the occurrence of negative or adverse environmental effects associated with construction.
- **Mitigation:** Where adverse environmental effects cannot be avoided, it will be necessary to develop appropriate measures to eliminate, or reduce to some degree, the negative effects associated with construction.
- **Compensation:** In situations where appropriate mitigation measures are not available, or significant net adverse effects will remain following the application of mitigation measures, compensation measures may be required to counterbalance the negative effect through replacement in kind, or provision of a substitute or reimbursement.

The existing conditions (**Section 3**) were used as baseline conditions against which changes due to the project (effects) were assessed. Based on the project description for the preferred undertaking (**Section 7**), avoidance measures can be applied in many cases, thereby reducing the extent of potential adverse environmental effects requiring the application of mitigation measures. The potential mitigation and compensation measures summarized below (**Table 8-1** and **Table 8-2**) are recommended to ensure that any short and long-term disturbances are managed efficiently through a variety of measures. These measures will be further confirmed and refined during the preliminary and detailed design phases.

Table 8-1: Potential Construction Related Effects and Mitigation Measures

Indicator	Potential Effects	Potential Mitigation, Compensation
Utilities	■ Potential need to relocate or protect existing utilities and infrastructure	During Preliminary/Detailed Design: ■ All subsurface utilities will be surveyed during the design phase to confirm utilities
Cultural Heritage Environment	■ Impacts to archaeological resources	During Detailed Design: ■ Complete the Stage 2 archaeological assessment as per the recommendations in the Stage 1 Archaeological Assessment Report (**Appendix F**) based on the final construction footprint. ■ 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 an archaeological assessment, in compliance with Section 48(1) of the Ontario Heritage Act. ■ The Funeral, Burial and Cremation Services Act, 2002, S.O. 2002, c.33 requires that any person discovering human remains must cease all activities immediately and notify the police or coroner. If the coroner does not suspect foul play in the disposition of the remains, in accordance with Ontario Regulation 30/11 the coroner shall notify the Registrar, Ontario Ministry of Public and Business Service Delivery, which administers provisions of that Act related to burial sites. In situations where human remains are associated with archaeological resources, the Ministry of Citizenship and Multiculturalism should also be notified (at archaeology@ontario.ca) to ensure that the archaeological site is not subject to unlicensed alterations which would be a contravention of the Ontario Heritage Act.
Air Quality	■ Dust emissions during construction	During Construction: ■ Require contractor to implement provisions for dust control. It is recommended that non-chloride dust suppressants be applied during construction ■ Require contractor to halt work in event that dust emissions are found to be unacceptable
Noise	■ Disruption to adjacent residents, and businesses	During Construction: ■ Use of low noise equipment during construction, where possible ■ Limit construction activity to within Noise Bylaw restrictions
Excess Materials Management	■ Discharge of a contaminant into the natural environment	During Construction: ■ In December 2019, Ministry of the Environment, Conservation and Parks released a new regulation under the Environmental Protection Act, titled “On-Site and Excess Soil Management” (Ontario Regulation 406/19). This regulation is a key step to support proper management of excess soils, ensuring valuable resources don’t go to waste and to provide clear rules on managing and reusing excess soil. New risk-based standards referenced by this regulation help to facilitate local beneficial reuse which in turn will reduce greenhouse gas emissions from soil transportation, while ensuring strong protection of human health and the environment. The new regulation is being phased in over time, with the first phase coming into effect on January 1, 2021 ■ Activities involving the management of excess soil should be completed in accordance with the Ministry of the Environment, Conservation and Parks current guidance document titled “Management of Excess Soil – A Guide for Best Management Practices” (2014) available online (http://www.ontario.ca/document/management-excess-soil-guide-best-management-practices) ■ All waste generated during construction must be disposed of in accordance with ministry requirements.
Erosion and Sedimentation	■ Potential for erosion and sedimentation	During Detailed Design: ■ Develop an Erosion and Sediment Control Plan During Construction: ■ Implement and monitor erosion and sedimentation control strategy ■ Any areas disturbed by construction will be restored and stabilized as soon as practically possible
Control of Inadvertent Spills	■ Potential inadvertent spill of hazardous materials during construction	During Construction, require contractor to: ■ Store all oils, lubricants, fuels and chemicals in secure areas ■ Construction vehicle re-fueling stations should be centralized away (30 metres) from natural areas and watercourses. ■ Develop a Spill Prevention and Management Plan in place prior to construction to reduce the risk of deleterious substance release to water, including a response, reporting, and containment plan. Spill kits should be on site and readily available and include a Spill Action Plan which includes procedures for clean-up, containment, and reporting (Ontario Spills Action Center).
Socio-Economic Environment	■ Disruption to surrounding properties during construction	Prior to Construction: ■ Undertake notification to area residents and businesses, including next steps for the removal of encroachments. A legal survey for the pedestrian walkway and City owned land will be undertaken to confirm and address the encroachments ■ Encroachments would be removed, at the City’s expense, and not reinstated, in order to construct the box culvert, outlet structure and channel. Efforts will be made to keep existing trees where possible and new trees/vegetation will be planted for those removed. During Construction: ■ Minimize construction duration (working days) ■ Affected property owners will be notified in advance (e.g., signage, notices), as to construction schedule/duration ■ General project information and updates will be provided through the City’s website ■ Implement air and noise mitigation measures (see above)

Table 8-2: Natural Environment Mitigation Measures

Indicator	Potential Mitigation, Compensation
Tree Removals and Preservation	During Detailed Design: ■ Review and update the tree inventory based on the final construction impact area, as needed ■ Confirm trees requiring compensation. Based on the larger preliminary tree inventory, Alternative 1 would require a total of 486 on-site replacement trees to compensate for the 289 tree removals based on the City's Public Replacement Chart. Additionally, a total of 1735 replacement trees are required to compensate for the 313 tree removals within the Toronto and Region Conservation Authority regulated area based on the Toronto and Region Conservation Authority's Guideline for Determining Ecosystem Services During Construction: ■ It is recommended that a Certified Arborist be retained during tree removal operations in order to ensure that standardized arboricultural techniques are employed, prior to and during the proposed work activities, and to confirm the need to remove or protect additional trees in proximity to the Impact Area. Additionally, it is recommended that a Certified Arborist return at the conclusion of construction to assess the health of trees that were protected during construction and identify opportunities for mitigation should any trees display signs of stress (i.e., falling limbs, declining health, etc.) ■ It is recommended that a Certified Arborist be retained to regularly monitor the Project's construction activities in order to ensure that all trees that are recommended for protection and retention are being maintained adequately, in relation to standard arboricultural practices. Additionally, no grading, excavation or restoration-related activities are to occur within the TPZ of any protected or retained trees, if it cannot be avoided, without the supervision of a Certified Arborist. Should the limits of the proposed excavation areas change, a Certified Arborist will be retained to review trees with TPZs intersecting new excavation area limits in order to determine whether trees shall be recommended for removal, injury and protection or retention ■ Tree protection recommendations that are further described in the **Arborist Report and Tree Preservation Plan (Appendix D)** includes, among others: ■ Installation of tree protection fencing signage and ground compaction mitigation ■ Clearing of vegetation outside of the breeding bird season (April 1 to August 31) ■ Branch pruning to avoid unnecessary damage to the trees ■ Restricting equipment in the vicinity of the existing TPZ and limiting equipment within the construction limit to minimize root damage ■ Ensuring methods of excavation within TPZ of trees proposed for protection or retention shall include those which cause the least harm to the tree, such as pneumatic or hydraulic excavation. These methods include tools which use high-pressure air or water to remove the soil around the roots without damaging the larger roots ■ Establishing access routes away from the TPZ. The existing grades within the TPZ shall not be disturbed to avoid damage to trees and soil compaction. ■ Any areas disturbed as a result of the proposed works should be re-vegetated or otherwise stabilized once construction is complete through the planting of native trees and herbaceous species. Common milkweed should be included in the proposed seed mix to improve Monarch habitat within the Study Area
Sediment and Erosion Control Fencing	■ Mitigation measures are recommended to be used for erosion and sediment control to prohibit sediment from entering the identified vegetation communities and watercourses during construction. The primary principles associated with sedimentation and erosion protection measures are to: ■ Minimize the duration of soil exposure ■ Retain existing vegetation, where feasible ■ Encourage re-vegetation ■ Divert runoff away from exposed soils ■ Keep runoff velocities low ■ Trap sediment as close to the source as possible ■ Details of the type and placement of sediment and erosion control to be used will be outlined in an Erosion and Sediment Control Plan to be drafted prior to construction
Peripheral Vegetation Protection	■ During construction adjacent to the identified vegetation communities, heavy equipment could damage peripheral vegetation from contact, excavation and/or soil compaction. Dust coated vegetation can reduce photosynthesis, increase susceptibility to disease and lead to death. It is anticipated that perimeter plants would be most susceptible to such effects ■ The following recommendations are made to mitigate these potential impacts: ■ Prior to heavy machinery working adjacent to the identified vegetation communities, a fence barrier for tree protection should be installed outside the drip-line of tree identified for protection and is in the vicinity of exposure to damage by machinery
Dust Suppressant Treatment	■ Dust suppressants during dry periods should be applied to those areas which generate large amounts of dust ■ Restrict earth movement immediately adjacent to woodlands during periods of high dust generation
Controlled Construction Vehicle Access	■ Construction vehicle access should be limited to areas outside of the drip-line of vegetation to be retained to prevent soil compaction and/or the initiation of soil erosion events. The following recommendations are provided to address these potential sources of impacts: ■ Construction vehicle access should be limited to existing roadways and construction paths where possible ■ For areas immediately adjacent to the work limits and vegetation to be retained, periodic supervision of the construction near retained vegetation is recommended to monitor for any incidental intrusions or indirect damage

Indicator	Potential Mitigation, Compensation
Construction Vehicle Re-fueling Stations	■ Re-fueling stations should be located within a centralized location on-site. ■ Re-fueling stations should be constructed in a manner to prevent soil and/or surface and groundwater contamination from any leaks or spills ■ An emergency response kit should be made available at each re-fueling station in case of a spill ■ All on-site crew members operating construction vehicles should be appropriately trained in handling a potential spill and have WHMIS Training ■ All chemical transfer/maintenance should be conducted within the refueling station areas
Damage to Rooting Zones during removals	■ During grading and construction in areas immediately adjacent to trees, roots may be damaged by machinery and soils may be compacted, thereby affecting the trees' ability to grow and absorb nutrients and water. In order to minimize root damage, it will be necessary to prune any exposed roots of adjacent trees during grading and excavation

Wildlife Habitat Protection and Mitigation Measures	■ Construction activities have the potential to disturb breeding birds and other resident wildlife. A certain degree of disturbance can be avoided by the proper scheduling of construction periods. The following mitigation measures are recommended to minimize impacts to wildlife. Upon the first encounter of any wildlife including Species at Risk (Endangered, Threatened or Special Concern) the following steps are to be taken:
	  ■ Work in the immediate vicinity of the observation is to come to a stop
	  ■ If the animal is uninjured, it should be allowed to leave the work zone under its own power and a record made of the observation
	  ■ Should the animal be injured, unearthed or cannot flee the work zone under its own ability, an Ecologist/Biologist should be contacted immediately.
	  ■ Ecologist/Biologist will notify the District Ministry of the Environment, Conservation and Parks Biologist within 48 hours of any observation of Endangered and Threatened species and/or immediately for any species going to a wildlife custodian
	  ■ It is not necessary to notify the District Ministry of the Environment, Conservation and Parks Biologist with observations of Special Concern species (i.e., Snapping Turtle) or general wildlife sightings (i.e., deer, raccoon, etc.)
	■ Wildlife exclusion fencing should be installed prior to April 1 of any year to prevent turtles from accidentally entering the construction work area if construction at the outfall must occur during the active turtle season (April 1 to October 30)
	■ Stockpiles of gravel and sand required for construction should not be placed in areas that are accessible to nesting turtles. If this is not possible, then exclusion fencing around stockpiled gravel and sand should be installed prior to May 1 and maintained until July 30

Breeding Birds and Vegetation Removals	■ It is recommended that all proposed vegetation clearing occur outside of the breeding bird period (i.e. April 1 to August 31) and all that all trees located within the FOD7 community greater than 10 centimetres in Diameter at Breast Height are removed outside of the bat roosting season (March 15 to November 30) to reduce potential impacts to breeding birds and SAR bats within the site limits and avoid contravention of the Migratory Birds Convention Act and Endangered Species Act ■ In the unlikely event that a potentially nest cavity tree for Pileated Woodpecker is identified and removal of this tree cannot be avoided, additional mitigation measures, field studies and permits may be required
Bat Species at Risk and Vegetation Removals	■ Candidate habitat for Species at Risk bats was identified in the Outlet Study Area. Leaf-off cavity tree searches for bat Species at Risk should be completed if tree removal is required within the FOD7 community. ■ Tree removals must occur outside of the bat active season (April 1 to September 30) to minimize effects on bat Species at Risk if confirmed present via Species at Risk targeted surveys (i.e., leaf-off cavity tree search and acoustic monitoring). Authorization under the Endangered Species Act for the removal of confirmed bat Species at Risk habitat may be required depending on the amount of habitat removed and if impacts can be avoided through implementation of additional mitigation measures (e.g., avoiding night time work, tree removal outside of bat active season, designing lights so they point away from retained woodland, installation of artificial roost boxes)
Pileated Woodpecker and Vegetation Removals	■ Leaf-off cavity tree searches for Pileated Woodpecker should be completed if tree removal is required within the FOD7 community. If the presence of Pileated Woodpecker is confirmed through surveys, authorization under the Endangered Species Act will be required for tree removals
Construction Mitigation – Noise Disturbance to Resident Wildlife	■ Limit construction activity to a period after 7 am and before 7 pm daily
In-water Works or Works within the high-water mark	■ Consult with Fisheries and Oceans Canada in the form of a Request for Review submission no later than the 60% detailed design stage to confirm permitting requirements ■ Given the warmwater classification of the Mimico Creek, a warmwater fisheries timing window is anticipated for any in-water work. The typical warmwater timing window does not allow in-water work from March 15 – July 15 (allowable in-water working period of July 16 – March 14); however, this should be confirmed with Toronto and Region Conservation Authority for works within their regulated limits, or otherwise with Ministry of Natural Resources and Forestry and Fisheries and Oceans Canada concurrent with the advancement of detailed design ■ In-water undertakings and activities will be completed during low flow periods, when possible ■ Watercourses will not be forded ■ All equipment fueling and maintenance activities should be controlled to prevent the entry of deleterious substances, including hydrocarbons, grease or other chemicals into any watercourse or Natural Heritage Feature. All refueling and maintenance should be conducted a minimum of 30 meters from any watercourse or site drainage feature ■ Storage of heavy machinery, fuels, portable washrooms and other hazardous material should occur a minimum of 30 metres from any watercourse or site drainage feature

8.1 Proposed Construction Monitoring

Contract tender documents will address mitigation in an explicit manner to ensure that compliance is maintained. The provision of an experienced field representative to review construction will ensure that the works associated with constructing the new box culvert, new upgraded outlet structure and channel follows contract specifications and does not unnecessarily impact the environment and the surrounding community, including property owners along the City's walkway.

8.2 Post-Construction Monitoring

Following construction, the operation of the new larger box storm sewer and new outfall upgrades described in **Section 7** is not expected to result in any negative impacts. Post construction monitoring will be required following construction to ensure that any disturbances have been properly restored (e.g., grading, seeding and planting). Encroachments that are removed at the City's expense will not be reinstated, in order to construct the box culvert, outlet structure and channel. Efforts will be made to keep existing trees where possible and new trees/vegetation will be planted for those removed. Post construction monitoring details will be developed during detailed design.

9. Consultation Summary

9.1 Notifications

9.1.1 Notice of Commencement

The Notice of Commencement was first issued on March 12, 2020 introducing the study and included contact information for the City and Consultant project managers. The following summarizes the methods of notice distribution:

- Posted on the City's project webpage
- Advertised in the Mississauga News on March 12, 2020
- Issued via email to the study's contact list
- Hand delivered to property owners within the general project/work area

Refer to **Appendix H** for a copy of the Notice of Commencement.

9.1.2 Notice of Public Impact Letters

A Notice of Public Impacts letter was mailed out in April 2021 to directly affected property owners. The purpose of the letter was to provide a project update, share preliminary preferred solution concept and identify specific encroachments adjacent to properties, including the City's plan for addressing encroachments. The City requested feedback and many residents provided their thoughtful comments that were reviewed by the study team. Refer to **Appendix H** for a copy of the template of the letter for the potential impacts of storm sewer culvert construction along the walkway.

Residents confirmed their past flooding experiences and expressed support for the solution. Several residents had inquiries and expressed some concerns regarding specific encroachments on the City's property that would be impacted by the Project. Concerns were expressed about loitering and litter and how these would be addressed through the new walkway design. Minimizing tree and vegetation removals and maintenance of the walkway were also important issues for residents. Refer to **Appendix H** for the detailed public correspondence received.

Efforts will be made to keep existing trees and shrubs where possible, and impacted trees will be replaced elsewhere within the City's property if there is adequate space. Other encroachments within the City's property that are removed will not be reinstated. The removal of encroachments will be at the City's expense understanding that encroachments may have been placed by past homeowners.

9.1.3 Notice of Public Information Centre

The Notice of Public Information Centre was first issued on June 14, 2023 inviting anyone with an interest in the study to view online Public Information Centre materials and included contact information for the City and Consultant project managers. The following summarizes the methods of notice distribution:

- Posted on the City's project webpage
- Issued via email to the study's contact list
- Hand delivered to property owners within the general project/work area

Refer to **Appendix H** for a copy of the Notice of Public Information Centre.

9.1.4 Notice of Completion

The Notice of Completion was first issued on February 28, 2024. The notice identified the preferred solution and specified where to access the documentation during the 30-day comment period. The procedure for submitting comments and Section 16 Order requests was also included in the notice, as described in **Section 10** of this report.

The following summarizes the methods of notice distribution:

- Posted on the City's project webpage
- Issued via email to the study's contact list
- Hand delivered to property owners within the general project/work area

Refer to **Appendix H** for a copy of the Notice of Completion.

9.2 Public Information Centre

An online Public Information Centre and comment form was posted to the City's website on June 16, 2023. The Public Information Centre was presented in the format of a narrated video.

The purpose of the online Public Information Centre was to introduce the study, past flooding issues and need for improvements, work completed to date and review the alternatives, including the preliminary preferred solution to mitigate flooding.

The presentation also provided a summary of feedback from residents and how these concerns are being addressed, next steps, and how to stay engaged and provide feedback.

Refer to **Appendix H** for a copy of the Public Information Centre materials. No comment forms were submitted.

9.3 Agency and Stakeholder Consultation

Key agencies and stakeholders were notified and engaged, as needed, over the course of the study. The study's external agency and stakeholder contact list is included in **Appendix I.**

A virtual meeting was held with Toronto and Region Conservation staff on September 10, 2020. The purpose of the meeting was to introduce the study, provide an overview of work completed to date and review the preliminary preferred flood mitigation solution.

A meeting was also held with the Region of Peel on March 22, 2021 to introduce the Project and discuss existing Region infrastructure within the Study Area.

Table 9-1 summarizes the key agency and stakeholder correspondence received by the Study Team and associated responses. Refer to **Appendix I** for the complete record of correspondence.

Table 9-1: Key Agency and Stakeholder Correspondence

Agency / Stakeholder	Date	Summary of Correspondence	Summary of Study Team Response
Hydro One	March 25, 2020; June 19, 2023	■ Indicated that based on preliminary assessment, there are no existing Hydro One Transmission assets in the subject area.	■ Comments noted.
Ministry of Citizenship and Multiculturalism	April 6, 2020	■ Letter summarizing the Ministry of Citizenship and Multiculturalism mandate of conserving Ontario's cultural heritage, which includes: – archaeological resources, including land and marine – built heritage resources, including bridges and monuments – cultural heritage landscapes ■ All technical cultural heritage studies and their recommendations are to be addressed and incorporated into the Environmental assessment project. ■ Requested a copy of any technical cultural heritage studies before issuing a Notice of Completion or commencing any work on the site.	■ A Stage 1 archaeological assessment report and desktop cultural heritage memorandum have been completed. ■ Ministry of Citizenship and Multiculturalism will be provided an opportunity to review the cultural heritage memorandum prior to issuance of the Notice of Completion.
Ministry of Citizenship and Multiculturalism	December 1, 2023	■ Provided comments on the draft Project File: – Our records indicate that the Stage 1 archaeological assessment (under Project Information Form number P123-0462-2020) has been submitted to MCM and is under review. Please clarify the Project Information Form numbers in Section 3.9.1 and Appendix F. – Please note that archaeological concerns have not been addressed until reports have been entered into the Ontario Public Register of Archaeological Reports where those reports recommend that: 1. the archaeological assessment of the project area is complete and; 2. all archaeological sites identified by the assessment are either of no further cultural heritage value or interest (as per Section 48(3) of the Ontario Heritage Act) or that mitigation of impacts has been accomplished through excavation or an avoidance and protection strategy. – Proponents should wait to receive the MCM's review letter indicating that the report(s) has been entered into the Register before issuing a decision or proceeding with any ground disturbing activities. – Proponents should follow the recommendations of the archaeological assessment report(s). MCM recommends that further stages of archaeological assessment (if recommended) be undertaken as early as possible during detailed design and prior to any ground disturbing activities. We note that this is captured in Section 7.5 (Additional Studies and Commitments) and Table 8-1 (Potential Construction Related Effects and Mitigation Measures). – A Cultural Heritage Memorandum – Desktop Review (dated December 14, 2020 and prepared by AECOM) was undertaken and concluded that there is no known or potential built heritage resources and cultural heritage landscapes within or adjacent the Study Area. Therefore, no further technical cultural heritage studies have been undertaken. – The Memorandum also recommends that it be submitted to the City of Mississauga heritage staff.	■ Comments acknowledged and addressed in Project File posted for 30-day review. ■ The Project Information Form number P123-0462-2020 for the Stage 1 archaeological assessment has been confirmed in Section 3.9.1 and Appendix F.
Ministry of the Environment, Conservation and Parks	May 5, 2020	■ Issued the "Areas of Interest" document provides guidance regarding the ministry's interests with respect to the Class Environmental Assessment process. ■ A draft copy of the report should be sent directly to the ministry prior to the filing of the final report.	■ Draft Project File will be circulated to the Ministry of the Environment, Conservation and Parks prior to issuance of the Notice of Completion

Agency / Stakeholder	Date	Summary of Correspondence	Summary of Study Team Response
Ministry of the Environment, Conservation and Parks	November 28, 2023	■ Confirmed that the ministry will provide comments during the 30-day review period.	■ Comment acknowledged.
Toronto and Region Conservation Authority	April 1, 2020	■ Letter summarizing Toronto and Region Conservation Authority areas of interest, assessment of alternatives, submission requirements, and review fees.	■ The Project Team will follow-up with City staff who are leading the Master Plan for Paul Coffey Park to ensure work is coordinated. ■ Toronto and Region Conservation Authority will be kept informed as the study progresses. ■ Meeting was held with Toronto and Region Conservation staff on September 10, 2020. The purpose of the meeting was to introduce the study, provide an overview of work completed to date and review the preliminary preferred flood mitigation solution.
Toronto and Region Conservation Authority	April 6, 2020	■ Note that as the project moves to permitting and implementation the technical input and review gets moved over to the Water Resources Engineering team within Engineering Services.	■ Comments noted. ■ AECOM provided project update on February 2, 2021. ■ PCSWMM models for the project were shared, as requested by Toronto and Region Conservation Authority staff.
Toronto and Region Conservation Authority	June 20, 2023	■ Toronto and Region Conservation Authority staff expressed interest in the Project will provide comments after reviewing the Public Information Centre materials.	■ Comments noted.
Toronto and Region Conservation Authority	August 1, 2023	■ Noted the City of Mississauga has also completed the Mimico Creek Erosion Control Project - a Schedule B Municipal Class Environmental Assessment Study for Mimico Creek East Branch from Etude Drive to Derry Road East and Mimico Creek West Branch at Rena Road that was reviewed by the Toronto and Region Conservation Authority under CFN 62348. Requested coordination for impacts to Mimico Creek arising from alternative solutions out-letting into Mimico Creek East Branch just north of Derry Road. ■ Ensure that geotechnical studies are conducted to inform the design of all proposed works. ■ For works at the watercourse and the channel design, ensure that fluvial geomorphological and geotechnical studies are undertaken to inform the design of the proposed works and are reviewed by fluvial geomorphologist and geotechnical engineers. The channel works and grade alterations will need to be designed so that they remain stable over the long-term. ■ Toronto and Region Conservation Authority staff can provide comments upon submission of all these studies, as well as future detail designs and plans ■ The Alternative Solutions 2-5 all propose storage in Ridgewood Park. Furthermore, the Preferred Solution shows a larger box culvert (3.0 metres span and 1.8 metres height) replacing the existing storm sewer that drains out into Mimico Creek east branch just north of Derry Road. This park area where the culvert outlets into the creek, which is adjacent to Derry Greenway Park, contains portions of the NHS and Mimico Creek. Toronto and Region Conservation Authority recommends that efforts be made to avoid impacts and removals of the Natural Heritage System and lands adjacent to the creek. Please note that an environmental impact study/assessment should be included as part of the Class EA, with the impacts of each alternative solution assessed. Toronto and Region Conservation Authority can provide comments upon submission, as well as future detail designs and additional plans (i.e. restoration plans, erosion and sediment control plans).	■ The Project Team will coordinate impacts with the Mimico Creek Erosion Control Project. ■ Geotechnical work is being undertaken in support of the detail design. In addition, hydrogeology and environmental quality (surplus soil) work is being undertaken and will be incorporated into the detail design. ■ The design will be reviewed by fluvial geomorphologist and geotechnical engineers. ■ Draft Project File will be circulated to the Toronto and Region Conservation Authority staff prior to issuance of the Notice of Completion. The future detail design plans will also be shared when the Environmental Assessment has been completed. ■ A Natural Environment Report has been completed and will be appended to the draft Project File submission that assesses the various alternatives. Inputs from the Natural Environment Report will be used to inform the environmental potential effects evaluation of each alternative in the Project File Report.

Agency / Stakeholder	Date	Summary of Correspondence	Summary of Study Team Response
Toronto and Region Conservation Authority	December 12, 2023	■ Provided comments on the draft Project File. ■ Toronto and Region Conservation Authority staff has no objections to the proposed flood mitigation measures to alleviate the stormwater management issues within the subject neighborhood. Please note that this proposed mitigation measure is not intended to address the flooding issue resulted from the regulatory storm which is Hurricane Hazel storm. As a result this area will remain to be a spill area during Hurricane Hazel storm. ■ Please refer to the comments provided on July 28, 2023 (Appendix C). Staff will provide further comments upon submission of these studies at the detailed design stage. ■ As per the preferred solution, Alternative 1, Toronto and Region Conservation Authority recommends that natural channel design options be implemented for the in-water channel reconstruction works and that options be explored to replace the existing failing gabion baskets with alternative bioengineered bank restoration approaches suitable for the natural area, including, but not limited to, soil wraps, log-crib baskets, root wads, and vegetated rock buttresses. The proponent is encouraged to refer to Toronto and Region Conservation Authority's Channel Modification Design and Submission Requirements for guidance. ■ Proposed tree removals for Alternative 1 as detailed within the Arborist Report and Tree Preservation Plan include all trees within the FOD7 community along the outlet channel and Mimico Creek outlet. However, Figure 3 in Appendix C, Preferred Solution Alternative 1, identifies approximately half of the trees located within the FOD7 community for removal. As noted within the Natural Environment Report, the FOD7 community contains potential bat maternity roost trees. Accordingly, to reduce the impact to the natural system and any other potential removals (e.g. SAR habitat, Ministry of the Environment, Conservation and Parks), please clarify the quantity of tree removals from the FOD7 community and explore options to avoid, minimize, and mitigate these impacts. ■ Alternative 1 proposes impacts and removals to the natural system associated with the Mimico Creek Valley system. As such, please note that Toronto and Region Conservation Authority will require compensation for vegetation removals and full restoration of all disturbed areas. The proponent is encouraged to refer to Toronto and Region Conservation Authority's Guideline for Determining Ecosystem Compensation and Post-Construction Restoration Guidelines for guidance. Toronto and Region Conservation Authority staff to provide review of compensation and restoration plans upon submission. ■ Please note that a detailed Erosion and Sediment Control Plan will be required at detail design. The proponent is encouraged to refer to Toronto and Region Conservation Authority's Erosion and Sediment Control Guide for Urban Construction for guidance. ■ This is for your information only, please note that Toronto and Region Conservation Authority's Erosion Risk Management team has completed the Malton Greenway Sanitary Infrastructure Protection Project in partnership with the Region of Peel at this location at the end of 2021. A 137 metres long vegetated crock buttress was constructed on the left bank to protect adjacent sanitary infrastructure. ■ Please note that there are potential planting opportunities available in the area close to the project location. The trees removed can be compensated and planted in the valley around the project location, please refer to the map below.	■ Confirmed comments dated July 28, 2023 have been previously addressed and provided responses to December 12, 2023 comments (refer to **Appendix I**). ■ Toronto and Region Conservation Authority commitments for detailed design have been added to Section 7.5 of the Project File.

Agency / Stakeholder	Date	Summary of Correspondence	Summary of Study Team Response
Peel Region	July 10, 2023	■ Peel Public Health supports the preliminary preferred solution (Alternative 1), as this option will result in upgrades to the existing pedestrian walkway into a multi-use trail with streetscaping improvements. This pathway provides an alternative route option, which increases the connectivity within the subdivision for pedestrians and cyclists. The proposed streetscaping improvements will make the pathway more accessible, attractive, comfortable and safe, which can encourage more residents to use the path for both recreation and active transportation. ■ Provided additional considerations for the detailed design: – There were some resident concerns related to loitering and litter along the path and a recommendation to not include benches. It is important to note that benches improve the accessibility of a pathway for people of all ages and abilities by providing rest stops, especially for seniors. During the detailed design phase, consider the risks and benefits of benches in this location as well as other streetscaping strategies to address this issue, such as increased lighting, improved sightlines, garbage/recycling receptacles and even the potential effect of increased traffic along the pathway. A well designed streetscape can promote community interaction, improve safety and reduce the incidence of crime. – Consider planting trees in areas where the path would get high sun exposure, in addition to the replacement trees. An expansive tree cover provides shade, enhances the pedestrian experience as well as mitigates the effects of climate change.	■ AECOM's original concept included benches along the trail, but the residents in the area were very resistant to including them as the existing walkway is subject to unwelcome use. Based on these comments the benches were removed, however, other streetscaping strategies are being implemented to improve safety and promote a sense of community ■ Replacement trees along the walkway will be finalized during detail design as it proceeds.
Peel Region	July 26, 2023	■ Peel Region's stormwater management team requested to confirm if there is a hydrology or stormwater management report for the Environmental Assessment	■ A stormwater management report has been developed for this project and will be available with the Project File.
Peel Region	November 17, 2023	■ Public Health would like the City to consider future opportunities to add rest stops near entries/exits of the Multi-use Pathway to support accessibility and design for all ages and abilities.	■ Commitment has been noted (Section 7.5) for the City to consider during detailed design.

9.4 Indigenous Community Consultation

The following Indigenous Communities were notified during this study:

- Mississaugas of the Credit First Nation
- Six Nations of the Grand River (Elected Council)
- Haudenosaunee Development Institute representing the Haudenosaunee Confederacy Chiefs Council
- Huron-Wendat Nation

The above noted Indigenous Communities were circulated on all notifications. No comments have been received to date. The Project Team also shared the draft Project File documentation in advance of distributing the Notice of Completion. Haudenosaunee Development Institute expressed interest in participating in the recommended stage 2 archaeological assessment.

The City will continue to engage with the identified Indigenous Communities if there any substantial changes to the project/process or if applying for subsequent permits from the Ministry of the Environment, Conservation and Parks that may be of interest or concern to the identified communities.

Refer to **Appendix J** for the complete Indigenous Communities consultation record.

10. Public Review of Project File and Next Steps

This Project File comprises the documentation for Schedule B requirements. Placement of the Project File report for public review on the City's website (www.mississauga.ca/malton-flood-mitigation) completes Phase 2 of this Municipal Class Environmental Assessment study. The 30-day comment period commences on **February 28, 2024** and ends on **March 28, 2024**. Interested persons are requested to provide written comments to the study team by **March 28, 2024**. All comments and concerns are requested to be sent directly to the Project Managers listed below.

- **Anthony DiGiandomenico P.Eng.**
  Project Manager
  City of Mississauga
  300 City Centre Drive
  Mississauga, Ontario L5B 3C1
  Telephone: (905) 615-3200, extension 3491
  Email: anthony.digiandomenico@mississauga.ca
- **Derek Gray, P.Eng., A.A.E, I.R.P.**
  Consultant Project Manager
  AECOM Canada Ltd.
  1000-5090 Explorer Drive
  Mississauga, Ontario L4W 4T9
  Email: derek.gray@aecom.com

In addition, a Section 16 Order request may be made to the Ministry of the Environment, Conservation and Parks (or Ministry) for an order requiring a higher level of study (i.e., requiring an individual/comprehensive Environmental Assessment approval before being able to proceed), or that conditions be imposed (e.g., require further studies), only on the grounds that the requested order may prevent, mitigate or remedy adverse impacts on constitutionally protected Aboriginal and treaty rights. Requests on other grounds will not be considered. Requests are to include the requester contact information and full name.

Requests are to specify what kind of order is being requested (request for conditions or a request for an individual/comprehensive environmental assessment), how an order may prevent, mitigate or remedy potential adverse impacts on Aboriginal and treaty rights, and any information in support of the statements in the request. This is to ensure that the Ministry is able to efficiently begin reviewing the request.

The request should be sent in writing or by email by March 28, 2024 to both contacts below with a copy to Anthony DiGiandomenico at the City.

- Minister of the Environment, Conservation and Parks
  Ministry of Environment, Conservation and Parks
  777 Bay Street, 5th Floor
  Toronto, Ontario M7A 2J3
  minister.mecp@ontario.ca
- Director, Environmental Assessment Branch
  Ministry of Environment, Conservation and Parks
  135 St. Clair Avenue West, 1st Floor
  Toronto, Ontario M4V 1P5
  EABDirector@ontario.ca

Please visit the Ministry's website for more information on requests for orders under section 16 of the *Environmental Assessment Act* at: ontario.ca/page/class-environmental-assessments-section-16-order.

All personal information included in the request – such as name, address, telephone number and property location – is collected, under the authority of section 30 of the Environmental Assessment Act and is collected and maintained for the purpose of creating a record that is available to the general public. As this information is collected for the purpose of a public record, the protection of personal information provided in the Freedom of Information and Protection of Privacy Act does not apply (s.37). Personal information submitted is part of a public record that is available to the general public, unless it is requested that personal information remain confidential.

11. Conclusions

This Project File covers the process required to ensure that the preferred flood mitigation solution complies with the *Environmental Assessment Act*. The Municipal Class Environmental Assessment planning process has not identified any significant environmental concerns that cannot be addressed by incorporating best management practices and established mitigation measures during construction.

The proposed works described in **Section 7** involves:

- Replacing the existing storm sewer with a larger box storm sewer beneath the pedestrian walkway and Honeysuckle Avenue within the existing City property, from Etude Drive to the outfall channel and associated restoration.
- Regrading of the walkway for the creation of an overland flow route to safely convey runoff during larger storm events.
- New upgraded outfall and channel realignment south of Justine Drive at the outfall channel in Derry Greenway Park that flows into Mimico Creek. The existing outfall will remain in-place while the new outfall is installed beside it, which will lessen construction impacts and disturbances in the area. The existing gabion basket retaining wall on the north side of the outlet channel will also be reinforced.

The implementation of the preferred flood mitigation solution would eliminate all homes from being impacted along the City's pedestrian walkway during a 100-year storm event.

A preliminary evaluation of potential effects indicates varied environmental impacts that can be addressed by recommended mitigation and compensation measures as identified in **Section 8**. The key impact to the community will be the removal of encroachments along the pedestrian walkway area. Encroachments would be removed, at the City's expense, and not reinstated. Efforts will be made to keep existing trees where possible and new trees/vegetation will be planted for those removed. The City will further engage with affected property owners prior to construction regarding the removal of encroachments.

Subject to receiving Municipal Class Environmental Assessment clearance, the City will complete and finalize the preliminary and detailed design and proceed to construction as soon as 2024, subject to the City's capital budget process and receiving all necessary approvals.